Sci Eng Ethics (2014) 20:947–961
DOI 10.1007/s11948-013-9498-4

ORIGINAL PAPER

Ethicist as Designer: A Pragmatic Approach to Ethics in the Lab

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Received: 1 May 2013 / Accepted: 5 November 2013 / Published online: 20 November 2013

Abstract Contemporary literature investigating the significant impact of technology on our lives leads many to conclude that ethics must be a part of the discussion at an earlier stage in the design process i.e., before a commercial product is developed and introduced. The problem, however, is the question regarding *how* ethics can be incorporated into an earlier stage of technological development and it is this question that we argue has not yet been answered adequately. There is no consensus amongst scholars as to the kind of ethics that should be practiced, nor the individual selected to perform this ethical analysis. One school of thought holds that ethics should have pragmatic value in research and design and that it should be implemented by the (computer) engineers and/or (computer) scientists themselves, while another school of thought holds that ethics need not be so pragmatic. For the latter, the ethical reflection can aim at a variety of goals, and be carried out by an ethicist. None of the approaches resulting from these lines of thinking have been adopted on a wide-scale basis. To that end, the approach presented here is intended to bridge the gap between these schools of thought. It is our contention that ethics ought to be pragmatic and to provide utility for the design process and we maintain that adequate ethical reflection, and all that it entails, ought to be conducted by an ethicist. Thus, we propose a novel role for the ethicist—the ethicist as designer—who subscribes to a pragmatic view of ethics in order to bring ethics into the research and design of artifacts—no matter the stage of development. In this paper we outline the series of steps that a pragmatic value analysis entails: uncovering relevant values, scrutinizing these values and, working towards the translation of

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values into technical content. In conclusion, we present a list of tasks for the ethicist in his/her role as designer on the interdisciplinary team.

Keywords Value-sensitive design · Embedded values · Embedded ethicist · Ethics in the lab · Design for values

Introduction

There is much talk surrounding the incorporation of ethics into the design of technological artifacts among scholars in the philosophy of technology (Brey 2000, 2005; van Wynsberghe 2013; Verbeek 2008), computer ethics (Friedman et al. 2006; Nissenbaum 2001), and design studies (Manders-Huits 2011; Van de Poel forthcoming; Zimmer 2010). Contemporary literature on the significant impact of technology on our lives leads many to conclude that ethics must be a part of the discussion at an earlier stage in the design process i.e., before a commercial product is developed and introduced. The problem, however, is the question regarding *how* ethics can be incorporated into an earlier stage of technological development and it is this question that we maintain has not yet been answered adequately.

There are two predominant schools of thought related to ethics in design. One school of thought incorporates the scientists, designers, engineers, computer scientists and computer engineers. This group of scholars believes that ethics ought to be incorporated into research and design practices and holds a pragmatic view of ethics—that ethics in this arena must facilitate the design process rather than hinder it. Ethical reflection need not be too in-depth and therefore can and should be done by the (computer) engineer and/or (computer) scientist (Flanagan et al. 2005; Friedman et al. 2002; Van de Poel forthcoming). Theories in this school of thought include but are not limited to Value-Sensitive Design (VSD) (Friedman et al. 2002), the embedded values approach (Nissenbaum 2001), and values at play (Flanagan et al. 2005). Critics of these approaches from the ethics domain claim there is insufficient ethical analysis, meaning the normative justification for decisions is not strong enough (Manders-Huits 2011; van de Poel and Kroes forthcoming).

The other school of thought incorporates ethicists, philosophers, sociologists, ethnographers and anthropologists (i.e., scholars from the social sciences). This group of scholars would disagree on both the type and role of ethics as well as who should conduct the ethical reflection. Ethics in the lab for this group of scholars takes place at the same time as the technological research and aims at providing a greater understanding of design processes and lab work for the ethicist (van Gorp and van der Molen 2011). This type of ethics in the lab need not necessarily provide a concrete utility for the engineers but can be broader to incorporate: a general reflection on how engineers identify ethical dilemmas and "ethics-free zones" (Grunwald 2001); how engineers can flourish in their roles (Rabinow 2012); or, how to stimulate reflection on the decision making process be it ethical or otherwise (Fisher 2007). Additionally, the ethical reflection within this school of thought is to be carried out by the ethicists rather than the (computer) engineers and/or (computer) scientists. Approaches of this kind are referred to as "ethics on the lab floor" (van der Burg and Swierstra 2013) or "the embedded ethicist" (van der Burg 2009; van Gorp and van der Molen 2011). Critics of these approaches from the engineering domains fail to see either a systematic process or the utility of such approaches.

Although there is agreement that ethics ought to be incorporated into research and design practices, none of the above approaches have been adopted on a wide-scale basis. To that end, the approach we are presenting here is intended to bridge the gap between these schools of thought. We agree with the engineers that ethics ought to be pragmatic and to provide utility for the design process but we also agree with the social scientists that adequate ethical reflection, and all that it entails, ought to be conducted by an ethicist. Thus, we propose a novel role for the ethicist—the ethicist as designer—a person who subscribes to a pragmatic view of ethics in order to bring ethics into the research and design of artifacts—no matter the stage of development. We begin this paper by addressing the terms "ethics, labs and value" to identify what we mean when we use these terms. We continue on to outline the series of steps that a pragmatic value analysis entails: uncovering relevant values, scrutinizing these values, and then working towards the translation of values into technical content. In conclusion we present a list of tasks for the ethicist in his/her role as a designer within the interdisciplinary team. When ethics is presented as a pragmatic tool it becomes clearer to all parties (e.g., engineers and scientists) that an interdisciplinary approach to their work, which includes ethicists, is valuable.

Of Ethics, Labs, and Value

Ethics

Since we are discussing ethics in a lab setting, what do we mean by the terms "ethics", and "lab"? These terms are not, self-explanatory. In fact, it is partly due to the ambiguity of the term "ethics" that ethicists have been seen as a group of morality police by non-ethicists—telling people what they can and cannot do. The engineer or designer fears this concept of ethics and ethicists, particularly when they are given unwanted direction in their work. To be clear, this is not the conception of ethics held by the authors.

Ethics is about how we should act, as individuals. Often the focus is on living a good life, in both what this means and how it can be achieved. The question "what should I do?" is an ethical question. Different ethical frameworks give different answers: the consequentialist asks one to do whatever provides the best consequences, the deontologist asks one to follow a rule or principle, and the virtue ethicist asks one to do what the "virtuous" person would do. To apply this ideal to technologies, we must ask: "what view of a good life do we have in mind (i.e., what values are we thinking of) when we are creating this technology?" Engineers and designers frequently subscribe to one of these ways of thinking learned through their own personal experiences in the workplace and in life (Akrich 1992; Feng and Feenberg 2008; Van Gorp and van de Poel 2008).

It is important to note that we are now constructing a view of ethics that goes beyond conceptions of ethics as being related solely to issues of safety and sustainability. These issues, in the view of the authors, fall within the domain of ethics committees and other regulating organizations (governmental or otherwise). The view of ethics we are constructing is one in which values are understood in the context of a globalized society, are scrutinized in light of other competing values, and are then translated into the technical content of an artifact.

The Lab

Ethics in the context of "the lab" is about utilizing theories, principles, and concepts *for* something. With this in mind, our specific view of ethics as it applies to technologies is a pragmatic one (Queraltó 2013). It is pragmatic in two senses: (1) For ethics to be successful in the lab we must show that ethics serves a goal or function for the use of the engineers and designers working on a project, and (2) rather than using a specific ethical theory to prescribe design changes, ethics in the lab should elucidate morally relevant features of research to force explicit ethical decisions and value tradeoffs by the designer or the engineer.

"Ethics in the lab" is an unfortunate phrase as it conjures up images of the ethicist dressed in a lab coat and protective goggles to fit in with the scientists calibrating and pipetting. This, however, is not where, or how, ethics is done. Observing scientists and how they work may be one activity among many. For this paper, the ethicist "in the lab" refers to the ethicist having a working knowledge of the goings on in the technical environment. The technical environment refers to a research institute working among natural scientists, computer scientists and engineers, roboticists, designers, etc. The type of work within a research institute varies greatly and covers a variety of goals from fundamental research (i.e., the design and carrying out of controlled experiments in controlled environments for testing concepts) to the application of fundamental research (i.e., the design of experiments to test a theory in semi-controlled environments).

In speaking of the "lab" in this manner, it is not our intention to exclude a business or industrial context. The working environments and the selection and/or prioritization of values will differ, but the role of the ethicist, as we conceive it, will provide a benefit in each of these contexts. The line between these two contexts is not as clear cut as one might assume—business is often a driving force for research endeavours at universities and likewise business settings often have their own "labs" for research related to their company (e.g., Google and/or Facebook, the pharmaceutical companies as well as the energy generating companies). There are also companies and consortiums dedicated to bridging the gap between academic and industrial partners e.g., The COMMIT project of the Netherlands, is the name of a consortium of business and academic partners who come together to share ideas.

Thus, the "ethics of the lab" which we are presenting here is characterized as a pragmatic ethics that is not reduced to one ethical theory or perspective. Additionally, it provides a benefit for the research goals of the design team working in a range of environments from a lab to an office. The next logical question is: what is this benefit? Simply put, we claim that this benefit lies in the making explicit engineers' values and value judgments/trade-offs throughout the design process in order to more consciously integrate values into the design of artifacts. This allows for: the tracking of values throughout the design process to determine whether or not intended values are being realized in context, the tracking of values and value trajectories over time, and the ability to question certain conceptions of a value and/or how values are being traded off. Before we discuss these in detail, we must first make clear what we mean by "value". Below we examine the concept of value to help us understand just what we are asking of our engineers.

Value

A logical starting point for an engineer is to understand what exactly a value is. Simply put, value statements "are statements about whether certain things or a state of affairs is/are good, i.e., valuable, or bad in a certain respect" (Van de Poel 2009, p. 974). It is important, though, that value is not merely reduced to preference. Saying that "I prefer apples to oranges" does not imply that apples are more valuable than oranges. Saying that something is more valuable than something else implies that it *should* be more valuable for others as well.

There are differences among values. There are instrumental, final, extrinsic, and intrinsic values. *Instrumental* value is used to describe something of value that is valued by virtue of it being a means to a final value. Money is the classic example here. We value money because it can be used as a means to procure that which has final value. Money can buy paintings, books, an education, etc. Money on its own is not a final value. It is only valuable as a means to an end.

In contrast to instrumental value is the concept of final value. Final values are those values that are an end in themselves. Happiness, or well-being, is a good example here. We do not value happiness for the sake of anything else—we just value happiness, period. Another example of a final value can be found in the Aristotelian concept of *eudaimonia. Eudaimonia*, meaning human flourishing, which for Aristotle is used to describe the purpose (or *telos*) of a human's life (Aristotle et al. 1998). The way to flourish is to have all the virtues (both moral and intellectual); the main point being that *eudaimonia* is not something valued as a means to happiness but is valued as an end in itself since it is the final goal.

When we discuss artifacts in terms of final values, they can be intrinsically valuable or extrinsically valuable. Intrinsic value for an object is value derived from properties of the object itself, for example, a painting. A painting is valuable because of its physical properties i.e., the way the paint is put on the canvas is beautiful. Extrinsic value, however, is value that is derived from the object's relational properties. Van de Poel (2009) uses the example of sea dykes which protect areas of the Netherlands from flooding to characterize this type of value. The final value in question is safety for the inhabitants, and it is difficult to separate that from the instrumental value of 'preventing flooding'. The artifact was designed for the purpose of safety—and Van de Poel argues that this is an example of an artifact embodying extrinsic final value.

The approach presented in this paper centers on value analysis. If we are to expect values to be taken into consideration during the design process, then the concept of value must be understood by those expected to take it into consideration. The discussion of value here was intended to shed light on how complex the concept of value is. Conceptualizing values in such detail is lacking in current methodologies for incorporating values into the design process (e.g., VSD) (Manders-Huits 2011; Van de Poel forthcoming 2009) but is necessary for understanding the relationship between a certain type of value and a design suggestion or initiative. What's more, it is necessary in order to incorporate values into the design of an artifact.

Incorporating Values into Design

The pragmatic ethics that we propose in this paper involves a value analysis throughout the design process; however, the idea to incorporate values into the design of artifacts is not new. The most well known of the value conscious design approaches is Value-Sensitive Design (VSD) which was developed by computer scientists Batya Friedman and Helen Nissenbaum among others (Friedman et al. 2006; Nissenbaum 2001). The criticisms of VSD and other related approaches center on: the normative foundation for ethical evaluation (Manders-Huits 2011), the lack of clarity surrounding the concept of value and/or embedded value (Van de Poel and Kroes forthcoming), and the lack of understanding of how values are translated into design requirements (Van de Poel forthcoming). Of particular interest is the latest criticism facing VSD: the disconnect between the intended values of engineers and the values realized once the artifact is used in context (Van de Poel and Kroes forthcoming). This work aims to address these criticisms of VSD and to show how one relates to the other, as well as to present a solution for overcoming the criticisms in order to allow for the successful incorporation of value analysis in design.

Value Discovery

With a clear concept of what a value is, we can now investigate which values are relevant to the research at hand. Such an investigation may be referred to as 'value discovery'—uncovering the relevant values for the artifact in question (Flanagan et al. 2005). This is no small task, and requires expertise in areas outside of engineering. Oftentimes values can come from an ethical theory but in many instances values are derived not from a theory but from elsewhere. Values can be found in: the motivation for the project; the designers and engineers themselves; possible users and other stakeholders; and, codes of ethics, standards, laws, etc. (Van de Poel 2009). As an example, computer scientists working on the design and analysis of computer systems value internet security above all else. This value is not derived from ethics or ethical theory. Instead the value is conceived of in consequentialist terms i.e., all programming must result in consequences that support the value of internet security.

Furthermore, values can be found within different realms of engineering and design. There are aesthetic values, moral values, economic values, engineering values, etc. (ibid). Sometimes these realms are not always relevant to the design team, e.g., research at a university may not need to consider economic values because their intention is not to produce a commercially available product. This logic is also often used to claim that moral and aesthetic values are not important for research and design at the university level. Again, researchers are not making a commercial product and therefore are not required to consider the moral impact on society at large. However, during the research and design of any new technology it has been argued that there are *always* intended future uses as well as users (Akrich 1992)—this is inherent to design and is called a *use plan* (Houkes et al. 2002). Even when the researcher does not intend to make a commercial product, their design parameters (e.g., algorithm used) imply a certain future use. This is precisely the reason for creating companies and/or consortiums to bring together research with industry. In other words, the gap between research and commercially available products is narrowing. Therefore, moral values are *always* relevant to the design process.

Which moral values though? The computer ethics approach of VSD would have us using surveys and interviewing stakeholders and future users to get an understanding of what is valued by the relevant parties involved. While this is a popular practice, Manders-Huits (2011) correctly identifies a tendency to commit the naturalistic fallacy here. By discovering what *is* valued according to stakeholders, they turn this into what *ought* to be valued. It is for this reason that the ethicist is incredibly important to assist the engineer. One job of the ethicist is to broaden the scope of the debate; to discover values that have not been considered by the relevant stakeholders but nonetheless *should* be considered. Sustainability was one such value which was not valued by stakeholders in the past and was therefore not considered in the design process. Following the involvement of environmental ethicists (amongst others), the goal of sustainability is now ubiquitous. The example of sustainability demonstrates that taking stakeholder values as the normative criteria fails to capture a range of other ethically relevant values.

Another job of the ethicist is to scrutinize the values intended by the engineer and/or design team. Not only may there be values intended which *should not* be incorporated into the design, but there may be values which are given too much or not enough priority—causing unfavorable value trade-offs. For example, when Google released its social network Google Buzz, they incorrectly placed a high priority on the value of 'ease-of-use' by using contacts in Gmail (Google's email service) to automatically create a user's social network (Helft 2010). They either forgot the value of privacy altogether or did not give it the priority it *should* have had. This ultimately resulted in the complete failure of Google Buzz.

In short, discovering values refers to the uncovering of values important for: the motivation of the project, the designers and engineers themselves, possible users and other stakeholders; codes of ethics; standards; laws, etc. Value discovery must be accompanied by an ethical critique of said values to ensure that the values themselves are relevant for the research in question and that the list is comprehensive. This need for scrutinizing values from an ethics perspective is another reason why the ethicist is most suitable for the role of value analyst. This step allows us to begin the process of translating the values of ethical importance into the design requirements of a technology.

Conceptualizing Values

Once the values relevant for the research project have been properly discovered and scrutinized, these values take shape as the 'intended' values. Intended values are those values that the design team wishes to be embedded into the technology (Van de Poel and Kroes forthcoming). While this might sound like a straightforward task it is quite difficult in practice. To begin, it must be made clear that along with an intended value there is an intended use and an intended context. Thus, the intended value is only realized when the artifact is used in its intended manner in its intended context of use. By making these aspects of the value clear and explicit, the engineer is forming a conceptualization of the value that allows for its translation into specific design requirements.

Although an artifact is almost always designed with an intended context and use in mind, artifacts are often used outside of those parameters in unintended ways or in unintended contexts, resulting in novel values, or alternatively a lack of values, being realized. Microwave technology, for example, was originally intended for the military domain. Its universal applicability for commercial and domestic purposes has made it one of the most popular kitchen appliances in the kitchens of developed countries. In its original context it (then referred to as a magnetron—a tube that produces microwaves) was intended for the detection of Nazi war planes on their way to bomb the British Isles during World War II. This realized the military value of security by offering protection from enemy attacks. Decades later, the technology became a staple in individual homes promoting an entirely new set of values—autonomy of family members, personal preferences etc. In short, the same technology used in differing contexts has the potential to realize entirely different values.

Alternatively, when an artifact is used in its intended context but in an unintended manner it may result in the realization of different values. For example, social networking sites used for the collection and distribution of research data rather than for the sole purpose of social networking may result in the discrimination of individuals (Zimmer 2010).

Consider the T3 Facebook project ("Tastes, Ties and Time"). Facebook researchers collected the data of 1,640 individuals over the course of 4 years. The data was anonymized to a certain degree to protect the privacy of individuals and then released for sociological research purposes. The initial release of data in 2008 revealed how mistaken researchers were in their conceptualization of privacy and thus how their attempts failed to protect the anonymity and privacy of the users' data. The consequences of this oversight exposed subjects' personal affiliations or sexual orientations and left certain subjects facing potential discrimination (Zimmer 2010). Thus, not only is it important to make explicit the intended values, and to scrutinize these values, it is of equal importance to have a detailed and thorough conceptualization of the values as they pertain to the particular context of use.

With these examples in mind one might insist on adopting the precautionary principle restricting the development and/or use of said artifacts; however, that is not always possible nor is it desirable in all instances. Still, it is not fair to blame designers for the consequences of a technology when they had not intended the artifact to be used in a particular way or in a particular context. The results of the T3 project highlight significant aspects for researchers and ethicists alike, namely that uncovering intended values and making them explicit allows researchers and ethicists to track the expression of values through the use of technologies along with the tracking of value trajectories over time (e.g., how the value of privacy evolves with the creation of new technologies like social networking sites).

At this point, it is evident that it is far from enough to just *intend* values to be a part of the technology; these values must be scrutinized and then translated into design requirements. This poses two problems for our engineer: firstly, how can one translate abstract values like privacy into design requirements? And, secondly, what does one do if these values conflict with each other? To be sure, the answers to these questions are not straightforward. There is no generally accepted answer to either question, and the answers offered in the literature all have their downsides.

Value Translation

To answer the first question posed above, let us first make clear the relationship between a value and a norm in a design process—abstract values like privacy or justice have to be translated into contextual norms which are then translated into design/technical requirements (Van de Poel forthcoming). Van de Poel discusses animal welfare with regard to chicken husbandry systems as an example of this: the abstract value of animal welfare is understood as the chicken's need for space, laying eggs in the nest, and the ability to perch. With these norms it is then possible to specify the design requirements of a chicken husbandry system (e.g., in terms of the actual measurements constituting enough "space" for the chicken to have). The translation of the value of animal welfare into norms is a necessary step towards the creation of design/technical requirements.

Using a contemporary example, we can see how translation fails in practice. Mark Zuckerberg, the founder of Facebook, has stirred a debate with his translation of privacy into design requirements. Mr. Zuckerberg understands the norms surrounding the value of privacy to have changed significantly (van Buskirk 2010). Mr. Zuckerberg says that—"we decided that these would be the social norms now, and we just went for it" (Johnson and Vegas 2010). The norm regarding privacy—to Mr. Zuckerberg—is that there "is no norm". This understanding of the norms surrounding privacy allows him to change the privacy settings of 350 million people at once—defaulting all status updates to 'public'.

Even if Mr. Zuckerberg had correctly understood the norms surrounding the value of privacy according to the users of Facebook, he mistakenly looks only to one source for such a translation; namely, certain users of online social network sites. The value of privacy, however, is a much discussed topic by philosophers (Moore 2008; Nissenbaum 2009; Smith et al. 1996; Zimmer 2010), lawyers, legislators, etc. Not only is Mr. Zuckerberg leaving out possible relevant stakeholders, but he is leaving out other sources for identification of the relevant norms (e.g., philosophy, computer ethics, or the law).

Accordingly, we must *correctly* translate values into contemporary norms if we are to successfully create design requirements around those norms. Understanding contemporary norms surrounding values like privacy is difficult and requires in-depth ethical analysis. After a conceptualization of the abstract value is made (as discussed in the previous section), an understanding of what the current norms are surrounding that conceptualization for the relevant stakeholders (as in VSD) is just one part of the translation of values into norms. A literature review on ethical discussions regarding the value, as well as the value in regard to the context at hand is also necessary. This will allow an evaluation of the norms found through the relevant stakeholders.

Such an analysis would most likely produce different norms regarding the value of ‘privacy’ than Mr. Zuckerberg’s norm. Indeed, the reaction his privacy changes caused suggests that while people might be more willing to share information publicly, the public does not disregard the value of privacy altogether. A proper analysis may have resulted in an “opt-in” design requirement in which users might opt-into sharing status updates publicly.

This example also shows the distinction between *intended* and *realized* values (forthcoming). The shortcut taken by Mr. Zuckerberg implies that he thought it was enough simply to *intend* for the value of privacy to be a part of Facebook. Ignoring the realities of context and without doing a thorough search for norms surrounding the value at hand severely impedes the possibility that the value will be *realized* in practice.

The purpose of sharing this example is to show that there is complex and difficult work to be done if we are to effectively translate values into design requirements. When we take shortcuts (e.g., by not looking in all of the relevant places for norms surrounding a value) there can be serious consequences—both for the values at stake, and for the technology being produced (e.g., people leaving Facebook for a competing product which is seen to respect the value of privacy).

Value Trade-Offs

Perhaps Mr. Zuckerberg does not really believe that a need for privacy is over. Perhaps privacy simply conflicts with another value that he wants to embed into Facebook, and privacy just was not valued *as much* as the other value. This is what is known as a value trade-off. There are many types of values that must be considered. Aesthetic, economic, ethical, etc. are all important in design (Van de Poel 2009). Often those values conflict: the aesthetic value of using gold as a design material may conflict with its economic value if it becomes too expensive for users to buy.

Mr. Zuckerberg juggles such values as well. Arguably the most important value he must consider is economic value. Being a publicly traded company, he must answer to his shareholders regarding the profits Facebook makes. This economic value of Facebook is a result of the public information that users generate which is sold to advertisers. Here we can see a conflict between economic value and the value of privacy. Respecting the value of privacy (perhaps by defaulting all status updates to ‘private’) would generate less public information to sell, and therefore would result in less profits.

The process of translating values into design requirements is called *specification*. There are usually multiple ways of specifying values into design requirements—each with their own value judgments and trade-offs (Van de Poel forthcoming, pp. 8–9). Retrospectively, we can criticize and evaluate design requirements by showing that with these requirements come the aforementioned value judgments and trade-offs (as we did with Mr. Zuckerberg). Prospectively we can weigh different possible design requirements based on the value judgments embedded into them.

Engineer as Ethicist?

Although some scholars argue in favor of the engineer as ethicist (Flanagan et al. 2005; Friedman et al. 2002, 2006; Grunwald 2001; Van de Poel and Kroes forthcoming; Van de Poel forthcoming), namely that the engineer engage in and be responsible for value analysis, we can see that the engineer is faced with quite a daunting task when *value analysis* is understood in its totality as we have done in the previous sections. We maintain that a proper value analysis requires value discovery, scrutinizing values, value conceptualization and value translation. Just as an engineer should not be responsible for understanding the relevant economic factors of their project—the job of the business manager—we claim that they likewise should not be entirely responsible for understanding the relevant moral values at stake—that is the job of the ethicist.

Why leave this to the ethicist and not train the engineer to do ethics on his/her own? Firstly, we believe it is not possible to suggest that the ethicist will learn enough about engineering or about a product to become an expert like the engineer/scientist. In the same vein we believe it is not possible to provide minimal education to the engineer and expect that they may provide a substantial ethical evaluation in the same way as the ethicist who has been trained to do so for years. To say that either the ethicist can do engineering with minimal instruction or the engineer can do ethics with minimal instruction would be an undervaluing of either/both disciplines. Secondly, the skills necessary for ethical analysis are not necessarily transferable from one project to another for the engineer whereas this is precisely the kind of training the ethicist will have.

Design is a process achieved by a team of people. There are business managers understanding and advocating for economic value, there are engineers understanding and advocating for engineering values (e.g., efficiency and speed), there are marketers and graphic designers advocating for aesthetic values, and finally there *should be* ethicists advocating for ethical and moral values in a skilled manner. Below we conceptualize the ethicist *as a member* of the design team.

Ethicist as Designer

In this paper we have argued in favor of a pragmatic ethics in the lab, one of value to the design team in the creation of a technical artifact. We have also made clear that the lab context to which we are referring may be the research environment of an academic institute or may also refer to a business environment in which the creation refers to the design of a commercially available product. We believe that fulfilling value analysis (as described in the previous sections) as it relates to design is a function of the role of the ethicist. What's more, this is precisely the pragmatic value that the ethicist brings to the team. Thus, we claim that truly interdisciplinary work ought to include an ethicist as a collaborating member of the team. In short, the ethicist as designer.

Ethics, in both of the instances mentioned above, is aimed at designing artifacts in conjunction with value analysis. 'Conjunction' of ethics and design here may be distinguished from parallel ethics and embedded ethics. In the case of parallel and embedded ethics the ethicist identifies ethical issues in the research and development of an artifact or product but both the ethical and technological projects remain separate entities (Van Gorp and van der Molen 2011). Thus, there is cooperation between the two domains but the ethicist is more concerned with understanding the process than with contributing to the final product. Conjunction may be defined as the act of joining or the condition of being joined. Therefore, our position argues that ethics and design be joined. Ethicist as designer demands that the ethicist work as a member of the design team such that the ethical reflection becomes incorporated into the product. Thus, there is collaboration between the two domains and the ethicist is just as concerned with understanding the process as with designing a product that incorporates ethical reflection into its design process.

With this in mind, the question then reverts to what is it exactly that the ethicist must do in his/her role as designer? Based on the overview presented above which describes in detail what is involved in a pragmatic value analysis, we summarize the following tasks of the ethicist: (1) value discovery, and (2) translating values into design requirements. These tasks, however, can be further divided into subtasks in order to accomplish the range of goals pertaining to each.

1 Value Discovery

   a making explicit the intended values as conceived by engineers and designers,
   b scrutinizing these values by illustrating value conflicts and trade-offs,
   c comparing intended values with the ethics literature

2 Translating Values into Design Requirements

   a value conceptualization
   b describing the disconnect between intended and realized values by speculating unintended uses and contexts of the artifact
   c exploring the translation/specification of values into design requirements.

While we can say that the start of the value analysis begins with value discovery, the remaining tasks and subtasks listed occur in an iterative fashion. Thus, there is no definitive start or end point for any of the tasks. In other words, values will still need to be critiqued during value translation. This is not to say that value discovery cannot also be iterative. For example, at certain moments throughout the design process design choices are made that introduce new values into the mix that need to be identified. It is also important that the ethicist remains open to new values and value conflicts.

The pragmatic approach we have been arguing in favor of is also pragmatic in the sense that the ethical theory or values to deliberate reveal themselves in the reflective process. The theory or values of interest will be dependent on the stage of development, the type of product being developed, the context-of-use, and the design team goals. Thus, contrary to the suggestion of Manders-Huits and Zimmer (2009, p. 41) that a normative foundation be decided upon before engaging in a value analysis, we are not taking a stand on which ethical framework *should* be used by ethicists working with engineers and designers. This, in the opinion of the authors, would detract from one of the primary values of the ethicist: to provide alternative viewpoints for designers to consider. An engineer or designer may argue, for example, that their research will be better for a greater number of people than the status quo—a utilitarian perspective. The ethicist might point out that the minority of people not covered by the engineer's research might argue that they have a *right* to a certain value (e.g., privacy, anonymity, etc.)—a deontologist perspective. By showing another ethical perspective, the engineer or designer is forced to make a choice between two or more perspectives.

Conclusion

This paper seeks to argue in favor of pragmatic ethical analysis in conjunction with the design of an artifact. Furthermore, the aim is to outline the variety of tasks of the pragmatic ethicist in a research context. The next step will be to implement this approach to reveal the benefits for engineers, scientists and designers. This is the subject of current ongoing work intended to be disseminated in future publications.

The crux of our argument rests on the assumption that when we ethicists and philosophers understand the value of ethics in the design process we are discussing a certain type of, or conception of, value. Alternatively, engineers and designers in the lab hold a different conception of the concept of value. In the former, 'value' is something intrinsic—thus ethics has value in its own right. In the second instance, 'value' is instrumental in the sense that it is pragmatic and thus ethics has value insofar as it is *for* something. Consequently, in order to be taken seriously by engineers and designers, we, the ethicists, (Van der Burg and van Gorp 2005) must show that ethics today embodies pragmatic value in order for us to make a contribution.

As shown in this paper, this task is neither small nor easy. Having an engineer do this work is asking too much. There are people who do have the skills necessary for such tasks: ethicists. The value that an ethicist adds is not simply value in the abstract philosophical sense, but value in the pragmatic sense. To be clear, this does not make the ethicist the scapegoat for decisions made—the engineer must be made to understand the impact of design choices. Thus, responsibility is shared amongst all.

The analysis of values in this paper is meant as an educational tool for future ethicists working in the field of technology and engineering but it is also meant as an educational tool for engineers. For the former, the list of tasks presented here act as a guide for future ethicists entering a research context to engage in value analysis. For the latter, the goal is to sketch a specific kind of ethics and how it may be of use for the work of engineers. In either instance, the analysis and prescribed list of tasks can be incorporated into an engineering and/or an ethics curriculum.

Ethics, presented in a pragmatically valuable way, will break down the barrier that exists between engineers and ethics. Ethics solely conceived of as a burden which gets in the way of their (engineers and designers) practical and important research which may or may not help society in some abstract way will never get the support it needs to truly become incorporated into the design of technological artifacts. Showing that ethics, and the role of the ethicist, is pragmatically valuable to the engineers themselves—as well as to the research project—is an important step to the significant goal of incorporating ethics into design.

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