Preparing for Ethical Judgment in Techno-Anthropology, Techno-Science and Engineering

T. Børsen[1]
Associate Professor
Department of Learning and Philosophy, Aalborg University
Copenhagen, Denmark
tom@learning.aau.dk

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INTRODUCTION

In September 2011 the first students enrolled at Aalborg University's new bachelor program in Techno-Anthropology (TAN), and a Master's program in TAN began in September 2012.

The TAN programs are interdisciplinary as they couple technological understanding with anthropological and ethical analysis. Hence, photos of a bridge are often used to illustrate TAN's central idea: bridging humans and technologies. The title, Techno-Anthropology, reflects this idea: "Techno" refers to technology, and "anthropology" can be defined as the science of humankind, i.e. an intellectual activity that "tries to achieve an understanding of culture, society and humanity through detailed studies of local life, supplemented by comparison" [1]. The words "techno" and "anthropology" are combined in techno-anthropology by a hyphen to underscore the bridge-building metaphor.

Ethics enters techno-anthropology from both sides. Values, normative orientations and power-relations entangle technology [2]. Humans develop, design, and use technology, and in doing so they are explicitly guided by or tacitly influenced by values and normative positions. Ethical reflections and judgments critically discuss and justify or reject those normative aspects of technological development, design and use. Anthropology extracts general insight regarding humankind from a number of particular studies of human practices. Anthropology illuminates how technology influences humans as well humankind, and such studies qualify ethical assessments of technology. Hence, techno-anthropological ethics identifies, reflects on and

[1] Corresponding Author
T. Børsen
tom@learning.aau.dk

evaluates normative aspects of the human–technology interface and use technological and anthropological research results as input, as it draws in to analyses both human influences on technology and technological impacts on humans and humankind in his ethical assessments.

This paper portrays the design of the ethics teaching at the TAN BSc study-program (University of Aalborg, Denmark), and proposes that the undertaken approach to techno-science and engineering ethics education can be transferred to other educational programs in science, engineering and technology. It first presents the overall idea behind the ethics teaching at TAN by showing and exemplifying how ethical judgment transfers into social responsibility competences. In the second part of the paper the introductory course in techno-anthropological ethics is presented, and an educational tool to support the development social responsibility competences is set up.

1 SOCIAL RESPONSIBILITY COMPETENCIES

Social responsibility competencies are closely related to ethical judgment of existing, new, emerging or potential technologies. Following Børsen [3] a scientist, engineer or techno-anthropologist masters social responsibility competencies if he or she is able to decide whether a specific technological or techno-scientific project is compatible with his or her ethical judgment. To make an ethical judgment means that one takes an ethical grounded decision to continue or abandon a technological or techno-scientific project, and specifies under which assumptions and circumstances the judgment holds. Of course the premises underpinning the ethical judgment must be well-researched and grounded.

Often a concrete technological or techno-scientific project is ethically ambivalent. This means that different ethical norms support or speak against different aspects of the project. Such a situation expresses an ethical dilemma. An ethical dilemma is difficult to resolve because regardless of what one decides, good arguments can be raised against the decision. This does not mean, however that any choice of judgment can be ethical:

1. If one makes two different judgments in two similar situations one must be able to point to an ethically significant difference between the two situations.
2. On a certain level of abstraction ethical judgments need to treat everyone alike. If I have a right for autonomy, everybody have that right, unless one can point to an ethical significant difference.
3. One should also be willing to follow an ethical judgment, e.g. to leave or try to change an unethical project.

Social responsibility starts with the ability to identify ethical dilemmas inherent in existing, new, emergent or potential technologies. Social responsibility also calls for the formation of ethical value systems that can be used to make ethical judgments about situated techno-scientific and technological projects by comparing them to ethical orientation systems. This is a reciprocal activity, as technological and techno-scientific projects and ethical value systems interact: Not all situations activate the same ethical principles, and sometimes the value-system is not prepared for a revolutionary new technology. Knowledge about the specific contextual elements surrounding a specific technological or techno-scientific project is important for the ethical judgment. Social responsibility competences are also about identifying appropriate reactions to situations where an ethical judgment shows that a technological or techno-scientific project violates an ethical orientation system. This endeavour is not only about forecasting and evaluating potential or likely

consequences of a project. It is also about not over-selling forecasting scenarios by presenting them as more certain than they actually are or over-emphasizing uncertainty and thereby delaying preventive efforts.

1.1 The Case of Sir Joseph Rotblat

The Manhattan project, especially Sir Joseph Rotblat's role in it, has gain exemplary status representing the essence of social responsibility of scientists, engineers and technical experts. In 1938 Rotblat worked at the Radiological Laboratory in Warzaw, where he realized that the fission of uranium could result in an explosion of unprecedented power. While delving into pure research his mind could not leave the issue. His ethical orientation system dictated him that "science should be used in the service of mankind" [4]. He feared that German scientists would develop such a devise, and that Nazis would not hesitate to use it. In 1939 Rotblat moved to England to work for James Chadwick in Liverpool while the matter still haunted him. Rotblat convinced himself "that the only way to stop the Germans from using [the nuclear bomb] would be if we too had the bomb and threatened to retaliate." [4].

Rotblat was allowed by Chadwick to set up a team of scientists that would investigate the nuclear bomb's feasibility. The feasibility was confirmed thought Britain alone was unable to realize it. Hence, Rotblat was send to Los Alamos to work on the US nuclear bomb project also known as the Manhattan project.

In March 1944 Rotblat overheard General Leslie Groves state that the real purpose of making a nuclear bomb was to gain advantage over the Soviets when the war had ended. Until then he was told that his and his colleagues' work was carried out to prevent a Nazi victory. Later in 1944, when it became evident that the Germans had abandoned their nuclear bomb project, Rotblat asked for permission to return to Britain, even though the authorities tried to harass him into staying. The premises for joining the Manhattan project had changed.

Many had joined the Manhattan project for the same reasons as Rotblat, but no one else left the project. Why? Rotblat identifies four reasons:

1. It was, in the words of Robert Oppenheimer who lead the Manhattan project, a technically sweet project.
2. The project had to continue as a US nuclear devise would potentially save lives of American soldiers, and end the war earlier than if the bomb was not developed.
3. Still others did not wish to leave the project as it might damage their carrier.
4. The majority was content with others deciding how their work would be used. They were happy to follow orders, and leave moral decisions to others.

The first three reasons, and especially the second, might ethically legitimize continued involvement. The fourth point hints that individual social responsibility was, and still is, not very predominant in science, engineering and technology.

The social responsibility category is not only relevant for individual researchers. Members of technological development and/or design groups can also act socially responsible, and so can decision-makers and even users or technology as they can do an ethical judgment regarding a technology at hand and act upon it. Of course what counts as an appropriate action will vary from occupation to occupation.

Social responsibility is not restricted to individuals. Also an organization can aim for social responsibility. Corporate Social Responsibility (CSR) can be perceived as the company's obligation to make ethical judgments over core activities, including their use, design and development of technology.

Social responsibility is especially relevant for scientists, engineers and techno-anthropologists because many of them are expected to join teams that design and develop new technology. Techno-anthropologists are even taught to research into how technology affects humans and humankind. If a techno-anthropologist had been asked to assess the Manhattan project he/she might have included in his/her ethical assessment the long term fears of nuclear cataclysms that heavily affected e.g. the authors in the 70'ies and 80'ies.

One can argue that natural scientists and engineers also need the techno-anthropological ability to incorporate assessments of how an existing, new, emerging or potential technology can influence human culture or biology.

2 TECHNO-ANTHROPOLOGICAL ETHICS

One of the central competences that the TAN study-programs attempt to develop among the students is social responsibility competence. On the TAN bachelor program this takes place primarily at the second semester which includes a course module in technology ethics and an inter-disciplinary project work done in groups that combines new and emerging technologies with ethical reflections. On the course module the students must build up his or her ethical judgment tool, which must be applied in the project module where the students need to link technological innovation and ethical judgment. In the following text the author presents one such tool, which also is navigation mechanism in the course curriculum.

The introductory ethics course module has run two times. Formal evaluations show that the students generally appreciate the course and find ethical reasoning and social responsibility competences important and interesting. Evaluations also suggest that students find it difficult to navigate in course's ethical readings. The following section provides the reader with a rough navigation guide by presenting an ethical tool to carry out ethical judgment.

2.1 Analytical tool and theoretical approach

During the second semester the techno-anthropology student will have to learn to identify ethical dilemmas related to existing, new, emerging and potential technologies, and to make an appropriate ethical judgment that either decides, transcends or resolves (some of) the dilemmas entangled in the technology.

An ethical dilemma is defined as:

- A conflict of ethical norms; several ethical value systems in collision

Ethical judgment has to do with balancing ethical norms that supports the development of an existing, new, emerging or potential technology with ethical norms that count against doing that.

The notion of ethical judgment is theoretically based on several pillars, one being Aristotle who in his Nichomachean Ethics [5] distinguishes between five intellectual virtues: Epistéme, Techné, Phronesis, Nous, and Sophia. The ethical judgment is based especially on the virtue of Phronesis, meaning that it is not defined as a universal and definitive solution to a certain dilemma, but as

- A decision on how to resolve an ethical dilemma that is particulate, related to context and always temporary
- It is based on experience, tacit knowledge and a wide array of insights, so it can never be universal.
- The decision is never fully disclosed; there will always be more to be said.

A number of ethicists are introduced during the course, with the purpose of introducing ethical norms and in that way the course tries to help the students to identify ethical dilemmas.

The author suggests that a potential starting point to identification of ethical dilemmas is to problematize and transcend the explicit, stated intention of an existing, new, emerging or potential technology. The intentions that are made explicit of proponents of a technological or techno-scientific project are always very positive and hype the resulting technology. But, as observed by Samuel Johnson, "the road to hell is paved with good intentions". We have to look quite other places than the official declarations of researchers and companies to identify the important ethical problems.

We can begin to problematize the official intentions by asking if they are ethical. We can use Kant's categorical imperative as a criterion for this assessment, but also criteria can be used. We also ask if the technology can be misused for unethical purposes, and thereby bring dual use to the fore.

From Kant's categorical imperative the concept of autonomy can be deduced. If we all have a duty to treat everybody as an aim and not as a mere mean, then it follows that everybody has a right to decide whether they want to participate or be affected by technological practices or projects. Of course we know that in real life it is difficult to claim autonomy because we are entangled in social and technical practices that influences our judgments. Nevertheless the author claims that it is useful to clarify the concept's premises, and discuss examples of technological uses that underpin or violate the norm of autonomy. Similar can argued regarding norms like dignity and authenticity.

We can also ask whether the official intentions of an existing, new, emerging or potential technology are overlapping with the actual consequences. Put in another way: Does the stated intention only tell half the truth? I.e. is the stated purpose ideological in the Marxist meaning of the term? A distinction between special and general interests is made, so that the notion of ideology can be defined as "special interests masked as general interests". To bridge the gaps between special and general interests, procedures for making ethical decisions can be discussed based on Rawls' Veil of ignorance or Habermas' discourse ethics, including his rules for rational debate that might lead to a collective ethical judgment:

1. Every subject with the competence to speak and act is allowed to take part in a discourse.
2. Everyone is allowed to question any assertion whatever. Everyone is allowed to introduce any assertion whatever into the discourse. Everyone is allowed to express his attitudes, desires, and needs.
3. No speaker may be prevented, by internal or external coercion, from exercising his rights as laid down in (1) and (2).

Next we can focus on consequences of existing, new, emergent and potential technologies. What consequences are ethical and desirable and which consequences are unwanted? For that purpose the principles of utility and justice can be introduced. The utility principle states that an ethical action must generate the greatest good for the greatest number of people, and the principle of justice says that actions are to be of the greatest benefit to the least-advantaged members of society. Both principles rest on the assumption that the consequences can be determined.

This assumption is problematized by introducing a distinction between short term and relatively certain forecasts, and long term consequences for human culture or biology

that are uncertain. The distinctions between respectively tame problems/wicked problems and normal science/post-normal science can qualify this discussion. Jonas' imperative of responsibility and the precautionary principle are ethical reactions to uncertain long term consequences. The imperative of responsibility requires that you act so that the consequences of your action are compatible with the permanence of genuine human life on Earth. The precautionary principle says that an action should not be undertaken if there is reasonable grounds for concern, though no scientific evidence, for it having dangerous effects on the environment, humans, animals or plant health.

A number of scholars can guide one's ethical judgement so that it captures the long term cultural consequences of technology. Francis Fukuyama [6], Richard Sennett [7] and Micheal Sandel [8] highlight and stimulate discussions on respectively enhanced normality and the risks associated with turning off the struggle for recognition that also Hegel emphasized, the loss of tradition and authenticity that leads to the corrosion of character, and the consequences and risks associated with the logic of the marked colonises areas where it does not belong.

One can be inspired by Nicolas Rose [9] who argues that new and emergent technologies can increase citizens' power over their lives, or Karl Wittfogel [10] who illustrates how technology can give rise to authoritarian regimes.

Post-phenomenological ethics that perceives technologies as ethical agents [11] and animal ethics problematize the anthropocentric perspective often chosen in technology ethics by discussing the ethical status of artefacts/designed procedures and non-human living beings.

If an individual and member of an organisation is expected or asked to conduct activities that violate his or her ethical judgment it follows that he or she must do something, and not just accept this situation. Political involvement, whistleblowing, conscientious objection, and even civil disobedience can be appropriate reactions to such violations. Value-sensitive design is also a possible reaction that actively embeds ethical norms in new and emerging technology.

2.2 Cases

The course module in technology ethics also consists of a number of cases where the students must identify ethical dilemmas and make an ethical judgment. The cases are supplemented by an interdisciplinary group project where a new or emergent technology must be ethically analysed.

The practical part of the course module consists of 16 different cases. The general form of each of the cases is that the students are asked to imagine that they find themselves in an ethically challenging professional situation. The specification of the circumstances includes relevant links and references. The students are then asked to identify ethical dilemmas and to try to resolve those dilemmas by exercising ethical judgment. Table 1 shows a list of the cases, and identifies potential dilemmas.

Table 1. Cases and ethical dilemmas

Case	Short case description	Potential dilemma
1	Hospitals offer an assessment of how many years of fertility left in a woman.	Encouraging young people to delay parenthood with possible consequences to family relations – and increased risk of infertility
2	Children are encouraged to use their	Distrust in civil society.

	mobile phones to report to authorities if abused by their parents.	
3	Facebook's new Graph Search makes it possible to search among their friends' friends on a number of parameters, including if they are single.	Gossip becoming 'knowledge' (as the true meaning of knowledge gets lost).
4	Researchers are able to generate stem cells from dead people's bone marrow.	Dignity of human dead corpses violated?
5	Insurances offered on the basis of gene tests.	Injustice "by genes"?
6	The use of robots for assisted eating in nursing homes.	Loss of human contact and empathy in elderly care?
7	Technology developed by Apple to fence off virtual communication including wireless devices in a limited area.	Freedom of expression violated?
8	A hospital department has suggested that the limit for abortion is moved from the 12th to the 18th week of pregnancy.	Brutalisation of cultural norms?
9	A huge Danish energy provider is considering using oil extracted from tar sand.	Anthropocentric disrespect for suffering nature
10	Several research projects aim at reviving extinct animal species such as the Great Passenger Pigeon, the Tasmanian Tiger and even the Woolly Mammoth by cloning retrieved DNA into eggs of familiar species.	Limits to human command and control over Natures wealth
11	Rare minerals mined in DR Congo by workers under slave-like conditions, and used in mobile phones finance brutal wars	An ethical smartphone possible?
12	A skin healing cream has been developed based on cells from foreskin left over from circumcision.	Fight against genital mutilation of boys inhibited?
13	Ethical aspects of the Milgram experiment.	Professional obedience no excuse for avoiding a personal responsibility
14	The Danish legislation for the protection of whistleblowers.	Access to "whistle" by researchers and engineers caught in a conscience trap
15	A project funded by the US government explores possibility of extracting methane hydrates captured in permafrost and under deep water as a new energy source.	Devastating to all efforts to limit greenhouse emissions
16	A Seattle bar has banned the use Google glasses, a case for concern at the company	Can "augmented reality" tech distract human presence and attention?

3 SUMMARY

The author has suggested a tool to identify ethical dilemmas and to carry out ethical judgment regarding new and emergent technologies. The tool highlights the following items:

- Problematize explicitly formulated intentions by asking
    - If they are ethical, ideological, or not likely to materialise?
    - Can the technology be misused for unethical purposes (dual use)?
- Procedures for ethical decision-making/conduct
    - Is individuals' autonomy, dignity or authenticity violated?
    - What processes for ethical decision-making has been followed?
- What are the expected consequences?
    - Are they beneficial or socially just?
    - Are they short term or long term? Are they certain or uncertain?
- What are the potential long term cultural or biological effects?

This analytical framework must be balanced by a number of cases. The author would like to suggest that the presented analytical framework can be used in all science and engineering programs if it is complemented by a number cases obtained from the specific discipline in which it is embedded.

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