

Building a techno-moral city – Reconciling public values, the ethical city committee and citizens’ moral gut feeling in techno-moral decision making by local governments

Authors

Maarten van Veen¹, Bart Wernaart²

¹ Department of Strategy, City of Eindhoven

² Research group Moral Design Strategy of Fontys University of Applied Sciences, the Netherlands

Abstract

It turns out to be quite difficult to steer the development of the city in an ethical direction. Interdisciplinary dilemmas remain at the crossroads of financial, legal, social and administrative aspects regarding the use of technology in relation to its the citizens. Therefore, the city of Eindhoven has set up an ethical framework, ethical review board, and an ethical team.

The aim of this paper is to reflect on the role of the city lab to contribute to ethical awareness of the city. The paper discusses an experiment that was set up together with the Fontys University of Applied Sciences to map the moral positions of the citizen of Eindhoven with the so-called ‘Moral Data City Hunt’. Its aim was to find meaningful ways to better mitigate the interests of the direct and indirect stakeholders in local techno-moral decision making.

To conclude, we will bring our insights from a policy point of view together and reflect on how the city lab can help to offer meaningful and transparent input for techno-moral decision making at the decentralized government level.

Keywords

City lab, Ethics, Ethical; Review Board, Citizen participation, Moral design, Moral Data City Hunt

Introduction

City councils struggle to keep up with the technological developments that can change the city. E-bikes transform the way cycle paths are used. Airbnb has an impact on the liveliness of a neighbourhood. Drones can have a profound effect on how streets are used. All technological developments require tailor-made solutions to steer it in the 'right' direction. The City Council of Eindhoven has established an ethical value framework in support of ethical decision making on the implementation of new technology on all decision-making levels, including decisions by civil servants, alderman and council. The framework consists of the following values: autonomy, human-centric, privacy, security, control over technology, justice and sustainability.

Together with partners from the creative sector, a city lab was set up to involve citizens in finding solutions for these complex societal challenges. The city lab offers a maker space, organizes hackathons and events. It also seeks cooperation with local companies and research institutes. One of the initiatives was the so-called 'Moral Data City Hunt' (MDCH) to engage with the citizens. This is how we develop a local and bottom-up approach to discuss complex techno-moral issues with citizens and collect data that enables us to map ethical preferences and conflicting values per neighbourhood around ethical administrative dilemmas. These insights are translated into design principles that can be central to making and explaining administrative decisions.

In this paper we focus on this experiment. We will first describe the concept of ethical city and explain how Eindhoven tries to implement ethics in her policy making. Second, we will describe our experiment – the moral data city hunt. And third, we will bring our lessons learned from the experiment together with policy making. We conclude with some reflections on the city lab.

Ethical City?

In several studies, the Rathenau Institute (2020) explains that city councils should be more critical when new digital technologies are proposed. Digital technologies are often presented as solution for complex problems for municipal services, social support, housing, sustainability, local economic development, management and use of public space and infrastructure. New digital technologies can bring great benefits for government, businesses, and citizens, but its use is not without risk. It can lead to intended and unintended changes in society. Technology should be considered within its larger context. It is important that local politics are actively involved in the use of digital technology, so that decisions about this are democratically legitimized. But how does that work? And how could the council debate on digitization be improved?

The City of Eindhoven developed a model in which the council, alderman and civil service can engage in an ongoing ethical conversation. Three separate roles were

identified: the council formulated ethical values, the civil service set up an (internal) ethical team that is able to help colleagues with ethical advice (we call it ‘ethics-as-a-service’) and an independent review board was established to provide counsel to the mayor and aldermen. Ideally this works like as follows; a civil servant works on a project and has some ethical dilemmas. They go to the ethical team and request ethical advice. The ethical team will have some discussions with the civil servant, possibly selects a method to work on and helps to identify and involve relevant stakeholders. The ethical advice is written down and shared with the ethical review board. The ethical review board is asked for a reflection on the advice so that the ethical team can learn from it. The ethical review board also writes an annual advice for the mayor and alderman on how to improve ethics in the organization. These views will also be published on the website of the ethical review board. The cycle aims to improve the quality of the ethical conversations over time and build a database of ethical views (figure 1). The development of the ethical framework is further explained in an open access paper: Van Veen & Visser-Knijff, 2022.



Figure 1. The ethical framework of the City of Eindhoven.

The establishment of an ethical review board fits in a larger development in the Netherlands. Many cities are setting up review boards, but differ in implementation, scope and tasks. Now Enschede, Hilversum, Amersfoort, Zwolle, Breda, The Hague, Helmond and Eindhoven have some sort of ethical review board. The general idea is that a group of ethical experts can give solicited and unsolicited advice to (local) administrators on ethical issues. In many cases, techno-moral themes are involved and are the core business of the ethics committee, or at least designated as a specific area of attention.

The formation of ethics committees specifically designed to discuss techno-ethical to guide dilemmas regarding the continued development of the smart city of the

future is a recent phenomenon. Little scientific research has therefore been carried out on the specific effects of an ethics committee on the smart city. In other, related, disciplines, the phenomenon of 'ethics committee' is more established. Ethics committees typically exist in the medical sector (e.g. Bhatt, 2016, Voljč, 2017), business (e.g. Zyung et al., 2020; Greenwood, 2016; Wernaart, 2021) and in conducting research (e.g. Koepsell et al., 2014; Ayoub et al., 2019).

However, the involvement of citizens is an important question in this matter. Some ethical review boards invite citizens to have a seat, others focus more on representatives of societal organizations. Eindhoven has chosen a somewhat different approach. Together with MadLab

¹ - an organization from the creative sector - it has set up a city lab as a maker space where citizens and civil servants can meet and work together on new solutions. This city lab – Stadslab Eindhoven - initiates all kinds of events, hackathons, and meetings on new technology². It labels itself as the R&D department of the city and works together with research institutes, schools, companies on finding new solutions for society.

Stadslab Eindhoven was officially opened on the 6th of March 2022. Its aim is to bring citizens, creative sector, civil servants, and companies together to work on the urgent challenges in society. The living lab offers a makers space and an open environment to meet and discuss relevant issues. The municipality of Eindhoven and the MAD foundation work together and formulate challenges and organize events. The Moral data city hunt was held before the official opening (on 2nd of December 2021) of the Stadslab but is considered its first experiment which led to many new initiatives on ethics.

The stadslab has formulated four principles:

We are a non-profit facility for social innovation, social creativity and technological implementation.

We make digital innovation in the city visible, understandable and discuss ethical issues.

We make knowledge, resources and programs available to residents, companies and public organizations.

We are a physical and digital breeding ground for all kinds of initiatives and research.

We offer access to the extensive 'quadruple helix' network of the Eindhoven innovation ecosystem.

Experiment: Moral Data City Hunt

¹ madlab.nl

² Stadslabeindhoven.nl

Many countries carried out experiments with citizen participation in decision-making at decentralized government level. For example, citizen participation in stratified drawing of lots in France and Germany (Fishkin, 2018), Citizens' Councils in Ireland (Farrell et al., 2019) Canada (Grant, 2014), the United Kingdom (Boswell, 2021), Citizens' Dialogues in Sweden (Lund et al., 2022), and the European Union, or Future Design in Japan (Kobayashi, 2018). There are many variants and a varied jargon to indicate the participation of citizens in decision-making that are beyond official voting in democratic procedures. The Netherlands also has a rich practice in such experiments (see Van der Heijden et al., 2011; Van Houwelingen et al., 2014 in a general sense; Boogaard & Michiels, 2016 on citizen summits). Recently, a book by Eva Rovers (2022) on citizen participation has motivated local and national politicians to consider citizens' assemblies on specific questions.

What the mentioned studies have in common is that they face challenges in three areas:

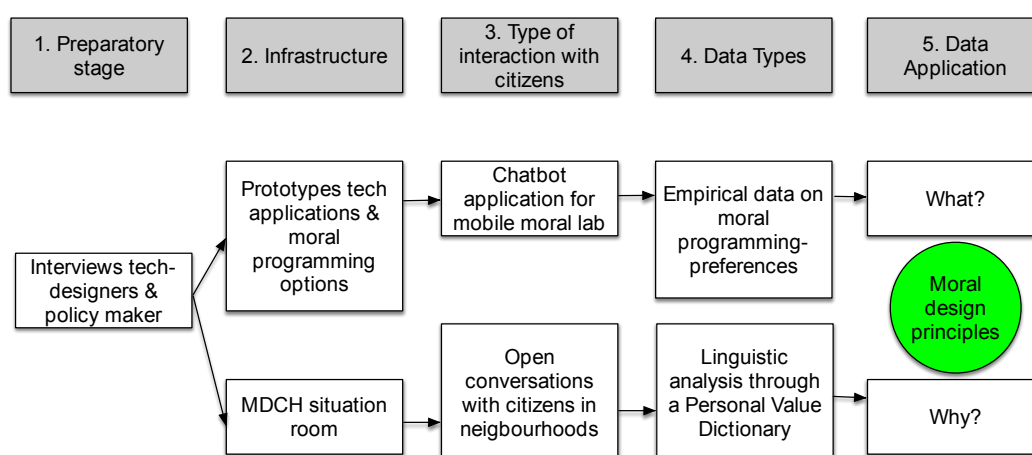
- The first is how to not only involve the 'usual suspects' (usually the assertive citizen who knows the way to citizen participation initiatives), but also the less assertive, silent, citizen?
- The second is how to ensure that we really understand the citizen's voice? In many citizen participation experiments there are challenges involving unintended nudges, peer pressure or biases when interacting with citizens. Consequentially, we do not always fully understand what that citizen experiences, feels and believes regarding techno-moral issues. In other words: we are not always fully aware of the nature of the techno-moral preferences of the citizens involved, and how this translates into (e.g. public) values.
- Third, these citizen involvements are designed to jointly take decisions (some of them even suggest a unanimous voting for a particular decision), while this may overlook the meaning of friction in a society. Values collide in specific techno-moral dilemmas. Citizens are mostly in disagreement. It is important to better understand the nature of the disagreement and the meaning of these colliding values rather than to strive for a harmonized single outcome.

To overcome these challenges, we developed a local and bottom-up approach to discuss complex techno-moral issues with citizens and collect data that enables us to map ethical preferences and conflicting values per neighbourhood regarding administrative techno-moral dilemmas. To be more specific: Fontys University of Applied Sciences (research group Moral Design Strategy) and the city of Eindhoven launched the concept of Moral data city hunt (MDCH). This is a city-wide research activity that combines methodologies of empirical ethics and linguistic analysis. The

idea is that in one day, the techno-moral gut feeling of a city is mapped into detail. The ‘hunt’ is centred around two techno-moral cases that are relevant in designing the smart city of the future. For instance, in the first hunt,³ one case was about responsible drone-services, and another case dealt with a city-mobility app that can feed an algorithm that operates traffic signs in a city to optimize traffic mobility. Both themes have deep techno-moral issues that relate to privacy issues, citizen autonomy, mobility and accessibility. Examples of ethical challenges that relate to commercial drones are: where can drones fly? What should be done with video-footage that the drone produces while flying (e.g. can it be shared with authorities if it can help to catch criminals?), what risks are acceptable compared to ‘traditional’ delivery services (a drone may fall from the sky, a bus may cause a traffic accident, both can result in casualties; both can deliver your package)? Examples of ethical challenges that relate to the city mobility app are: should bicyclists be given priority in traffic downtown as a rule? Should polluting cars be given priority to make sure there is as little pollution downtown as possible, or should relatively clean (or electric) cars be given priority to encourage the purchase of cleaner (but also more expensive) cars?

The objective of this method is twofold: on the one hand it contributes to raising awareness amongst citizens that techno-moral issues are more important than ever and strengthens the urgency for citizens to participate in techno-moral discourse. On the other hand, it is a tool to collect detailed data that can be used to develop design principles for new technology that will become part of our future smart cities.

The MDCH-approach is composed of five research-elements (see figure 2).



³ See for a video-registration of the Moral Data City Hunt in Eindhoven, the Netherlands, November 2021: <https://www.youtube.com/watch?v=mnunJOMty7g>

Figure 2. Moral data city hunt, research elements.

First, interviews with technology experts and policy makers are conducted to narrow down the scope of the technological possibilities that can be foreseen in designing or using the new technology involved, and better understand the potential moral issues that can play a role within these technological possibilities. This is important, since the complex technological designs we may expect to use in the (near) future are not always known by citizens. This means that for having a meaningful dialogue with non-technological people, we need to understand the technological potential first, and determine the way these technological possibilities may affect human values (Aliman & Kester, 2019).

Second, we need to build the required infrastructure for the MDCH. Since we collect two types of data that needs to be combined (see below at step three-five), two infrastructural items need to be built. One is that of a translation of technological possibilities and moral complications into understandable prototypes, language and visualisations in a chatbot in such a way that citizens can ‘play’ with the moral settings of these prototypes and set their preferred moral programming. For example, how risky should a drone be in terms of potential harm to people during usage compared to a delivery truck? Or: in what proportion should our mobility algorithm give preference to clean cars over polluting cars? The other is the creation of a situation room that enables researchers to receive linguistic data that will be collected during the MDCH and to be able to categorize that data in a personal value dictionary.



Figure 3. The chatbot of the Moral Data City Hunt.

Third, the MDCH takes place. In our example of the Eindhoven MDCH, 140 students were divided over the different neighbourhoods and brought the equipment (chatbot) in the streets. They asked people who would live in these neighbourhoods to interact with the chatbot, and invited them for an open conversation about the chatbot themes afterwards (figure 3 and 4). To this end, we propose a methodological approach (Wernaart et al., 2022) in which we engage citizens with the possible future design of new technology and invite them to morally program this technology. This approach is called ‘augmented utilitarianism’ (Aliman & Kester, 2022), and the involved data is collected through the chatbot application. Discuss this programming with these citizens in an open, unstructured conversation. The language used is translated – through a value dictionary- into core human values (Ponizovsky et al., 2020). This way, the language level of the respondent is not relevant, and the interviewer is not required to lead the conversation in a fixed direction (as would be in e.g. semi-structured interviews), potentially causing a research bias.



Figure 4. Screenshot of the chat bot.

Fourth, the MDCH activity leads to two types of data: the first type is empirical data regarding preferred moral programming options (what kind of people would prefer what kind of moral solutions in what kind of techno-moral challenges?). The second type is the linguistic data that is filtered using the Personal Value Dictionary (Ponizovsky et al., 2020) which is based on the value categorization proposed by

Schwartz et al. (1990, 1992, 1994, 2012, 2014). It enables us to understand the values that are expressed through language, and how these values relate to other (sometimes conflicting) values.

What is the Personal Value Dictionary?

Ponizovsky et al., (2020) propose a comprehensive theory-driven tool to detect and analyze personal value orientation in large amounts of texts, build on five different text corpora including single authored, self-expressive texts: the Personal Values Dictionary. These text corpora serve as both data input, and as source of validating the value dictionary. In essence, the proposed approach combines linguistic analysis theory and the value-orientation proposed by Schwartz et al. (1990, 1992, 1994, 2012, 2014). We are amongst the first to put this tool into practice and modify its usage to a Dutch-language setting. The tool in itself is a response to the criticism to the work of many value-scholars who mainly use self-reporting tools as a way of validating their findings. Self-reporting is to some degree biased and ineffective when exploring and analyzing human values.

Fifth, the data-collection now gives us insights in what the preferred moral settings should be according to the citizens of the involved city, and why these settings are chosen (based on what values). Please note that this is not a uniform conclusion, but rather a diverse collection of different viewpoints that are dominant in the discussion. Eventually, these insights are translated into design principles that can be central to making and explaining administrative decisions. Even when there are opposing values, the design principles might be constructed in such a way that it can protect most (or all) of the involved values. This contributes to transparency and trust in administrative actions and offers concrete tools and methodologies to settle moral administrative dilemmas not for but with citizens (Wernaart, 2022). This includes ways of connecting, collaborating, tackling problems and creating interventions in which policymakers or administrators are able to structure their work, give direction and achieve impact.

What did Eindhoven learn from the data?

- The coding and data analysis is still in progress, so final and validated results cannot be presented.
- Talking about the positive and negative aspects of technology gave a huge awareness boost to the city: 140 students, more than 500 interviews and around 450 chatbot interactions.
- The researchers find it remarkable that people in general have absolutely no idea what to expect from new technologies and how to contribute to a 'better' design.
- People were, however, very enthusiastic to talk about new technologies and have great expectations.

- When people were asked to share their concerns about responsible drone services, they say that the camera feeds should not be recorded and publicly shared. They expect that delivery drones will be a less risky means of transportation than other transport modalities (scooters, bicycles, cars, vans, etc) and the drones should fly over the current network of roads so noise pollution is restricted.
- The Personal Value Dictionary and the ethical values formulated by the council do partly overlap; after the data is coded and analyzed we will try to match them.

Reflections for moral policies

The Moral data city hunt was a very valuable experience for Eindhoven and the city lab, we would like to reflect on the following three topics:

- Citizen participation
- Societal readiness
- Societal challenges

Citizen participation. The MDCH-approach is very helpful to get in contact with large numbers of citizens in just a short period of time. The experience was very valuable for Fontys and Eindhoven. It brings us closer to the 'silent' citizens that are not intrinsically motivated to join citizen participation experiments or initiatives by literally bringing our equipment to the streets in all neighbourhoods. It overcomes bias, peer pressure or other distorting elements that can happen in other citizen-participation initiatives by augmented utilitarianism (chatbot) and linguistic analysis. Moral programming is done in complete privacy, and interviewing is not dependant on prefabricated interview structures; instead, it is the language of the interviewee that matters, regardless of the language level or knowledge of the theme. The MDCH method was tested and will be scaled up to other cities. It is our intention to set up an event with more cities on the same day to gather 'moral data'. The method has its disadvantages as well. It takes a lot of time to analyse the data, especially when it depends on study programs and the availability of students.

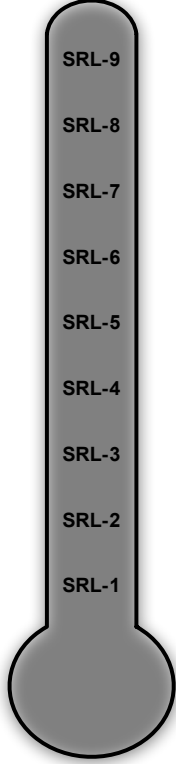
Societal readiness. Innovation in the city is not only about developing, implementing and using technology, it is also about doing it in an ethical, legal and socially acceptable way. The concept of 'societal readiness' is quite helpful in this matter. We think that citizen involvement is important for responsible innovation in which ethical, legal and social issues are taken into account by the development of technology. The insights of the MDCH are especially valuable for the first three stages of the new societal readiness (SRL 1-3). The MDCH and the city lab offer a way to identify the moral values at stake which can bring the development of technology to the next

level. Other participation approaches are necessary for the higher societal readiness levels.

Societal Readiness Level (SRL) is a way of assessing the level of societal adaptation of innovation to be integrated into society.

Levels

- SRL 1 – identifying problem and identifying societal readiness
- SRL 2 – formulation of problem, proposed solution(s) and potential impact, expected societal readiness; identifying relevant stakeholders for the project
- SRL 3 – initial testing of proposed solution(s) together with relevant stakeholders
- SRL 4 – problem validated through pilot testing in relevant environment to substantiate proposed impact and societal readiness
- SRL 5 – proposed solution(s) validated, now by relevant stakeholders in the area
- SRL 6 – solution(s) demonstrated in relevant environment and in co-operation with relevant stakeholders to gain initial feedback on potential impact
- SRL 7 – refinement of project and/or solution and, if needed, retesting in relevant environment with relevant stakeholders
- SRL 8 – proposed solution(s) as well as a plan for societal adaptation complete and qualified
- SRL 9 – actual project solution(s) proven in relevant environment



Source: Danish Innovation Fund, 2019, https://innovationsfonden.dk/sites/default/files/2019-03/societal_readiness_levels_-_srl.pdf

Societal challenges. The challenge is to find meaningful ways to better mitigate the interests of the direct and indirect stakeholders in local techno-moral decision making. This is becoming quite urgent considering that society is facing major challenges in the areas of energy, raw materials, circularity, food, space, economy, education, healthcare, social and democracy: all issues involve local techno-moral decisions (Rotmans, 2021). The city lab can play an important role in linking

researchers with citizens as a central base for MDCH; it can serve as a centrally located situation room, and it can be a place where workshops or interviews with tech-experts and policy makers can take place.

Conclusions

In this paper we described how the city of Eindhoven is trying to implement an ethical framework on different levels. We think it is important to have conversations about new technologies in the city. Too often, technology for social welfare, smart lights, crowd control and smart mobility was implemented without too much consideration of relevant stakeholders, with sometimes very harmful effects (Morozov, 2013). We expect that ethical conversations about public values at an early stage of technological development can bring more innovative solutions. Multidisciplinary dilemmas will always remain at the crossroads of financial, legal, social and administrative aspects but it is better to make them explicit in a democratic system. The MDCH is a powerful tool that can help to raise awareness about techno-moral dilemmas, and better understand the techno-moral gut-feeling (including friction) amongst citizens.

Eindhoven developed an ethical framework in which the council formulated a set of public values that guides the ethical conversations of the ethical team. The ethical team consists of peers that help their colleagues in discussing ethical matters. They had some extra training in different approaches on ethics and can reflect from an outsider perspective on a project. The ethical team put its advice down in a 3-pager that is sent to the external review board for reflection. The aim is to develop a learning cycle in which the reflections of the ethical review board help to improve the expertise of the ethical team. The city lab is a safe space for the ethical team to reflect with citizens on the moral issues of new technologies. For example, a roundtable was organized on our new policy on the security cameras in public spaces to identify concerns and stakeholders.

But our most important lesson learned is this: the city lab should not only have a good external network, reliable data and great people. It should also actively be supported by the council, the alderman and the civil servants. Only then is it possible to develop a shared understanding of the ethical issues and contribute to solutions for the common good.

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