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R	Document, report	
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DEC	Websites, patent filling, videos, etc.	
O	Other	
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Executive summary

Deliverable: A series of blog posts and multi-media reports about interim empirical findings disseminated to the IoT community

Description: Blog posts that have been published and are scheduled to be published in the new year.

This deliverable aims to share the interim empirical findings of the Virt-EU project with the general public through a series of blog posts and multi-media reports. Please find attached the blog posts that have been published in the last year, and also the ones that are scheduled to be published in the new year once the new Virt-EU website goes alive.

In addition, we are also planning to open a YouTube channel for our project, where we will be featuring unboxing videos of internet of things devices and reviewing them from an ethical perspective, including their privacy policies and security. We have identified “Sammy Screamer” a Bluetooth enabled alarm developed by Bleep Bleeps as our first device to be reviewed on our channel.

Can Nontechnicians Code? Ethics, Communities and the IoT London Meetup

Dec 17, 2018 (published)
Dec 6, 2018 (submitted)
By Sebastian Lehuedé

Internet of Things (IoT) is a highly contested ethical arena. While some see connected devices as a source of empowerment, recent reports associate them with domestic abuse and home surveillance. So far, some of the proposals to address these ethical concerns highlight the fundamental role that *designers*and *developers* can play in achieving a more reflexive ecosystem. Two examples of this approach are calls to foster more and better codes of conductand to strengthen ethics in the curricula of STEM programmes.

In this blogpost I shine a light on an alternative path, suggesting that policies, research projects, ethical tools and other initiatives focusing on ethics would benefit from paying more attention to the collective spaces where designers and programmers participate. Looking at my engagement with a hacker community and an IoT meetup based in London, I argue that communities help actors to broaden their ethical concerns by facilitating their interaction with people from different backgrounds. Although this statement sounds obvious, in this post I will provide a grounded example of how the dynamic operates in practice. I hope to inspire more people to get involved and support these types of communities.

Certainly, what I am saying here is not new. Moral philosophers from different currents agree with the idea that ethics is a collective endeavour[1]. As Hannah Arendt argues, morality "finds itself always and primarily, even if I am quite alone in making up my mind, in an anticipated communication with others" (2006, p. 217). A similar claim has been made by indigenous groups and religious spiritualities. For example, buddhism employs the idea of the *nonself*to refute the assumption that we are individual units in essence (Kongtrul, 2006). In this post I reflect on some ways in which these formulations can be put to work in the IoT.

Why Communities? Tackling Isolation in Programming

The ideas I am discussing here started to take shape in a visit we had to a hacker community as part of our ethnographic work for Virt-EU[2]. In this visit, we met John, a developer who ran weekly programming workshops. He told us that he decided to start them as a result of his own isolated experience as a developer. Interestingly, he did not think he was incorporating any 'ethical' component in these workshops. He said, he just wanted to provide beginner programmers a nice and warm environment where they could help each other and learn collectively.

In the beginning, I felt John was missing an opportunity. His workshops could be employed to introduce some ethical discussions or to spread free softwareor other types of value-led

technologies. However, after a while I realised that his workshops could also be understood as an ethical argument *in themselves*. I started to interpret John's initiative as an argument according to which, in addition to discussions of the values guiding the IoT, we need to pay attention to *theconditions* under which technical actors do their work. Indeed, the lack of human proximity that he perceived can have relevant ethical reverberations. As some philosophers argue (Benhabib, 1992; Habermas, 2015), moral reasoning usually takes place through communication, and since what is considered 'good' is collectively defined, the only moral assessment we can undertake is on whether the process was guided by mutual understanding and solidarity. John's discomfort made me think that programming in isolation might not provide the best *social infrastructure* to conduct this type of ethical deliberation.

It is important to mention that John's initiative is not an exemption when it comes to technical communities. In recent history, designers and programmers have shown awareness of the necessity of building more community-oriented spaces not only online but also offline. Hackers are a great example. Even though they are usually associated with an inclination towards individuality and autonomy, in practice they tend to negotiate these values with more communitarian mechanisms of organisation. For Gabriella Coleman, hacker conferences are instances when the "social bonds between participants are made manifest, and thus felt acutely" (2010, p. 50). In contrast to hackers, however, people involved in IoT development share a more varied range of sensitivities, such as makers and entrepreneurial ethics. Also, the increasingly popular co-working spaces can provide them the opportunity to meet people facing similar challenges. The obvious question, then, is what type of social infrastructure might be appropriate for groups focusing on the design and development of IoT projects.

London IoT Meetups and the value of 'Amateur' Communities

As part of our ethnographic work at Virt-EU, we have visited conferences, co-working spaces and companies, among other social IoT spaces. So far one of our deepest engagements have been with the Internet of Things London (*IoT London*hereafter), a meetup run by Alexandra Deschamps-Sonsino that started seven years ago and which I have been attending for more than a year. This group is the most popular one in Europe in the Meetup platform, with more than 13,000 members.

Looking at IoT London brings to the surface the ethics of putting together people from different backgrounds to discuss a specific topic. As a developer once told me, one of the main characteristics of this group is it targets 'amateurs'. Being called 'amateur' might be offensive for some, but for me it is precisely this 'amateurism' that illustrates one of the main strengths of the initiative. Compared to similar communities in the same city, participants of IoT London come from quite a diverse range of backgrounds[3], such as programming, design, law, commercial development and academia. As I discuss below, this setup can enrich the process of ethical deliberation.

A few weeks ago I had the chance to present some of the findings of our project in one of these meetups. As a PhD researcher used to write essays addressing a very specific audience, one of the

main challenges I had was to introduce our insights in a way that the audience could make sense of it. Why would an engineer interested in mechanical joints or pollution sensors care about the values shared by different IoT communities? Certainly, it is easier to think of why *should* he/she care, but this normative position does not ensure that the person is going to really engage with your arguments. The point I want to make here is that the diversity of backgrounds requires presenters to make adjustments of their speech.

These 'adjustments' do not only encompass avoiding technical jargon but also an active transformation of the form and the content.

In the introduction I referred to Arendt's concept of *anticipation*, an idea that comes to the surface again. In a way, the presentations delivered in IoT London are the product of a negotiation between the speakers' thoughts and their *anticipation* of the interpretation that the rest of participants will do on it. In the words of Swierstpra and Rip (2007), we are challenged to mentally transit from a cold morality of 'unproblematic acceptance' to a hot ethics of 'explicitness and controversy'. In the sessions of IoT London there is also a moment of Q&As after each talk, but if Arendt is right then the dialogues that is established at this stage have been already partially 'cooked' by the anticipations made by the actors.

The anticipations required to address communities with diverse backgrounds can help participants to cultivate what Aristotle calls *practical wisdom*. For him, the search for the right decision does not only has to do with finding 'scientific' truths but also with taking into consideration the broader context in which these decisions are taken. Among other elements, practical wisdom implies taking into consideration not only one's but also other people's perspectives. Speaking in IoT London makes it necessary to draw on this virtue in order to make sense to the whole of the community. This is not only true for those working in academia, and I guess that the people who presented previously that evening on wireless network platforms and developing an animal care startup had to go through a very similar process.

Technicians and Nontechnicians Altogether

Since their backgrounds are so varied, speakers in IoT London have touched upon a broad range of topics. Certainly, the majority of presentations are 'technical' (sensor networks, programming languages and so on), but there are also 'softer' ones addressing themes such as the implications of Brexit for the IoT or the different regimes of intellectual property. I think it is precisely this encounter between 'technical' and 'nontechnical' actors — its amateurism — what makes IoT London a fruitful platform for advancing collective ethical deliberation.

Some might argue that I am being naive since, in the end, what makes a decision *technical*is precisely the fact that it is informed by neutral and objective criteria. According to this understanding, discussions on ethics are relevant, but in practice programmers conduct their work based on a

rational assessment of the available options. However, ethnographic research and science and technology studies depict a different dynamic. For example, Alison Powell(2018) argues that the distinction between *moral* and technical *arguments*is not always clear-cut. Her study of the discussions surrounding the Openmoko project illustrates that programmers and designers draw on an *operational pragmatics* that entangles ethical and technical justifications to define what qualifies as a 'good' or 'bad' technological development. In sum, communities such as the IoT London can provide nontechnicians the opportunity to inform the ideas that technicians will later employ during the design and development of products and services.

Events like IoT London meetups provide a social infrastructure that facilitate this interchange between technical and nontechnical arguments. Looking at some of the first hacker conferences during the eighties, Fred Turner argued that focusing in technological conferences "allows us to acknowledge the roles nontechnicians have played in shaping our perceptions of life with digital technologies" (2006, pp.265–266). In Turner's vocabulary, I argue that IoT London provides a platform for the *articulation* of different visions surrounding the IoT. In other words, a process like this one can significantly enrich ethical deliberation by broadening programmers and designers' repertoire of moral considerations**.**

Conclusion

In this blog post, I explored one of the ways in which communities such as the IoT London can provide a social infrastructure to facilitate collective ethical deliberation, an advantage that might be especially helpful for programmers and designers working in isolation. Of course, there is still much work to do in technical communities to involve a broader range of participants, especially when it comes to less privileged groups in terms of gender, race and class. Also, here I have mainly discussed positive aspects of communities, but a more in-depth analysis might also want to take into consideration the power dynamics of exclusion and oppression that also form part of them. However, even in its current form spaces like IoT London provide a valuable platform for the exchange of perspectives between technical and non-technical actors.

Initiatives such as policies or ethical tools seeking to advance a more reflexive IoT ecosystem could have much more impact by acknowledging this social dimension of ethics. So far collective organisations have proved to be one of the main sources of ethical articulation and transformation. As a group in Colombia affirms, "the word and the action outside the spirit of the community are death" (as cited in Escobar, p.176). Initiatives overlooking this fundamental dimension of ethics will have a hard time seeking to produce impact.

[1] Due to space constraints, in this article I do not distinguish between *social*, *collective*and *communitarian*approaches to ethics.

[2] I have changed the details in order to preserve the anonymity of the actors.

[3] I employ the word ‘diverse’ here in reference to the professional background of participants. Unfortunately, this diversity does not range to other backgrounds, such as gender, ethnicity and race.

When Things Shape Values (1/3): Data and Network Architectures in the Internet of Things

Published 26 October 2018

This blog post is the first of a three part series looking at the ethical stakes of different technical elements that make up the Internet of Things (IoT). Here I discuss data and network architectures, and in the next posts I will touch upon hardware components, energy, maintenance, repair and interfaces.

1/3 post by Sebastian Lehuedé

Changing the focus: From Values to Things

A common way of studying the relationship between ethics and technology is to look at the shared values of the different groups involved in the process of design and development. This approach usually builds upon constructivist research focusing on how the assumptions and interests of actors shape the final product (Bijker et al., 2012). Echoing this approach, in Virt-EU we have argued that the European IoT landscape is marked by what Robin Mansell (2012) calls *mainstream*and *alternative* imaginaries of technology, with the former focusing on issues such as privacy and trust and the latter more interested in advancing transparency and openness.

More recently, a ‘material turn’ in academia has tended to emphasise the way the specific characteristics and affordances of devices, objects and things can also shape societal values (Marres, 2012). As Swierstpra and Rip put it, technology can “rob moral routines of their self-evident invisibility and turn them into topics for discussion, deliberation, modification, reassertion” (2007, p. 6). In the case of the Internet of Things, this means that building IoT devices or software can make more salient specific moral dilemmas or concerns, informing the morality of the groups involved in the process of design and development. As I explore here, the ethics that shape the IoT is the product of an interaction between human values and technical properties whose outcome is difficult to predict.

In the case of our research, this way of understanding ethics has two main advantages. The first one is that it allows us to move beyond the almost automatic association that designers and developers do between ‘ethics’ and ‘data’. Instead, when observing and talking about the process of design and development, it is easier to identify a more varied range of moral challenges that are not framed as ‘ethical’ by the actors involved. The second advantage of this approach is that it allows us to study

ethics *in the language of designers and programmers*. By this I mean that, instead of expecting them to verbally express their visions, we can see the process of coding, prototyping or business model development as a form ethical argumentation that does not rely on verbal argumentation but on technological ideation and practice.

Drawing on an inductive reading of the ethnographic observation and participatory methods carried out by researchers at the LSE, ITU and CIID, in this blog series I identify some technical components that usually become ethically salient in the process of design and development of IoT devices. From now on I use the word 'developers' to refer to designers, developers and business managers of European IoT companies and organisations.

Data

Data is what usually first comes to the mind of developers when they are asked about ethics. Although 'big data' is usually framed in positive terms as a commercial opportunity, in practice the increasing velocity, volume and variety of data seems to be a 'big headache' for people who have to decide what is going to be collected or how is it going to be archived, for example. As a result, and as a programmer told us, very often startups simply "don't understand their data". The implementation of the GDPR in Europe introduced an additional element of complexity. Under this scenario, startups have tended to respond in two ways: by ensuring the anonymisation of the information — an approach that does not necessarily solve all privacy issues — or by stopping all processes of data collection.

However, we have also found cases in which the dynamic between data and values have had a more productive outcome. Some developers do approach data with enthusiasm, taking advantage of its capacity to advance values such as transparency, openness and social justice. For example, Provenance and TagItSmart! are projects that seek to improve the process of consumption by allowing users to access additional information about the production and supply chain of products. Founded by Jessi Baker and based in London, Provenance employs blockchain to store the data and allows to interact with companies. TagItSmart!, on the other hand, is an EU's Horizon 2020 project, and uses QR codes made with an ink sensitive to temperature and humidity.

These cases illustrate that the outcome of the interaction between technical affordances and ethical values is not always determined. One developer's headache can be another's resource for ethical tinkering, making possible the enactment of principles such as openness and transparency.

Network Architectures

The Internet of Things draws on the idea of 'connected devices' or 'machine-to-machine communication' In technical terms, realising this sociotechnical imaginary of connectivity requires the employment of cables, data centres and standards, among other resources. As usually happens with infrastructure, the technical, embedded and pervasive character of the network architecture of

the IoT makes it harder to interrogate its ethical character. However, issues of ownership, compatibility, security and access are not morally neutral. The choice between 4G, Wi-Fi, LoRa,Bluetooth® mesh networking, Sigfoxor NB-IoT has an important technical component, but the decision will nonetheless have environmental, economic and societal consequences. Interestingly, in our fieldwork we have seen a proliferation of commercial and non-profit alternatives for connectivity that, by mobilising specific values, bring to the fore the non-purely-technical nature of the network supporting the Internet of Things.

Dowse, for example, is a home networking technology that, among other goals, seeks to make evident the ethical dimension of connectivity by purposely deleting military references such as 'firewall' and 'defense' of its documentation. Additionally, this project is being developed by the non-profit and open source organisation Dyne, raising issues of governance and ownership to the discussion.

In our research we have also found that alternative network architectures can inform community building. An analysis of the IoT Meetups in Europe reveals that, along with geography, the resources for connectivity employed to build devices is an important variable in the formation of sub-groups within the IoT community. An interesting focus for further research could be in the way the different technologies they use can shape their group values. Along these lines, in a Meetup in London we heard from a developer that he uses Android Things not only because of its technical features but also because of the quality of its community, with people supporting and providing advice to each other in the process of development.

Although we usually tend to think of standards as related to computers, they have an important ethical component. As Star and Bowker argue, infrastructures "standardize both people and machines" (2002, p. 234–235), which in the case of the Internet of Things means that the technical dimension can also facilitate or constrain the enactment of values and the conditions for human flourishing.

Conclusion

Data and the network architectures are far more than mere technical resources. In this blog post I have shown some ways in which the properties and affordances of these technologies that make up the IoT introduce specific challenges and opportunities for developers with clear ethical elements. Looking at cases such as Provenance and Dowse, I have argued that the outcome of the interaction between human values and technical properties is not determined but instead open for innovation and creativity. Further research might want to describe in full detail how this process works. By now, it is possible to say that putting 'technology' before 'values' in the analysis can bring about a less deterministic and more flexible way of understanding the ethics of the IoT.

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A Conceptual Framework for Studying Internet of Things: Virtue Ethics, Capability Approach and Care Ethics

Published on Oct 26

This blog is based on Values and Ethics in Innovation for Responsible Technology in Europe, July 2018 Report. Contributors of the report are Irina Shklovski, Rachel Douglas-Jones, Luca Rossi, Ester Fritsch, Obaida Hanteer, Matteo Magnani, Davide Vega D'aurelio, Annelie Berner, Monica Seyfried, Alison Powell, Funda Ustek-Spilda, Sebastián Lehuedé, Alessandro Mantelero, Maria Samatha Esposito, Marcella Sarale, Javier Ruiz, Ed Johnson-Williams, Pasquale Pellegrino, Inda Memić.

Editing and further analysis by Funda Ustek-Spilda

A brief look into the recent coverage of technology news demonstrates that technology reporting happens only at the extremes. The two future scenarios we are portrayed with are the dark future of hyper-surveillance society à la *Black Mirror*or the ultimate connected future in which your fridge, kettle, toaster and [self-driving] car can all speak to one another to make your life fully integrated and seamless in the perfect smart city you live in. In this imaginary of two extremes, it is often portrayed that cases of data breaches, mass privacy violations or the implications of datafication for profiling, discrimination and exclusion turn the second scenario into the first one. It is rarely explored, however, how the connected future scenario itself might carry the characteristics associated with the first scenario, and where responsibilities might lie. Further, such a dichotomization presents a flickering search for responsibility, as neither the technologies (e.g. networks, sensors, hardware, software and so on), nor the humans developing them are thought to be [fully] accountable for the consequences.

How should we approach the scenario of two extremes? How is this imaginary for the future influencing the way in which technologies are built today? Where should we look for responsibility, and how should we approach the role of developers and innovators of new technologies? To answer these questions, the Virt-EU consortium, has over the last eighteen months, been working to develop a conceptual framework through which we can study how developers of new and emergent technologies in the field of Internet of Things (IoT) across Europe are making ethically consequential decisions for connected technologies they develop. Based on our extensive research into the IoT technologies in Europe, we have developed a practical framework for ethics, which incorporates three different philosophical approaches: Virtue Ethics, Capability Approach and Care Ethics.

In conceptualizing ethics as values in action with responsibilities for power, we draw upon the basic idea that ethics is a process of the application of values in human conduct, including but not limited to reasoning, design, communication and knowledge-sharing, which guides understanding and decision-making in the development of new and emergent technologies. In practice, this entails sometimes complementary and occasionally competing values being expressed and enacted; and a position of power that developers, designers and innovators of IoT technologies may find themselves in. As connected devices and services proliferate, data collection and algorithmic processing become increasingly black-boxed. Here, the onus of ethical decision-making about what data should be collected, how it should be processed, stored or shared as well as what kind of hardware should be deployed, given their economic, social and environmental implications, shifts further onto those developing those technologies and services. Technologies, however, are never developed in vacuum. They are part of, and embedded in the social contexts of their developers. This means, the constraints and power relationships which the developers may find themselves in also come to be reflected in the technologies they build. Such a positioning entails that we include power relationships and constraints in our basic conceptualization of ethics, and permits us to engage with a range of different ways of thinking about ethics.

Much of the contemporary writing on ethics and technologies leverage two related approaches: consequentialist and utilitarian ethics. While consequentialist approaches generally focus on the consequences of new technologies for the groups that are impacted by them, the utilitarian approaches suggest an evaluation of possible alternatives, given their [potential] consequences for the different groups that might be affected, and advises the decision-maker to choose the one that leads to the “greatest good for the greatest number”. The prominence of thinking with these two ethical approaches is also echoed in our in-situ ethnographic investigations where conversations with IoT developers often veered toward efficiency, optimization and cost-analysis when making an ethical decision. Indeed, we often see various examples of different versions of the age-oldtrolley problemdiscussed in media and with developers. The question is almost always simplified into an either/or (one person definitely needs to be killed) and the ethical justifiability of killing someone is rarely questioned. Part of the issue we take with these approaches is that they make the rational calculus intractable and often lead to significant reductionism of the issues at hand. This is why we propose to go beyond these and look for alternative approaches that we can both explain and

account for how developers of IoT make ethical decisions, but also provide them with an alternative lens to approach the ethical challenges they face.

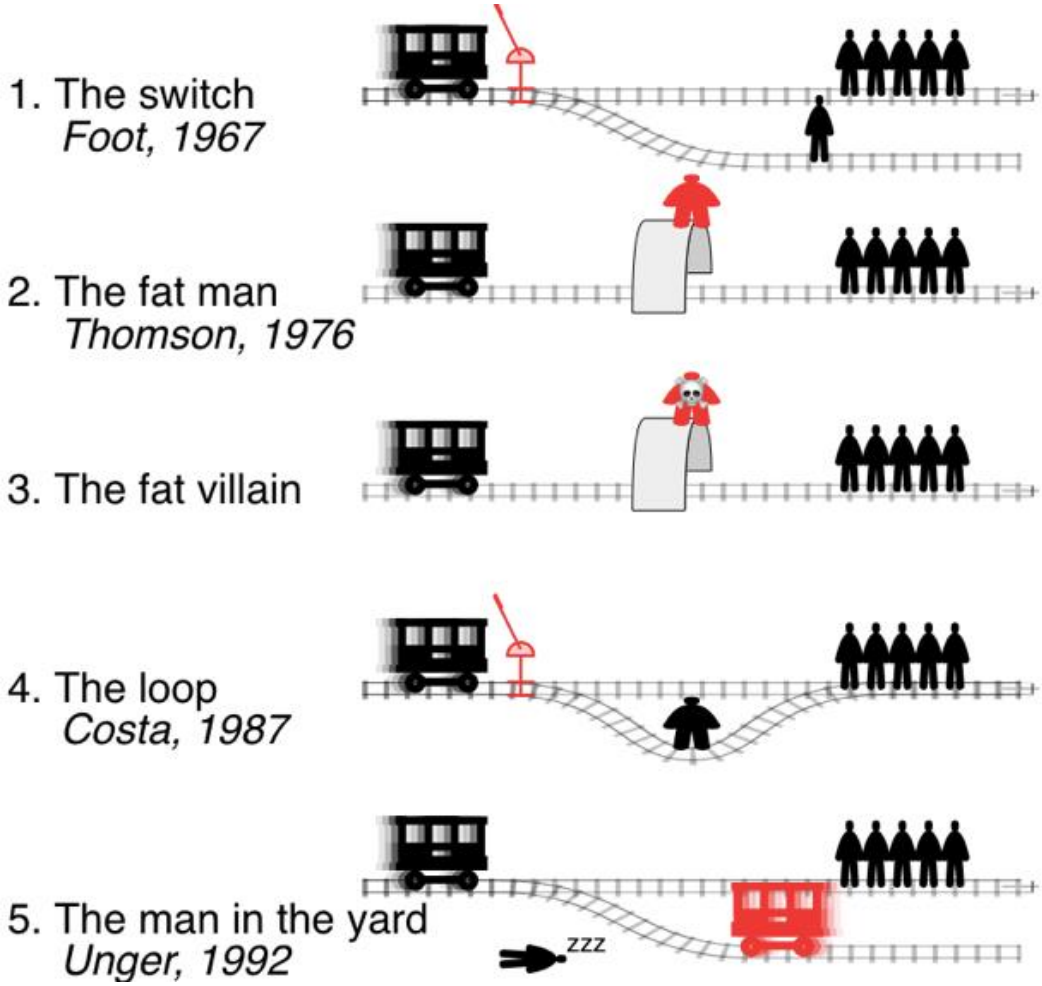

Illustration of the original and four variant of the Trolley problem by CMG Lee. Creative CommonsAttribution-Share Alike 3.0 . From Wikimedia Commons

Our conceptual framework: Virtue Ethics, Capability Approach and Care Ethics stems from our definition of ethics where both the constraints to making ethical decisions and the responsibilities for power are acknowledged as context-sensitive. Virtue ethics comes from the Aristotelean schools of thought where leading a virtuous life is considered the basis of leading a good life. These virtues, however, are not qualities one is born with, but learnt and acquired through continuous striving towards being *good,* and indeed, Aristotle counts the continuous struggle to turn acting in a virtuous way into *habit a*s a virtue on its own. While virtue ethics mainly focuses on an individual's process of attempting to live a good life, the capability approach examines the ability to lead a good life, given the existing social contexts individuals are embedded in, which present them with a variety of opportunities, but also constraints. Care ethics, brings both the Virtue Ethics and the Capability Approach together in that, it suggests taking into account the shifting obligations and responsibilities of individuals as they are positioned in a web of relations, while examining their responsibilities for their decisions. By bringing these approaches together into a coherent framework, we are able to acknowledge that ethics as a process is not exclusively dependent on the principles and actions of

the individuals, but acknowledges the inherent dialectic of life where conflicting demands, obligations and structural conditions can both limit and shape even the best intentions.

In our ongoing engagement with developers of IoT products as part of our ethnographical fieldwork, one question we ask is: Could this [device/software/platform, etc.] be made differently? The answer to the question is not always an outright "Yes", but it is not an outright "No" either. How developers elaborate on their response tells us important things about where their values lie, what they care about and how they might be constrained in building the products that speak to those values and concerns. For instance, in a conversation with a company that builds fridge cameras, I asked this question. The fridge camera they built takes pictures of the content of the fridge each time a fridge door is opened, and sends it to its owner in real time through their app. The owner is, then, able to keep track of what is in her fridge at all times, plan meals accordingly and ideally, reduce food waste, the developer explained it to me. So, obviously the company and the developer[s] were concerned about the growing problem of food waste in the UK and the world, but also the mental work required to keep track of the contents of our fridge, in our ever-busier daily lives. But would the answer to these two concerns and values need to be more surveillance inducing cameras that we put in our fridges? Would having a picture of the contents of our fridge each time somebody opens its door really solve our problem of food waste or the worries [and the mental work] of what to cook for dinner? Here, the capability approach is helpful to acquire a reflexive standpoint and walk through the opportunities and the constraints the company that develops fridge cameras have. The opportunity, at the very least, is to make an intervention to a growing problem and a market, given the increasing demand from consumers to have products designed with environmental concerns in mind. The constraint, on the other hand, might be one of technology and accessibility. Sensors that would detect the quality of food and indicate whether or not a particular item of food is good for consumption require highly complex technological infrastructures, given the variety of food items that can be stored in a fridge. Equipping fridges with these sensors would also mean that the fridge prices might be higher and the cost of purchasing the IoT technology would be much higher than the fridge camera, as it involves buying a new fridge altogether for the customer. So, the calculations of market share, cost-analysis of profits and revenues and potentially the push to be "innovative" from investors with simple and scalable solutions, might be constraining the developers. Thus, the Virtue Ethics, Capability Approach and Care Ethics help us ground our thinking and analysis in the contexts of the developers we research, rather than engage in ethical evaluations based on consequential logic or top-down ethical principles.

Photo by Alexandru Aceaon Unsplash

In the following series of blog posts, we will provide how using this conceptual framework enables us to move away from consequentialist approaches to emergent technologies, and move beyond the imaginary of two extremes (the dark future of hyper-surveillance or the ultimate-connected future). This entails that, we are able to situate both the developers as individuals embedded in social contexts that shape, constrain or at the very least influence their decision-making and the technologies they work with (e.g. hardware, software, networks and sensors, etc.) that limit or facilitate these decisions. We are able to consider what kind of values they identify with and what kind of virtues can be integrated in the design and development of new products; and where they think their obligations lie in adhering, tweaking or moving away from those values.

Upcoming Blogposts

Blog 1: Do-ers v. Postpon-ers: How do IoT developers respond to ethical challenges?

By Funda Ustek-Spilda

Ethics is understood differently by those interested in building ethical companies from the outset, and those that see ethics as compliance with a regulatory framework. The second group tends to postpone the ethical discussions until they are legally required to do so.

In an event organised by one of the major IoT networks in London, I asked a developer who recently started her own company on wearable IoT technologies, if she ever faces any ethical challenges in her work. She leaned in and repeated more loudly: "Ethics?" as if she did not hear. I nodded and said, "Yes, ethics." She then looked at me puzzled and confused, as if ethics were the keys she recently misplaced or a personal item she forgot where she left. Then she responded: "Oh that!" and continued "Unfortunately, ethics never makes it into my ever-growing to-do list. Maybe one day, I will have time for it. But not at the moment, not when I am just starting my company." Indeed, time and time again, I came across this response, even when it was formulated in slight variations. For instance, a software developer explained it to me how in their company they mainly rely on "the giants" such as Google in ensuring their data is kept secure, as they use Google Drive or other Google products, which are mainly free. "After all" he said, "Google has all the resources, time and money to make sure everything is in order. I neither have time, nor the money." Another developer who works at a company that develops software for supply-chain management mentioned how in their company, they make sure they comply with legal rules and regulations, but other than that, ethics is not one of their "day-to-day concerns." In contrast, I have met developers who refused major investments because the origin of the funds did not fit with their personal values. Or I have met with developers who went separate ways with their co-founders as they did not agree with how far they were willing to veer away from the values they identified with and set up for their products and companies. Similarly, I had lengthy discussions with developers who continue to provide product support to their customers, even when their ventures [products] went bankrupt years ago, as they ethically responsible for the full life-cycle of their products. Therefore, it emerged that developers of IoT products mainly have two [seemingly] contrasting standpoints towards ethics. In this article, I will refer to the first group as Postponers, as they tend to defer any ethical decision unless they absolutely need to respond to them (e.g. legal liability); and the second group as the Doers, as they strive to build their companies around the values they identify with. This however is a simple categorisation. Why do some developers postpone ethical decisions, while others take it to be their responsibility to face them head-on? I will try to look for explanations to this question in this blog.

Blog 2: ***Ethics beyond Data: How does IoT challenge our perspective on data ethics?***
By Funda Ustek-Spilda
Data ethics is usually framed around Big Data ethics. Nevertheless, IoT presents important challenges to this perspective, as hardware, software and sensors might all individually or together present important ethical risks.
In this article, I argue that we need to expand our understanding of data ethics to include both hardware, software and sensors in order to respond to the ethical challenges new and emerging technologies pose. By focusing on home IoT devices, I explore how the boundaries between hardware and software and sensors get blurred and how data ethics approach would be limited to understand, caution against but also find solutions for the ethical risks these devices present.

Blog 3: ***Tech for Good: Is it Business-as-Usual?***
By Funda Ustek-Spilda
There is a growing hype around "Tech for Good". It is argued that tech can not only solve existing societal problems, but it can also solve them at a scale that it benefits businesses (and consequently investors) but also have an impact on societies that are not achievable through charitable means. Tech for Good, however, blurs the boundaries between what is for business and what is for good. As a developer once put it, "You cannot be a business and a charity at the same time. You can only be one." But does that then mean tech for good is just another term for business-as-usual?
In this blog post, I present my findings of an ethnographical fieldwork I carried out at a Tech for Good Accelerator in London, and my conversations and interviews with developers who identify themselves and their businesses/ventures as tech for good.

Blog 4: ***Tech for Money, Tech for Good and Tech for Tech: Social Imaginaries of Tech***
By Funda Ustek-Spilda
Start-up scene is brutal. 80% of all start-ups are expected to fail within the two years of their ventures. And the majority of those that manage to get through their first years are expected to fail within five years. This means an ever increasing number of IoT products which promise 'connectivity' to their users end up being disconnected, with limited/no customer support after the companies cease to exist.
In this blog, I discuss three approaches developers in IoT take towards their businesses and founding a start-up: Tech for Money/Business, Tech for Good and Tech for Tech's sake. I present these three approaches as seemingly distinct but progressively convergent in terms of their business models and interests. I argue that 'money-making' emerges as the dominant value in this social milieu, but how much this value becomes the central or main value of starting a company depends on the social imaginaries developers have about why they are building the product they are building and how their customers/users will respond to it.

Blog 5: Developer Cultures Series
By Funda Ustek-Spilda

Blog 5a: *Developer Cultures Series: Serbia and DesCon*

Blog 5b: *Developer Cultures Series: Londo*n

Blog 5c: *Developer Cultures Series: Rotterdam, ThingsCon*

Blog 5d: *Developer Cultures Series: Values and Ethics of Developers in Europe*
In this series of blogs, I will explore the different developer cultures that exist in London, Rotterdam (ThingsCon) and Serbia (DesCon) based on my fieldwork. The blog posts will include reflections on developers' values in IoT and how they see their products in terms of their ethical underpinnings and implications.
This series will be mainly about summarising the values that we have identified throughout our fieldwork and what kind of ethical thinking they present, or lack of.

Blog 6: Peril v. Promise: IoT and the Imagination of Future
By Funda Ustek-Spilda
In this blog post, I will explore the future scenarios often associated with IoT. I will argue that there are mainly two scenarios, one focusing on the peril of IoT devices for the future, and the second, the promises they are making for an ever-connected, efficient, productive as well as careful future. By focusing on products that are often considered 'creepy' and 'revolutionary', I will explore the 'digital sublime' of the IoT discourse.

Blog 7: When Things Shape Values (2/3): Hardware Components and Interfaces in the Internet of Things
By Sebastian Lehuede
This blog post is the second of a three part series looking at the ethical stakes of different technical elements that make up the IoT. Echoing the 'material turn' that is taking place in social sciences, I discuss the ethical concerns and opportunities brought about by the *hardware components* and *interfaces* that make up the IoT. While the former provide an opportunity to discuss environmental issues, the latter have to do with the way IoT products alienate users from the 'offline' world.

Blog 8: When Things Shape Values (2/3): Energy and Maintenance and Repair Systems in the Internet of Things
By Sebastian Lehuede
This blog post is the last of a three part series looking at the ethical stakes of different technical elements that make up the Internet of Things (IoT). Echoing the 'material turn' that is taking place in social sciences, I discuss the ethical concerns and opportunities brought about by energy and maintenance and repair systems. While energy consumption usually forces developers to

compromise some features offered by IoT products and services, maintenance and repair is a challenge for small companies seeking short-term growth.

Blog 9: Can Nontechnicians Code? The Relevance of Communities for Ethics-Oriented Initiatives
By Sebastian Lehuede
In this blog post I provide some thoughts on the relevance of communities for policies, research projects or tools seeking to advance a more ethically-conscious IoT. Combining observations from my participation in the Internet of Things London and some literature on technical cultures, I argue that communities are one of the way sin which nontechnicians can shape the ethical trajectory of IoT devices and platforms.

Unboxing Videos

Video 1: Bleep Bleeps, Sammy Screamer Unboxing Video
Dec 2018
By Funda Ustek-Spilda
In this video, I will unbox Sammy Screamer, which is an alerting IoT device that can be attached to anything that one does not like it to be moved; e.g. cookie jar, handbag, pram, etc. While unboxing I will discuss some of the ethical questions this type of alerting devices raise, while looking specifically into the privacy and security policies of Sammy Screamer, which is advertised especially for the protection/safeguarding of kids.

WHEN THINGS SHAPE VALUES (2/3): ENERGY AND MAINTENANCE AND REPAIR SYSTEMS IN THE INTERNET OF THINGS

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By Sebastian Lehuede This blog post is the last of a three part series looking at the ethical stakes of different technical elements that make up the Internet

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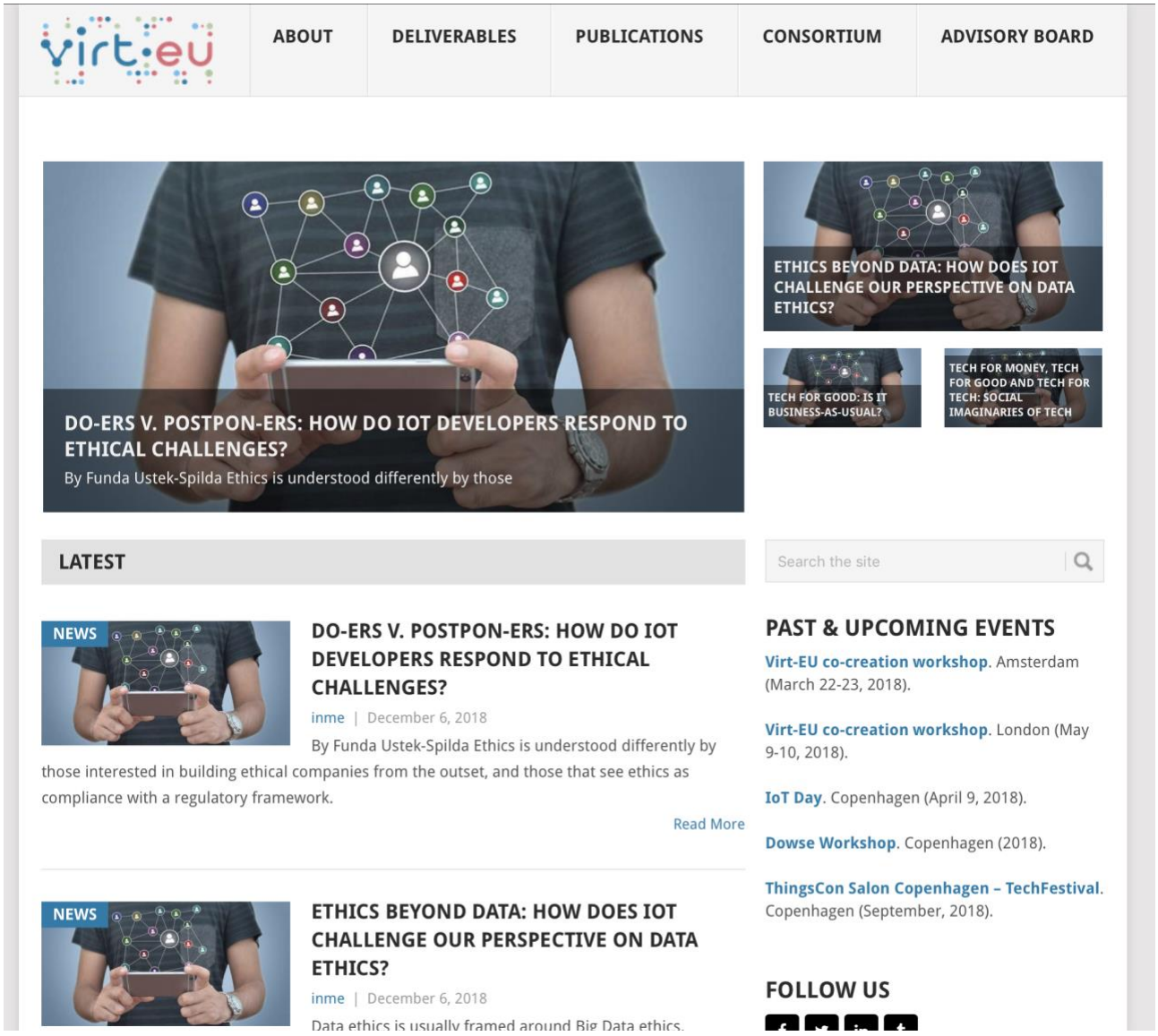
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