



**The State of  
Responsible IoT  
2019**

Small Escapes from  
Surveillance Capitalism

THINGS



# **Challenge the Status Quo.**

*(Zuversicht)*



**ThingsCon Report:  
The State of Responsible Internet of Things 2019**

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# Editorial

*The individual in the western society of affluence has become accustomed to the fact that everything revolves around the fulfilment of one's own needs.*

2019 is the year where the term "Surveillance Capitalism" really took root. It is not necessarily the year where the dams broke and some dramatic event pronounced the arrival of dystopian reality, but perhaps the year where progressive deterioration and the introduction of this term, Surveillance Capitalism, by economist Shoshana Zuboff, has made it clear that 1984 has not just arrived: We might already be past it.

In the field of Design and Technology the development came creeping and was packed in the supposed advantage of the user-centred design. Whereas in the 1990s it was a question of putting the user at the centre of the development of digital products, this well-intentioned philosophy today poses a threat for both individuals and the society in which these individuals live. The individual in the western society of affluence has become accustomed to the fact that everything revolves around the fulfilment of one's own needs.

The digitization of products, services and processes enables the constant and completely unnoticed observation of the user by software. And it does not stay with classic software. By integrating the digital in our entire habitat – the networking of everyday objects in our offices, homes, even cities – a complete and lifelong data profile of a person can be generated.

In its essence, Surveillance Capitalism describes the current economic model of technology companies that make revenue by surveilling our online lives, gathering data that is processed and transformed to result in targeted advertising packages. The better the data, the more likely it is that we do what is expected of us: buy what we are shown. Surveillance Capitalism is therefore not only an economic model, it is a form of control over our behaviour.

It's not that users do not know that their personal data is the currency to reach their convenience – but most do not know the price or don't want to know it as they are addicted to the convenience offered by tools made with this data. It's not that companies do not know secretly, that they should not turn customers into victims, they can exploit – they just cover themselves with the fig leaf of state-of-the-art user orientation and digital disruption. It seems like we have, in our imperceptible confidence in the societal progress by technology and market-economy, produced the same unhealthy mutual dependency as of a drug dealer and its customer.

The irony is that technology – applied with social responsibility – can still solve a lot of existing problems, but this perspective often is taken only into account by companies, if it pays off. Indeed, many eyes were looking towards the European Union, which, after a long struggle, in 2018 enforced the GDPR (General Data Protection Regulation),

a trans-national protection of personal data. But the only result that can be seen so far is information on websites: "We use cookies. Here we have a complicated text for you that fulfils the sole purpose of legally bringing our informational liability." As important as this ordinance is, it also shows the powerlessness of a united state system characterized by a social market economy. In November 2019, digital rights activist Aral Balkan urged attending parliamentarians to ensure that Europe does not become an Ferengi alliance, pointing out that it is not just about the fight for transparency towards users, but simply about the fact that companies and states should not be allowed to use the identity and property of citizens to enrich themselves exclusively. (Ferengi: An exclusively economically interested extra-terrestrial species in the series "Star Trek Next Generation".)

So, what if the great and powerful of our political and economic world find no way to understand the problem and to eliminate it consistently? With this year's edition of RIOT Report – State of Responsible IoT, we are looking for small escapes that show us a way out of surveillance capitalism that can be implemented for all of us. How to solve the wicked problem of designing and developing for our digitally entangled lives, with respect for the dignity and sovereignty of individuals and societies? With ThingsCon we have devoted ourselves to working towards a "responsible IoT". But what does that look like in the light of Surveillance Capitalism? In order to understand not only the problem, but also to offer small escapes from the current dilemma, the authors of this issue deal with the following key questions:

*So, what if the great and powerful of our political and economic world find no way to understand the problem and to eliminate it consistently?*

*We are looking for small escapes that show us a way out of surveillance capitalism that can be implemented for all of us.*

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We would like to thank our wonderful authors of this issue. Indeed, a “best practice” model to oppose Surveillance Capitalism does not exist yet. But we are convinced that we need a discussion about how we want to live in the future, supported by technology that allows for our self-determination and a respectful coexistence with society and nature. With this report we would like to open that discussion about the consequences of Surveillance Capitalism and how the IoT community can oppose them.



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## Editors

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# The Alienating Consequences of Things That Predict

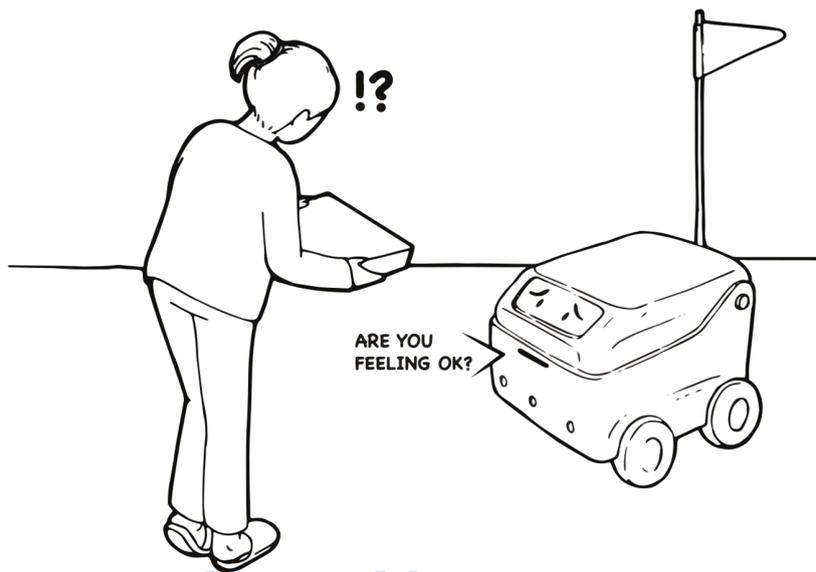
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Things become networks, autonomous things with their own agency as result of the developments in artificial intelligence. The character of things is changing into things that predict, that have more knowledge than the human it interacts with. Things are building new kinds of relations with humans, predictive relations. What is the consequence of these predictive relations on the interaction with humans? Will the things that know more than we humans do, help us understand the complex world, or will the things start to prescribe behaviour to us without us even knowing? What is the role of predictive relations in the design practice of the future designer?

This notion of predictive relations is linked to earlier research in the research program PACT (Partnerships in Cities of Things) and the work in the Connected Everyday Lab by Elisa Giaccardi and others. The notion that we will have affective things that draw conclusions from the interaction things have with humans, and combine these with build-up knowledge from the network, is illustrated in the provocation by Iohanna Nicenboim and Elisa Giaccardi called Affective Things.

In a paper (Lupetti, Smit, & Cila, 2018) we described some near future scenarios in which things connect to existing data and cloud services in the smart city and act in concert with people. In a few specific scenarios we sketched how these relations may play out. From a pizza delivery pod that knows so much of the background information in combination with historical data on orders, that it can become an affective thing, starting a dialogue on the situation of the person ordering the pizza. She used to order always two pizzas but lately the orders became one pizza and combining with other behaviour the conclusion is drawn the relationship of the girl with her partner has ended. The delivery pod here takes on a new role as good friend, a shoulder to cry on. A role that can do no harm if it stays within the domain of that one interaction. The links to other behaviour in other situations indicates though that this is not the case.

*The delivery pod here takes on a new role as good friend, a shoulder to cry on.*



*Figure 1: a new relation with autonomous things. Illustration by M.L. Lupetti from (Lupetti et al., 2018)*

Another example describes a future public transport situation, based on a system of smaller transport pods that have a flexible route planning for going from A to B. This means that the pods don't follow fixed routes and the travel time is severely reduced. But there is a catch. The system is not only flexible in the journey mapping, the planning is also considered who is travelling and including the social status of the person traveling. The service is there for planning its routes via a combination of actual efficiency in the route and the priorities. Consequence is that the journey time is hard to predict for the individual traveller. Creating more transparency in the decision making is key in building citizen robotic systems that are trusted by human citizens (Lupetti, Bendor & Giaccardi, 2019).

What is driving these systems to materialise? The first driver is the digitization of our world in all aspects. We have deconstructed our cities with increments of buildings or structures into a layered model where the basic layer is the physical layer. On top of that we have a digital layer that is connected to databases and computing capabilities. Entities can be physical or digital and are using the digital layer to be assembled to a state in a service. This is the fluid assemblage (Redstrom & Wiltse, 2018). Not only can these assemblages be defined at the moment of use or interaction, also the physical layer func-

## **The Fundament of This Future Society**

*The thing itself is changing too into an intelligent artefact. It connects with an existing network, collects real-time data and acts proactively*

## **Predicting and Prescribing**

*This creates a situation in which the thing has more knowledge on possible future developments than the human can have based on the combination of observation and anticipation.*

tions differently. Instead of setting the stage it is a blank sheet with the right components. Kitchin & Dodge described this situation as a Code/space (Kitchin & Dodge, 2011), a space where the digital computing layer has become crucial in defining the functionalities. No computing layer means no functionality. Something that already can be seen in ultimo at an airport. In the deconstructed city the services offered are totally open for interpretation but at the same time the control of that layer is more and more limited to a selected number of players.

The thing itself is changing too, into an intelligent artefact. It connects with an existing network, collects real-time data and acts proactively. And most interesting, it has a social behaviour. These things take their own role in our society, things are citizens.

That things are becoming networked objects behaving as fluid assemblages is the start. These things can adapt to the data in the network and the interaction with other things and humans. This creates a situation in which the thing has more knowledge on possible future developments than the human can have based on the combination of observation and anticipation. Anticipation is here based on knowledge from experience or learned interpretations. If we let go of a ball we understand it will fall to the ground. When that same ball is an autonomous operating ball it can connect to the network and things start to predict outcomes, it means that it will feed forward on situations we did not anticipate.

The more complex the behaviour of the thing is the more anticipation on expected results is steering the interaction. The more complex the thing the more depending we will be on the predictions made.

In the future we will shift continuously between the simulated future and the now. Think on simple examples as the weather app that is predicting rain based on radar data and sensors, ruling our perception of the expectation of becoming wet when going outside more than the judgement of the real rain situation. And more specific the example of a Tesla that is predicting an accident and taking the initiative to brake before the first accident is really happening.

We are entering here an interesting domain of tension; what is ruling, the predictive system that helps us to understand the complex world, or a system that is prescribing our behaviour?

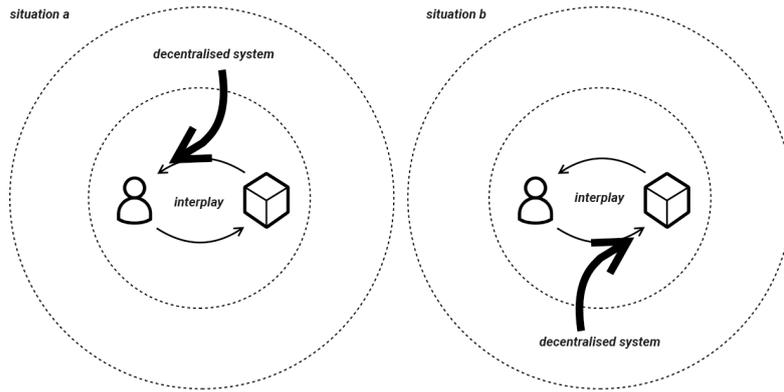


Figure 2: model of predictive relations and how the decentralized system is informing user to make decisions (a) or prescribing behaviour (b)

If the things will form a framework for our decisions, will we transfer agency to the system of things? And if we do so, will that limit our own agency? This is no question; we already put more trust in systems to keep knowledge and remove this knowledge from our memories. Google is the ultimo assistant. And this is an example of what dependency entails. The filter bubble became a recognized concept. What we think is true is depending on what tools like Google present to us.

*What we think is true is depending on what tools like Google present to us.*

As soon as we start to experience this disconnect from real world and (pre)scripted life alienation is a possible outcome. We feel disconnected from the devices as the working is more defined in the decentralized system than in the direct working. This even can cause physical unease (Bean, 2019).

The interplay of predictions and actions creates a complex interrelated design space. Predictive behaviour shapes our mental model on the acting of the thing. At the same time our actions shape the digital model of the thing. In a first model of predictive relations the interplay of the human and the autonomous operating thing is deconstructed into a combination of pattern recognition, interactions with a digital representation of the thing and knowledge from probable futures generated by similar instances in the network.

## A New Design Space

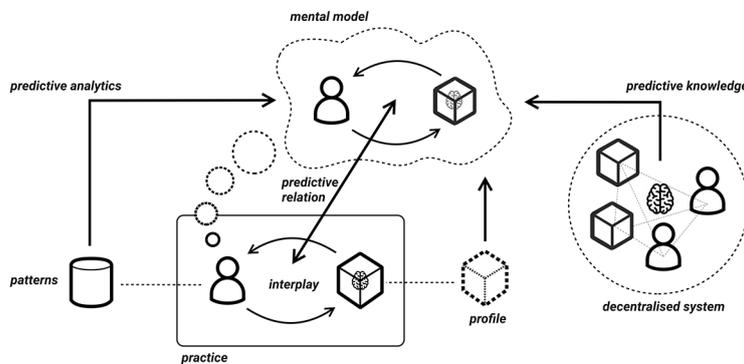


Figure 3: visualization of the hypothesis of the working of predictive relations

*The choices made in the design defines the distribution of agency between system, thing and human.*

For designers of physical things, the span of control is already extending from the physical instance to the digital service that is incorporated or unlocked via the physical artefact. With the notion of predictive relations there is a need for designing contextual rule-based behaviour. The choices made in the design defines the distribution of agency between system, thing and human. Systems of things form an entity on its own and the design is both influencing the system as the things, as it is influencing the interplay of the thing and the human. To deal with this complexity the default acting might be to automate the system behaviour with machine learning and AI. But what does that mean for our position in that system. Can we keep a set of responsible rules? We like to work with known knowns and known unknowns. But what is the consequence for the way we design if we need to do this for unknown knowns?

## **3** Tips to Escape Surveillance Capitalism

### **Transparency in Decision Making**

The more complex our world becomes, the more we depend on predictions to be able to anticipate our behaviour. Creating more transparency in the decision making is key in building systems that are trusted by humans.

### **Contextual Rule Based Behaviour**

For designers of physical things, the span of control is already extending from the physical instance to the digital service that is incorporated or unlocked via the physical artefact. With the notion of predictive relations there is a need for designing contextual rule-based behaviour.

### **Understand The New Design Space**

The designer of things will have a new design space when things become things that predict. Understand how people build a relation with the future through the working of autonomous technology.

**Bean, J.** (2019). Nest Rage. *Interactions*, 26(3), 22–23. <https://doi.org/10.1145/3320495>

**Bianchini, S.** (2012). The 23rd Player—A Behavioural Ball. Retrieved December 4, 2019, from <https://dispotheque.org/en/le-23eme-joueur>

**Fingas, J.** (n.d.). Tesla Autopilot avoids a crash before it happens. Engadget. Retrieved from <https://www.engadget.com/2016/12/28/tesla-autopilot-predicts-crash/>

**Kitchin, R., & Dodge, M.** (2011). *Code/space: Software and Everyday Life*. MIT Press.

**Lupetti, M. L., Bendor, R., & Giaccardi, E.** (2019). Robot citizenship: A design perspective. *Design and Semantics of Form and Movement*, 87.

**Lupetti, M. L., Smit, I., & Cila, N.** (2018). Near Future Cities of Things: Addressing Dilemmas Through Design Fiction. *Proceedings of the 10th Nordic Conference on Human-Computer Interaction*, 787–800. <https://doi.org/10.1145/3240167.3240273>

**Nicenboim, I.** (n.d.). Affective Things: More than Human Design - Iohanna Nicenboim. Retrieved December 4, 2019, from <https://iohanna.com/Affective-Things-More-than-Human-Design>

**Redström, J., & Wiltse, H.** (2018). *Changing Things: The Future of Objects in a Virtual World*. Retrieved from <http://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=5516511>

## References



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**Iskander Smit**, is a visiting professor at Delft University of Technology. He is coordinating Cities of Things Delft Design Lab. With AI and IoT the concept of what is a “thing” shifts from passive artifact to active partner. The research program Cities of Things explores the role that such Things will play in our future cities “as citizens”. In his research Iskander is specifically looking into the relationship we will have with things that have more knowledge of the future than we do and shape our view on the world. Next to his research activities in Delft Iskander is innovation director at Amsterdam based digital agency INFO and chairman of the Dutch chapter of ThingsCon. He is also co-organizer of Behaviour Design AMS meetup and TechSolidarity NL.

