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TU Delft

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AMSTERDAM INSTITUTE FOR
ADVANCED METROPOLITAN SOLUTIONS

Designing Things that Predict

Iskander Smit

agenda

Context of research
First phase of results
Interaction

PACT

PACT

Partnerships in Cities of Things

PACT

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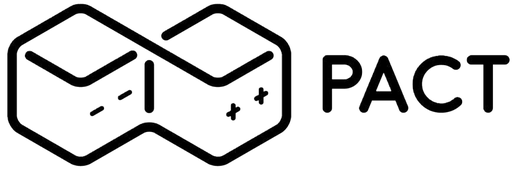

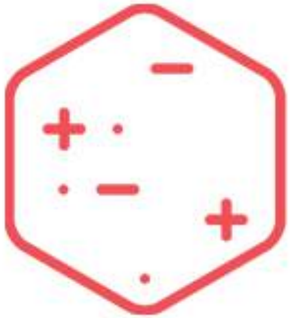

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EVERYDAY
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Affective Things

Iohanna Nicenboim, Elisa Giaccardi, 2017

Affective Things

Roboats

AMS & MIT Senseable Cities Lab

Delft Design Labs

City of Things

Cities of Things

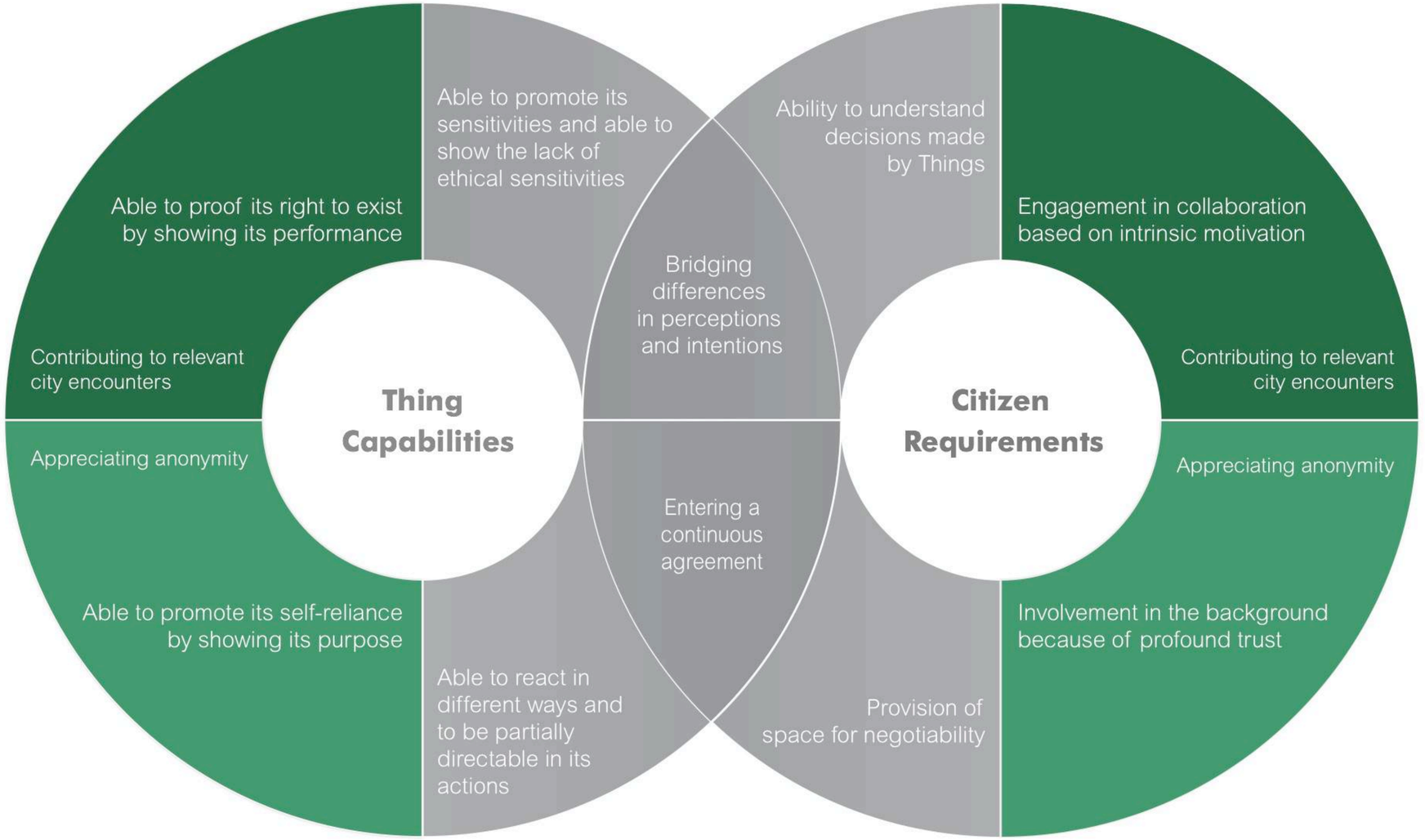
With the rise of AI (artificial intelligence) combined with IoT (internet of things) the concept of what is a “design thing” shifts from passive artifact to active partner. Capable to perform tasks and make judgements next to us, Things increasingly “work with us” to produce positive change in everyday life. In Cities of Things, we focus on the role that such Things will play in our future cities “as citizens”, moving past the idea of the smart city and smart products as a dashboard and tools for easy living.

about →

Things as citizens as design inquiry

Graduation research Louise Hugen, 2018

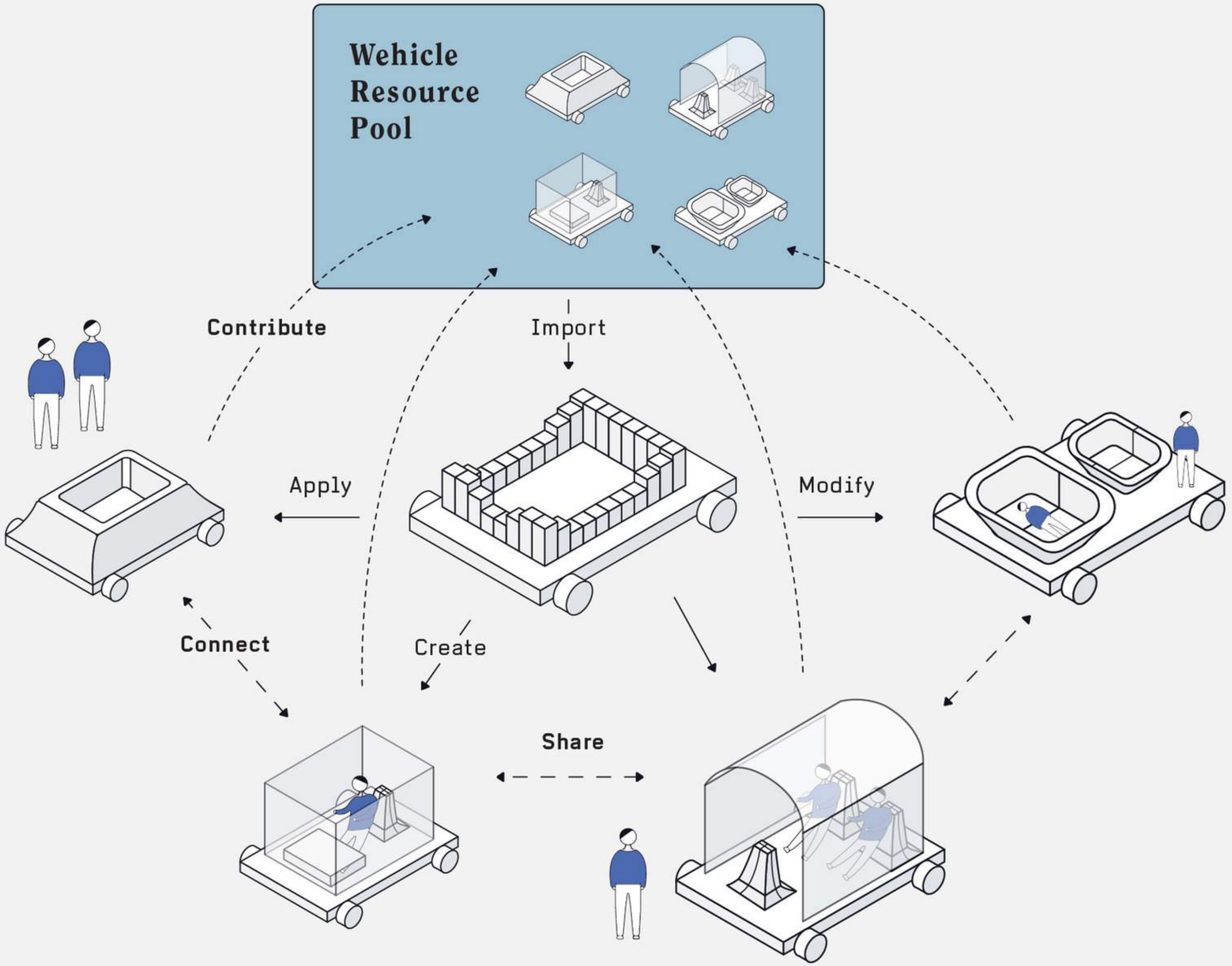
THE DESIGN QUALITIES MODEL



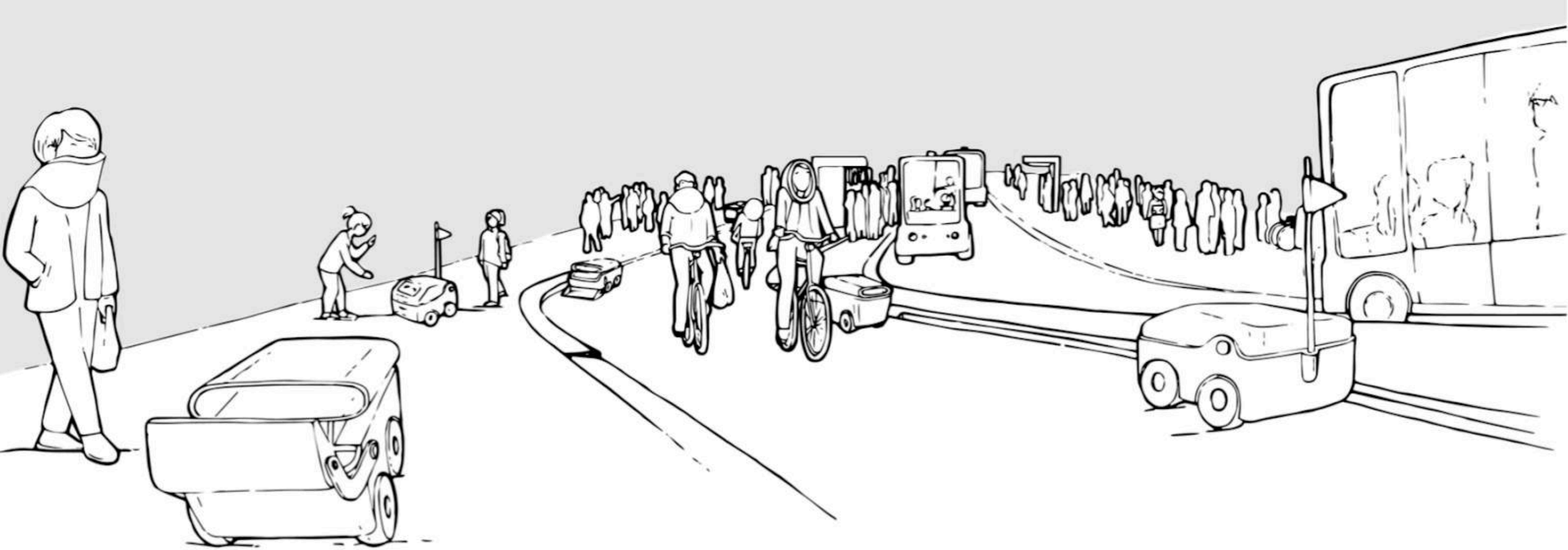
Louise Hugen, 2018

Hinting Civic Futures

Graduation research Sen Lin


Wehicle
Resource
Pool
Contribute
Import
Apply
Modify
Connect
Create
Share

Sen Lin, 2018

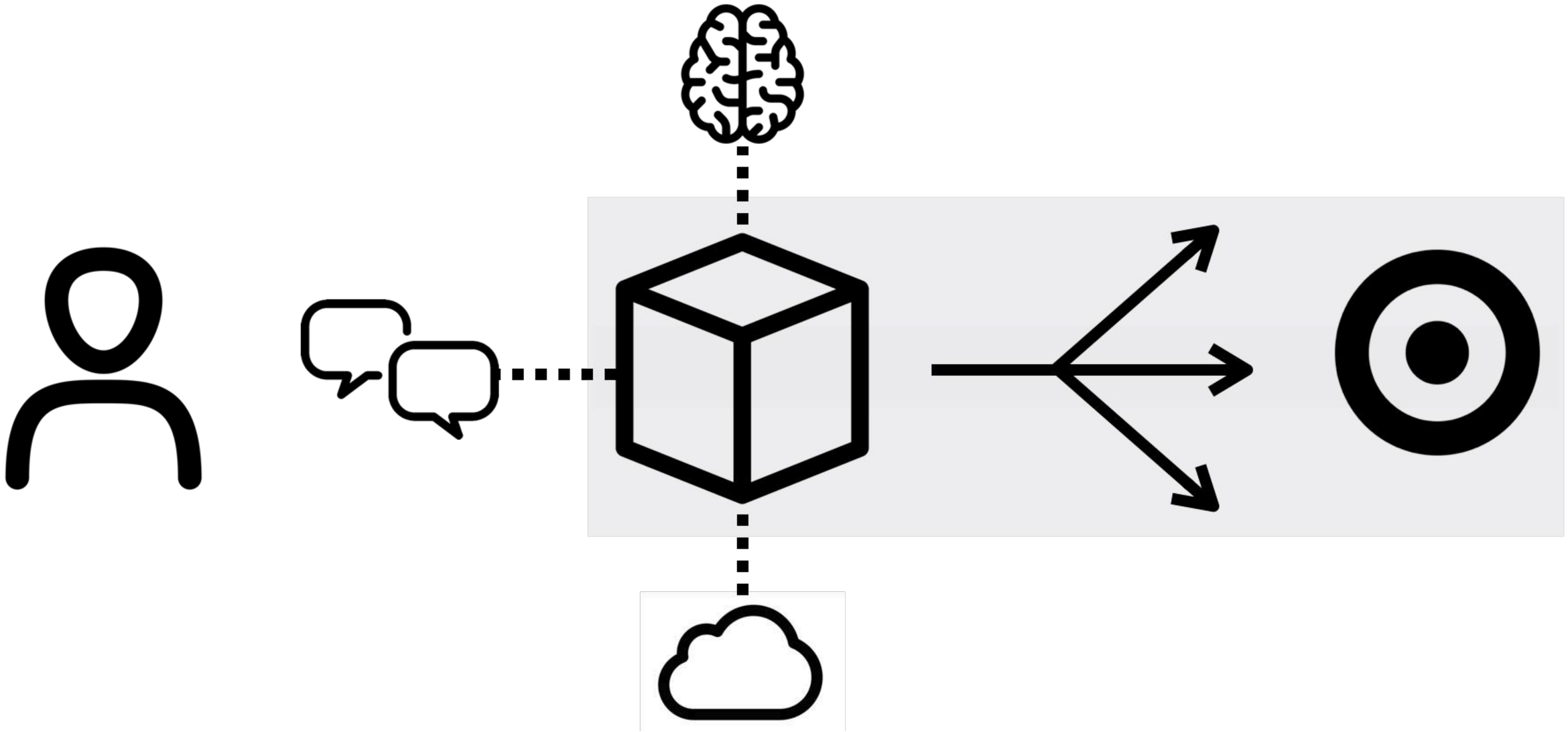


Cities of Things

How can things connect to existing data and cloud services in the smart city and act in concert with people?

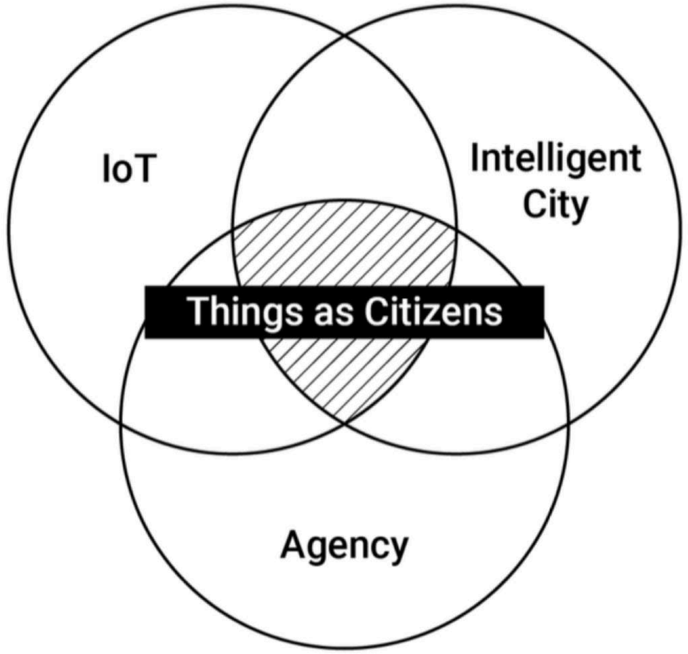
Lupetti, M.L., Smit, I., Cila, N. (2018), Near Future Cities of Things: Addressing Dilemmas through Design Fiction

Rush Hour _ Black Sheep Films



Things with agency

Intelligent, fed by the cloud, in conversation with humans



Intelligent artefact

- Connect with existing network
- Collect realtime data
- Act proactively
- Behave socially

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Smart city paradigms

#1 Data dashboard

#2 Adaptive infrastructure

#3 City of Things

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Paradigm #3

Cities of Things

- Things as social entities
- Cannot be controlled (like humans) but can be governed
- Need for social contracts (pacts, agreements)

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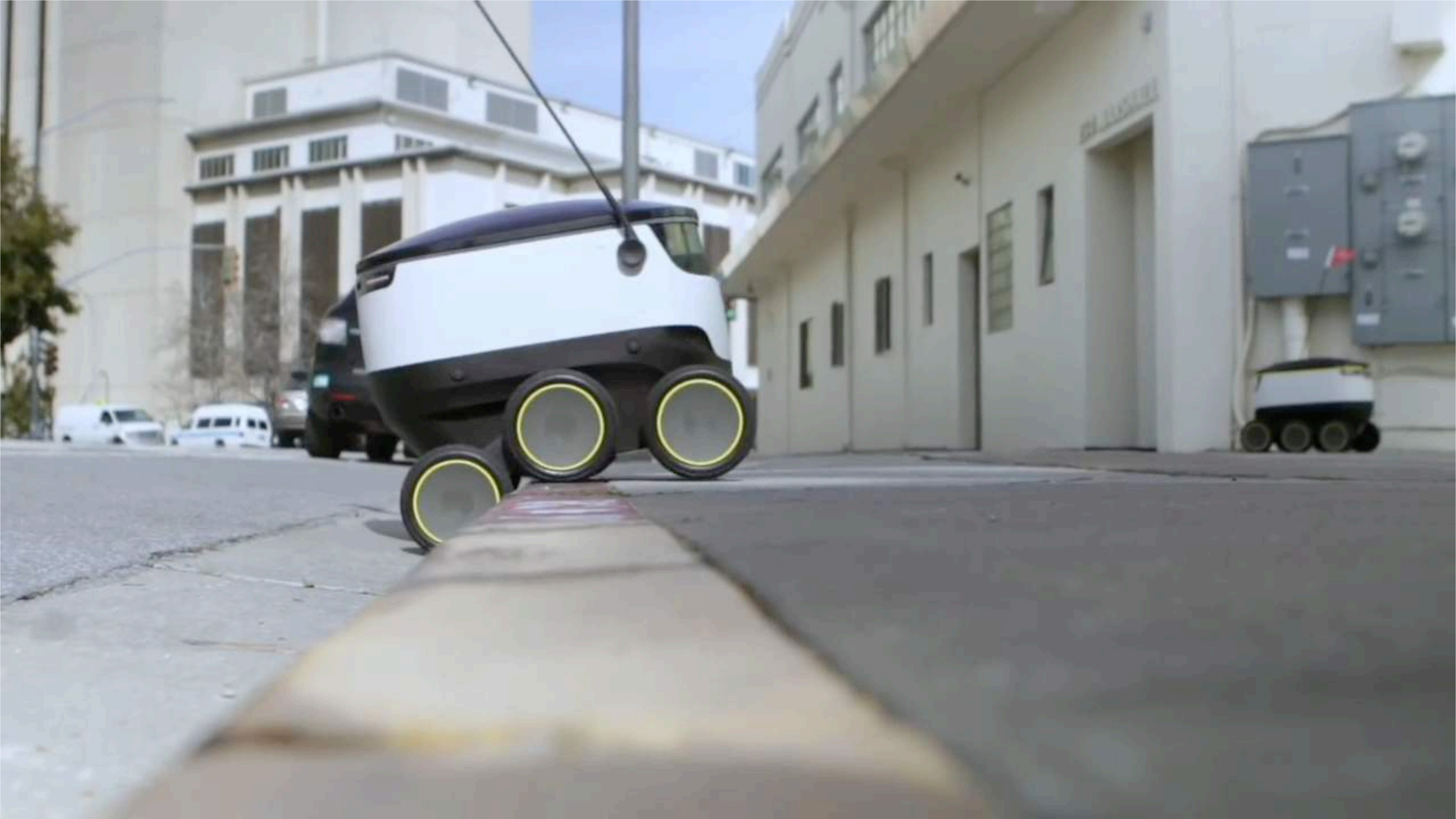
Delivery pods

Starship technologies

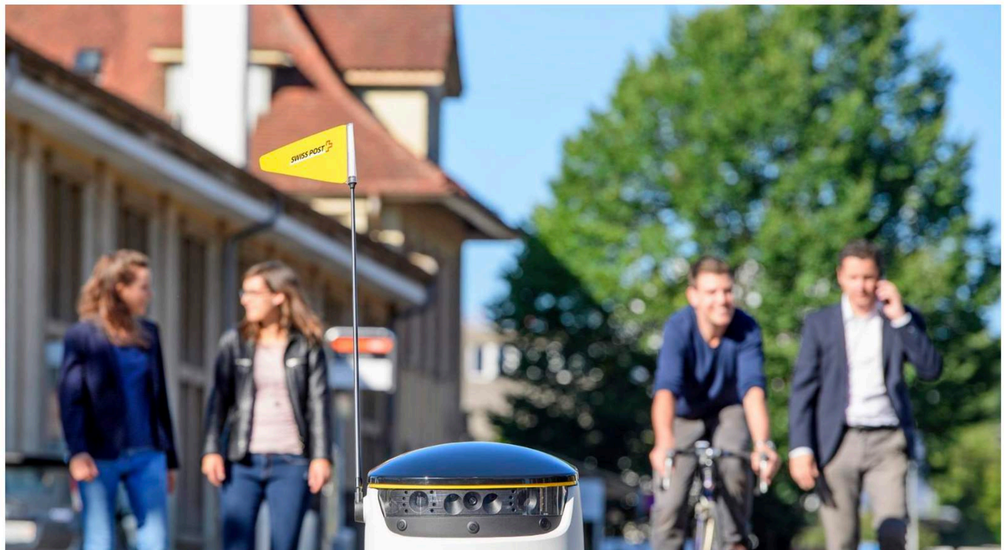


Non-humans getting typically human statuses

People kicking these food delivery robots is an early insight into how cruel humans could be to robots

Isobel Asher Hamilton
Jun. 9, 2018, 9:00 AM 3,131

FACEBOOK LINKEDIN TWITTER EMAIL PRINT



Arizona law gives delivery robo

Secure | https://www.foxnews.com/tech/arizona-law-gives-delivery-robots-same-rights-as-pedestrians-b...

FOX NEWS 8:45 AM

U.S. World Opinion Politics More Watch TV

Hot Topics NFL protesters clash

ARIZONA · Published May 31

Arizona law gives delivery robots same rights as pedestrians – but they must abide by same rules

By Charlie Lapastora, | Fox News

TaCIT

Things as Citizens Ideation Toolkit

Ideation of a future scenario characterized by provocative design concepts.

Dilemmas

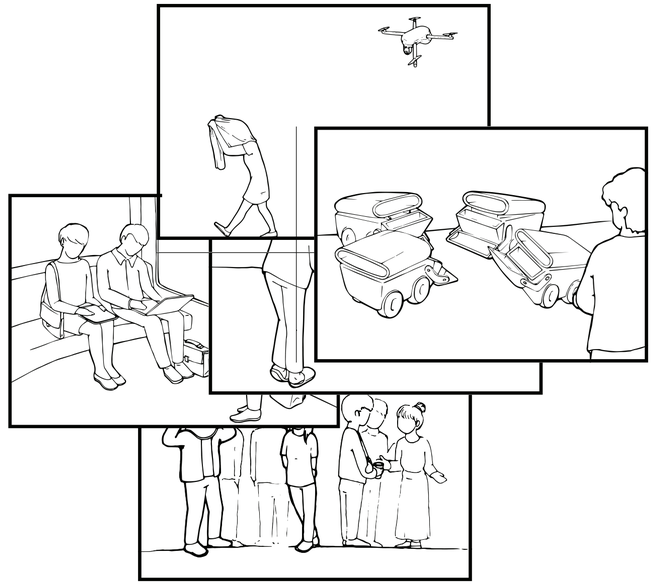
Responsibility
private – public

Priority
human – system

Relationship
tool – social partner

Adaptation
human – thing

Delegation
partial - total



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The self sufficient robot cleaner

Delegation

In the future our streets will be cleaned by swarms of cleaning robots.

We delegate the cleaning task, and delegate rights to be not disturbed by individual human citizens...

The friendly delivery robot

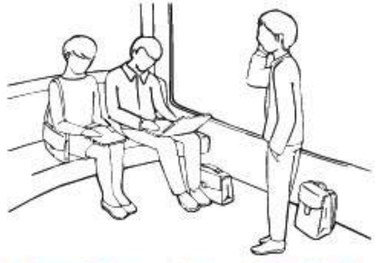
Relationship

In the future our deliveries will be done by autonomous vehicles.
We build a relationship with the (service) of the robots as they know all of our habits.

The efficient public transport

Priority

In the future we use a public transport service that is optimised for our combined commutes.
You might take a longer commute as that is benefiting the overall priorities...



The national guardian angel drone

Responsibility

In the future we will have our personal security agents in the form of surveilling drones.

We trust the responsibility for our security by having a personal drone guardian us...

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Designing Things that Predict

Iskander Smit

What is the role of predictive relations in the design practice of the future connected product-service designer

Research question

Changing Things

The Helpful BBQ

Sietse Taams

labs.info.nl


Master of the party
occasionally

INSPIRATION

PREPARATION

USE

BARBECUING

- A CUSTOMER JOURNEY -

"My **grill** is my castle"

THINGS

Several kitchen accessoires can be used for marinating, cutting and other food preparation purposes.

Kitchen Accessoires

A steel brush can quickly get rid of the dirt that is sticking to the grill.

Brush

A starter is a nice way to evenly ignite the charcoal. It required less effort from the user as well.

Starter

The type of barbecue determines the length of the preparation phase. Charcoal takes more time than gas.

Barbecue

Barbecue tongs are a tool that allows picking up food without penetrating it.

Tongs

Several food types require different kinds of cutlery. Also the plates are cleaned more often or even replaced.

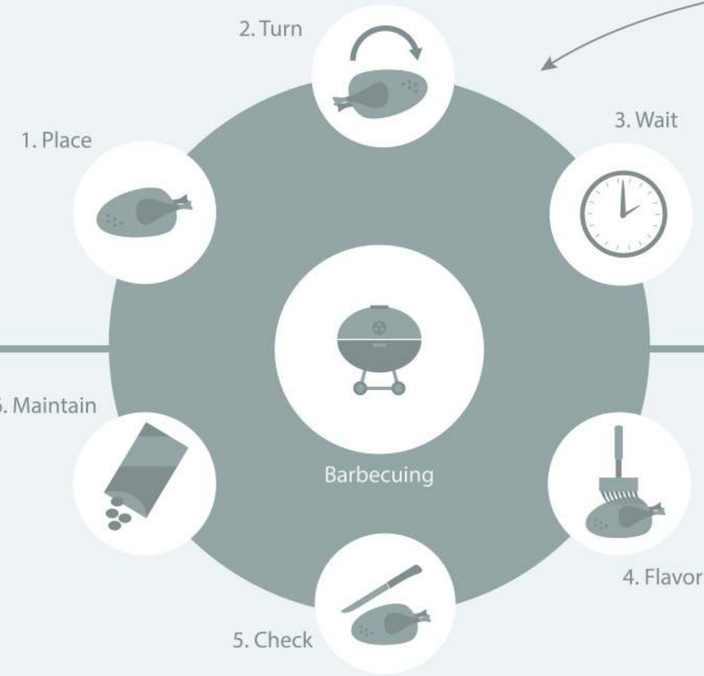
Cutlery

A spatula is used to pick up fragile food types and is also a tool for scraping of grill residue.

Spatula

For heavy pieces of food that can withstand penetration, a fork is used.

Fork



DATA

8+

People

The amount of people and their food preferences are important.

Weather

Warm and dry weather is often preferred. Weather data is used.

Agenda

In order to plan a date, people's agendas are consulted.

€

Prices

Food, especially meat can be expensive. Information about products and prices is required.

Food

The availability of certain food can vary. Also some food types go better with other food or drinks

Temperature

To start grilling, a certain temperature has to be reached.

Temperature

The temperatures on the grilling surface, inside the meat and around the meat determine the result.

Cooking time

There are different cooking times for different kinds of meat and personal preferences.

Humidity

Sometimes water is added because the humidity can influence the meat's succulence.

Feedback

The result is eaten by people who might have a different taste. Their feedback could be useful.

Smell

The smell of the barbecue is typical and inviting. It can trigger people to barbecue.

Light & Temperature

Evenings are 'long', the temperatures are comfortable and the light is practical: summer is the most popular barbecue season.

Invite

Barbecuing is a social event organized together with family or friends.

Plan

Most people associate barbecuing with nice weather and will check the weather forecast in advance.

Shop

Depending on the amount of people and their wishes, the food and drinks have to be bought.

Prepare

Food that goes on the barbecue has to be seasoned or prepared in another way. Also side dishes are made.

Ignite

The charcoal has to be ignited and it requires time for it to be hot enough to start grilling.

Clean

Once the grill is hot, it can be cleaned more easily. Using cleaning agents should be avoided to prevent corrosion .

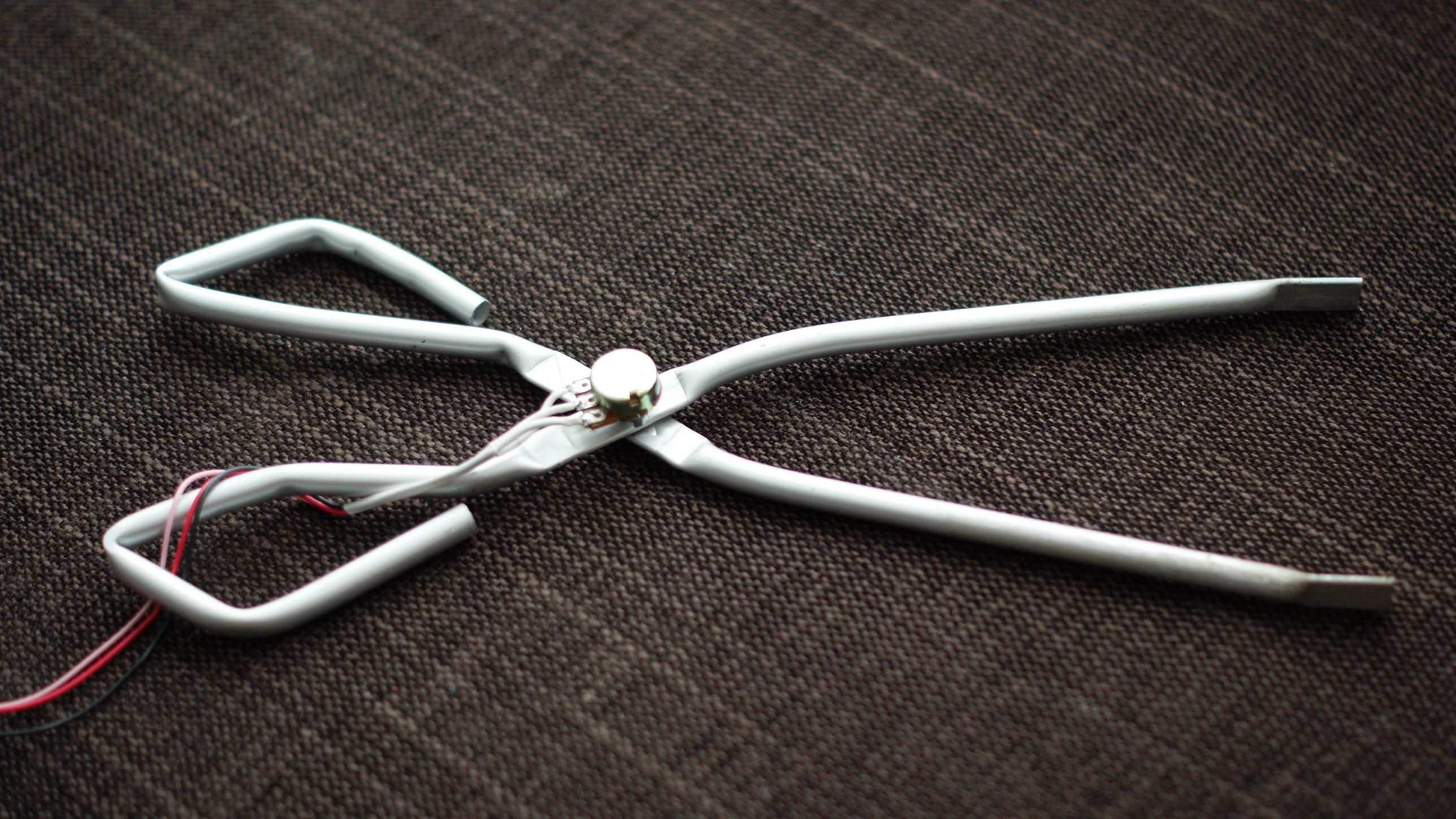
Eat

Eating will be done during and after barbecuing but this can be different for the main user.

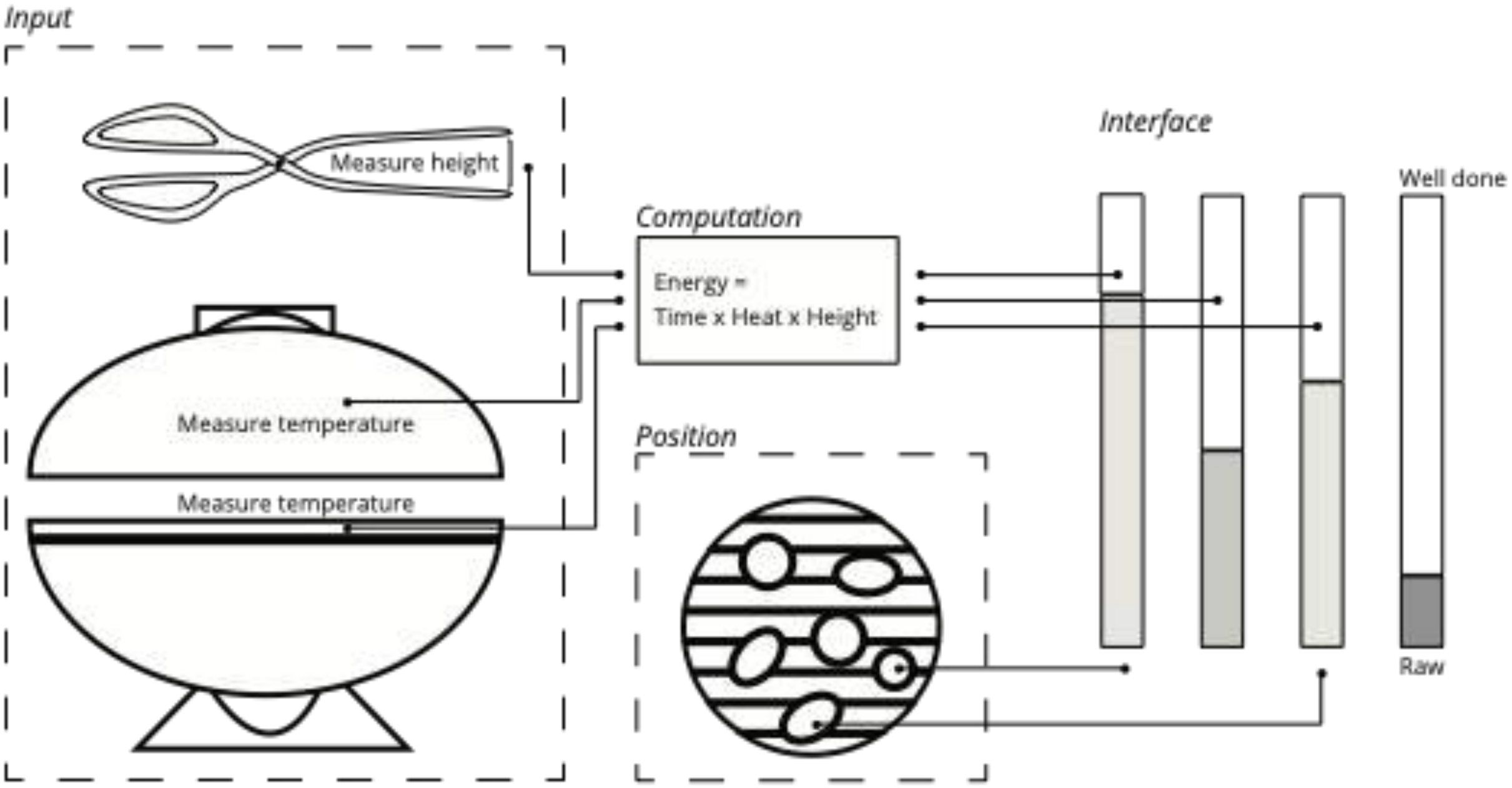
(ecosystem of) things

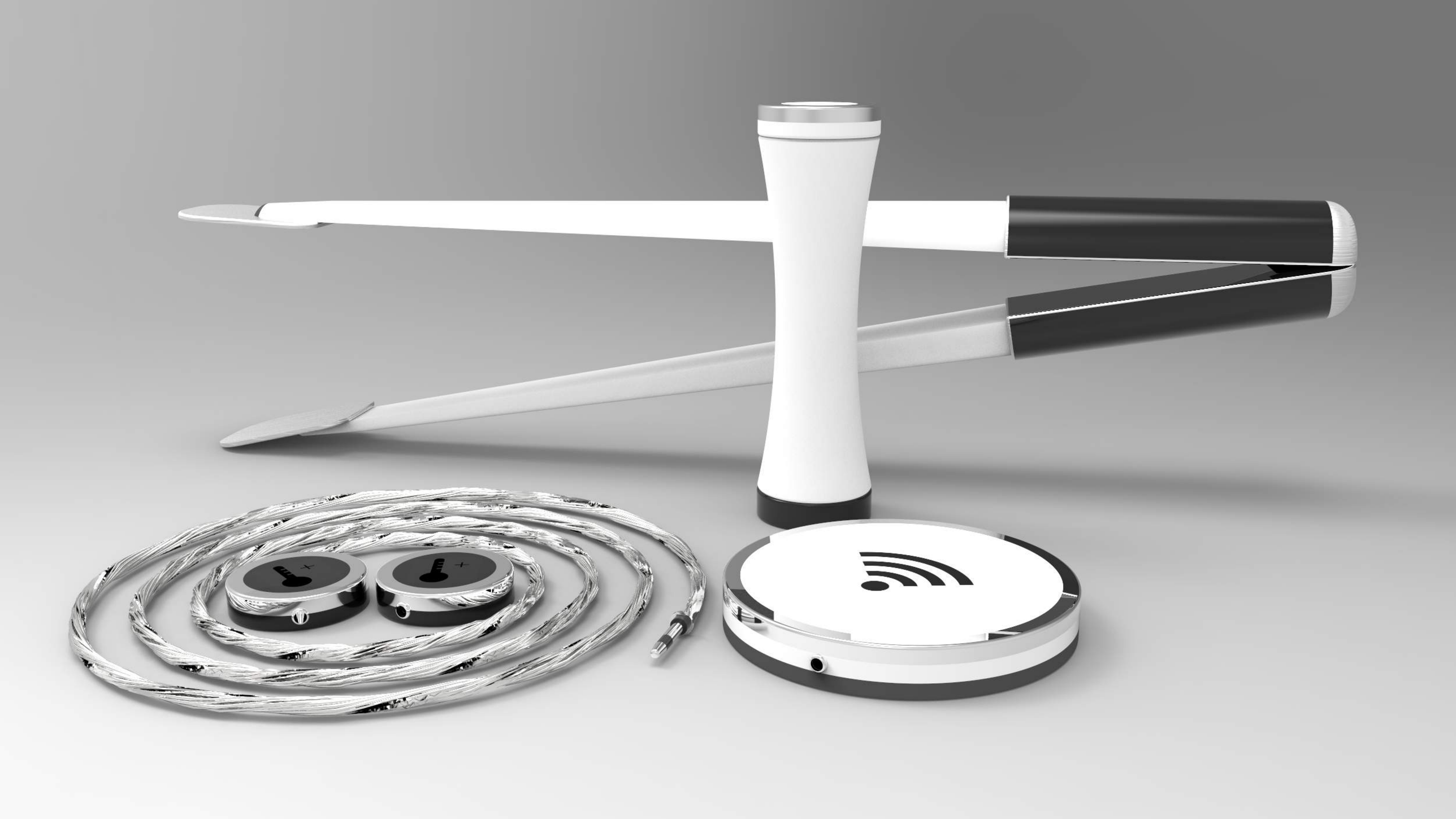
activities while using

data




Maxtor


Input
Measure height
Measure temperature
Measure temperature
Computation
Energy =
Time x Heat x Height
Position
Interface
Well done
Raw




EGGPLANT
CHICKEN
RIB EYE STEAK

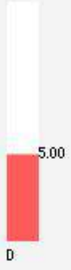
DASHBOARD

Connected Barbecue

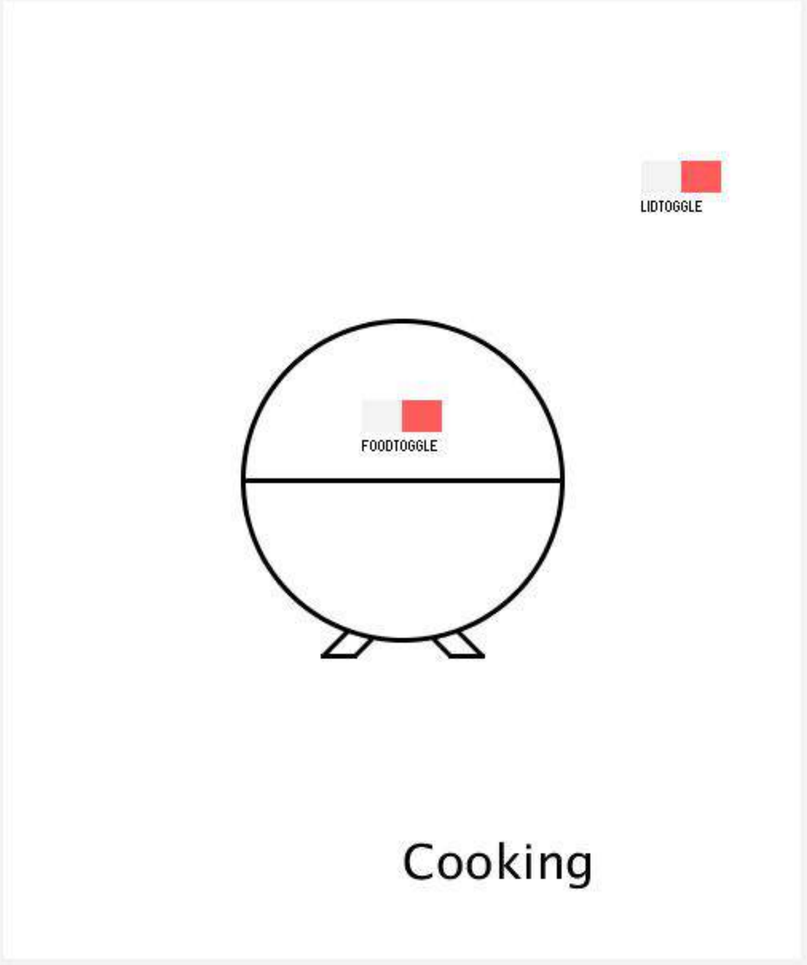
- Demo version

LID TEMPERATURE

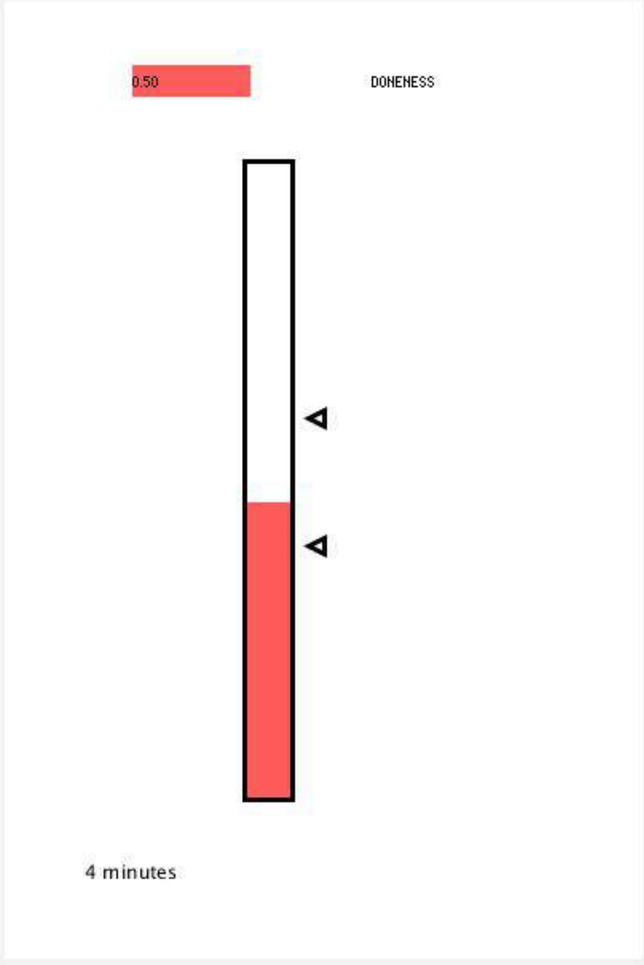
188 220



GRILL TEMPERATURE



Cooking



4 minutes

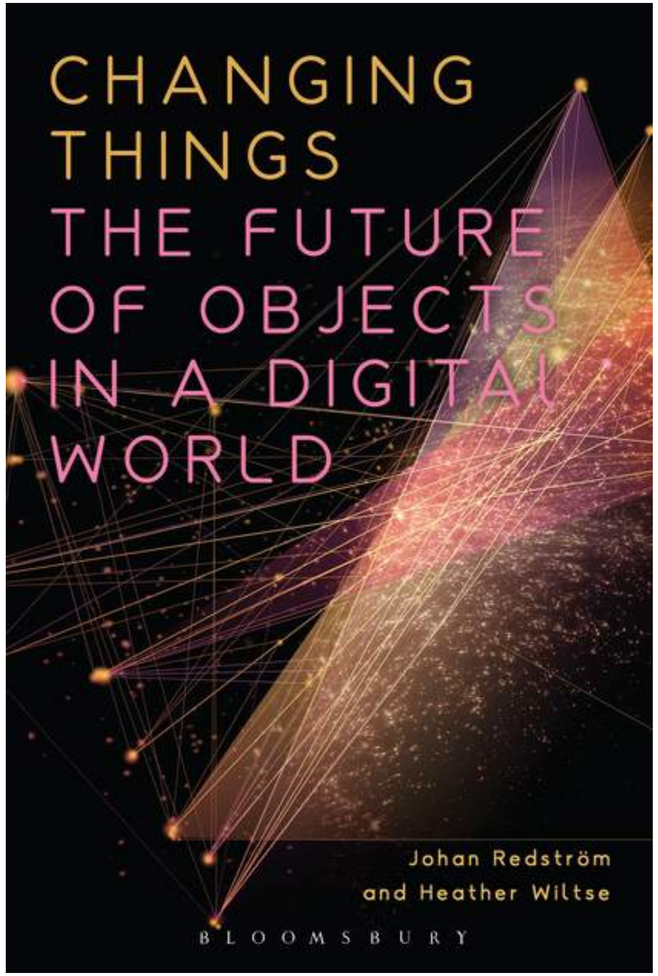
Hardware as a platform

Conversations with the machines

Beyond screen interactions

Context aware, rule-based

New type of things



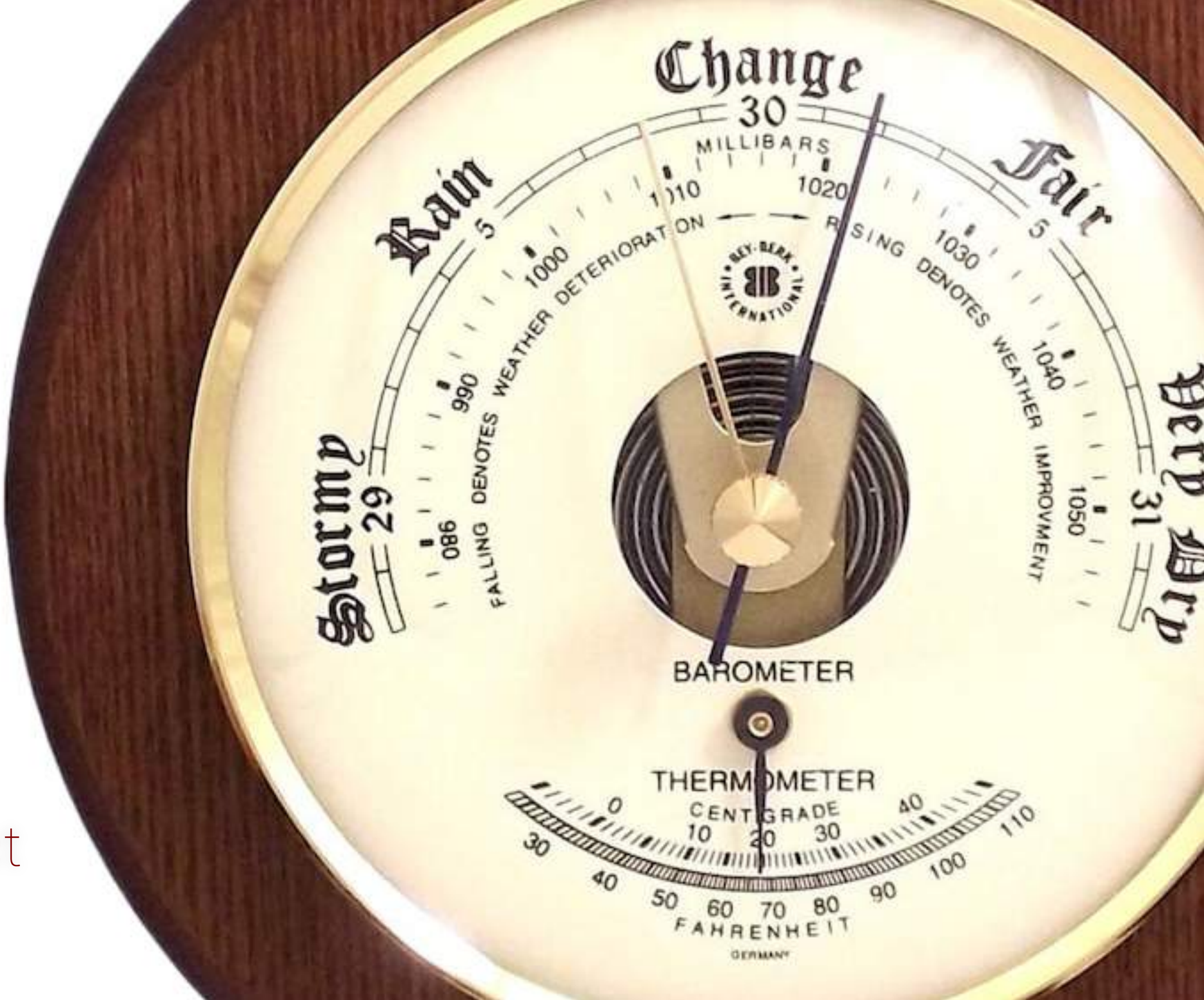
Things are often now composed on the fly from a variety of networked resources, both physical and digital.

The moment of use is a state in a continuous changing hybrid product-service-system.

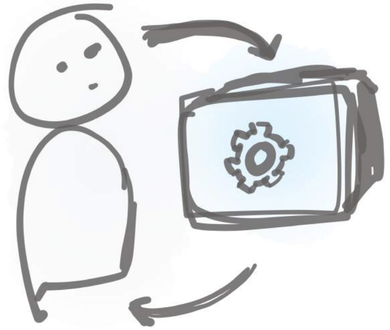
With machine learning mechanisms the Changing Things will have knowledge on possible futures before the user have these

Changing Things that can predict

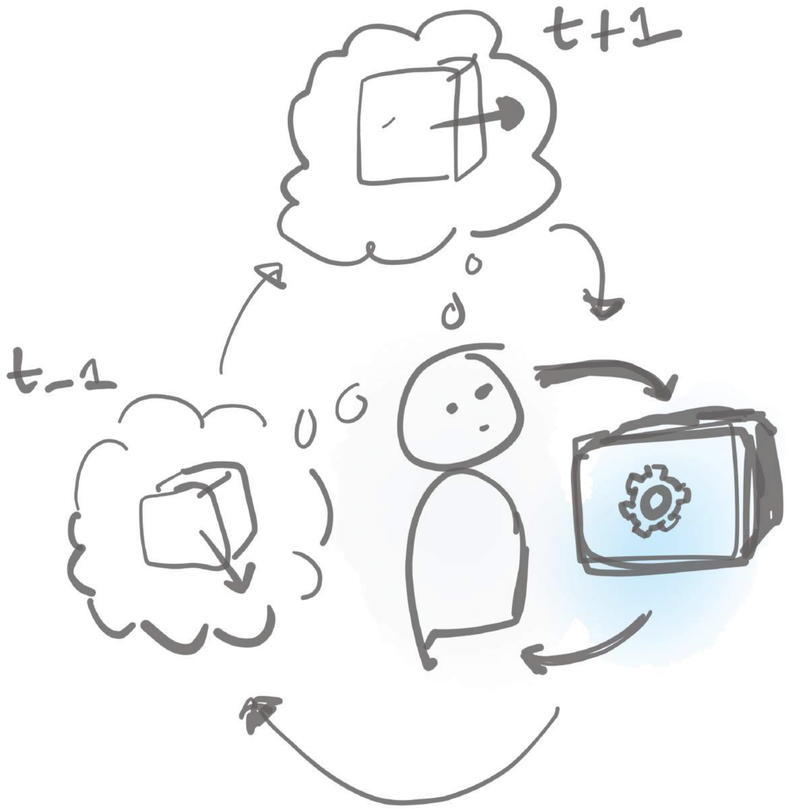
Things That Predict



When using a product/service, there will be a feedback loop while using validating anticipated behavior



The user anticipates on what will happen when forming a mental model (t+1), based on experiences from the past (t-1)



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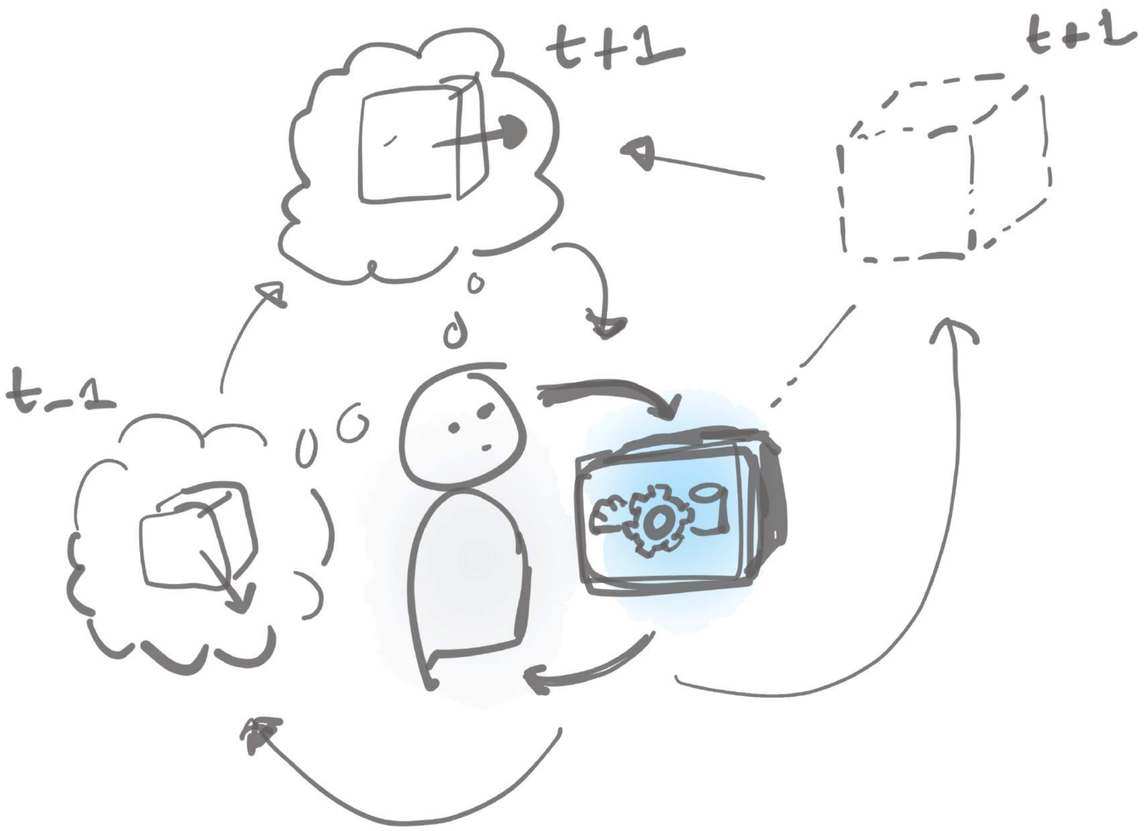
With smart objects, the ‘digital twin’ might influence the mental model of the user.



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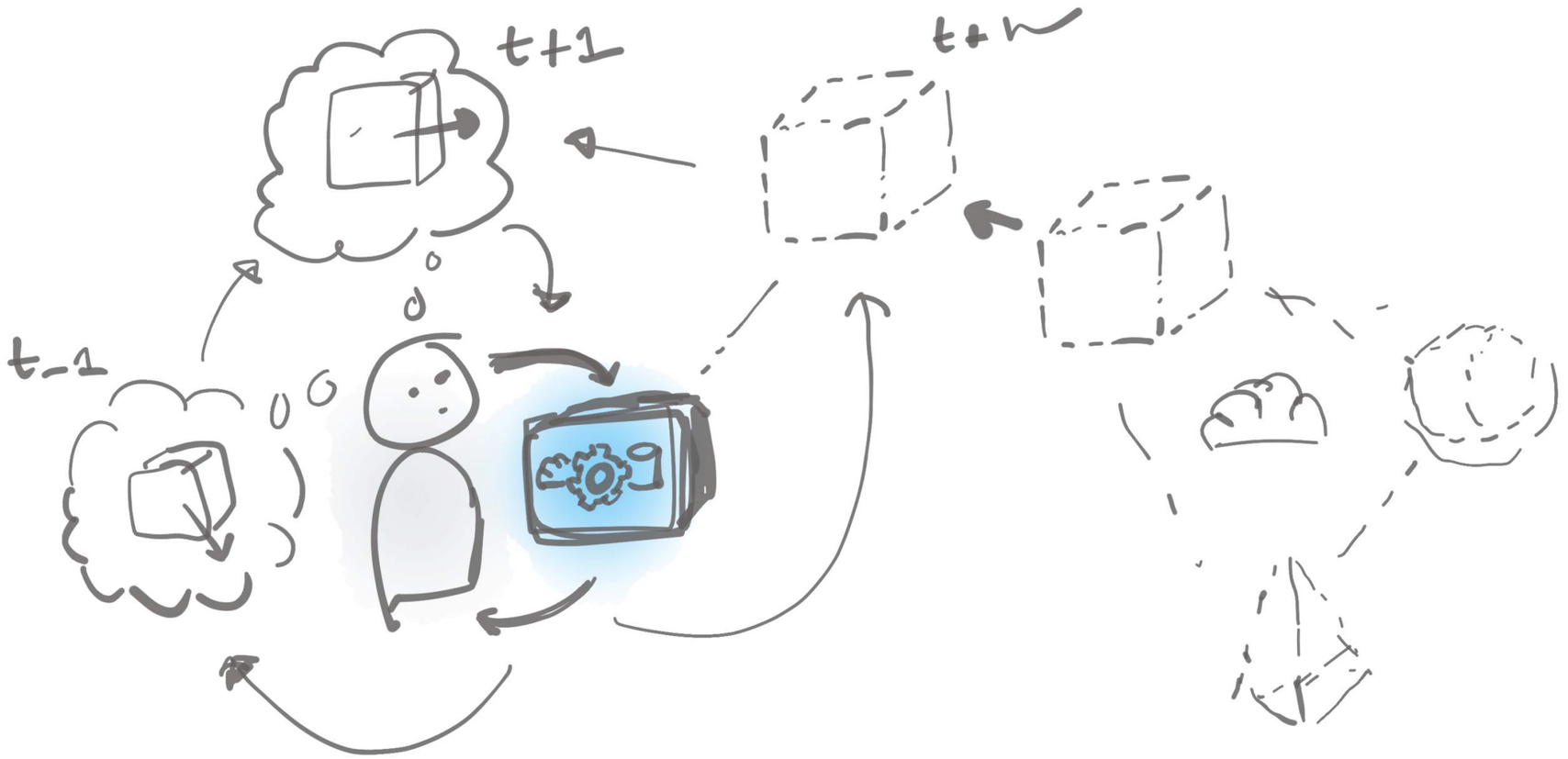
With a smart object fed with predictive intelligence, the digital twin will be formed by predicted futures.



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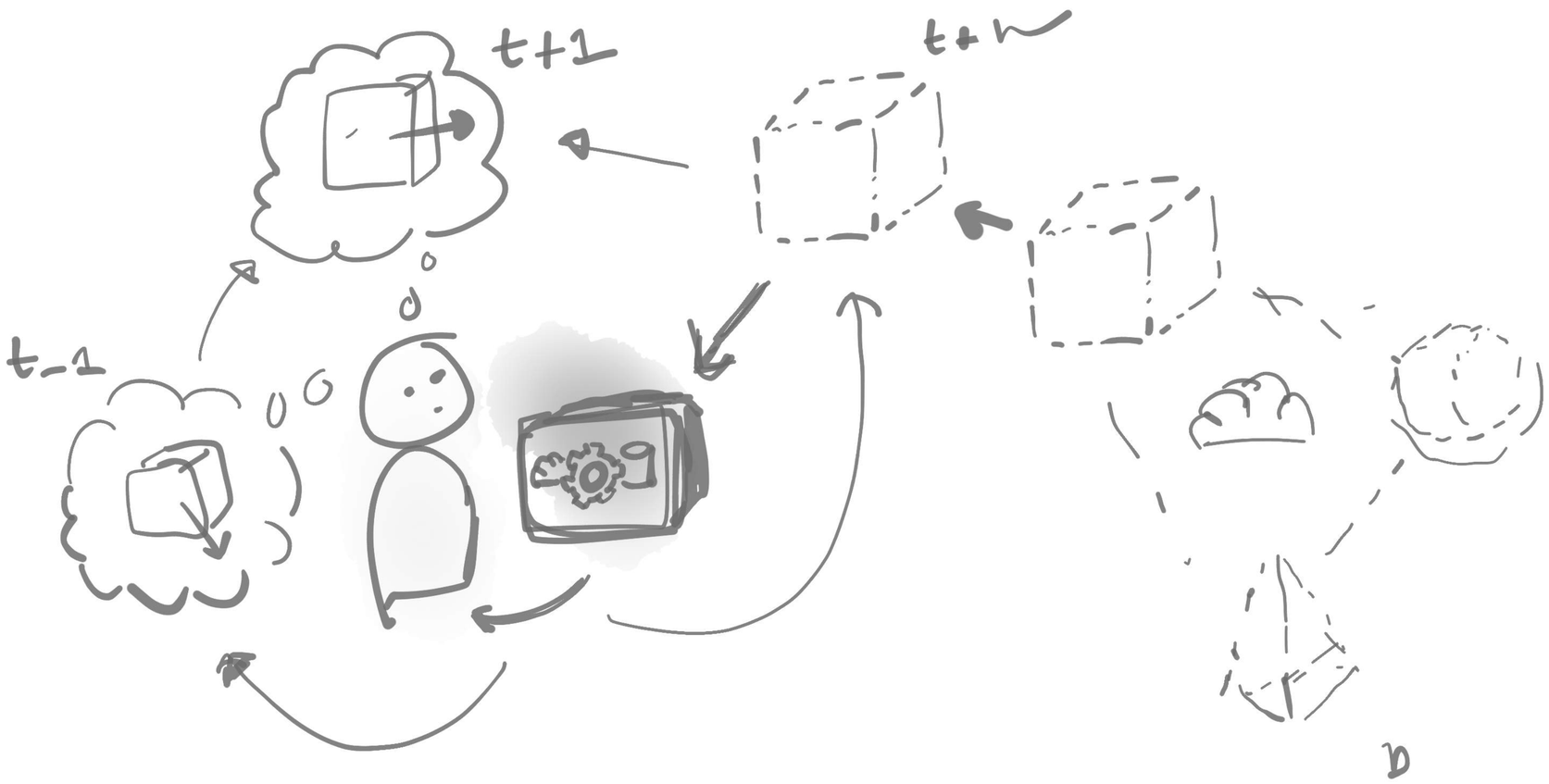
Decision making might end up in the virtual space, leaving the user with passive use.



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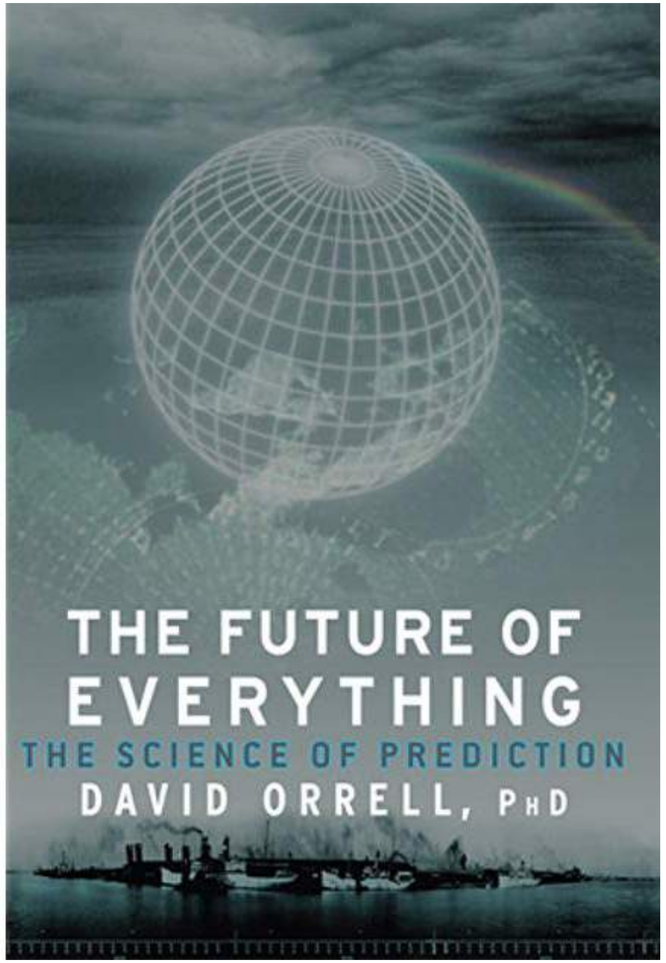

"**We are all predictors, living by our forecasts**."

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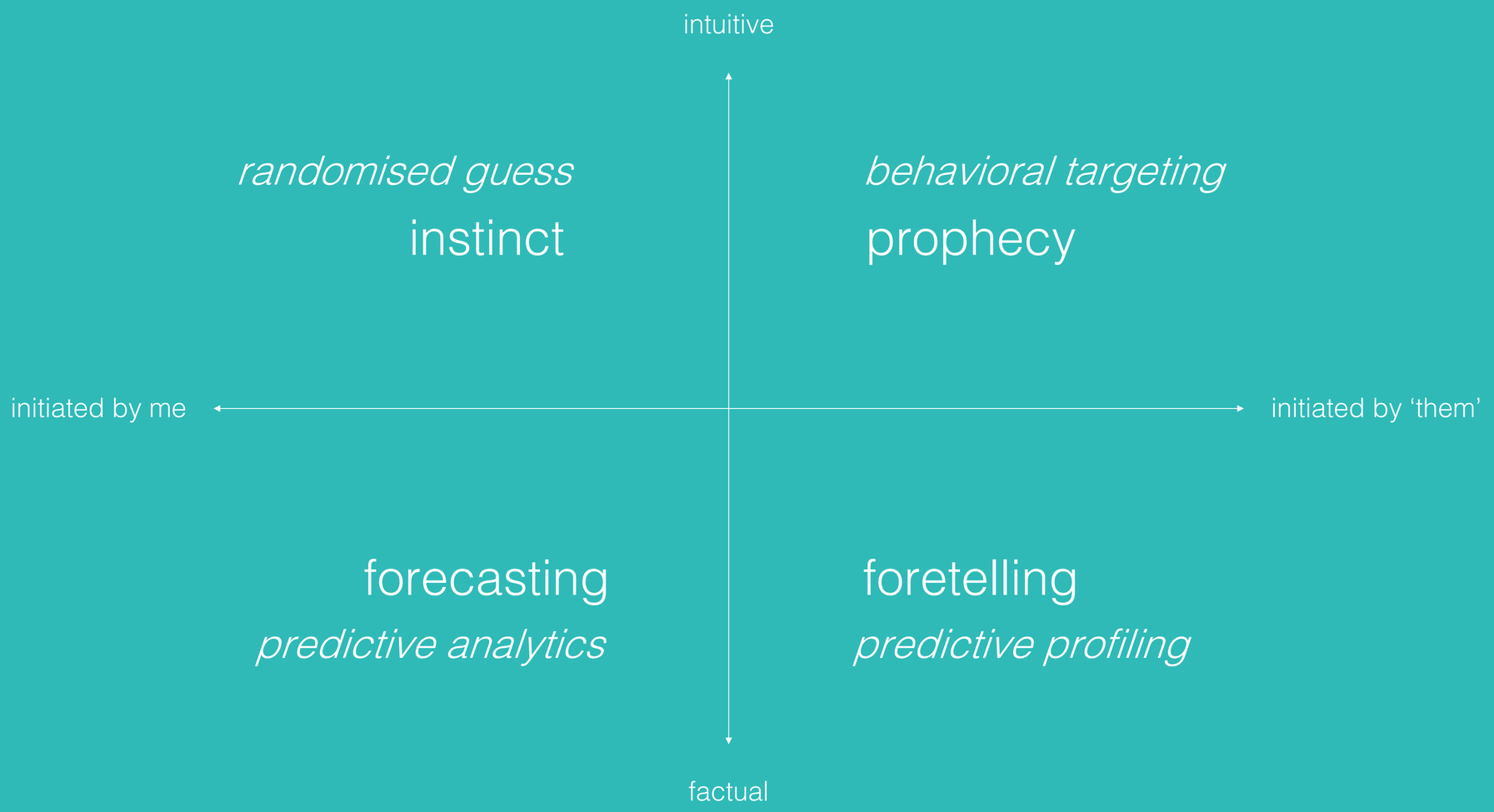
summise
presume
presage
prognosticate
read
portend
judge
suppose
conclude
omen
forebode
think
prophecy
call
telegraph
foretell
vaticinate
predict
adumbrate
gather
forecast
foresee
soothsay
augur
envision
croak
psych out
figure
conjecture
see coming
make book
figure out
guess
be afraid
infer
size up
forespeak
chrystal-ball
have a hunch
hazard a guess


intuitive
instinct
prophecy
initiated by me
initiated by ‘them’
forecasting
foretelling
factual


intuitive
randomised guess
instinct
behavioral targeting
prophecy
initiated by me
initiated by ‘them’
forecasting
predictive analytics
foretelling
predictive profiling
factual

Predictive relations with Things

Things that predict

Predictive relations with things

Things that predict

Predictive relations through things with ‘the world’

UNIVERSITY
OF TWENTE.

When things start to predict outcomes, it means that it will feed forward on situations we did not anticipate.

The more complex/opaque/unpredictable the behavior 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.

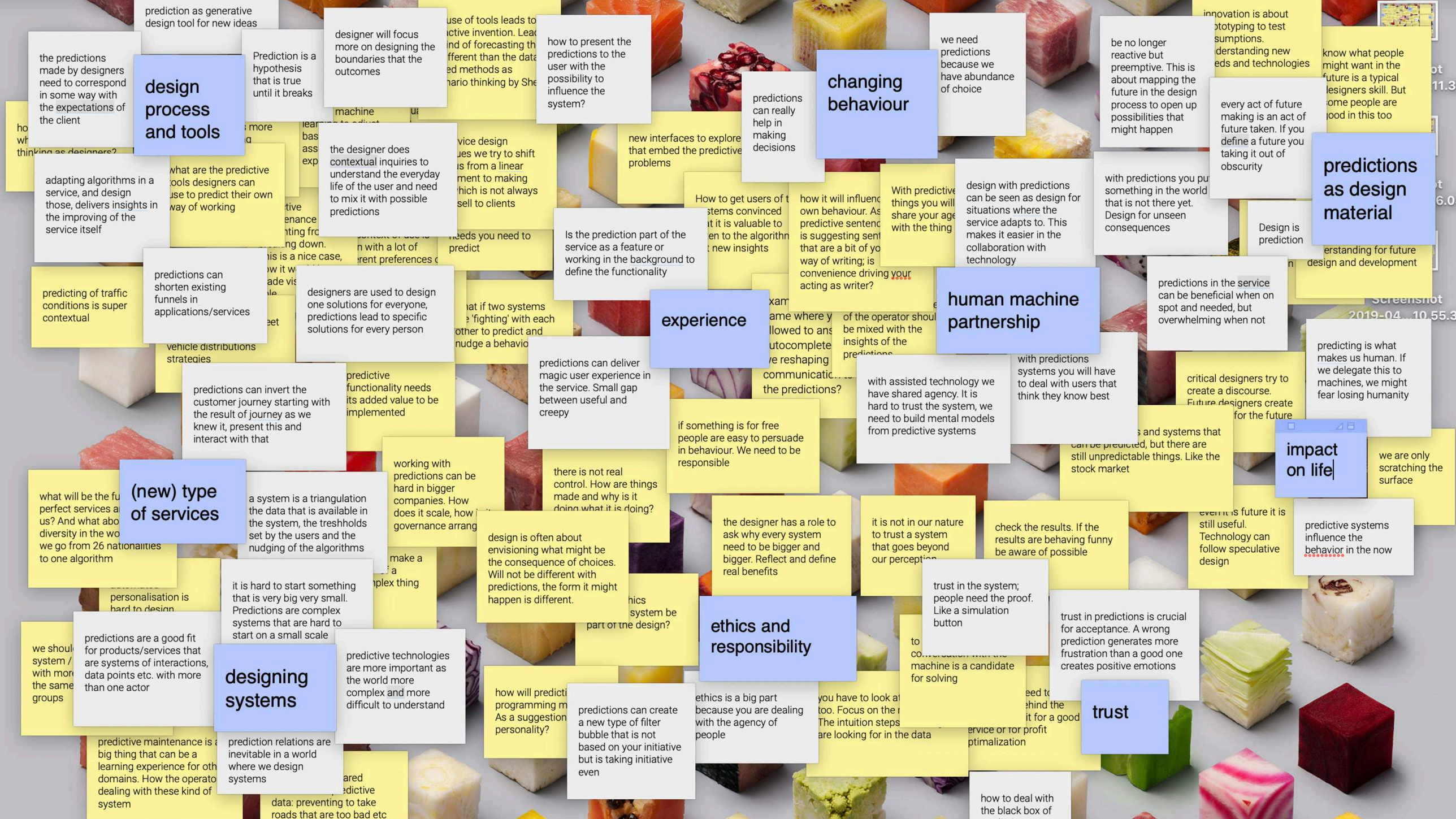
That is the moment we will have predictive relations with Things.

In the future we will shift continuously between the simulated future and the now.

Tesla Autopilot

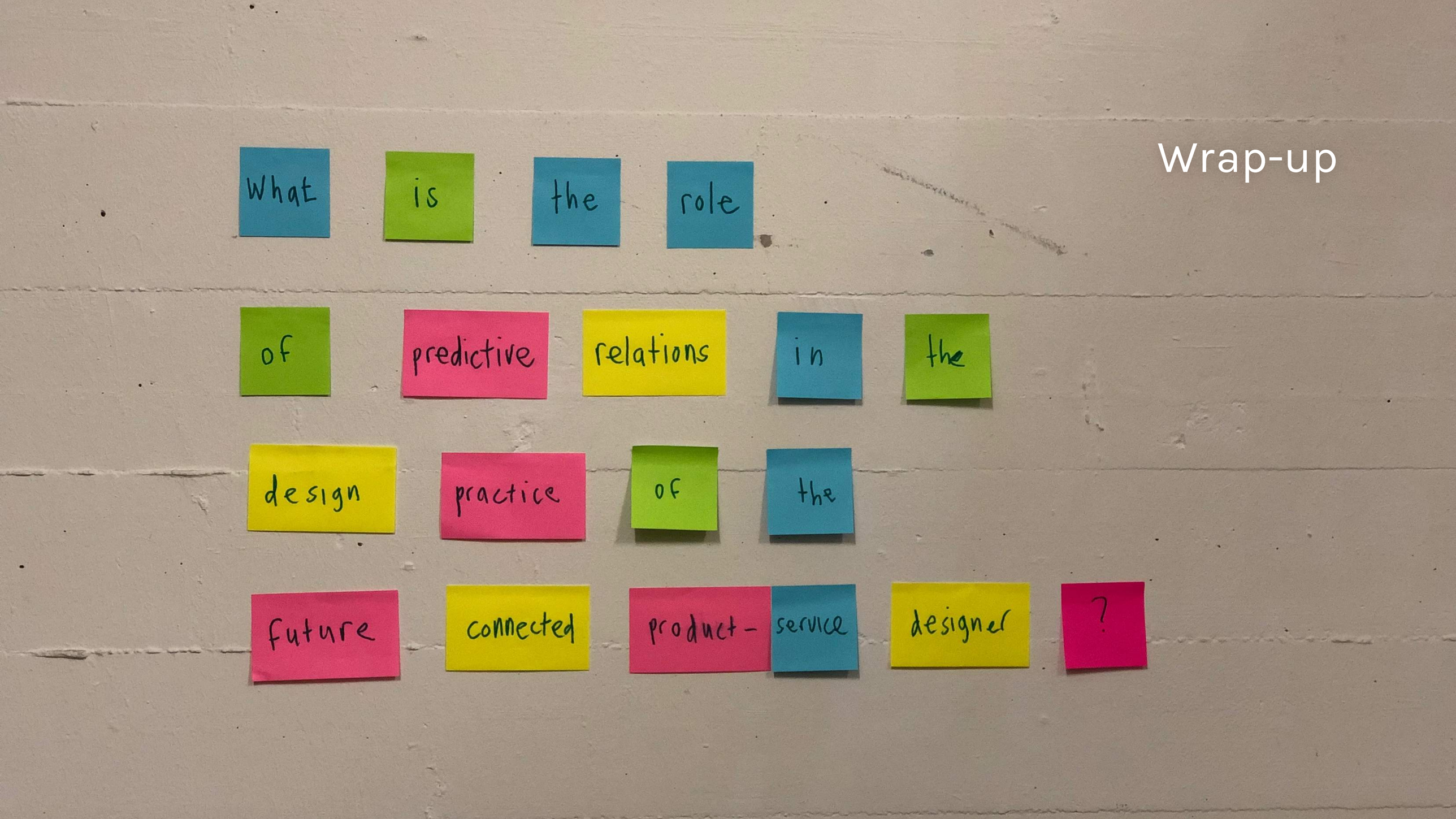
If the Things will form a framework for our decisions, will we **transfer agency** to the system of things?
And if we do so, will that limit our agency?

Stewart by Felix Ros


prediction as generative design tool for new ideas
designer will focus more on designing the boundaries that the outcomes
how to present the predictions to the user with the possibility to influence the system?
we need predictions because we have abundance of choice
be no longer reactive but preemptive. This is about mapping the future in the design process to open up possibilities that might happen
innovation is about prototyping to test assumptions. understanding new needs and technologies
the predictions made by designers need to correspond in some way with the expectations of the client
design process and tools
Prediction is a hypothesis that is true until it breaks
predictions can really help in making decisions
changing behaviour
know what people might want in the future is a typical designers skill. But some people are good in this too
every act of future making is an act of future taken. If you define a future you taking it out of obscurity
predictions as design material
the designer does contextual inquiries to understand the everyday life of the user and need to mix it with possible predictions
new interfaces to explore that embed the predictive problems
adapting algorithms in a service, and design those, delivers insights in the improving of the service itself
what are the predictive tools designers can use to predict their own way of working
How to get users of t stems convinced t it is valuable to en to the algorithm new insights
how it will influenc own behaviour. As predictive sentenc is suggesting sent that are a bit of yo way of writing; is convenience driving your acting as writer?
With predictive things you will share your age with the thing
design with predictions can be seen as design for situations where the service adapts to. This makes it easier in the collaboration with technology
with predictions you pu something in the world that is not there yet. Design for unseen consequences
Design is prediction
Is the prediction part of the service as a feature or working in the background to define the functionality
predictions can shorten existing funnels in applications/services
designers are used to design one solutions for everyone, predictions lead to specific solutions for every person
predicting of traffic conditions is super contextual
experience
human machine partnership
predictions in the service can be beneficial when on spot and needed, but overwhelming when not
predictions can deliver magic user experience in the service. Small gap between useful and creepy
predictions can invert the customer journey starting with the result of journey as we knew it, present this and interact with that
with assisted technology we have shared agency. It is hard to trust the system, we need to build mental models from predictive systems
with predictions systems you will have to deal with users that think they know best
predicting is what makes us human. If we delegate this to machines, we might fear losing humanity
critical designers try to create a discourse. Future designers create for the future
if something is for free people are easy to persuade in behaviour. We need to be responsible
working with predictions can be hard in bigger companies. How does it scale, how governance arrang
there is not real control. How are things made and why is it doing what it is doing?
impact on life
we are only scratching the surface
(new) type of services
a system is a triangulation the data that is available in the system, the treshholds set by the users and the nudging of the algorithms
design is often about envisioning what might be the consequence of choices. Will not be different with predictions, the form it might happen is different.
the designer has a role to ask why every system need to be bigger and bigger. Reflect and define real benefits
it is not in our nature to trust a system that goes beyond our perception
check the results. If the results are behaving funny be aware of possible
predictive systems influence the behavior in the now
it is hard to start something that is very big very small. Predictions are complex systems that are hard to start on a small scale
ethics and responsibility
trust in the system; people need the proof. Like a simulation button
trust in predictions is crucial for acceptance. A wrong prediction generates more frustration than a good one creates positive emotions
predictions are a good fit for products/services that are systems of interactions, data points etc. with more than one actor
designing systems
predictive technologies are more important as the world more complex and more difficult to understand
predictions can create a new type of filter bubble that is not based on your initiative but is taking initiative even
ethics is a big part because you are dealing with the agency of people
trust
prediction relations are inevitable in a world where we design systems
predictive maintenance is big thing that can be a learning experience for oth domains. How the operato dealing with these kind of system
how to deal with the black box of


design process and tools
changing behaviour
predictions as design material
experience
human machine partnership
impact on life
ethics and responsibility
trust
designing systems
Thought of practitioners
Design = prediction
Predictions as new design material
Hyper-personalization and reversed user journeys
Shared agency with machines
Trust, ethics

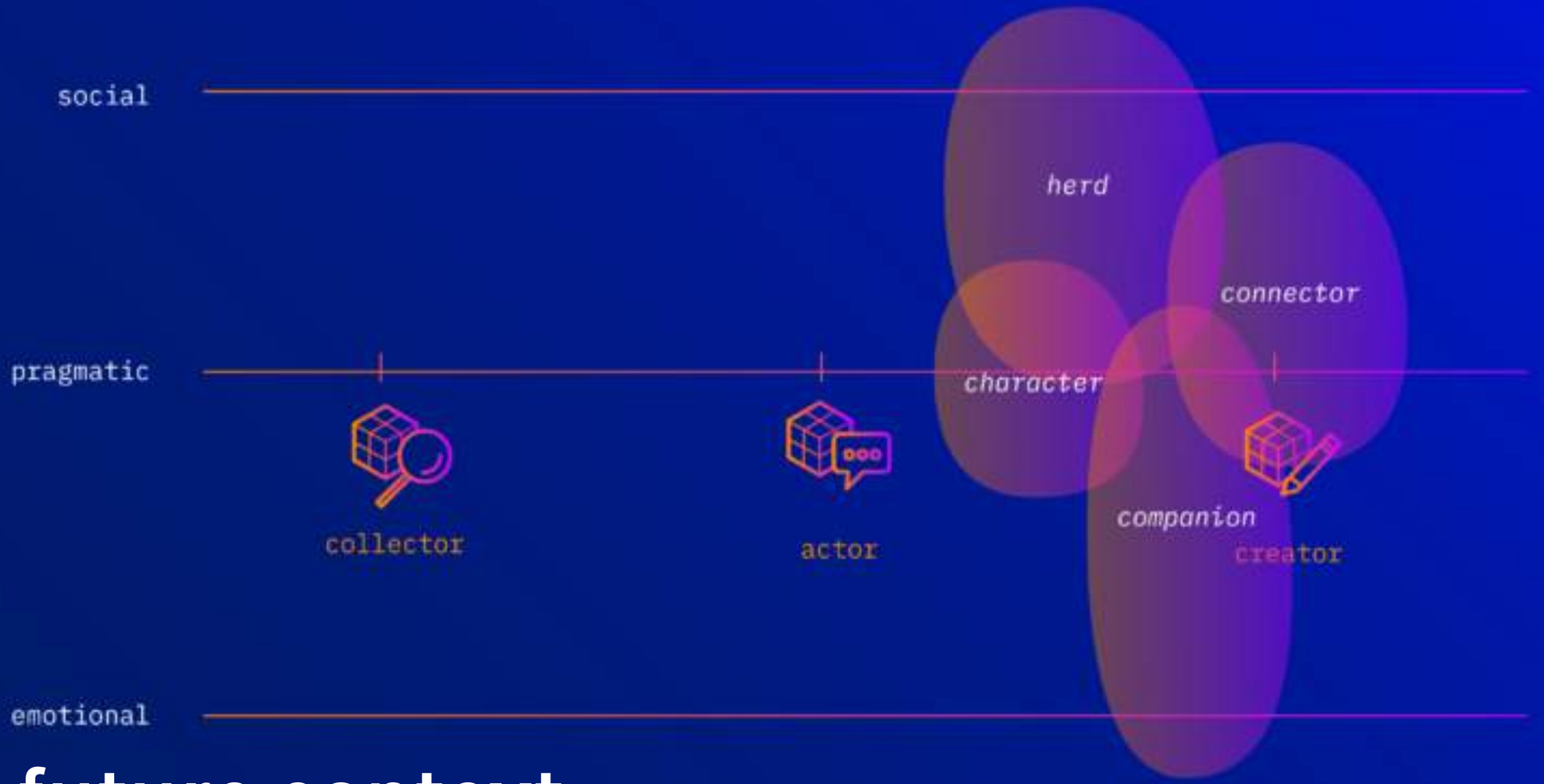
Wrap-up


What is the role
of predictive relations in the
design practice of the
future connected product-service designer ?

The interaction of predictions and actions creates a complex interrelated design space.

Predictive behavior shapes our mental model on the acting of Thing.
At the same time shape our actions the digital model of the Thing.


Bike as partner…



Bike in future context

Project studio Yolo, Master Digital Design AUAS, 2018

Bikes that predict maintenance – phase 1

OV-fiets bike repair can be predictive. The data collected from all the bikes and their life-cycle can inform the status of that one bike. The state of the bike is actively communicated to the maintenance officer. The bike can create its own repair plan and plan the tasks of the repair shop.
The bike takes an active role in it’s life-cycle management.

Bikes that predict city experience – phase 2

OV-fiets bike ride can be predictive. All data on trips, roads, rental terms, profile of the user, weather conditions, traffic conditions is combined in the bike identity.
The bike has an active dialog with the user. The bike is his companion. Every (boosted) bike looks the same, but feels different, based on the preferences of the user.
The bike takes an active role in the experience of the city.

So how are we going to design for the
unknown knowns?

As Things become more and more part of digital distributed systems, predictions will give us agency to control the working of Things.

As Things become more and more part of digital distributed systems, predictions will reduce the agency we will have over our own behavior.

When things around us become parts of digital, distributed systems, the job of designers will be to design the interface to them.

When things around us become parts of digital, distributed systems, the job of designers will be to design the interface to them.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Thanks!
@iskandr