THE RECYCLING MACHINE

An Urban Intervention project

Who are we?

5th year students at AU in
IT Product Development

Study group since
7th semester

Who are we?

Martin L. B. Jeppesen

- Student worker at LEGO System A/S

Interests:

- User-involvement and stakeholder management
- Products and technology

Who are we?

Jonathan E. Hansen

Interests:

- IoT
- Drones

Who are we?

Christoffer Ø. Skovgaard

- Student worker at LEGO System A/S

Interests:

- Domestic design and prototyping
- Playing music

Who are we?

Peter K. Christensen

- Student worker at LEGO System A/S

Interests:

- UX design and product development
- Weightlifting

Agenda

- **Course: Urban Intervention**
- **Our approach: The Fun Theory**
- **Our intervention: The Recycling Machine**
- **Evaluation and results**

Pause

- **International Urban Design Conference**
- **3 highlighted themes**
  - **smart city, transportation, population change**
- **Our experience with attending**

Urban Intervention

Theme: Consumerism, Sustainability, **Recycling**

Case: How to reuse material, raising awareness, call to action, broaden horizons, perspectives..

→ Make people **think, reflect, act**

Intervention: Stage an intervention in a public space in Aarhus

Urban Intervention

Borassi, G. (2008). City 2.0:

"They [urban interventions] contribute to an erosion of some established notions of urban comfort; they undermine conventional wisdom but don't necessarily confront it head on"

"What seems important here […] is their capacity to trigger a "disturbance", certain discomfort in the predefined system"

"[they] arise in a definite territory of friction and tension between the daily lives of urban residents and what would otherwise considered the norm proposed by the city."

The Fun Theory

Initiative by Volkswagen

“A thought that something as simple as fun is the easiest way to change people’s behaviour for the better. Be it for yourself, for the environment, or for something entirely different, the only thing that matters is that it’s change for the better.”

VÄRLDENS
DJUPASTE
SOPTUNNA

The Recycling Machine

A Thursday afternoon - Ryesgade (Strøget) - 2,5 hours

The Recycling Machine

PAP
PLAST
GLAS

The Recycling Machine

Inspired by Volkswagen's **The Fun Theory**

Theme: Habit formation

- Positive Punishment (e.g. Trash in nature)
- Positive Reinforcement (our approach!)

The AELIA-model:

- Difficult evaluating Influence - Action

Results

Desired evaluation: Study over several months

Limitation: 7 week course

- Follow-up interview
- Effect of pictures and videos

?

Conference

Acceptance of our paper:

“The Recycling Machine: Promoting Habit Formation for Sustainable Citizens through an Urban Intervention”

The Recycling Machine:
Promoting Habit Formation for Sustainable Citizens through an Urban Intervention

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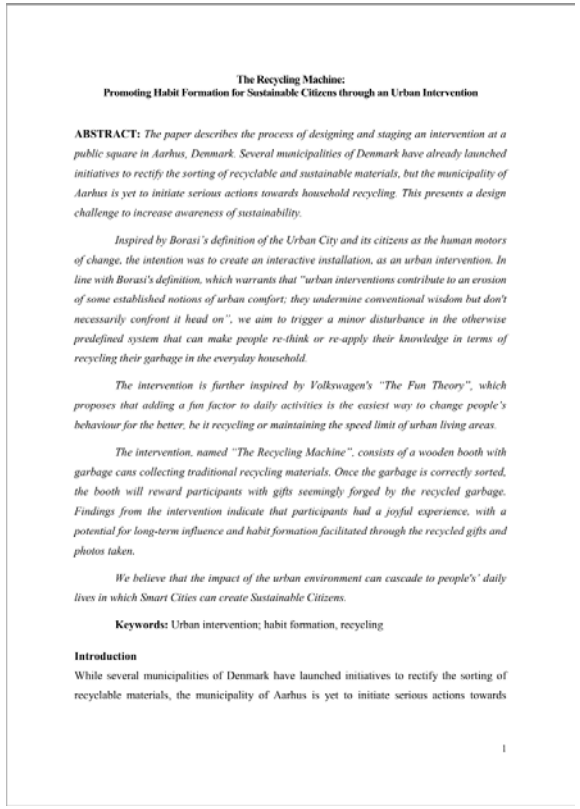
Paper Presented at the
9th International Urban Design Conference
Canberra, 7-9 November 2016



The Recycling Machine:
Promoting Habit Formation for Sustainable Citizens through an Urban Intervention

ABSTRACT: *The paper describes the process of designing and staging an intervention at a public square in Aarhus, Denmark. Several municipalities of Denmark have already launched initiatives to rectify the sorting of recyclable and sustainable materials, but the municipality of Aarhus is yet to initiate serious actions towards household recycling. This presents a design challenge to increase awareness of sustainability.*

Inspired by Borasi's definition of the Urban City and its citizens as the human motors of change, the intention was to create an interactive installation, as an urban intervention. In line with Borasi's definition, which warrants that "urban interventions contribute to an erosion of some established notions of urban comfort; they undermine conventional wisdom but don't necessarily confront it head on", we aim to trigger a minor disturbance in the otherwise predefined system that can make people re-think or re-apply their knowledge in terms of recycling their garbage in the everyday household.

The intervention is further inspired by Volkswagen's "The Fun Theory", which proposes that adding a fun factor to daily activities is the easiest way to change people's behaviour for the better, be it recycling or maintaining the speed limit of urban living areas.

The intervention, named "The Recycling Machine", consists of a wooden booth with garbage cans collecting traditional recycling materials. Once the garbage is correctly sorted, the booth will reward participants with gifts seemingly forged by the recycled garbage. Findings from the intervention indicate that participants had a joyful experience, with a potential for long-term influence and habit formation facilitated through the recycled gifts and photos taken.

We believe that the impact of the urban environment can cascade to people's' daily lives in which Smart Cities can create Sustainable Citizens.

Keywords: Urban intervention; habit formation, recycling

Introduction

While several municipalities of Denmark have launched initiatives to rectify the sorting of recyclable materials, the municipality of Aarhus is yet to initiate serious actions towards

Aarhus
HongKong
Sydney
South Wales, Australia

”Smart cities for 21st century Australia –
how Urban Design Innovation can change our cities.”

9th International Urban Design Conference

7-9 November 2016

Conference overview

- Attendees: Practitioners, directors, academics
  - Urban Designers, Architects, City planners, landscape architects, engineers

- How to make a city smart?
- Population change and liveability
- City Infrastructure
- High density living
- Future of car dependant cities
- …

“Be inspired by innovations and projects that are transforming cities. This conference is an opportunity for design professionals to exchange ideas and experiences, to be creative and visionary, and to contribute to redesigning our urban futures.”

The social dimensions of a smart city. How are we going to live in the new smart city?

OZBREED
THE RECYCLING MACHINE
MAKING PEOPLE THINK AND REFLECT ON THEIR RECYCLING HABITS

SMART CITIES FOR 21ST CENTURY AUSTRALIA
Smart Cities for
21st Century Australia

Fun facts

- 180.000 people move into cities a day
- By 2050, 70% of the global population will live in cities
  - Up from 34% in 1960 to 54% today
- Frost and Sullivan predict that by 2020 the Smart Cities market will be worth $1.5 trillion
- 40% of traffic in city centres is caused by people looking for parking spaces

Smart Cities

"A smart city is an urban development vision to integrate multiple **information and communication technology (ICT)** and **Internet of Things (IoT) solutions** in a secure fashion to **manage a city's assets**".

What is a Smart City?

A smart city is one that…

… **dramatically increases the pace** at which it improves it sustainability and resilience.

… by fundamentally improving how it **engages society**, how it applies **collaborative leadership** methods, how it **works across disciplines and city systems**, and how it uses **data and integrated technologies**.

… in order to **transform services and quality of life** to those in and involved with the city (residents, businesses, visitors).

Why have a Smart City?

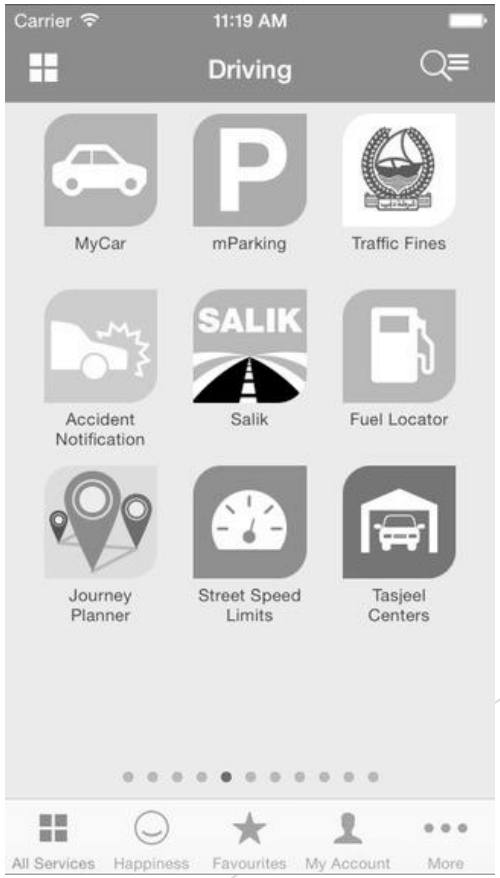
"The goal of building a smart city is to **improve quality of life** by using **urban informatics and technology** to **improve the efficiency** of services and **meet residents' needs**"

How to build a Smart City?

- A simple answer: **there's an app for that!**

DubaiNow Smartphone App

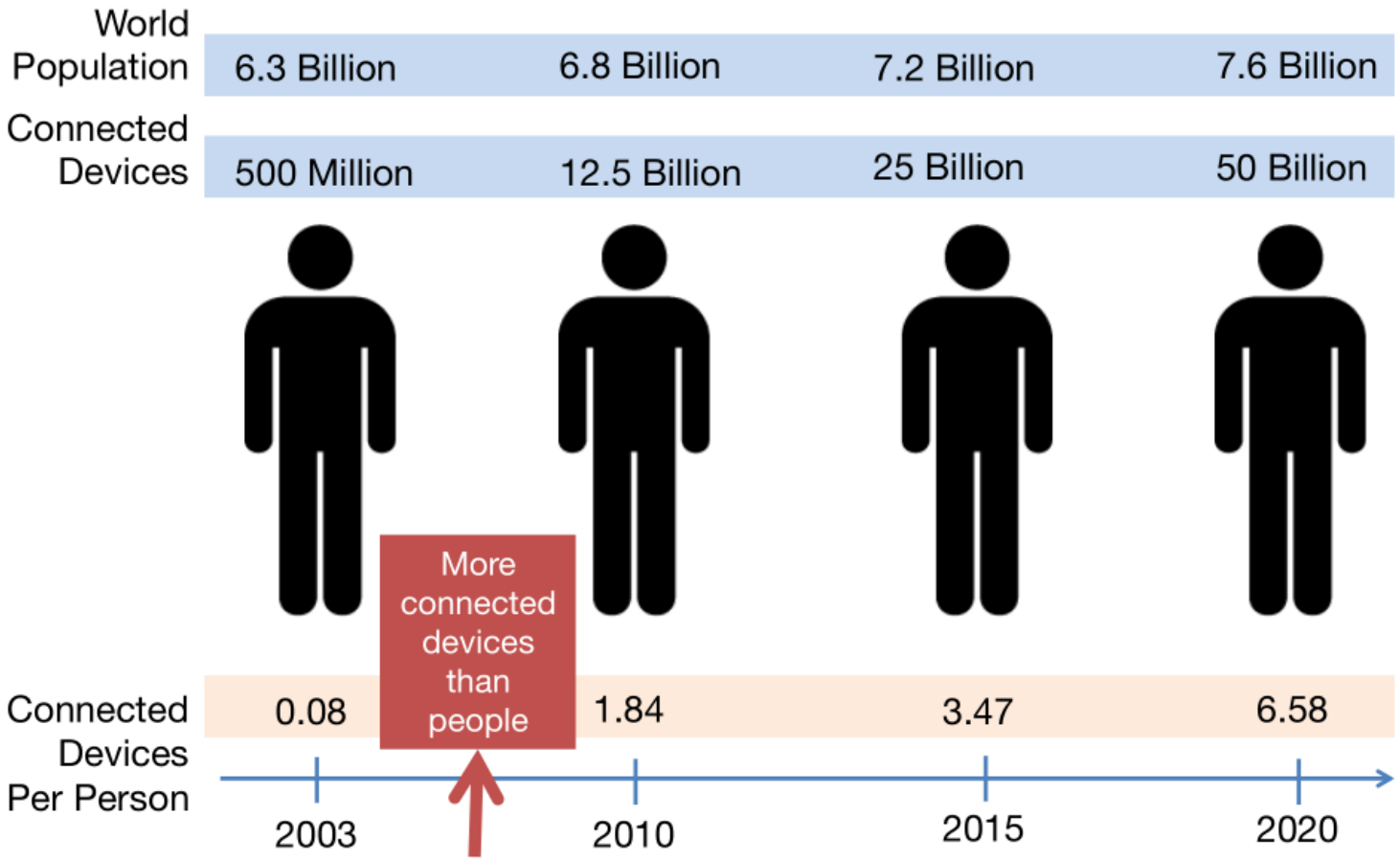
$1 billion saving



What a Smart City really is

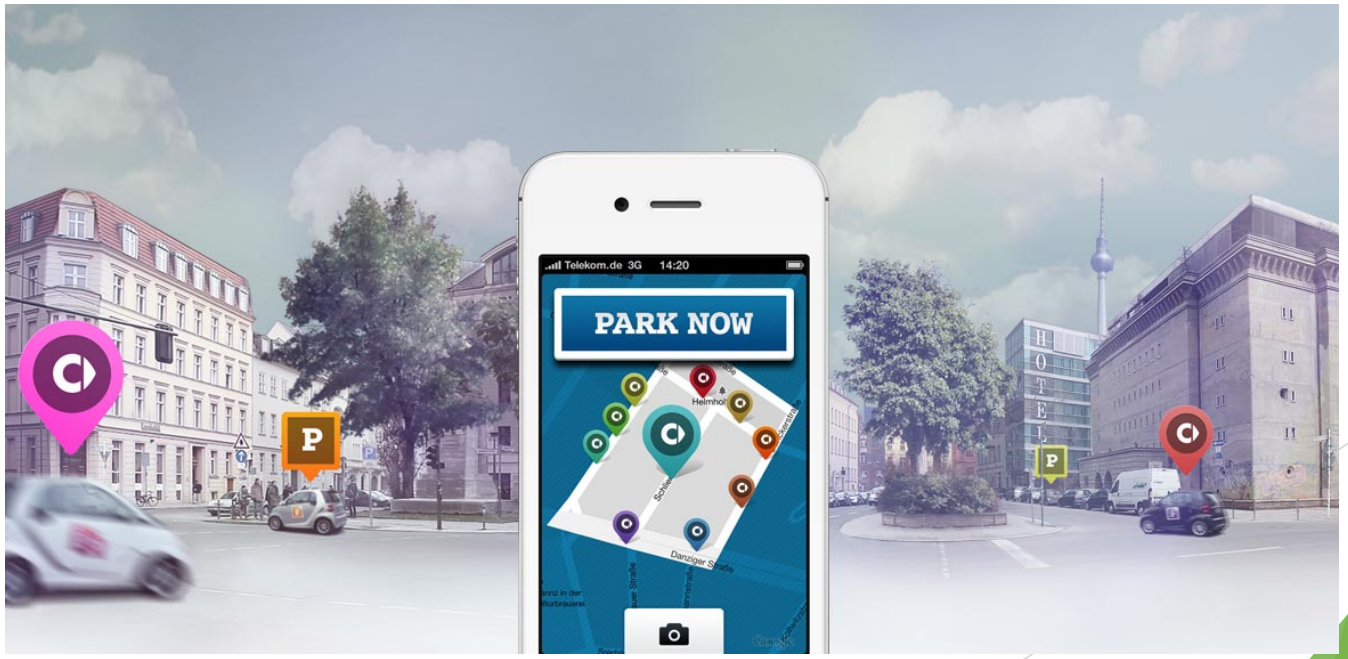
1. **Smart Energy**
2. **Smart Citizen**
3. **Smart Healthcare**
4. **Smart Governance**
5. **Smart Buildings**
6. **Smart Mobility**
7. **Smart Technology**

IoT: More Connected Devices Than People



Example: Smart Parking

- Visibility into the availability of parking spaces across the city
- Reserve the closest available space
- Demand-based pricing.



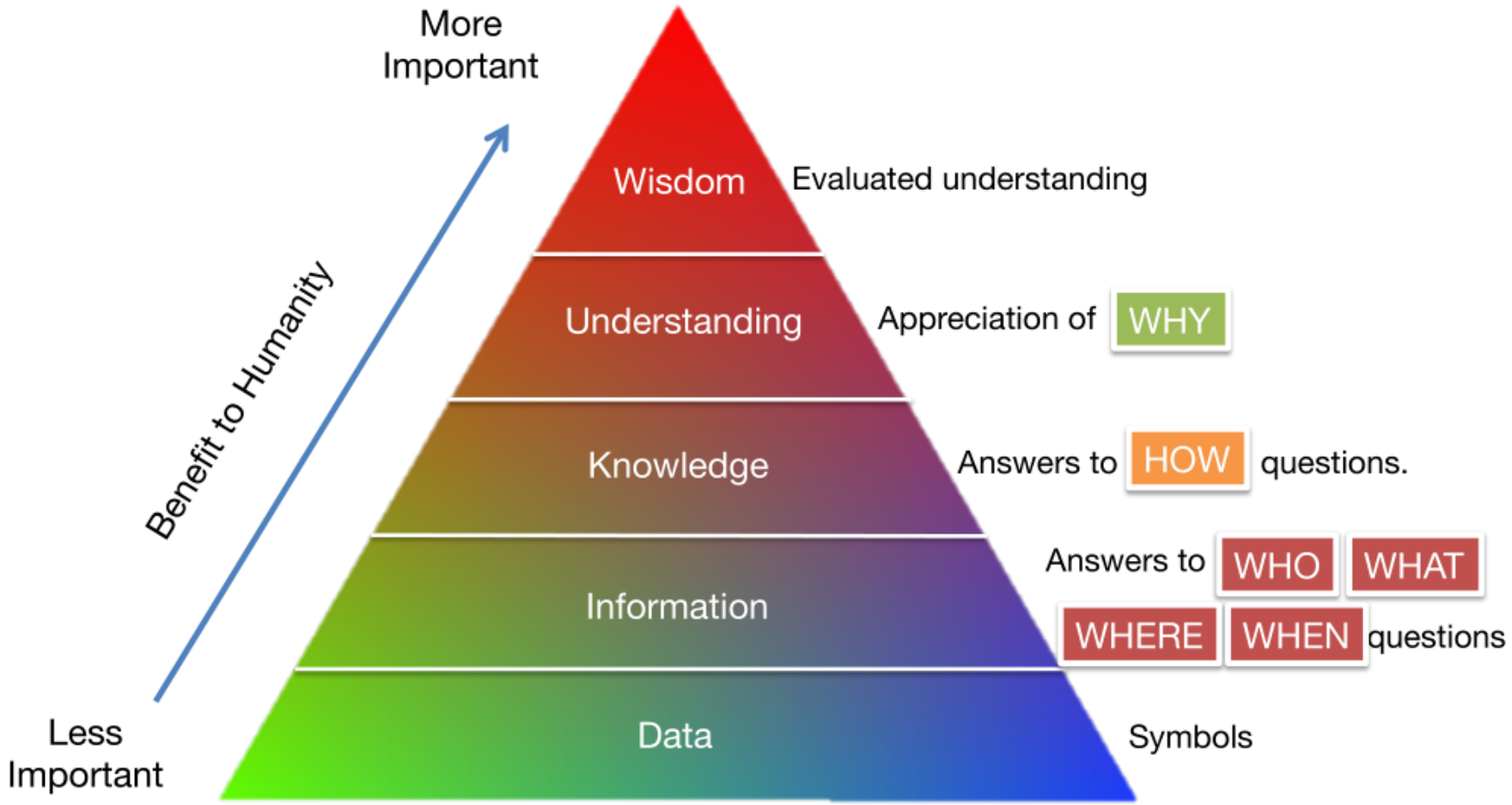
More examples: Remote Sensing

- Water management
- Gas monitoring
- Power usage
- Air quality monitoring

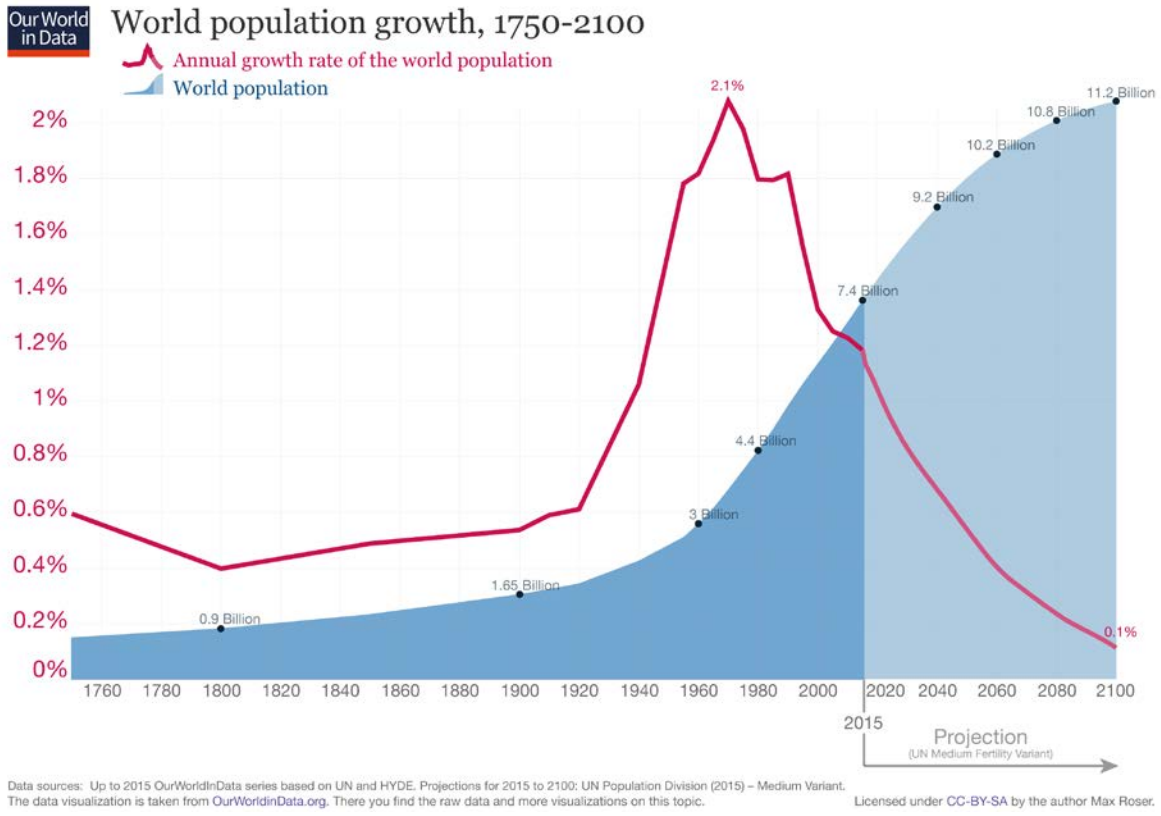
Sensor Network Infrastructure

- Community based
- LoRaWAN network
- Available for anyone to use

Big Data is not Magic



Population change and liveability



Population change and liveability

Response to population change:

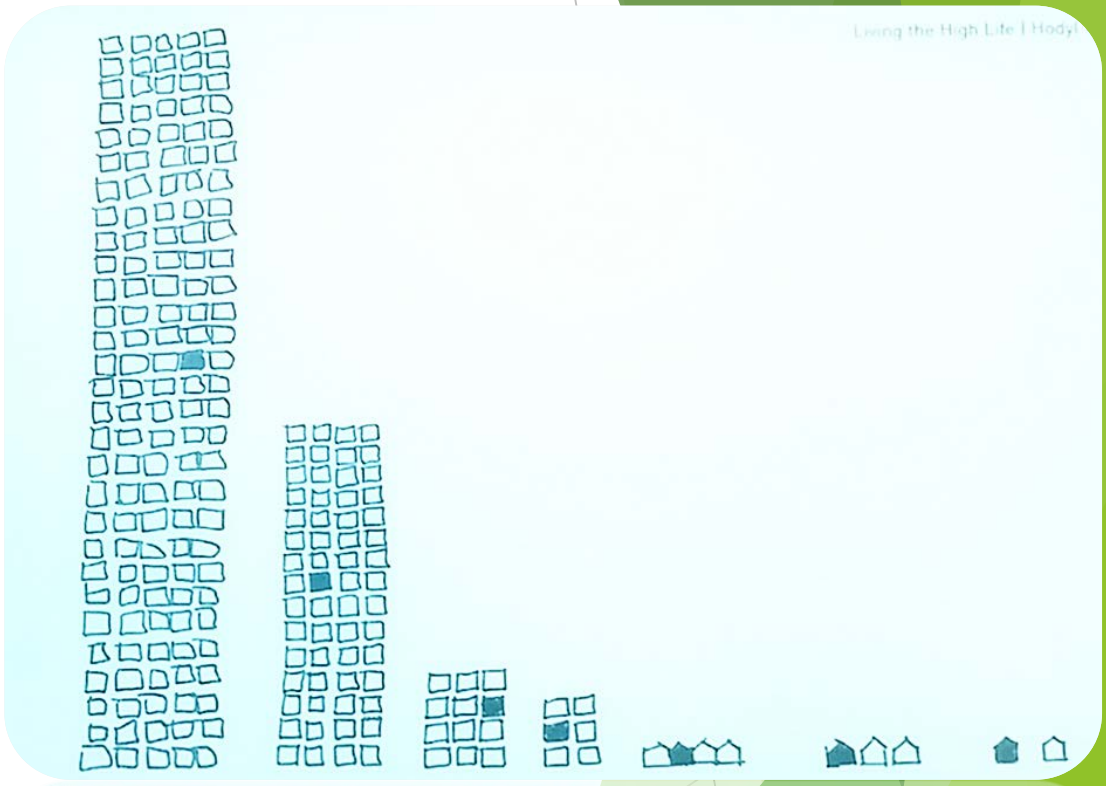
- High-rise living

Aspects of well-being:

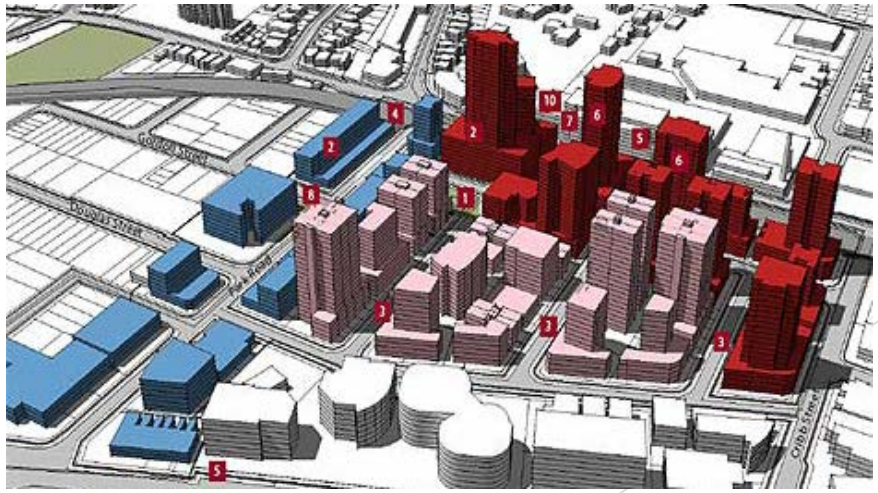
- Belonging, attachments, identity
- Many of these aspects are not found in high-rise living

Problem:

- All human beings has the same basic needs, but yet we built in a way that treat them as if they don't need certain things.



Population change and liveability



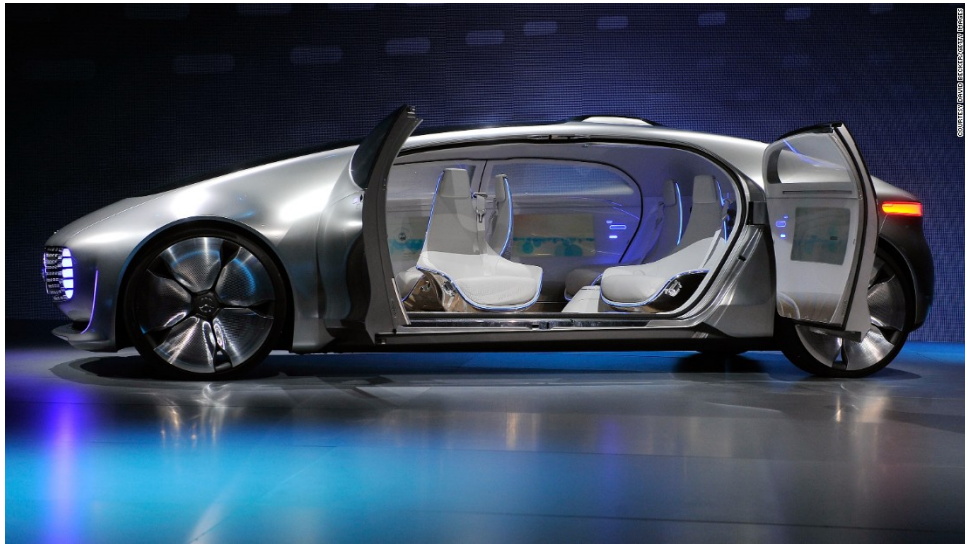
5 min break

Future of Transportation

4 technical disruptors to have a major impact on the future of private transportation:

1. Solar energy 2. Electric (battery) 3. Autonomous 4. Ownership vs. service

Focus on driverless cars



Future of Transportation

4 technical disruptors to have a major impact on the future of private transportation:

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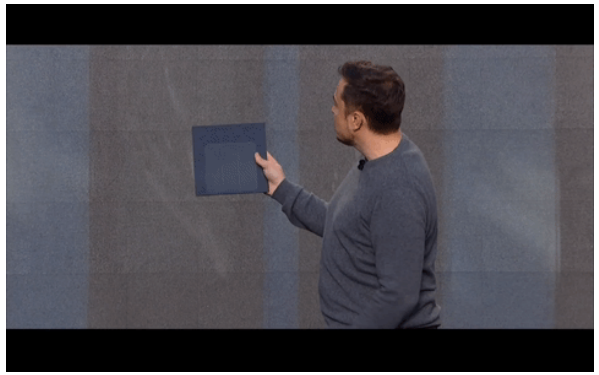
"We need to make solar panels as appealing as electric cars have become" – Elon Musk



Future of Transportation

4 technical disruptors to have a major impact on the future of private transportation:

1. Solar energy **2. Electric (battery)** 3. Autonomous 4. Ownership vs. service

Tesla Gigafactory for battery technology in Spark, Nevada

Expects to double current battery life time distance of 485 km within 1-2 years

Battery technology for your home

Works with Tesla's solar energy

Future of Transportation

4 technical disruptors to have a major impact on the future of private transportation:

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SAE level	Name	Narrative Definition	Execution of Steering and Acceleration/ Deceleration	*Monitoring* of Driving Environment	Fallback Performance of *Dynamic Driving Task*	System Capability *(Driving Modes)*
***Human driver* monitors the driving environment**						
0	**No Automation**	the full-time performance by the *human driver* of all aspects of the *dynamic driving task*, even when enhanced by warning or intervention systems	Human driver	Human driver	Human driver	n/a
1	**Driver Assistance**	the *driving mode*-specific execution by a driver assistance system of either steering or acceleration/deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	Human driver and system	Human driver	Human driver	Some driving modes
2	**Partial Automation**	the *driving mode*-specific execution by one or more driver assistance systems of both steering and acceleration/ deceleration using information about the driving environment and with the expectation that the *human driver* perform all remaining aspects of the *dynamic driving task*	**System**	Human driver	Human driver	Some driving modes
***Automated driving system* ("system") monitors the driving environment**						
3	**Conditional Automation**	the *driving mode*-specific performance by an *automated driving system* of all aspects of the dynamic driving task with the expectation that the *human driver* will respond appropriately to a *request to intervene*	System	**System**	Human driver	Some driving modes
4	**High Automation**	the *driving mode*-specific performance by an automated driving system of all aspects of the *dynamic driving task*, even if a *human driver* does not respond appropriately to a *request to intervene*	System	System	**System**	Some driving modes
5	**Full Automation**	the full-time performance by an *automated driving system* of all aspects of the *dynamic driving task* under all roadway and environmental conditions that can be managed by a *human driver*	System	System	System	**All driving modes**

Future of Transportation

4 technical disruptors to have a major impact on the future of private transportation:

1. Solar energy 2. Electric (battery) **3. Autonomous** 4. Ownership vs. service

- Google has had driverless cars driving over 2 million miles
- Singapore has launched its first driverless taxi
- Lyon has launched the world's first driverless bus
- Uber has launched a driverless car in Pittsburg

Future of Transportation

4 technical disruptors to have a major impact on the future of private transportation:

1. Solar energy 2. Electric (battery) 3. Autonomous **4. Ownership vs. service**

- 90% of the time, your car is parked
- 2 parking spots pr. person
- In US: 4 parking spots to every car
- In UK: on average, a person uses 106 days of a lifetime looking for parking spots

Future of Transportation

4 technical disruptors to have a major impact on the future of private transportation:

1. Solar energy 2. Electric (battery) 3. Autonomous **4. Ownership vs. service**

People's mindset will change – has it already started?

Future of Transportation

How will this impact cities?

Today, the city infrastructure is determined by roads

Parkings spots → Pick-up points?

Project Highlights

MONA: Museum of Old and New Art

Project to piss off academics: “art can be fun!”
Serve alcohol – people had to go to WC – toilets with mirrors
Community-driven: calling it “our museum”

- Completely changed the city of Hobart
- Festivals, visitors, transport, shops, tourists

Project Highlights

The Soofa Bench

Clever use of space:

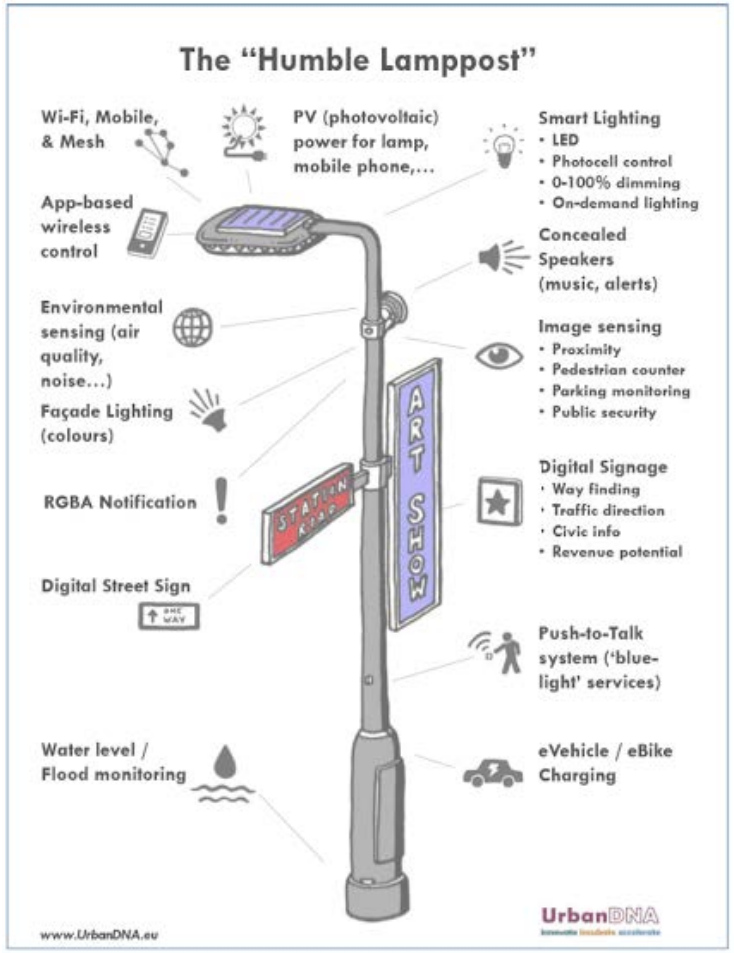
- We have benches → added value

The Soofa Sign

Solar-powered display

Project Highlights

The “Humble Lamppost”



Rationale:

- We already have lampposts – they take up space
- So why not add functionalities that exceeds just light?

- E.g. Calling emergency, charging cars, speakers, alerts, display information, gathering point

Our experience with attending

Theory vs Practice

How practitioners involves theories in their work – and where they don't!

- E.g. User Involvement

Cultural differences

"Urban Design"

"What is a Smart City?"

Our experience with attending

Experience in the field

Networking
Broadened practical scope

- What keeps the wheels turning?

Beyond 5 ECTS

What else did we do?

?

Thank you!

Martin Lykke – Jonathan Hansen
Christoffer Skovgaard – Peter Knøsgaard

The Recycling Machine
Aarhus Universitet