INCLUSIVE DATA-DRIVEN SOCIETIES: CHALLENGES AND SOLUTIONS

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DATA-DRIVEN SMART CITIES

‘Smart cities are places where information technology is combined with infrastructure, architecture, everyday objects and even our bodies to address social, economic and environmental problems.’

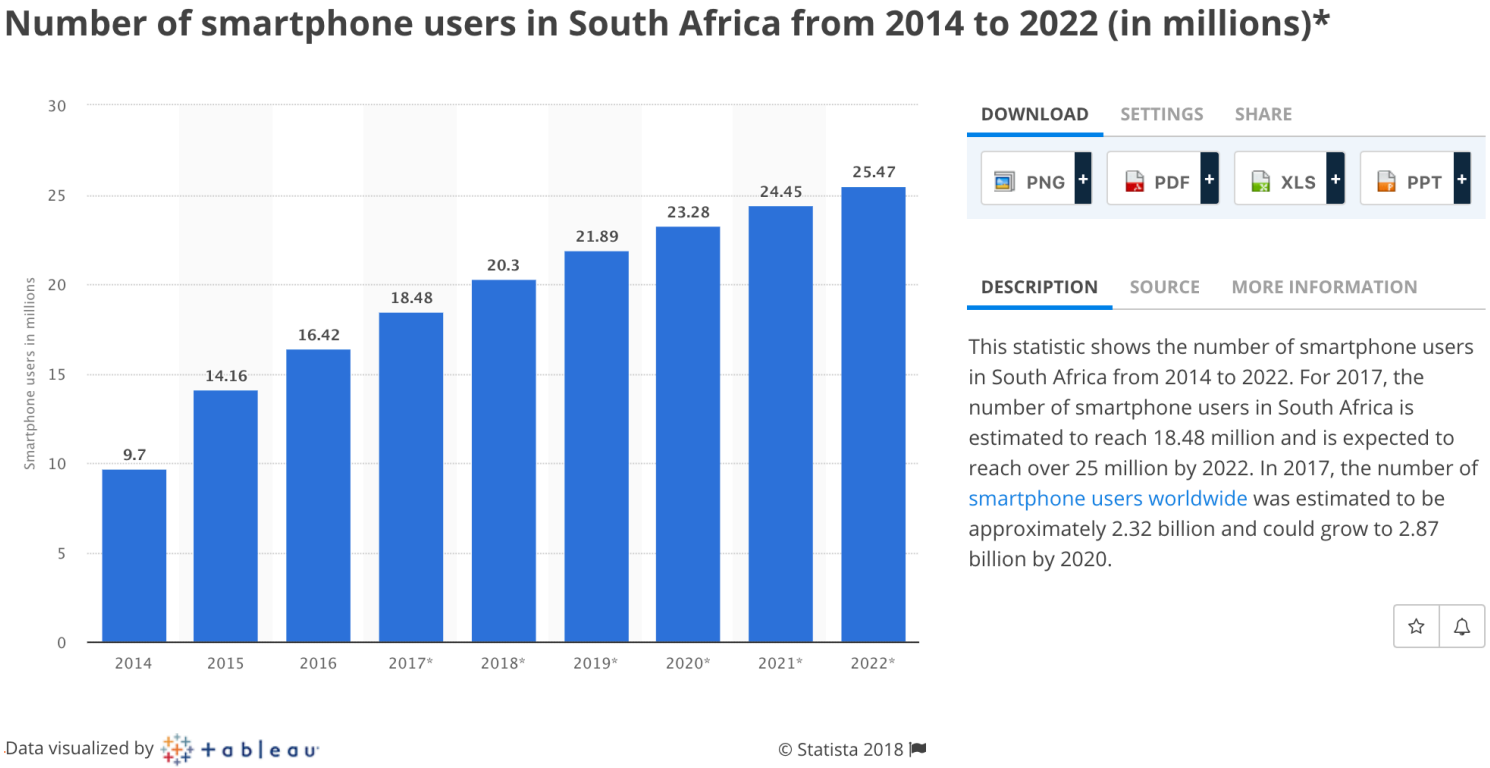
— Anthony Townsend, New York University —

CITY OF THINGS @ANTWERP

SMART FLANDERS

SMART CITY CHAIR @VUB

DATA-DRIVEN SMART CITIES IN SOUTH AFRICA



→ Forecasts IoT installed base in SA will reach 35 million by 2020

CITY OF THINGS
FLOOD
REDUCES DAMAGE TO BUILDINGS
REDUCES LOAD ON FIRE DEPARTMENT
REDUCES LOAD ON EMERGENCY LINE 112
imec
RISK OF FLOODING
APPROPRIATE MEASURES
REAL-TIME MEASUREMENT OF SEWAGE WATER - LORA SENSORS
PREPARE FOR FLOODING

DATA-DRIVEN SMART CITIES IN SOUTH-AFRICA

- URBANISATION
- WATER SUPPLY
- ENERGY SUPPLY
- WASTE MANAGEMENT
- TRANSPORT / TRAFFIC
- AGRICULTURE
- MINING / PETROLEUM / …
- ….

INCLUSIVE DATA-DRIVEN SMART CITIES: CHALLENGES

WHAT ARE THE RISKS OF DATA-DRIVEN SMART CITIES?

(PATH) DEPENDENCY – BUY IN – VENDOR LOCK-IN

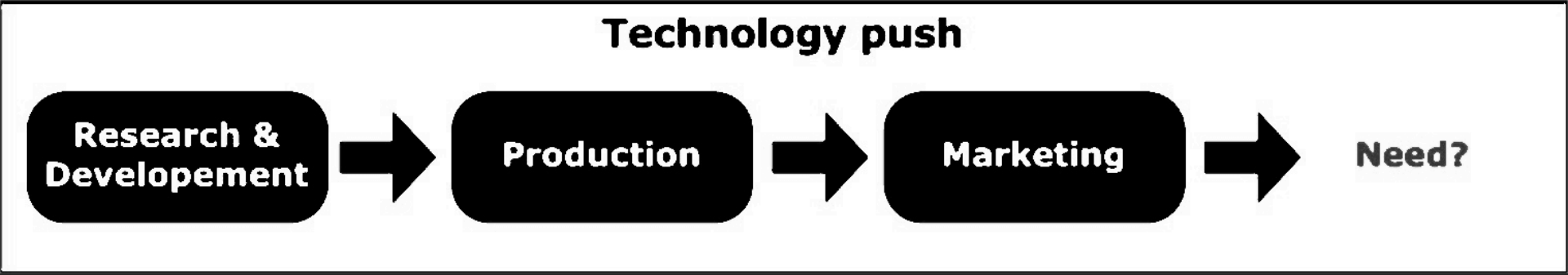
surfcity.hht.net.au
SYDNEY
Martin Pl
Pitt
JCDecaux
Which extra would you love on your car?
PARKING SENSORS
SUNROOF
304
327
We automatically insure the extras others don't.
Find out more at nrma.com.au/carcreation
experience the difference
NRMA INSURANCE

WHAT ARE THE RISKS OF DATA-DRIVEN SMART CITIES?

MARKET DISRUPTION

WHAT ARE THE RISKS OF DATA-DRIVEN SMART CITIES?

TECHNOLOGICAL DETERMINISM & TECHNOLOGY PUSH CAUSING USER WITHDRAWAL / SOCIETAL REJECTION



WHAT ARE NEW CHALLENGES OF DATA-DRIVEN SMART CITIES?

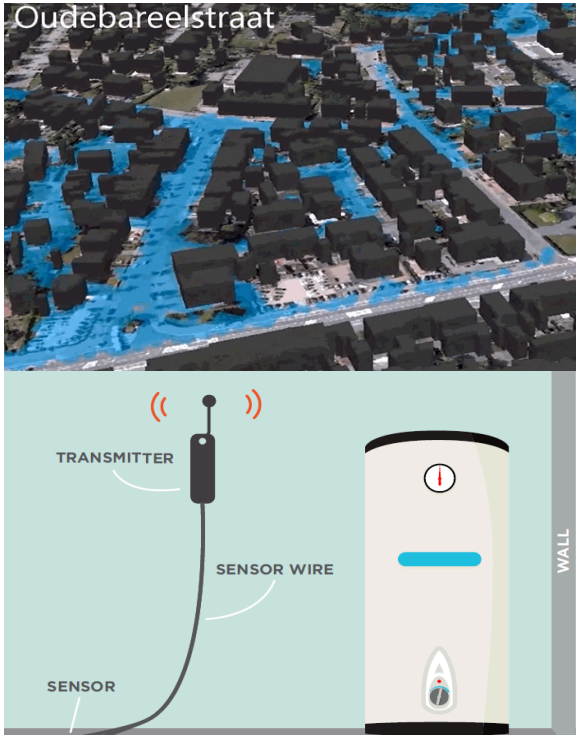
DATA – PRIVACY – ETHICS – LITERACIES WILL BE CRUCIAL

- Data is part of a process with plenty of human decision moments
- Data is a commodity

- WHAT DATA IS GATHERED?
- HOW IS DATA USED AND BY WHOM?
- WHO HAS OWNERSHIP OVER (OPEN) DATA?
- HOW TRANSPARANT ARE DATA-DRIVEN PROCESSES?
- WRONG INTERPRETATION OF DATA LEADS TO WRONG DECISIONS

Fallacy of misplaced concreteness

- Where are the sensors placed and how are they distributed?
- Who is helped first in a flooding?
- What happens with missing data?



WHAT ARE THE RISKS OF DATA-DRIVEN SMART CITIES?

MATTHEW EFFECT – RICH GET RICHER / POOR GET POORER

WHAT ARE THE RISKS OF DATA-DRIVEN SMART CITIES?

(DIS)EMPOWERMENT AMONG WORKFORCE

INCLUSIVE DATA-DRIVEN SMART CITIES: SOLUTIONS

WHAT IS NEEDED TO ENSURE SUSTAINABLE DIGITAL SOLUTIONS?

The wrong way

- Use case-driven
- Lock-in by companies
- Fragmentation
- Top-down vs bottom-up
- Technocratic

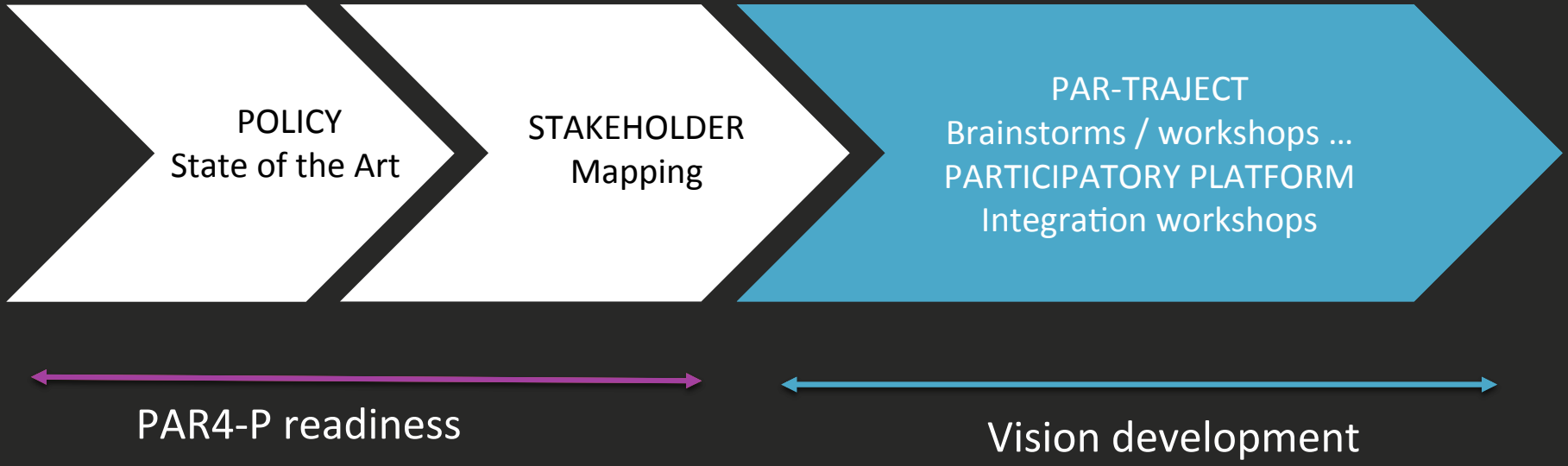
The right way

- Problem-driven
- Open data & systems
- Shared technological and ethical standards
- City as a platform
- Democratic

➔ SOCIAL INNOVATION, CO-CREATION & LIVING LAB METHODOLOGIES

WHAT IS NEEDED TO ENSURE SUSTAINABLE DIGITAL SOLUTIONS?

PARTICIPATION IN POLICY & SOLUTION DEVELOPMENT



WHAT IS NEEDED TO ENSURE SUSTAINABLE DIGITAL SOLUTIONS?

E-INCLUSIVE PANEL for CO-CREATION & LIVING LABS

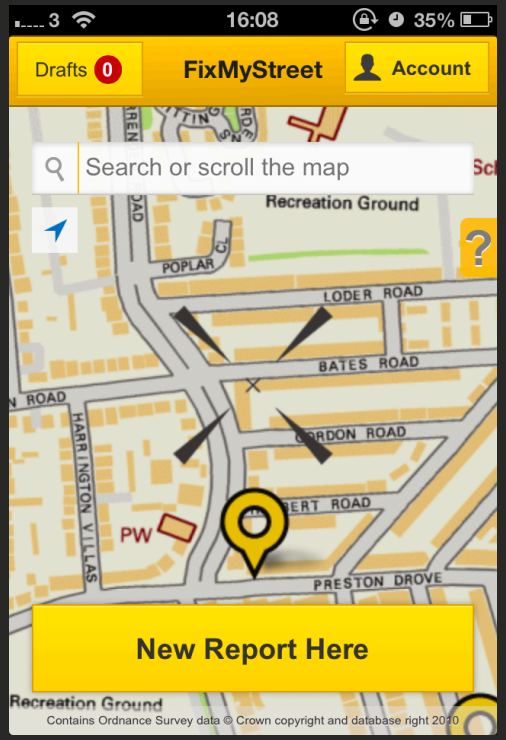
- Non-users
- Illiterate users
- High-skilled users
- Professional users
- Collaborate with intermediaries (ngo's, internet cafés…)

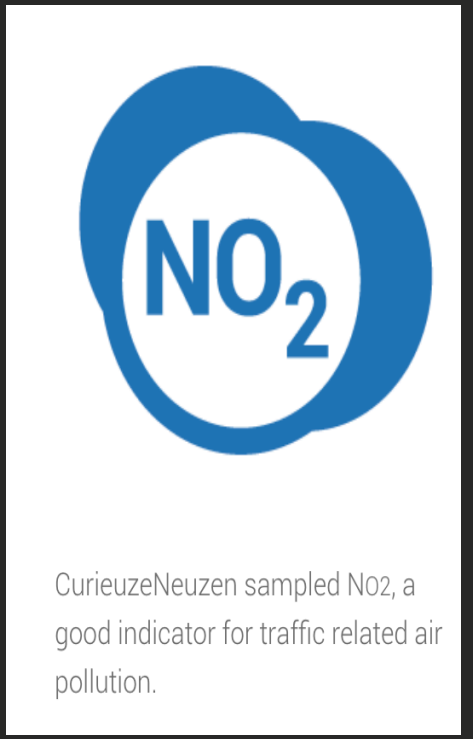
WHAT IS NEEDED TO ENSURE SUSTAINABLE DIGITAL SOLUTIONS?

CITIZEN SCIENCE

Easiest / cheapest way to collect data

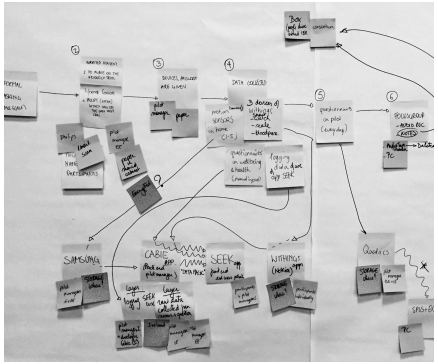
- Mobile-friendly
- User-friendly
- Open data





WHAT IS NEEDED TO ENSURE SUSTAINABLE DIGITAL SOLUTIONS?

DATA – PRIVACY – INCLUSION
TRANSPARANCY IN DESIGN



INCLUSIE
toegang

Smart City technologie:
Mobiele applicatie

PRO | CONTRA

PRIVACY
attitude

Smart City technologie:
Mobiele applicatie

PRO | CONTRA

DATA
geletterdheid

Smart City technologie:
Mobiele applicatie

PRO | CONTRA

- Sensibilisation
- Mapping of data processing
- Data protection impact identification
- Prioretisation of solutions
- Implementation
- Evaluation

G-STIC – SUSTAINABLE DIGITAL SOLUTIONS for DEVELOPMENT

G·STIC Smart Water

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- What does this mean for policy makers

- In-situ and remote sensing data collection are complementary technologies. Both are needed. Combining them with predictive models enables reliable information and reduces the need for assumptions.
- We need to stimulate governments, industry and researchers to openly share data. This will bring rewards, some of them will be unexpected.
- Citizen engagement on active data collection should be reinforced. This is an important step to changing human behaviour and move to a water resilient future.
- Make use of data and imaging tools contributing to a "Water watch" of our BLUE planet, monitoring the progress towards the realization of the SDGs.
- The sense of urgency on water risks and solutions needs to be communicated in an impact-based way.
- Provide an enabling environment to encourage cities, agriculture and industry to adopt new business models – safeguarding the human right to water. Governance structures and multi-stakeholder partnerships are needed to recognize and embrace the true value of water.
- Water is an essential part of solutions towards smart cities, tackling climate change and implement circular economy loops. The nexus needs recognition and action planning.