IoT, Crowdsourcing and Risk Managment
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Sébastien Ziegler
sziegler@mandint.org
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Risk Definition (ISO 31000)

Risk = «Effect of uncertainty on objectives»

Effect = «deviation from what is expected»

Uncertainty = «state/condition that involves a **defficiency of information** that leads to inadequate or incomplete understanding»

Risk Management

Risk Management requires

- **Stakeholder consultations**

- **Environment analysis**

- **Approach to Governance**

- **Capabilities monitoring**

Largely based on collecting information
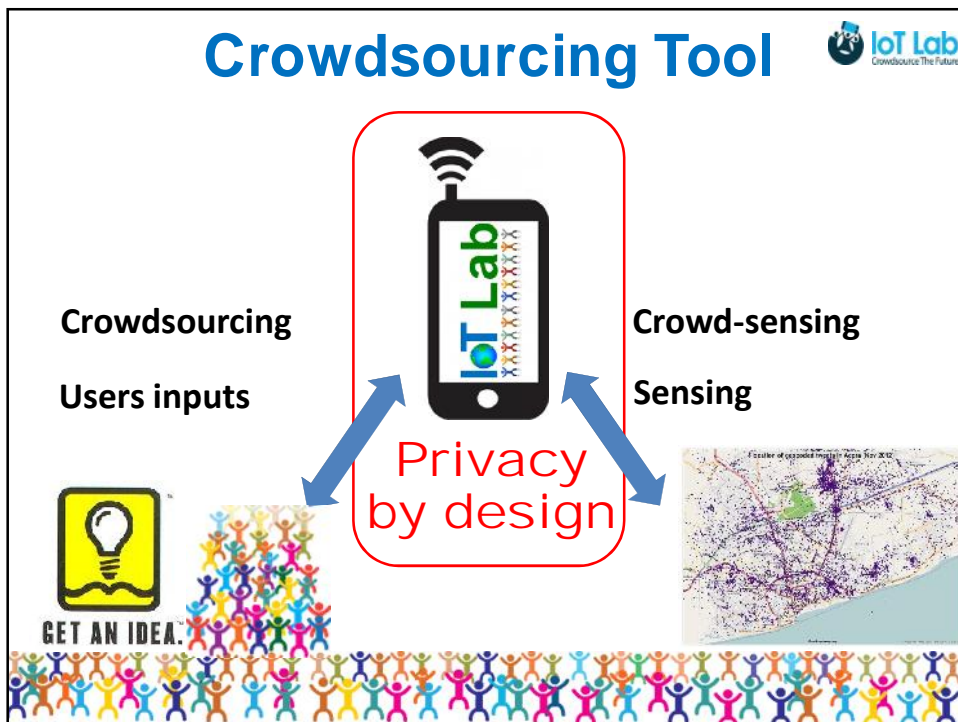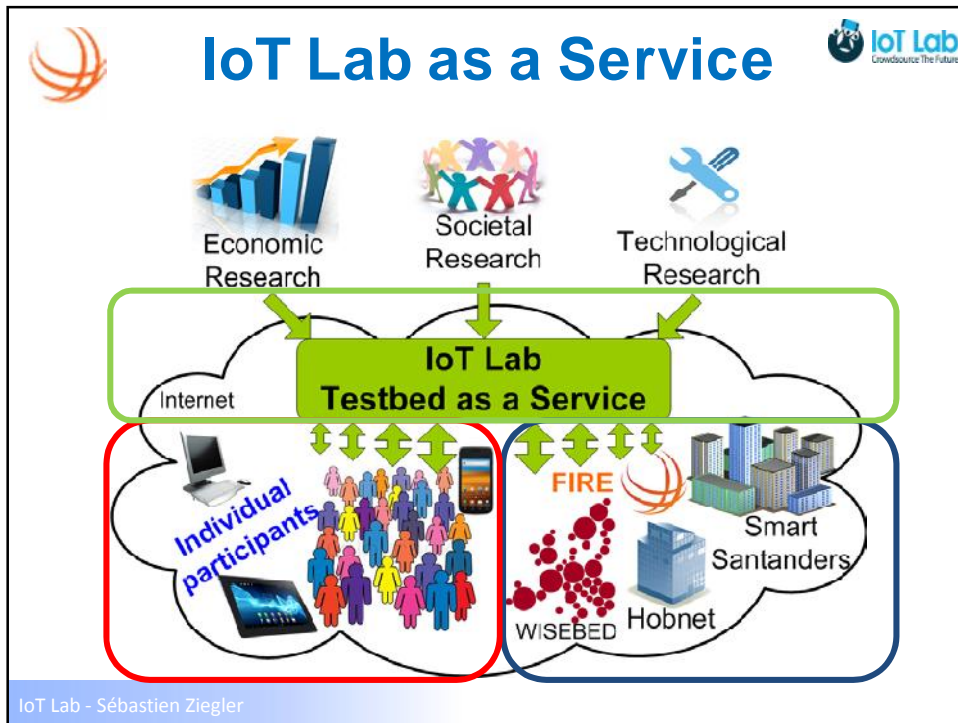
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IoT Lab

To research the potential of crowdsourcing for the Internet of Things (IoT)

To extend test bed infrastructures for multidisciplinary experiments with more end-user interactions.
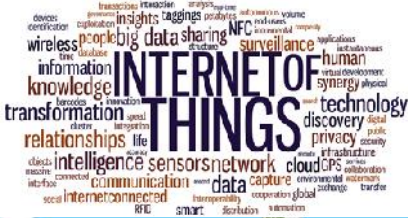
Pervasive Urban Testbed

IoT Lab
European Research Project

Exploring
Testing
Validating
Improving

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IoT for Improved Safety

https://www.protec.co.uk/our-products/

http://beachsafe.org.au/tsunami/ema/pages/09_detecting
Tsunami.html

http://www.libelium.com/wireless_sensor_networks_to_control_radia
tion_levels_geiger_counters/

Clear Benefits

IoT & Crowdsourcing

➢ Extend information (scope / sources)

➢ Improve quality of information (real time)

➢ Reduce risk of misalignment between design and user needs

➢ Better resource allocation

➢ Quicker reaction

➢ Improved security and safety

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Acceptability

Should SSC KPIs take into account measurements done through sensors or other similar devices?

23.81%

■ Yes
■ No
■ No answer

7.14%

69.05%
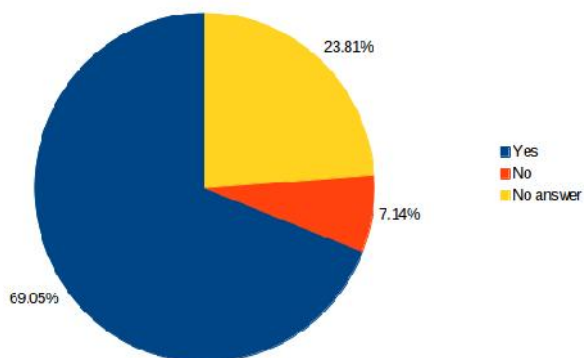
Should SSC KPIs take into account citizens' opinion/perception of their city?

19.05%

80.95%

Dual Impact on Risks

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Systemic Reduction of Risk, by
- **Improving information** (scope + real time)
- **Reducing uncertainty**

BUT ALSO
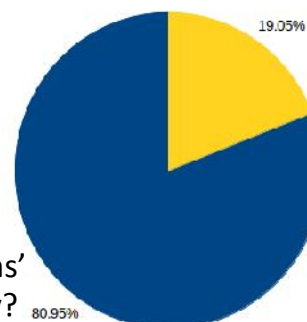**New risks to be addressed:**
- **Privacy and personal data protection**
- **Cybersecurity attacks**

**for end-user / market acceptance
and for public security**

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Privacy

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➢**User / Market Acceptance**

➢**Legal Risks**

European General Data Protection Regulation (GDPR)
Regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation)

➢**Financial Risks**

Art. 79: "…subject to administrative fines up to 20 000 000 EUR, or in case of an undertaking, up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher" Dec15

// US Federal Trade Commission

Need to better identify, assess and mitigate IoT privacy risks
Ongoing research: H2020 Privacy Flag: www.privacyflag.eu
Privacy Certification: www.europrivacy.org

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Views on IoT Security

*"***How do we protect potentially billions of [IoT devices]** *from intrusions and interference that could compromise personal privacy or threaten public safety?"* **WIND Report**

Security in the Internet of Things, WIND

"The **IoT represents a major transformation** *in a digital world that has the potential to affect everyone and every business."* **Symantec Report**

ISTR 20, Internet Security Threat Report, April 2015

*"***70%** *of the most commonly used IoT devices* **contain vulnerabilities***."* **EY Report**

Cybersecurity and the Internet of Things, EY

"IoT will introduce unprecedented growth in devices and data *(…and)* **introduces new cybersecurity concerns***."*

ESG White paper commissioned by Cisco

The Internet of Things: A CISO and Network Security Perspective, Enterprise Strategy Group

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Views on IoT Security

*"***Nuclear Facilities in 20 Countries May Be Easy Targets for Cyberattacks***"* *New York Times, Jan 14 2016*

"Government should **support the development of (IoT) standards** *that facilitate interoperability, openness to new market entrants and* **security against cybercrime and terrorism***."* *UK Office for Science, Recommendation 5*

The Internet of Things: making the most of the Second Digital Revolution A report by the UK Government Chief Scientific Adviser

«There is a small – and rapidly closing – window to ensure that IoT is adopted in a way that maximizes security and minimizes risk.»

US NSTAC Report

NSTAC Report to the President on the Internet of Things
The President's National Security Telecommunications Advisory Committee

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Conlcusion

IoT can contribute to
significantly reduce risks
and build a better world.

However, in order to get adoption and to reap the IoT benefits
IoT Security and Privacy by design is required,
including at standard level.

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THANK YOU!

Sébastien Ziegler

sziegler@mandint.org   www.iotlab.eu