

Internet of Things Applications and Usage

Milos Maryska

Faculty of Informatics and Statistics

University of Economics in Prague

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Agenda

- Internet of Things
- Problem Definition
- Data Sources and Methodology
- Locations of Persons and Equipment
- Electronic Seals with Remote Detection



Internet of Things

- Interconnection of the physical and virtual world
- Gradually developing for several decades mentioned for the first time in 1999
- ISO definition: an infrastructure of interconnected objects, people, systems and information resources together with intelligent services to allow them to process information of the physical and virtual world.
- Industrial Internet of Things



Implementation & Benefits of IoT

- Implementation is driven by:
 - technological process, the penetration of information technologies into an ever-increasing number of products and lower prices of information technologies and their components and network connection
 - human need to be more and more connected to immediate events in an increasingly wider environment
- Benefits:
 - Cost savings
 - Increasing quality of service
 - Increasing customer satisfaction



Data Sources and Methodology

- Survey:
 - 50 experts
 - different business companies and universities
 - o between 2016 and 2017
- 67 two-round workshops
- First round: 50 structured workshops
- Second round: 17 workshops



Results from Survey

- 124 identified application opportunities
- 16 application opportunities with priority 1
- 20 application opportunities with priority 2
- 25 application opportunities with priority 3
- 63 not assigned any priority due to differently evaluated factors



Potential Use Cases

- Potential of usage of IoT solutions in monitoring:
 - the integrity of seals on meters of utilities (e.g. water, electric power, gas, etc.).
 - the locations of employees and equipment
 - utility consumption



Electronic Seals with Remote Detection

- Reduce or mitigate non-technical losses caused
- Metering the resistance wire if it is damaged, interrupted or shortcircuited, the sensor will immediately send information
- Systematic solution for detecting the integrity of seals
 - Technical solution;
 - Sensors;
 - Communication in the IoT network;
 - Work with data prior to transmission;
 - Power supply



Electronic Seals with Remote Detection

- We assume about 500,000 apartments
- Personal validation:
 - During a work shift one person can check 80 meters on average in Prague
 - Laboure cost: 19 million CZK in annually
 - Transportation costs: about 25 million CZK
- Automatic validation:
 - IoT device with an electronic seal is about 2,500 CZK
 - Implementation about 1,5 billion CZK
 - Annual savings of about 20 million CZK
- 19 + 25 less than 1.500 20

Conclusions

- Main benefits:
 - Immediate identification of the location of persons or pieces of equipment with high precision;
 - Immediate identification of seal broken
- Main Benefits of Location of Persons:
 - Easy installation
 - Low operating costs;
 - Low investment costs in case of location
- Main Benefits of Detection:
 - Easy installation
 - Low operating costs;
- Main Negative Factor of Detection:
 - High investment costs



Questions/Discussion

Prof. Ing. Petr Doucek, CSc.

Faculty of Informatics and Statistics

University of Economics, Prague

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