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https://www.sintef.no/en/events/erf2019_workshop_on_inspection_and_maintenance/

20 March 2019

TOPIC GROUP ON INSPECTION AND MAINTENANCE

ERF workshop on Inspection and Maintenance

Inspection & maintenance – Robots in action and new possibilities

Want more info about the topic group or to join it? E-mail Aksel.A.Transeth@sintef.no

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RUDOLF ESSEL, MAARIT SANDELIN, SPRINT ROBOTICS

Background

euRobotics TG on Inspection and Maintenace Robotics

Started in 2014

Previously led by Ekkehard Zwicker, GE Inspection Robotics, until Oct 2016

Now led by Aksel A. Transeth, SINTEF, in cooperation with Ekkehard Zwicker

Ca 120 members

Goal and scope: To influence and to drive the research, development and operative deployment of robotics in the domain of maintenance and inspection of process plants such as oil&gas facilities, power stations or chemical plants by connecting the stakeholders from research and industry.

2.6.3. Sub-Domain Inspection and Maintenance

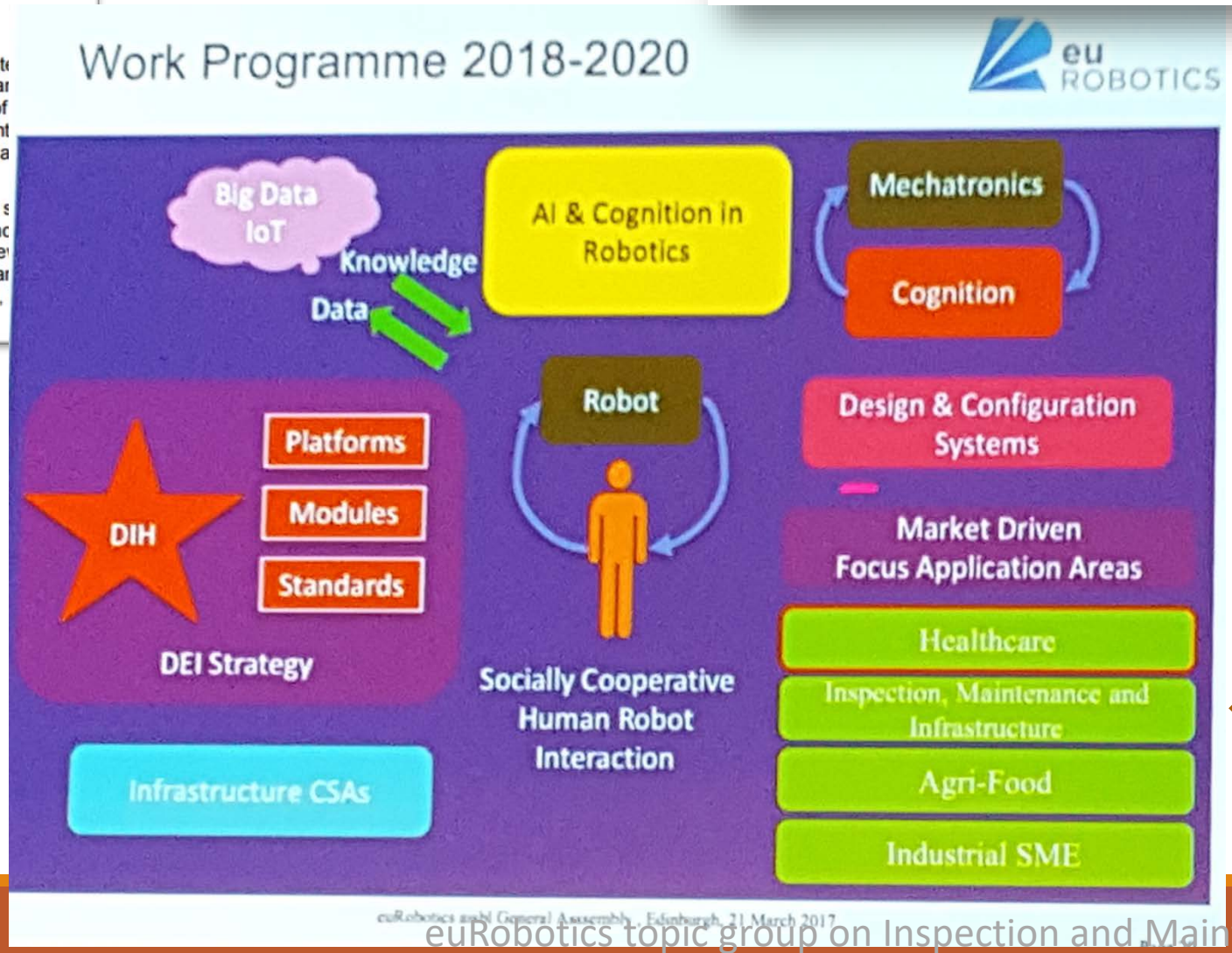
2.6.3.1 Sub-Domain Overview

Robotics provides significant advantages over current methods of inspection and mainte
for example 24/7 working, and have the ability to operate in hazardous, harsh ar
environments. The utility and energy domains have begun to explore the potential of
technology. There is an emerging trend for these industries to include robot based maint
and inspection within their forward planning. However there is currently no wide scale a
or validation of this technology.

The lack of wide scale adoption can be attributed to a number of different factors, s
insufficient availability of robust technical solutions and the concern of implementing innc
without track record. At the root lies a disconnect between the robot technology being de
for this industry and the requirements of the users. This is due to an insufficient understar
what challenges are being faced by asset owners for inspection and maintenance tasks,
basic requirements that drive their needs for robotic technology uptake.

RIMA | Robotics for Inspection and Maintenance

Strategic Research and Innovation Agenda 2019



WS program

AGENDA

14:00-14:05: Introduction (E. Zwicker, A. Transeth)

14:05-15:05: Successful commercial deployments and future developments

- Equinor, Anders Røyrøy
- GE Inspection robotics, Ekkehard Zwicker
- Chevron, Mauricio Calva
- Vopak, Mathijs Kossen
- SINTEF, Aksel Transeth
- University of Nottingham, Dragos Axinte
- FundingBox, Nikolaj Nygaard and Izabela Zrazinska, funding opportunities in EU-projects RIMA (www.rimanetwork.eu) and RobotUnion (www.robotunion.eu)
- **15:10-15:25:** Moderated workshop discussion.

Golden questions:

- What is needed to scale up robotic deployments further?
- How could a business model look like to support the scale up?
- How can we leverage simlilarities between the various industrial sectors (Oil&Gas / Power Generation / Public Infrastructure / Civil Construction ...)

15:25-15:30: Summary and conclusions

Introduction by Ekkehard Zwicker

Observations from my side …

- Robotics is about to start getting common practice, slowly but surely ….
- Robotic deployments are currently driven by the asset owners / operators
- Many industrial service providers are hesitant to step in, due to
  - Significant invest needed to buy into robotics (systems and know-how)
  - Changing & unclear business models
  - Because it is new ….
- Different industries are driven by different business models
  - Power Generation / Jet Engines … OEM driven services
  - Oil&Gas / Infrastructure … industrial service provider driven
- In common: the asset owner / asset operator is the driver

Summary of discussion

Golden questions for discussion

Q1: What is needed to further scale up robotic deployments?

Q2: How could a business model look like to support the scale up?

Q3: How can we leverage similarities between the various industrial sectors (Oil&Gas, Power Generation, Public Infrastructure, Civil Construction ...)

In the subsequent slides we summarize the discussions during the workshop.

Discussion moderator: Ekkehard Zwicker

Minutes by: Aksel A. Transeth

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Summary of workshop discussion

The workshop gathered around 100 people

We need good reference cases, but also to share know-how about challenges and limitations

The value chain must interact to understand each other

- How big is the gap between the need and the offer?
- Then look at the business plan: commercial value <= actual cost <= what are we competing against and what is the perceived value of the offering?

Need good reference cases – preferably as close to the relevant industry as possible.

How to achieve this? Need trial deployments. Need to cooperate between supplier and user.

Sharing knowledge and experience. This is important – and the target of the topic group.

- Get the "fence" between industry and academia away. Instead focus on the needs and possibilities.
- The community need to also share the challenges and limitations of the system being used. Not only talk about the successes.

Should research push solutions or should end-users push needs? We need both. E.g., with the RIMA project (weblink).

- Idea: map the requirements from the end-users in a database? To share experience. The SPRINT Robotics roadmap (weblink) has input on this.

We need transparent business models

Can we have multi-purpose robots that can perform many different tasks? This will in many cases be very difficult.

Need a transparent business model.

- Business model: Hardware as a service – sell hours of the hardware.

Industry is not interested in robots per se – they are interested in solving their problems in the real world.

How to get to a point where technology can be sold commercially? The SPRINT robotics roadmap gives indication into which applications are of interest within oil and gas and where is the market.