

# Building Trust in the Internet of Things

VIRTUAL VEHICLE Research Center, Graz/Austria



**secure connected trustable things**



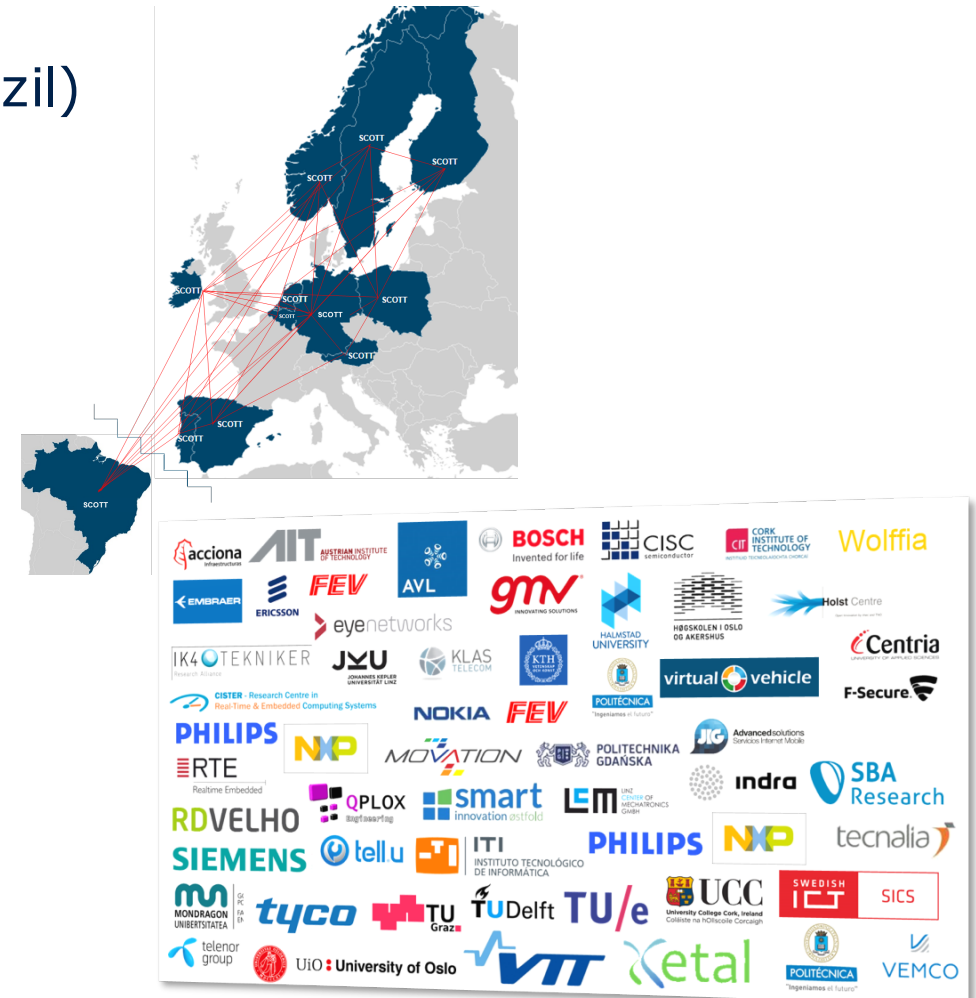
*SCOTT has received funding from the Electronic Component Systems for European Leadership Joint Undertaking under grant agreement No 737422. This Joint Undertaking receives support from the European Union's Horizon 2020 research and innovation programme and Austria, Spain, Finland, Ireland, Sweden, Germany, Poland, Portugal, Netherlands, Belgium, Norway.*



# SCOTT – Secure COnnected Trustable Things

- **Coordinator:** VIRTUAL VEHICLE Research Center
- **57 Partners from 12 Countries**  
(AT, BE, DE, FI, ES, IE, NL, NO, PL, PT, SE, and Brazil)
- **15 industry-driven Use Cases (TRL 6-7)**
- **50 Technology Building Blocks**
- **25 Demonstrators**
- **5 (+1) Domains:** Automotive, Aeronautics, Home/Building, Rail, Healthcare, and Cross-domain  
→ truly “cross-disciplinary”
- **~40M€** Project Budget
- **2017 – 2020** (started in May 2017)
- **“more than 120 dedicated people working full-time over 3 years”**

[www.scottproject.eu](http://www.scottproject.eu)

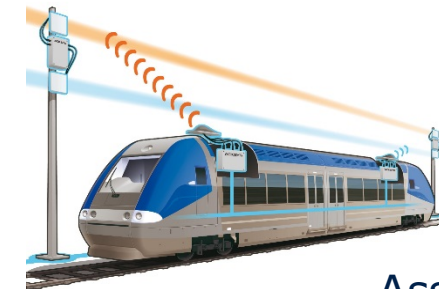
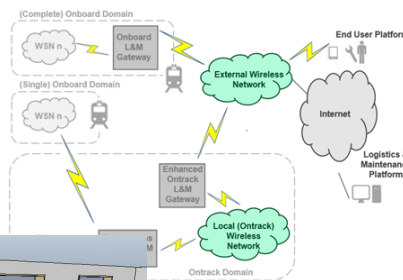
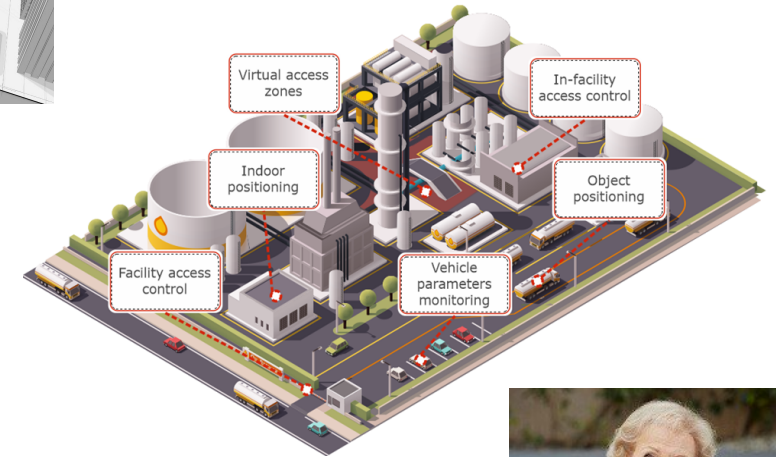
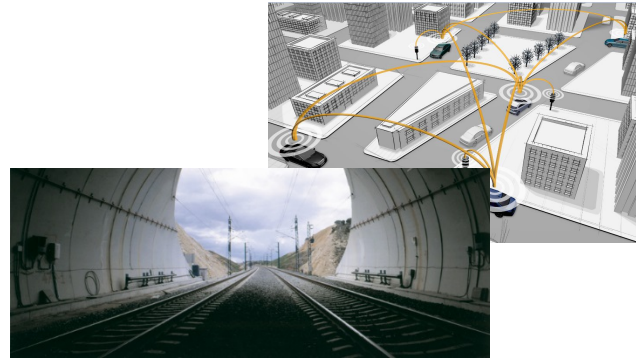
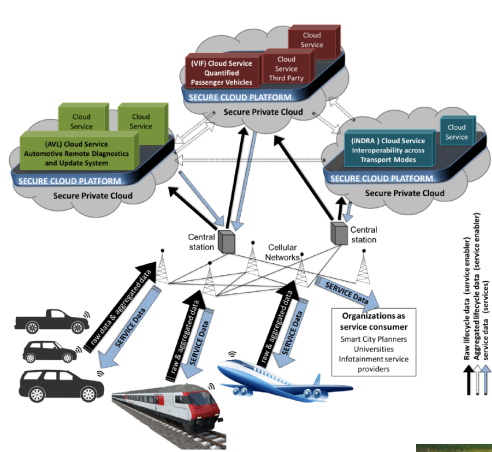




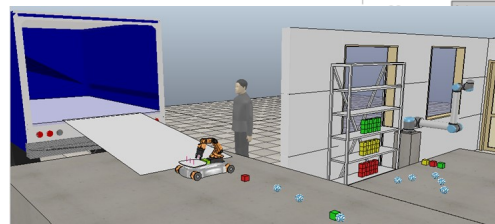
# SCOTT – 15 Use Cases from European Industry

## ■ Aeronautics, automotive, home/building automation, healthcare, rail + cross-domain

### Vehicle-as-a-sensor within smart infrastructure



Trustable wireless in-vehicle communication network



Air quality monitoring for healthy indoor environments

Assisted living and community care

# Building Trusted Systems is a Complex Issue of Technical and Non-technical Factors





# Framework for Building Trusted Systems

- Trust is different from system acceptance
- Trust **calibration** is essential, not just trust vs. no trust
- There are plenty theories and knowledge about trust
  - How do we translate this into system design?
  - How can we create generalizable lessons learned?
- The central concept in our framework are „trust issues“ which are the specific, contextualized concerns that a system does not meet the trustors goals

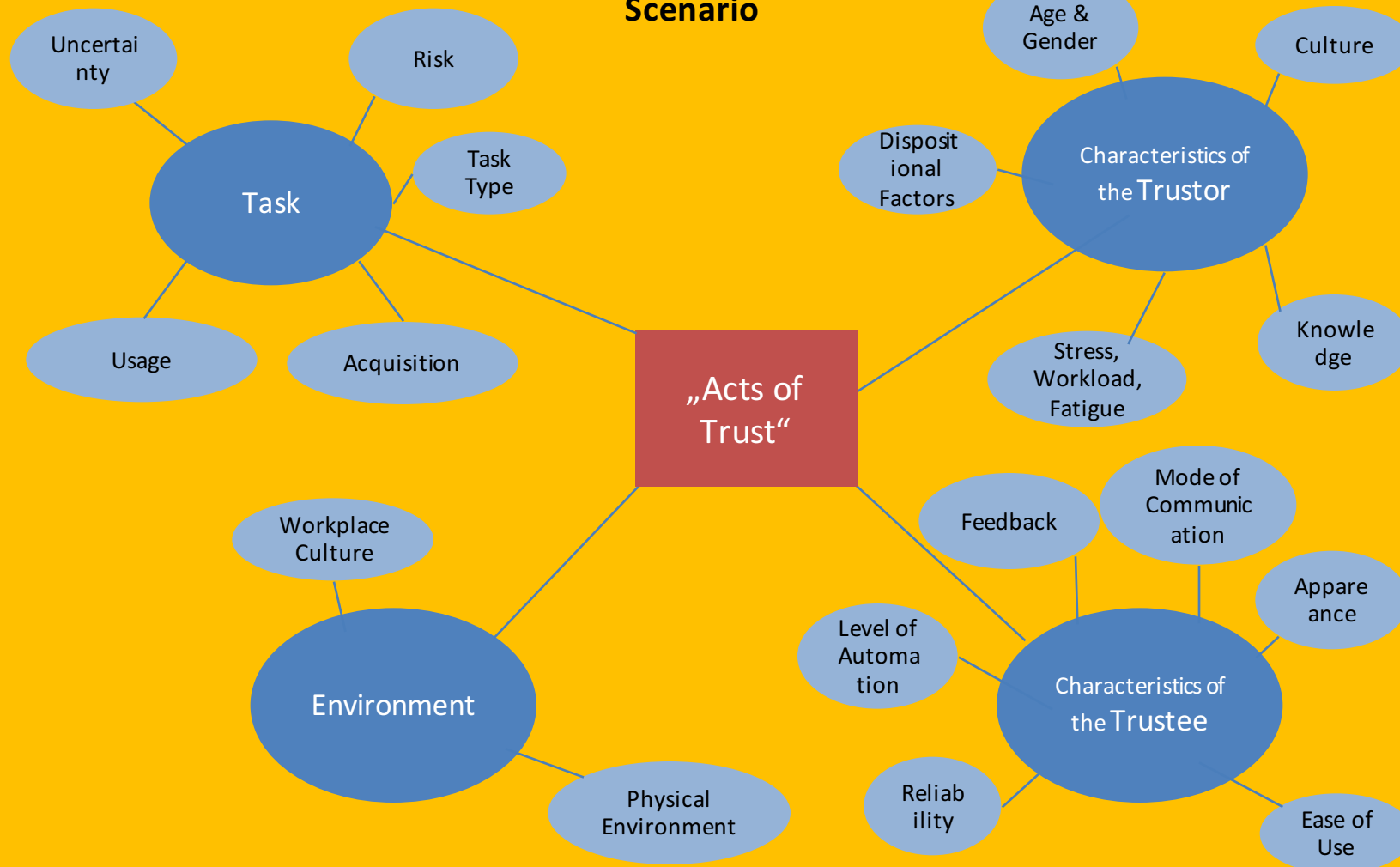
- *“Trust is the attitude that an agent will help achieve an individual’s goals in a situation characterized by uncertainty and vulnerability.” (Lee & See 2004)*

**If you had the choice, would you cross this bridge?**

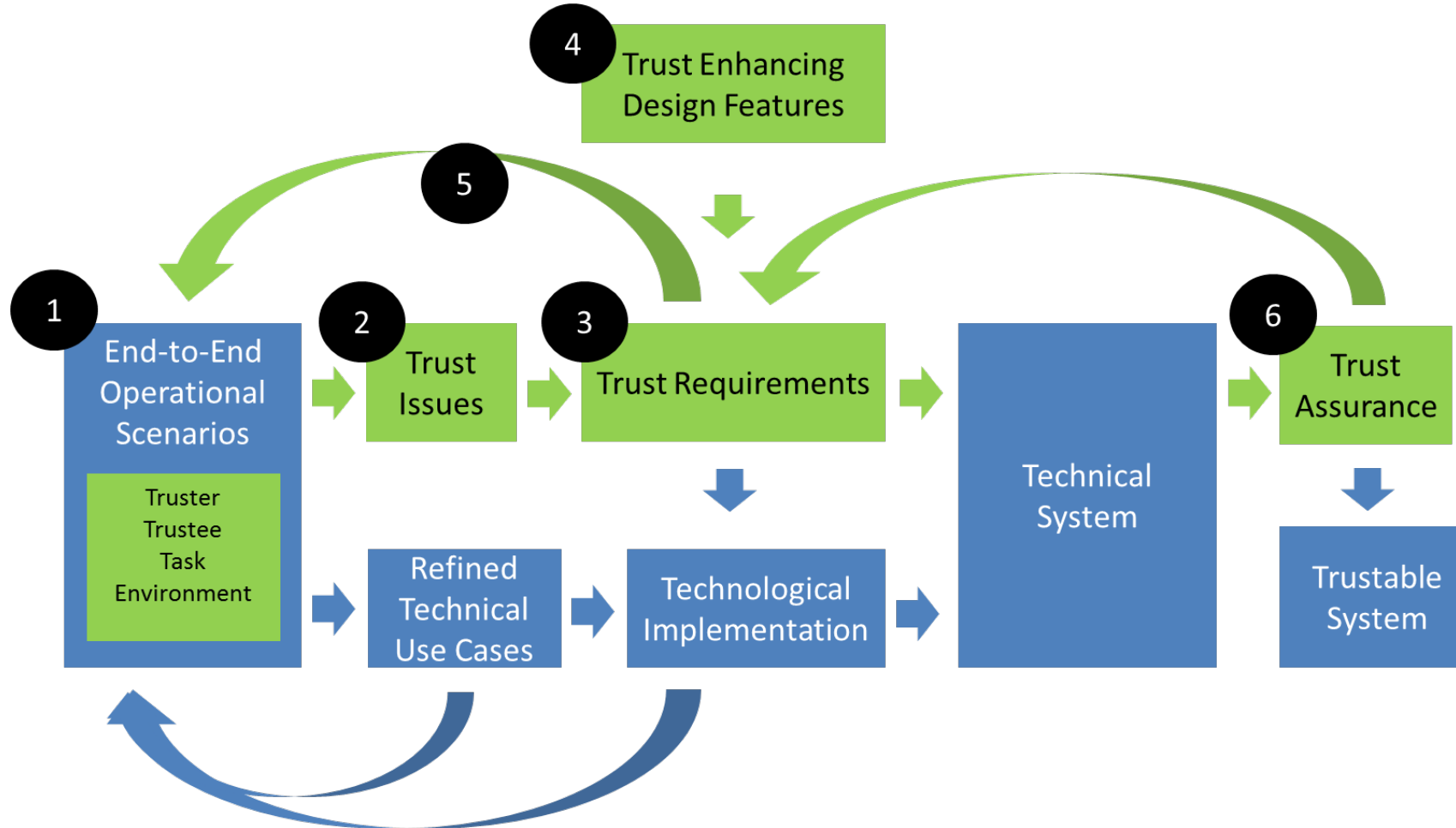


[https://www.scientificcomputing.com/sites/scientificcomputing.com/files/Solving\\_the\\_Trust\\_Equation\\_Socially\\_Intelligent\\_Computers\\_can\\_turn\\_Difficult\\_Negotiations\\_into\\_Win-win\\_Situations\\_ml.jpg](https://www.scientificcomputing.com/sites/scientificcomputing.com/files/Solving_the_Trust_Equation_Socially_Intelligent_Computers_can_turn_Difficult_Negotiations_into_Win-win_Situations_ml.jpg)

## Operational Scenario



- Trust issues are concerns of users or potential buyers about aspects of the system that relate to the trustor's uncertainty and vulnerability.
  - Can concern reliability, availability, usability, security, functionality, ..
- The extraction of trust issues occurs from the viewpoint of the trustor



1. Analyse end-to-end operational scenario
  - With sufficient contextual information
2. Extract trust issues
3. Specify trust requirements
  - Internal and external ones
4. Proposed trust enhancing design features
5. Iterations
6. Conduct trust assurance



# Questions?

[scott@v2c2.at](mailto:scott@v2c2.at)

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