Automated industrial collaboration through distributed ledger technology and smart contracts

Can we find requirements relevant to Productive 4.0?

Ulf Bodin, LTU

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Background

Distributed Ledger Technology (DLT)

- A consensus of **replicated, shared, and synchronized data** spread across multiple sites (computers) – **no need for central authority**

- A blockchain is a type of distributed ledger, comprised of unchangeable data arranged in blocks upon which **distributed consensus** are reached

- Not all distributed ledgers employ blocks or chain transactions
  - Other types of data structures can be used to provide secure and valid achievement of distributed consensus. e.g. to avoid delays caused by block based processing

Smart contracts

- Some distributed ledgers manages dynamic contracts, referred to as *smart* contracts

- Smart contracts are typically fully deterministic computer programs for non-static agreements between collaborating parties

DLT and smart contracts in Productive 4.0

Can DLT and smart contracts be used to automate collaboration in industrial production systems?

- Main objective is (can be) to:
  - Automate any agreement handling and/or sharing of data so that manual negotiation and/or setup can be alleviated or simplified

- What could DLT and smart contracts be used for in the context of industrial automation and Productive 4.0?
  - Automatic handling of **data sharing and use** based on smart contracts
  - Enforcing **allowed configurations and/or use** of equipment, tools, etc.
  - Other needs related to Productive 4.0 use cases?

- *How do we identify requirements?*

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How to proceed in identifying requirements?

- **Find needs and requirements related to selected use cases, e.g.**
  – T8.1.1 Vehicle individualization/automated assembly – BMW, EDMS, Volvo?
  – T8.1.3 E2E integration of process and networks – Airbus?
  – T8.1.4 Industrial IoT/CPS system – VTC, Ericsson, LTU, SEB, MIDROC?
  – T8.2.1 Smart services for test equipment – AVL?
  – T8.2.2 Cost engineering powertrain – AVL?
  – T8.3.1 Frontend/backend cooling – Infinion, SYSTEMA?
  – T8.3.3 Data analytics, semiconductor – Infinion, SYSTEMA?
  – T9.1 Shaver system – Philips?
  – T9.2 Extended product lifecycle – Thales?
  – T9.6 Machine and fleet management – VTT, others?

- **Webex/Skype meetings**
  – E.g. every third week during the fall of 2017, **first in late August**
  – **Who to invite?**
    - All listed above? Others?
    - Send an email to me: **ulf.bodin@ltu.se**

Other use cases?

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