Digital Transformation of Manufacturing Record Books - An Ontology Based Case Study

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1: What is the problem?

Document-digitalisation is needed for quality assurance of complex industrial engineering projects. Aerospace, ship building, construction and offshore
Current situation

Documentation of all the stages in the production for each product

Manually check to ensure equipment compliance

Regulations and customer specifications
Current situation

Documentation of all the stages in the production for each product

Manually check to ensure equipment compliance

Regulations and customer specifications

Collate into a single unique comprehensive document commonly referred to as the Manufacturing Record Book (MRB)
2: Why is document digitalisation important?

Manual processing is

- Costly
- Error prone
- Slow
- Hard in inter-organisational processes
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"Finding Data Should be Easier than Finding Oil"
3: What are the requirements for a good document digitalisation solution?

- Represent documents by their data
- Use a language understandable to both computers and humans
- Represent data according to semantic technology standards
4 / 5: What solution – and why is it a good solution?

Solution:
Define an ontology for Manufacturing Record Books (MRBs)

Because:
Enables digitalized and automated processes across enterprises
Ontology technologies already proven in oil & gas projects
Eliminates issues with inconsistent and ambiguous requirements
Automates laborious verification and validation of requirements
Reduces engineering hours and project management efforts
Case study – CodeIT – Developing eMRB solutions for the oil & gas industry

Transformation from manual document-based work processes to digitalised and automated processes
Ontology defined for welding certificates
A certificate coded as TTL (Terse RDF Triple Language)
Future work

**Business**
- Uptake by businesses
- APIs needed
- Plug & Play solutions needed

**Ontology**
- Further develop the application ontology
- Aligned with domain ontology & upper level ontology