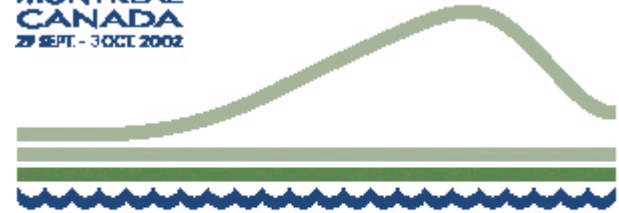


18th International CODATA Conference

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MONTREAL
CANADA
29 SEPT - 3 OCT 2002



CODATA 2002
18th INTERNATIONAL CONFERENCE

Requirements for access to technical data -- an industrial perspective

LSC GROUP

Dr. Timothy M. KING CEng MIMechE

Executive Consultant, Enterprise Integration Technologies -- TMK@LSC.CO.UK



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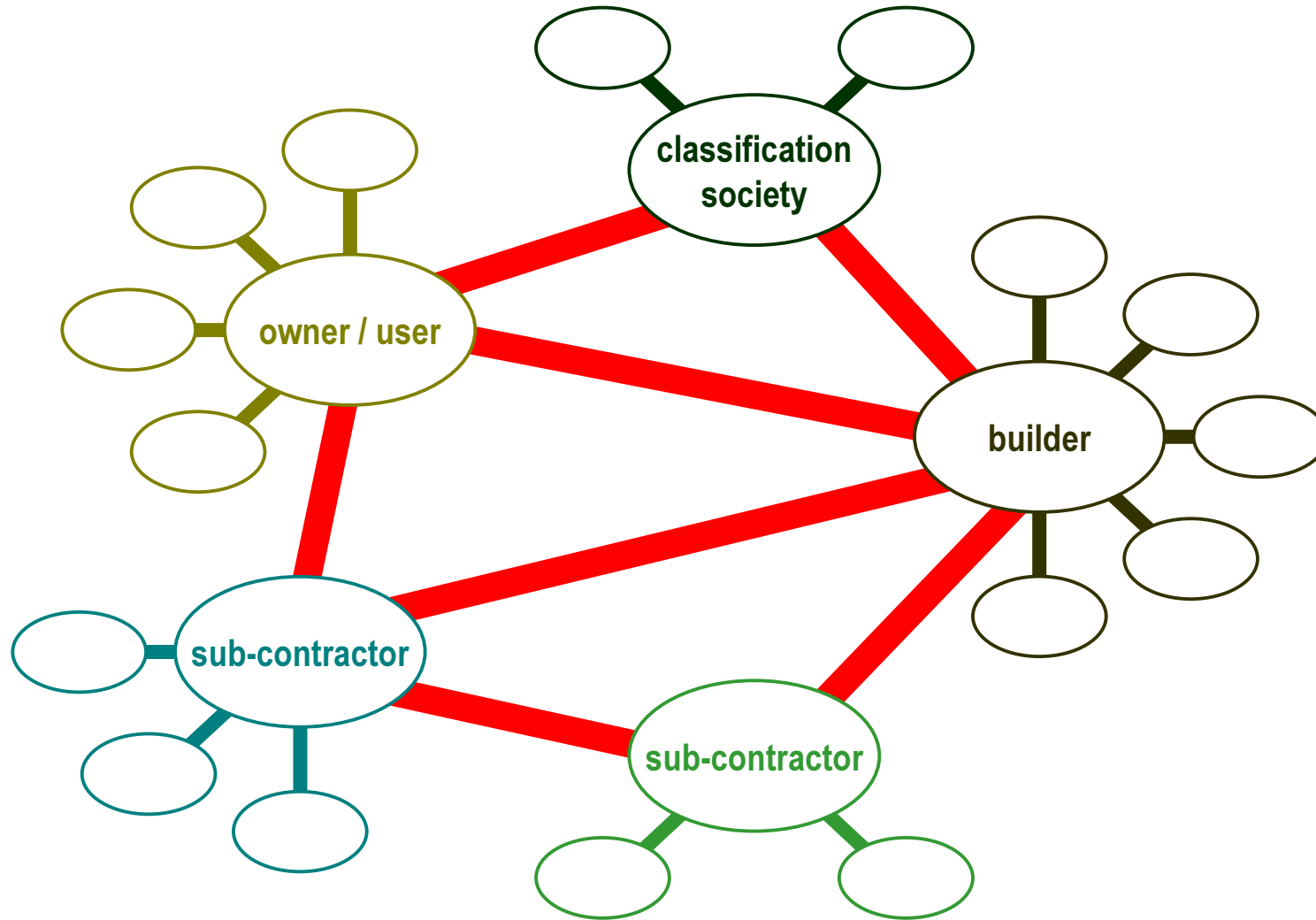
Contents

- what is the context for access to technical data?
- how can we solve interoperability problems in order to access technical data?
- what relevance is the industrial perspective to CODATA?
- the focus for this presentation ...
 - the digital product model
 - anything & everything about a product

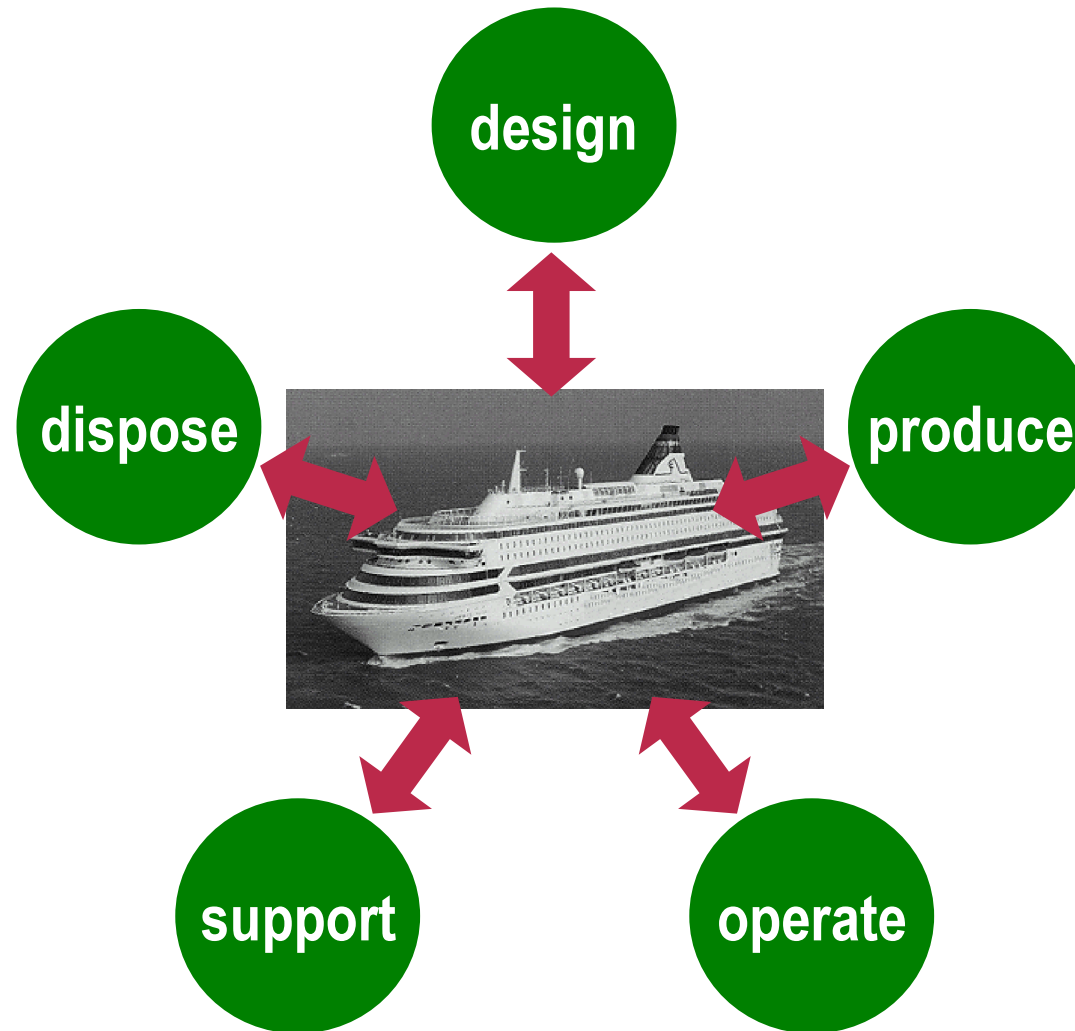
Technical data in industry

- innovation
 - e.g. use of new materials
- accurate repeatability & control of processes
 - e.g. material properties for manufacturing
- decision making
 - e.g. is this crack still safe?

The extended enterprise



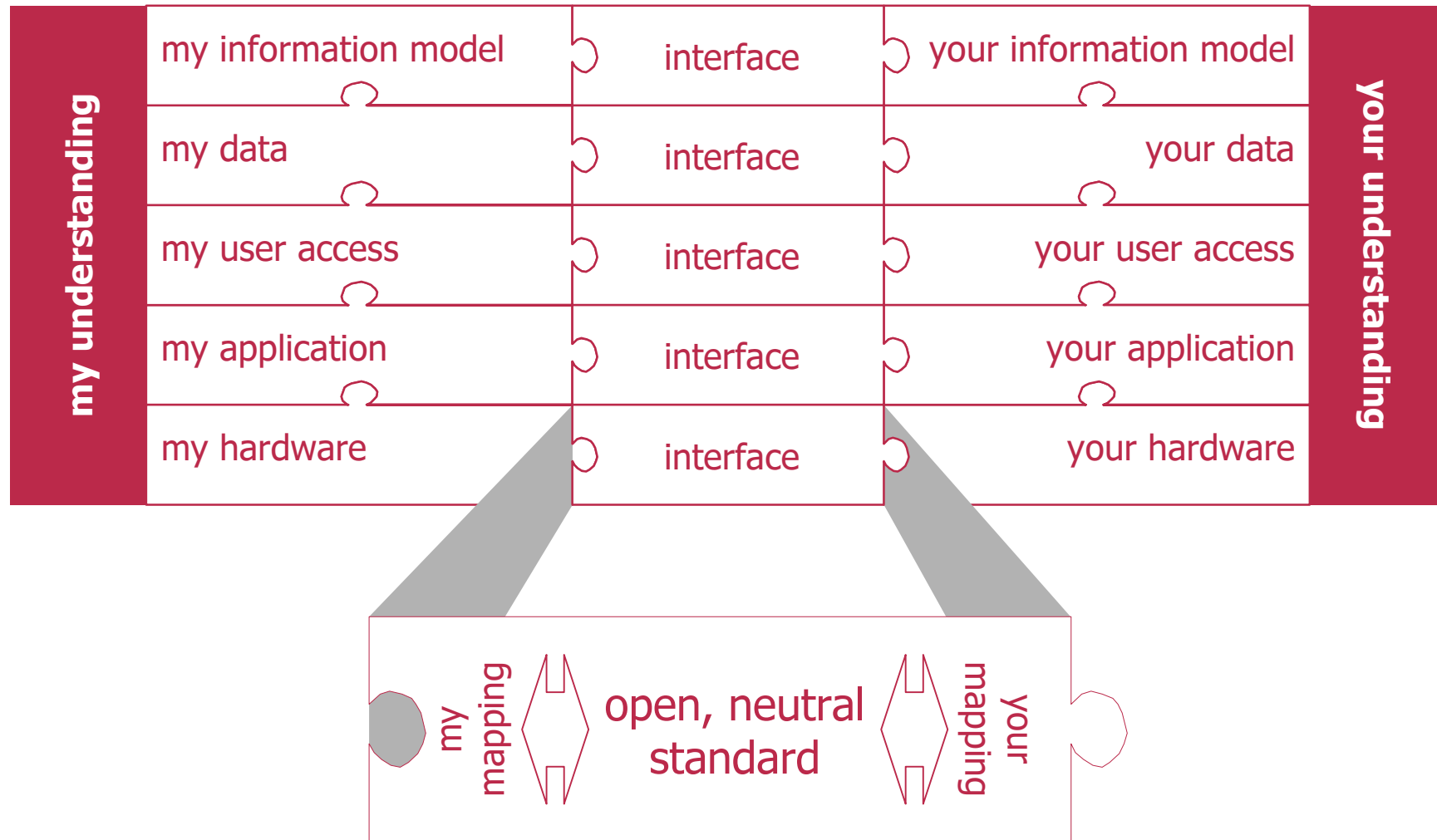
Life-cycle activities - concurrent



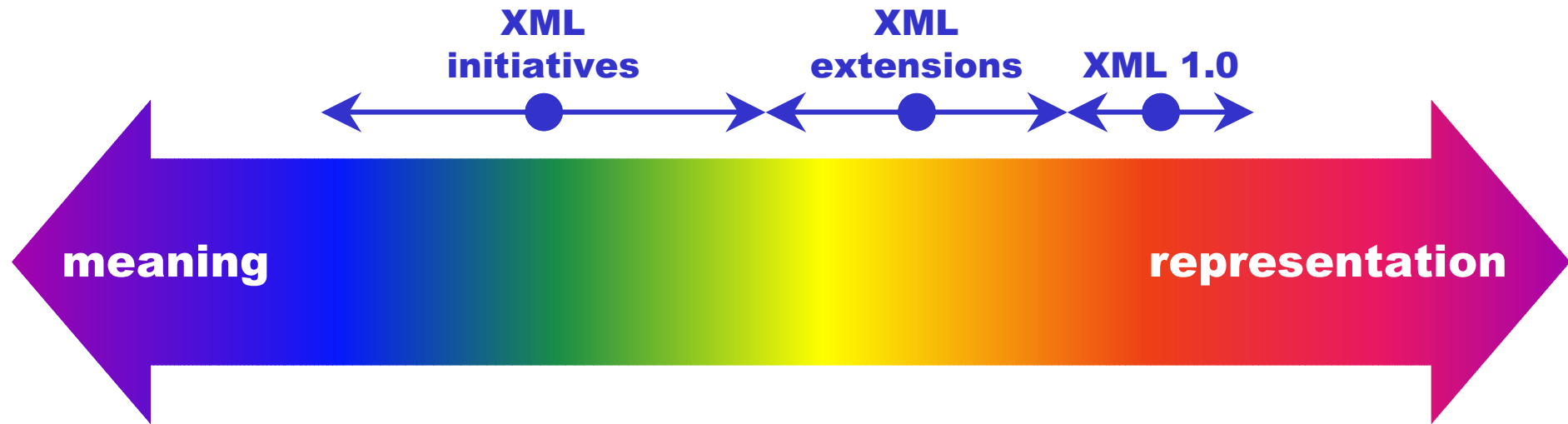
The information management requirement

- information is a strategic through-life asset
- computer-sensible semantic understanding of technical data
 - avoid costly human intervention
- standards to support interoperability
 - avoid point-to-point solutions

Interoperability is multi-layered

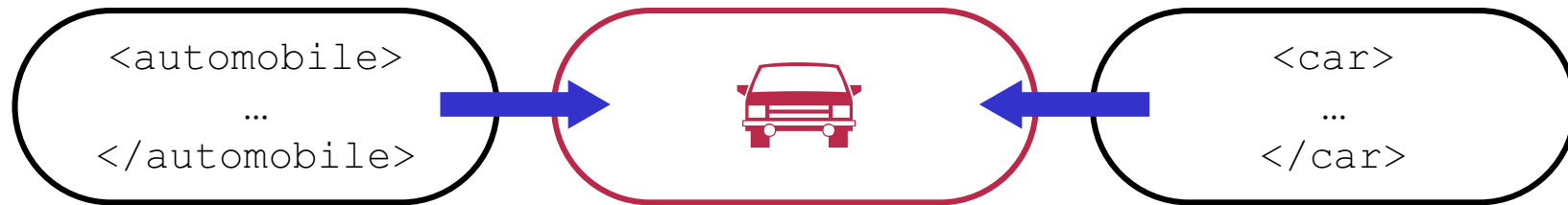


XML

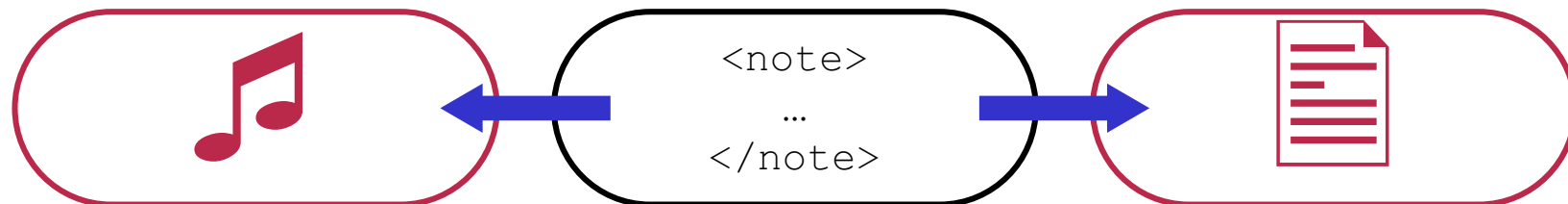


- core language does not guarantee interoperability

Just what did you mean?



American or British?



music or memorandum?

ISO product data standards

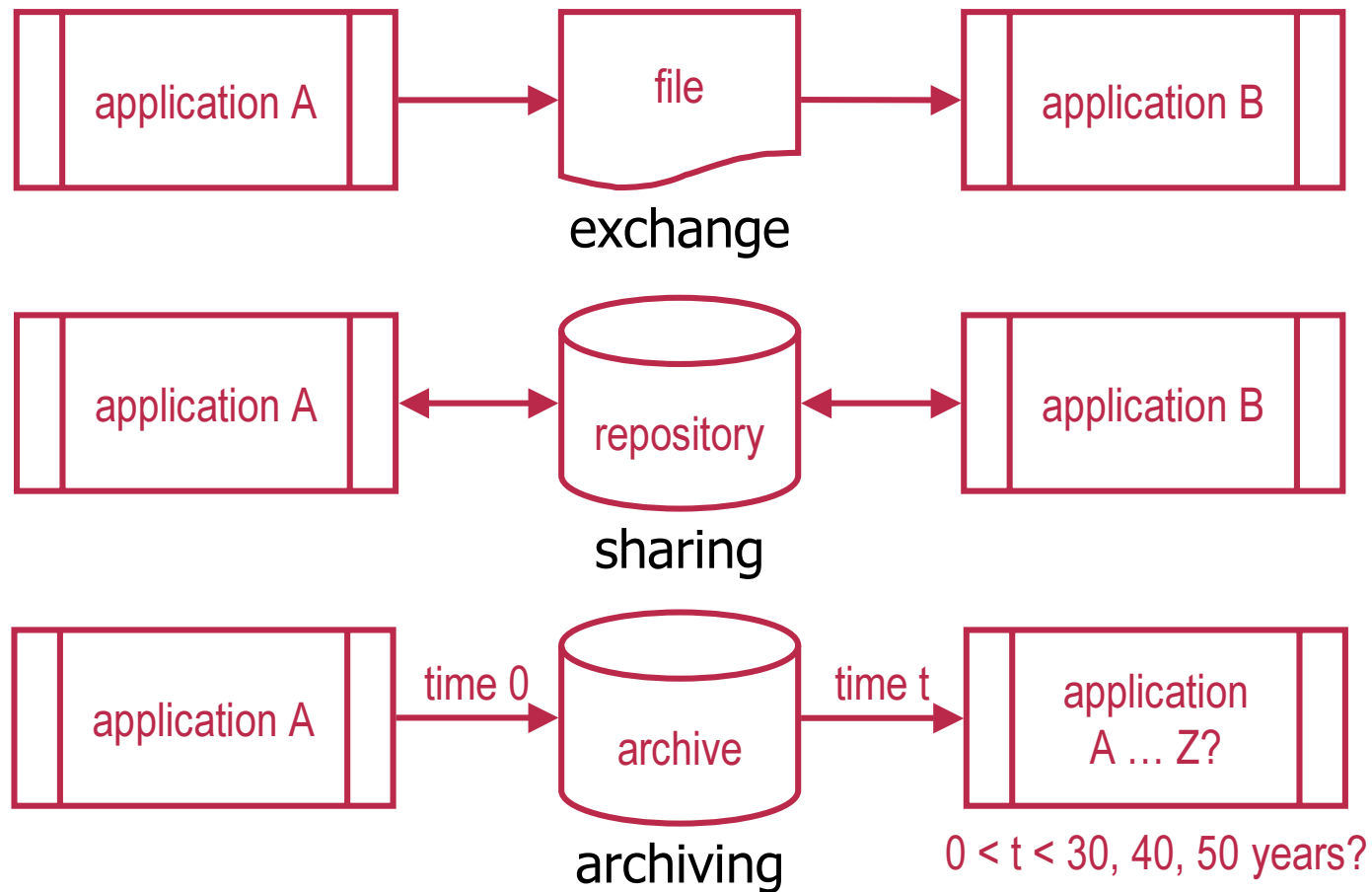
The sub-committee

- ISO/TC184/SC4
 - Industrial data
- began work in 1984
- ... and is still active
- <http://www.tc184-sc4.org/>

The standards

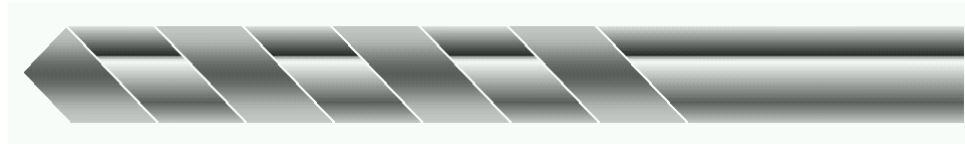
- ISO 10303
 - Product data representation and exchange (STEP)
- ISO 13584
 - Parts library (PLib)
- ISO 15531
 - Industrial manufacturing management data (MANDATE)
- ISO 15926
 - Integration of life-cycle data for process plants including oil and gas production facilities (Oil & Gas)
- ISO 18876
 - Integration of industrial data for exchange, access, and sharing (IIDEAS)

What do product data standards achieve?



Why multiple standards?

- a drill ...



- is a product

- perspective: creation by vendor (design & manufacture)
 - STEP (ISO 10303)

- is a catalogue item

- perspective: selection & purchase by customer
 - PLib (ISO 13584)

- is a resource

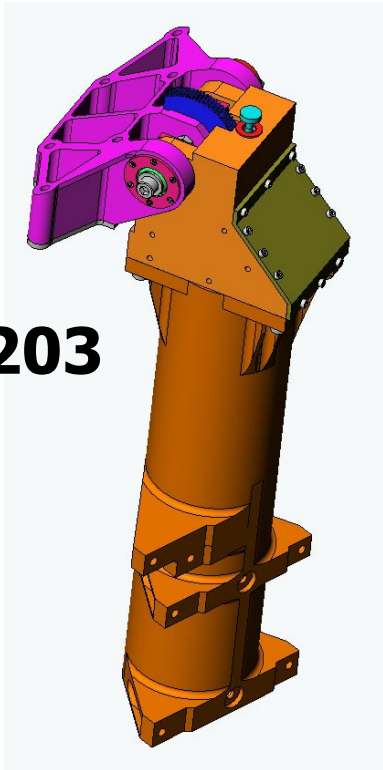
- perspective: utilisation by manufacturing engineer
 - MANDATE (ISO 15531)

Industrial information requirements

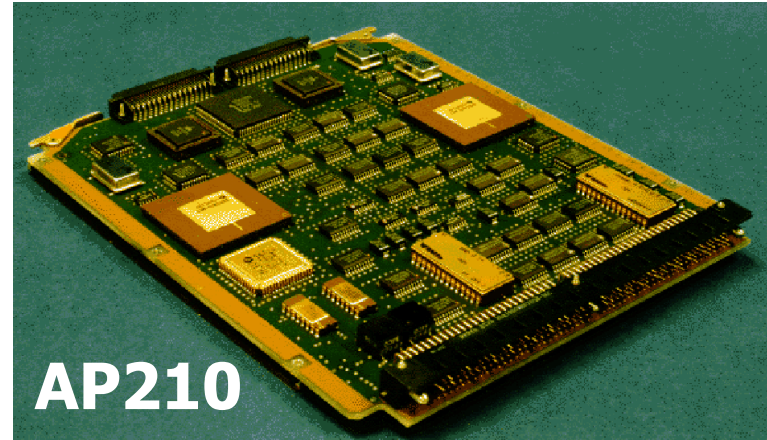
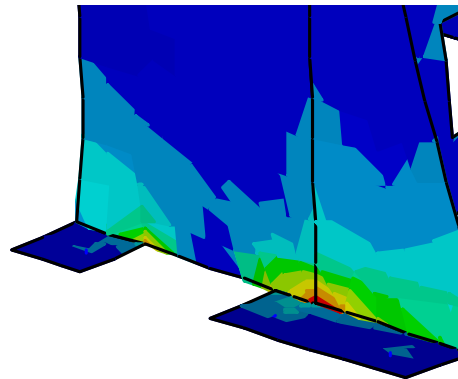
- EXPRESS
 - computer-processable information modelling
- multi-technology implementation architecture
 - XML is not the panacea ...
 - but one part of the solution
- ISO 10303 Application Protocols
 - industrial information requirements
 - maturity
 - design (“AP203” – PowerSTEP)
 - manufacture (“AP224” – Rapid Acquisition of Manufactured Parts)
 - key gaps
 - systems engineering (“AP233”)
 - Product Life Cycle Support (“AP239”)

STEP Application Protocols

AP203

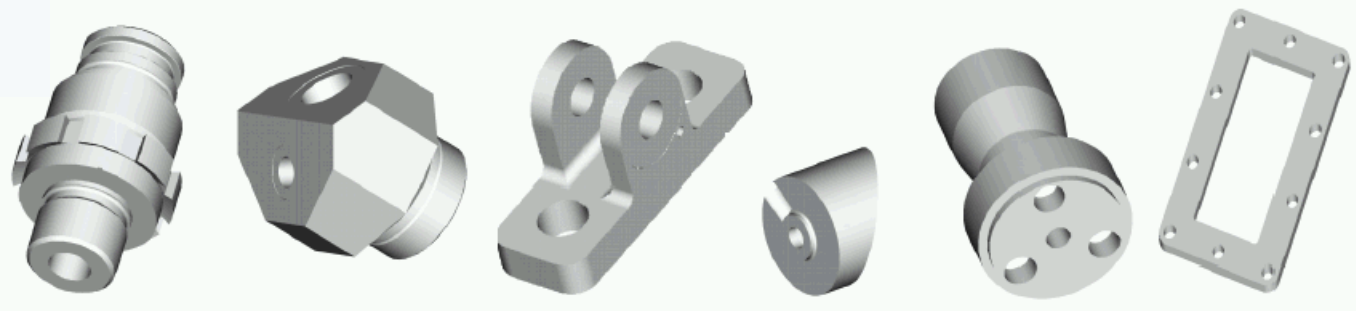


AP209

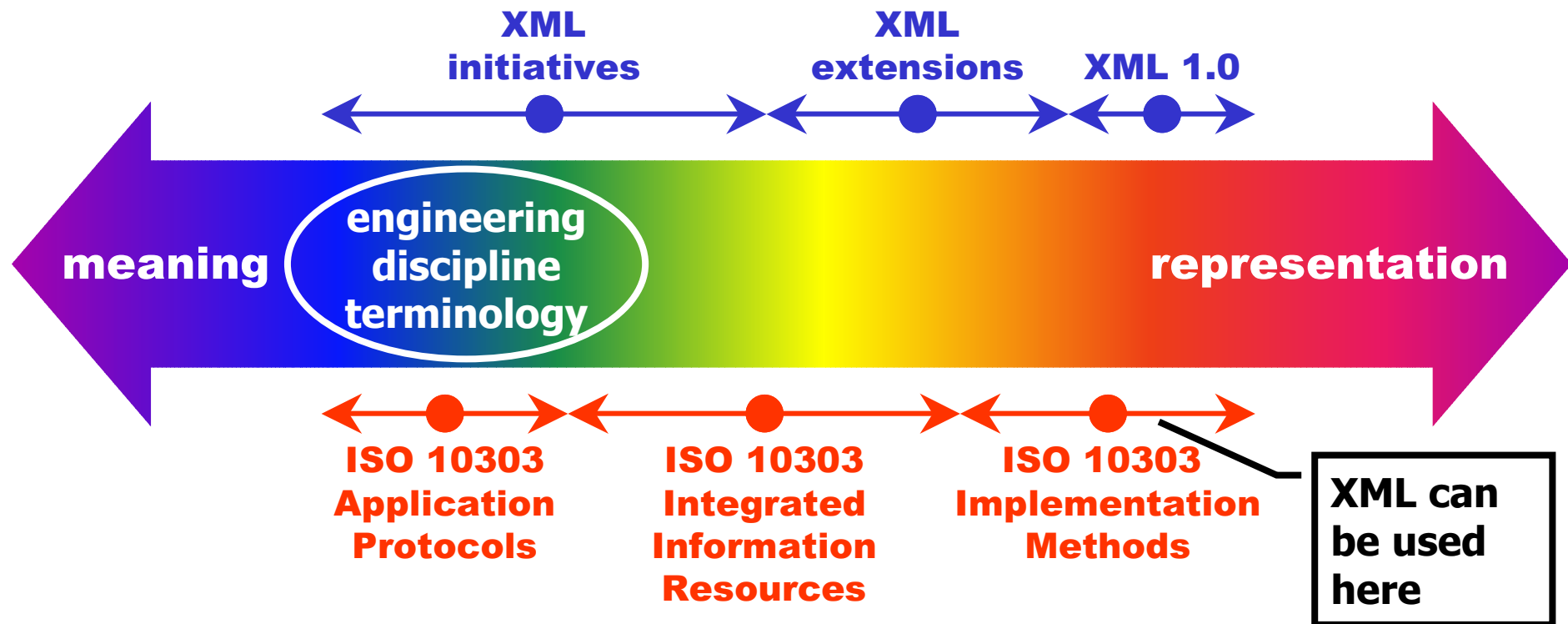


AP210

AP214



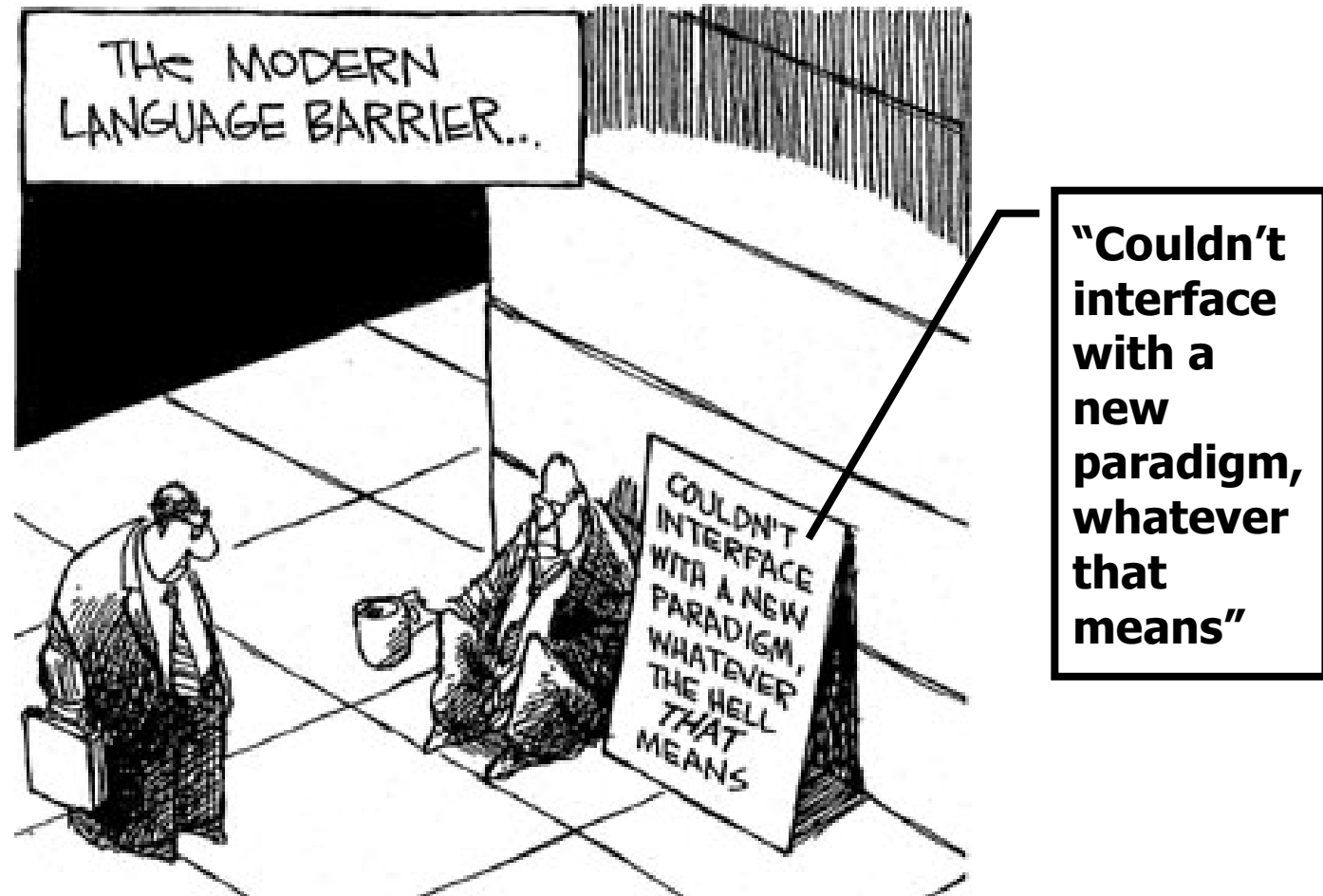
XML – important but not a panacea



The future

- ontology ...

Ontology?



The future

- ontology ...
- traditional information technology
 - what is in the world? = information modelling
 - how do things behave? = programming
- Standard Upper Ontology ... <http://suo.ieee.org/>
 - axioms
 - KIF, DAML+OIL
 - logic-based processing
- multi-level content

ISO 10303 versus "ontology"

	CAD model	photographic image
creation	human-engineered process based on conventions for the purposes of engineering	attempt to capture reality as is
applications	industrial, with relatively stable intended target processes	numerous, with many different characteristics
as computer-sensible knowledge	creation process is typically computer-based; knowledge format can be imposed	requires analysis after the capture event in order to generate knowledge
applicability of ISO 10303	relatively high (e.g. geometry definition or assignment of required surface finishes)	relatively low (e.g. file name for digital storage or title for image)
applicability of ontology	relatively low (e.g. interpretation and harmonisation of models created by different paradigms)	relatively high (e.g. physics of light, camera technology or content-specific knowledge)

Conclusions

- interoperability a multi-layer problem
- strategic direction lies in explicit statement of information requirements, independent of implementation
- CODATA challenges
 - research issues remain, e.g. ontologies
 - researchers have a collaboration requirement
 - research has industrial application