

Information Engineering

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Information and data

- Information processing is every company's second business
- Information is knowledge of ideas, facts, processes
- Information is derived from data items
- We communicate data items in order to transfer information
 - Data storage is a special case of communication



Hardware analogy

- Supply chain for hardware depends on specifications for inputs and outputs
 - To minimise cost
 - Reduce re-work, etc
 - Support quality control and quality assurance
- Direct communication of items between different hardware processing stages is therefore possible
- Nobody makes their own screw threads and special nuts and bolts



Software analogy

- Each software application is an island
 - with its private data structure (syntax)
 - with its private data meaning (semantic)
- Direct communication is impossible between different software processing stages
- Everybody is making their own screw threads and their own nuts and bolts



Information communication

- Requires knowledge of the
 - structure (syntax) for the data items
 - meaning (semantic) for the data items

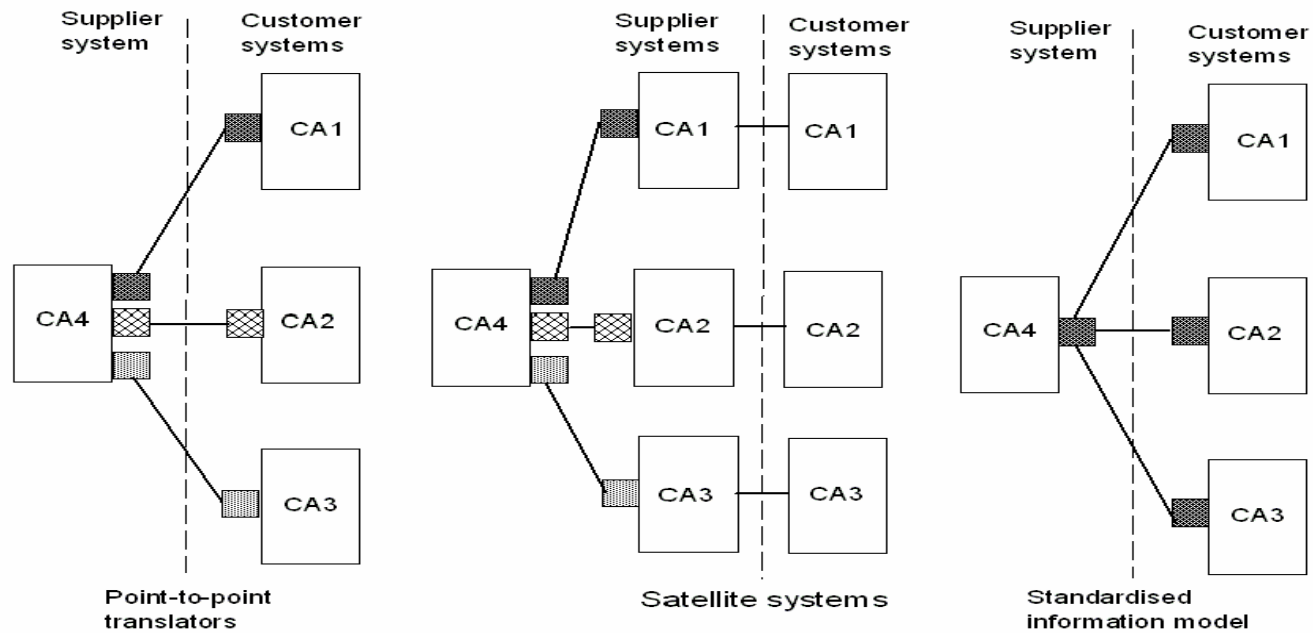
In order to understand the communication
- Syntax is specified by an information model
- Semantics are specified in a data dictionary



SC4 Technologies

- ISO TC184/SC4 provides specifications for the computer representation of product information
 - using information models (syntax and semantics) for the data items with explicit rules for interpretation
 - using dictionaries for specialised domain knowledge
- To support the business needs for:
 - Communication of product information
 - Data quality control and assurance
 - Data process integration
 - Data archival, etc
- Enable a supply chain for information

Systems versus Standards





Application: Engineering properties

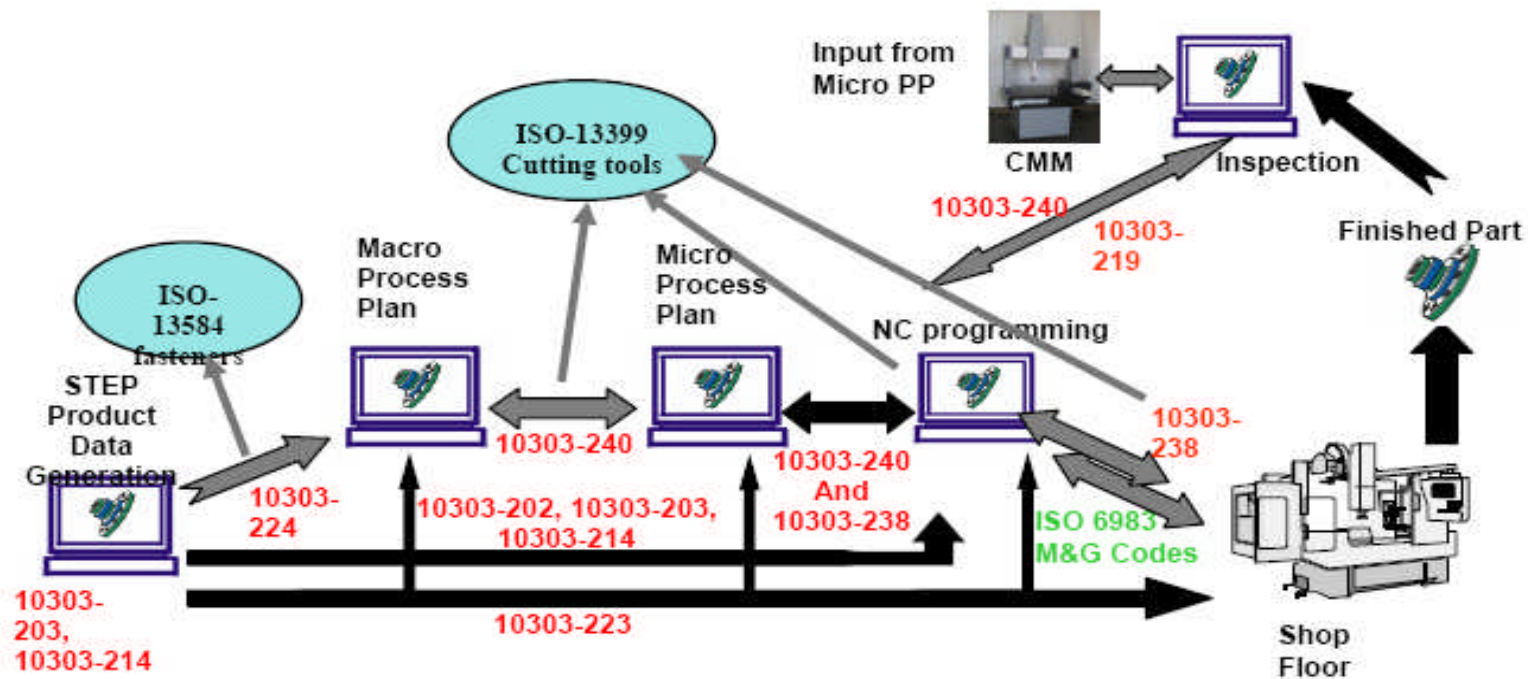
- ISO 10303-235 Engineering properties for product design and verification
- Information model for any product property derived by any method
- Dictionaries will define methods and their properties
- Data verification and traceability is a important feature



Application: dictionaries

- ISO 13584 Parts libraries
- Information model for classifications of products and properties
- A computer-processable dictionary
 - References from information models
 - References between dictionaries
 - Used by ISO 13399 and ISO 10303-235
 - Basis of the eCI@ss system used by Renault for catalogue information

Application: manufacturing



Application: Cutting tools



Image courtesy of AB Sandvik Coromant

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ISO 13399 Cutting tool representation and exchange

- Part 1: Information model to describe the assembly of a modern cutting tool
- Part 2,3,4,5,50,60 are dictionaries to define the components and their properties
- Now being implemented by AB Sandvik Coromant and projects in France



Application: Oil and Gas

- Business need was to communicate product data between multiple contractors for a major construction
- ISO 15926 is a Reference Data Library that defines exactly the terms to describe all the components of a chemical process plant or oil or gas extraction platform



Applications: castings

- ISO 10303-223 Exchange of design and manufacturing information for cast parts
 - Being developed for US Army
- Harmonises data representations with:
 - Part 203 B-spline representation of solids
 - Part 224 Machining features, etc



Further information

- DEPUIS project (part of INNOVA network)
 - <http://www.depuis.enea.it/>
 - E-learning programme for self-instruction on SC4 Technologies
 - application to life-cycle thinking (Integrated Product Policy of the EC)
- Courses and self-tests plus workshops in several member states



Conclusions

- SC4 technologies are the result of 20 years of research and development
- SC4 Technologies are available to:
 - improve data confidence
 - reduce costs
 - support a supply chain for data
 - change to a data-centred paradigm instead of a system dependent regime