

## NCS relationship to ISO "Parts Library" ISO 13 584

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- ◆ Origin
- ◆ Status
- ◆ Goal of the study
- ◆ Findings
- ◆ Challenge for NCS
- ◆ A suggested migration process
- ◆ Conclusion

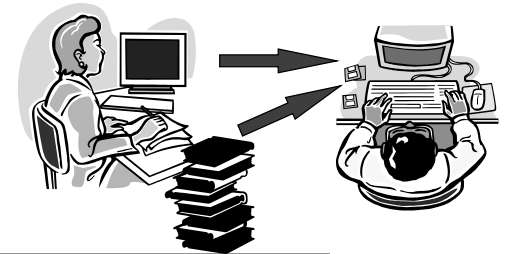
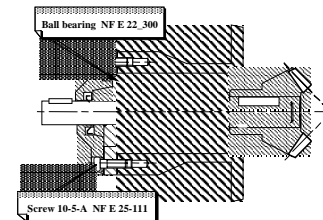
## Characterizing items by class and properties: A precursor: the NCS

- ◆ The need:
  - ▼ define a common understanding about items of supply
  - ▼ reduce supplies of military forces
  - ▼ facilitate logistic data management
- ◆ The NCS solution
  - ▼ hierarchical classification structure for names
  - ▼ characteristic properties (MRC) for characterization
  - ▼ NATO Stock Number for identification

**A 50 years old complete solution for computer-supported logistic !**

## New industry requirements: mid 80's Library for CAD and digital mock-up

- ◆ Most products consists of components:
  - ▼ characterizing product by **computer-sensible** properties (searching)
  - ▼ managing component libraries



**Requirement:  
to switch from documents to data!**

## New industry requirements: 90's Electronic commerce

- ◆ Buying, ordering, inquiring about something need to specify the **what** :

I need a can of hexagonal machine screw:  
total length? 20  
threaded length? 10  
diameter? 5  
coating? teflon



- ◆ Electronic commerce : information shall be **explicit**



### Requirement:

- to define computerized information models for dictionaries and catalogues
- to define and to share computer-sensible product / properties dictionaries

## Definition

### Product / property dictionary:

Set of product and product property concepts with:

- computer-sensible identification
- computer-sensible definition, and
- computer-sensible value representation

## Current status: NATO VS Current IT practice

### NATO

- \* Large experience in developing and maintaining product / property dictionaries
- \* huge content available : > 20 000 properties, 2500 product domains,...

### But

- + NATO specific structure (RDB) ==> specific systems / software *cost* ↑
- + NATO specific value encoding ==> specific codification process *cost* ↑

### Current IT practice

- \* Accepted language for technical information modeling *EXPRESS*
- \* Accepted format for technical data exchange *STEP Physical files*
- \* Accepted model for product / property dictionary and catalogues *Parts Library*

### But

- + no (few) existing dictionaries

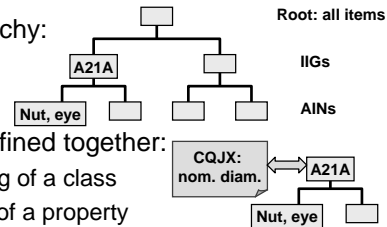
## AC/135 study on NCS relationship to Parts Library

### ◆ Goals:

- ▼ to make profit of IT opportunities
  - ☞ reduce the cost of NATO systems
- ▼ to investigate partial automation of codification through direct use of NCS in the industry
  - ☞ reduce the cost of item codification
- ▼ to investigate process and model simplification
  - ☞ reduce the cost of NATO process

## Findings (1) approach similarities

- Classification of all parts through a hierarchy:



- class hierarchy and the properties are defined together:

- applicable properties precise the meaning of a class
- application domain precise the meaning of a property

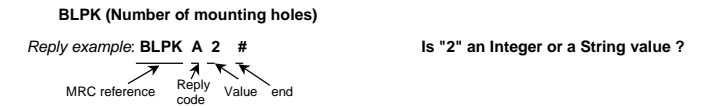
- Similar property description: a number of attributes

- definition, unit, drawings...

- Similar sets of property values (data types): codes + meaning, measure, set of values...

## Findings (2): values are not fully computer sensible

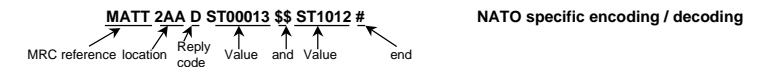
- Example 1: properties with reply code "A" (may be alphabetic or numeric)



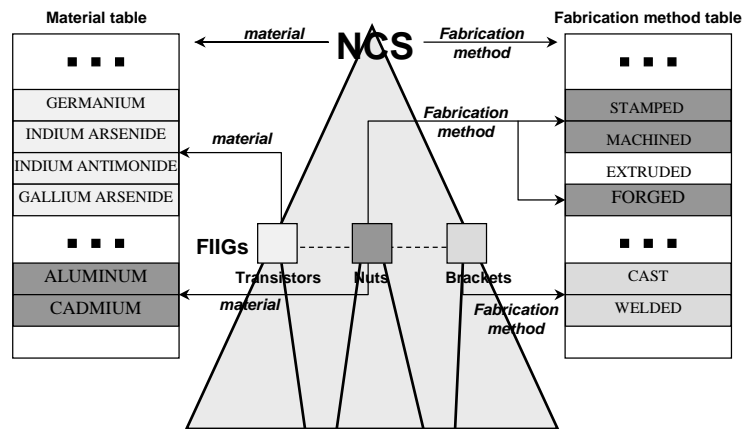
- Example 2: The unit of a measure may be part of the name

CQQR (Thread pitch in millimeters) How could the computer know that "2" is "2 mm"?

- Example 3: multiple or optional replies need specific string encoding



## Findings (3) highly centralized approach



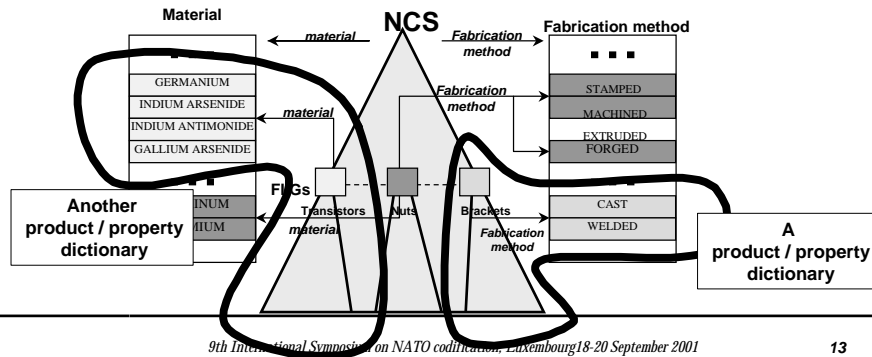
How to extract subsets suitable for one industry ?

## Challenges for the NCS

- To switch from information encoding to formal information modeling while preserving legacy data and knowledge
  - Standard system and software
  - Full data representation of document contents
- To make (subsets of) the NCS available for industry
  - get partial codification for free

## taking up the gauntlet: Study results

- ◆ The complete information content of NCS may be modeled into PLIB
- ◆ PLIB modeling would clearly suggest simplifications
- ◆ For industry use, each IIG may be provided as a stand alone dictionary



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## A suggested migration process

- ◆ Select a target information model for NCS
  - ▼ suggestion: ISO13584 + small extensions
- ◆ Map individually each IIG structure onto the PLIB formal structure
  - ▼ suggestion: use this opportunity to simplify IIGs
- ◆ Promote the use of re-structured IIG within industry
- ◆ Develop import (export) interfaces from NCS-based system from / to restructured NCS
- ◆ Base new developed systems on restructured NCS

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## CONCLUSION

- ◆ The NCS represents the largest consistent body of knowledge about product characterization
- ◆ It is possible to switch from data encoding technology to modern information modeling while preserving legacy data and knowledge
- ◆ Software systems and links with PDM would be simpler
  - ◆ NCS documents would be generated from data
  - ◆ synergy restructuring / simplification
- ◆ Subsets of restructured NCS could be offered to / used by the industry
  - ◆ Use by industry => direct access to data
  - ◆ reduction of codification cost

**A path for preserving NCS advance in the new Millenium**

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