NATO codification system as the foundation for the eOTD, ISO 22745 and ISO 8000
Nations Using the NCS Today

- NATO countries
- Sponsored countries
- Nonparticipating countries
The NATO Codification System (NCS)

- A standard for logistic information exchange covering 16 million items of supply
- A flexible system that can be tailored to national requirements
- An important cornerstone to logistics interoperability
- 15+ million NATO Stock Numbers have been assigned
  - 7 million by the U.S. and 8 million by the other NATO countries
  - 31 million reference numbers have been registered on these NSNs
  - These NSNs contain more than 22 million user registrations
- 1.5 million manufacturers and other organizations are registered

<table>
<thead>
<tr>
<th>Language</th>
<th>Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polish</td>
<td>SRUBA, MASZYNOWA</td>
</tr>
<tr>
<td>English</td>
<td>BOLT, MACHINE</td>
</tr>
<tr>
<td>Dutch</td>
<td>BOUT, MACHINE</td>
</tr>
<tr>
<td>Spanish</td>
<td>PERNO, TORNEADO</td>
</tr>
<tr>
<td>Italian</td>
<td>BULLONE PER METALLO</td>
</tr>
<tr>
<td>German</td>
<td>SCHRAUBE MIT KOPF</td>
</tr>
<tr>
<td>Czech</td>
<td>SVORNÍK, STROJNÍ</td>
</tr>
</tbody>
</table>
What is impossible to do right now, but, if you could do it, would fundamentally change your business?

1990 Joel Arthur Barker

• Cataloging at source (vendor supplied data)!
  – Common metadata (eOTD)
    • an end to data mapping
  – Requirement specifications (ISO 22745-30 eOTD-i-xml)
    • an end to incomplete data
  – Data provenance (ISO 8000-120)
    • an end to inaccurate information

Faster – Better – Cheaper
Automating the data supply chain

Codification at Source

NCB (buyer)

eOTD-i-xml
(data requirements statement) ISO 22745-30

Sub-Tier eOTD-q-xml

Supplier

eOTD-q-xml
(query) ISO 22745-35

Sub

Sub-Tier eOTD-r-xml

eOTD-r-xml
(data exchange) ISO 22745-40

“Data Quality in Practice”
NATO Codification System Architecture

NSN Master Data

is coded using concepts in

conforms to the constraints in

FIIG Identification Guide

constrains the use of

H6+MRD Dictionary

ACodP-1 Identification Scheme

"Data Quality in Practice"
eOTD Architecture

Master Data (eOTD-r-xml) is coded using concepts in the Identification Guide (eOTD-i-xml).

The Identification Guide (eOTD-i-xml) conforms to the constraints in the Identification Scheme (0161-1#nn-nnnn#1).

Dictionary (eOTD-xml) constrains the use of the Identification Scheme.
ISO 22745 Architecture

Master Data
ISO 22745-40

is coded using concepts in

Identification Guide
ISO 22745-30

conforms to the constraints in

Identification Scheme
ISO 22745-13

constrains the use of

Dictionary
ISO 22745-10

“Data Quality in Practice”
✓ Common Concept Encoding

“metadata”

- Across the supply chains
- In design and engineering applications
  CAD-CAM-CAE
- In ERP applications
  vendor-customer-material-service masters
- In production applications
  PDM
- In product life cycle management
- In asset management applications
- In human resources applications
Machine Bolt; Product Number: 3225020037; Nominal thread diameter: 1.0 inches; Width across flats: 1.450 inches; Width across corners: 1.653 inches; Head height: 0.591 inches; Count per pack: 10; Pack price: $0.80 (M-Bolt;NTD1.0”;WAF1.45”;CPP10)
Buyer contract clause

The contractor, sub-contractor or supplier shall supply technical data in electronic format on any of the items covered in this contract as follows:

a. The data shall comply with applicable ISO 22745-30 compliant Identification Guides.

b. The data shall be encoded using concept identifiers from the ECCMA* Open Technical Dictionary (eOTD), an ISO 22745 compliant open technical dictionary.

c. The data shall be provided in eOTD-r-xml, an ISO 22745-40 compliant Extensible Markup Language (xml) format published by ECCMA*.

d. The data shall be certified as ISO 8000-110 compliant.

* The Electronic Commerce Code Management Association (ECCMA) (www.eccma.org) is the Dictionary Maintenance Organization for the eOTD, a compliant open technical dictionary as defined by ISO 22745 and can provide technical assistance in meeting this requirement.
The ECCMA Open Technical Dictionary (eOTD)

Terms

Definitions

Images

Concept Identifier

0161-1#nn-nnnn#1

“Data Quality in Practice”
Terminology mapping

- Public domain concept identifiers
- Free identifier resolution to underlying terminology (web services)
- Hyperlink to source standards
- Multilingual
- Multiple terms, definitions and images linked to single concept identifier

“Data Quality in Practice”
eOTD Dictionary

● Contains
  – Concepts with identifiers
  – Terminology to specify meaning of concepts

● Does not contain
  – Classifications
  – Relationships between concepts*
  – Constraints on property values*
  – Data types*
  – Reply instructions*

*These are all contained in identification guides.
classifications

- FSC/NSC
- UNSPSC
- CPV
- CPC
- eCl@ss

Class
- *machine bolt*
- *self-aligning plain bearing*

Property
- *thread series designator*
- *thread diameter*

Controlled Property Value
- *Monday*
- *iron*

Unit of measure

Qualifiers of measure

Currencies

Identification Guides ISO 22745-30

ISO 13584-501
ISO 13584-511
RDLs
eCl@ss
The steps to quality descriptions

ISO 8000:110
Quality master data

Quality metadata

Quality descriptions

“Data Quality in Practice”
<table>
<thead>
<tr>
<th>Original ERP Short Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTRIC MOTOR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Original Supplier Catalog Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N 1234EF: 400KW 6 POLE 525VOLT FRAME HGF355E: FT MOUNTED RPM 988 SF1,0 CODE G:IP65:INS F:IL/IN 6.6:DUTY SI: NR.88695 11 00:AMB 40DEGREE C:DELTA T 80DEG: COS 0,86:COOLING IC 411:ALT1000M</td>
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</table>

<table>
<thead>
<tr>
<th>Standardized ERP Short Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTOR, ELEC: 400 KW, 525 V, 988 RPM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standardized ERP PO Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTOR, ELECTRIC: POWER RATING 400 KW, ELECTRICAL RATING 525 V, FRAME HGF355E, FOOT MOUNTING, SPEED 988 RPM, INSULATION CLASS F, 6 POLES, SERVICE FACTOR 1.0 CODE G, ENCLOSURE IP65, MNFR P/N: 1234EF MNFR: WEG, FFT: IL/IN 6.6: DUTY SI: NR.88695 11 00:AMB 40 DEGREE C:DELTA T 80DEG: COS 0,86:COOLING IC 411:ALT 1000M</td>
</tr>
</tbody>
</table>
Motivation for ISO 8000:2008

Supplier and Manufacturers recognize that:

● data integration is one of the keys to a long term relationship
● the ability to provide their customers with quality data is a significant differentiating factor.

Suppliers and Manufacturers are:

● publishing the specifications of their products, capabilities and services on their web sites.
● looking to increase their visibility and understand that the best way to do this is to improve the quality of their data.

Suppliers and manufacturers are looking for a Standard that they can use to identify the quality of their data.

“Data Quality in Practice”
ISO 8000-110:2008

Syntax

Each data set shall contain a reference to the syntax to which the data set complies. The reference shall be resolvable to the specification of the syntax through a mechanism that is publicly available.

Semantic encoding

Each data element value shall reference all concepts necessary to unambiguously define its meaning. Each reference shall be to a concept dictionary entry contained in a concept dictionary that supports an interface for resolution of a concept identifier.

Conformance to requirements

Each data set shall contain a reference to the data requirements statement to which the data set complies. The reference shall be a globally unambiguous identifier that was used to encode the data set. The reference shall be resolvable to the data requirements statement. The data requirements statement shall be publicly available.

Syntax and semantic resolution shall be available at no charge unless the data carries a “fee based encoding” warning label.
ISO 8000:2008

Master Data
ISO 22745-40

is coded using concepts in

Identification Guide
ISO 22745-30

conforms to the constraints in

constrains the use of

Identification Scheme
ISO 22745-13

Dictionary
ISO 22745-10

“Data Quality in Practice”
Extra slides
An international non-profit membership association of industry and government master data managers and their application or service providers

**Our Mission**

To increase the quality and lower the cost of descriptions through developing and promoting the implementation of International Standards for Master Data Quality

“Data Quality in Practice”
master data

data held by an organization that describes the entities that are both independent and fundamental for an enterprise, that it needs to reference in order to perform its transactions

Master data describes individuals, organizations, locations, goods, services, rules and regulations.

- Customers
- Suppliers
- Materials
- Services
- Assets
- Locations
- Employees
- MSDS
- ........
Justification for codification

- Manufacturers and suppliers identify items of production by their reference numbers (part number)
- Master data managers identify items of supply by their characteristic data

Reference data
- NCAGE+ Part number
- Drawing number
- Standard reference

Characteristic data
- Fit
- Form
- Function
- Interface

“Data Quality in Practice”
Justification for codification

- **Item reduction studies**
  - Identification of duplicates
  - Save up to 15% of total inventory cost

- **Better sourcing and contracting**
  - Save up to 20%

- **Substitution and interoperability**
  - Part standardization during design and manufacture
    - Increases equipment availability
    - Can be mission critical
Justification for codification

“Boeing currently buys 200 different kinds of safety glasses and 80 different shades of white paper. The defense and commercial aircraft divisions each negotiate for their own aluminum and titanium. Why can't we buy two or three kinds of safety glasses? Why can't we have standard part numbers that go across the enterprise?”

James F. Albaugh, CEO Boeing Integrated Defense Systems,
Business Week March 13, 2006
“There is and always has been a philosophical gulf between the application of cataloging for military purposes and ... for commercial. ...commercial practices are not precise enough to support cost-effective military inventory management and military cataloging is far too detailed and costly for commercial purposes ...ECCMA offers a way to bridge the gulf” Mr. Alan Williams, Asst Dept Minister, Canadian Dept of National Defence.
The eOTD is a foundation for design collaboration and industry standards.

ISO 22745 and the eOTD are the foundational enablers for the breakthrough our industry needs in the next generation of direct, accurate, and effective collaboration across the supply chain at meaningful and granular levels of data exchange never before imagined.

Alton Sanders
Senior Manager,
IDS Engineering Standards Control Function
PW Knowledge and Reuse Management (KARMA)
Goal and Guiding Principles

All sites will catalogue the same items in the same fashion, including names, descriptions and associated classification links (catalog and associated data).

Guiding Principles

- Adopt an open standard (eOTD)
  - Based on NATO Schema – familiarity and system base
  - Linked to UNSPSC for global spend analysis
- Design a system and process to lower the pain across the sites
  - Level of effort – resources
  - Cost
- Catalog the ‘right’ items
  - Remove duplicates and obsolete (archive)
  - Integrate eProcurement program to move items to Suppliers catalogs
ACW Common Coding

- **52368965412** – Tyre Bridgestone 435/95 R25
- **56329845** – Tyre BS 435/R25 Standard Purpose E3 2 Star Radial
- **125435** – Bridge Stone 25inch 435/95
- **965123465** – Tyre Bridgestone Part Number 12345

One Common Anglo Number

**Standardised Long Description:**

**Standardised Short Description:**
- Tire Pneumatic: Loader 25’ 445mm 0.95 2*
<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Original Data</th>
<th>Description</th>
<th>Price(USD)</th>
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<td>SEAL, O-RING</td>
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</tr>
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<th>Manufacturer</th>
<th>Master Part No.</th>
<th>Description</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>WARMAN INTERNATIONAL LTD</td>
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<td>1.311IN; 0.11IN; RBR</td>
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<td>JAMES WALKER</td>
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<tr>
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<td>115763VIT</td>
<td></td>
</tr>
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<td>LIGHTNING MIXERS PTY LTD</td>
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<td>SEW EURODRIVE</td>
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<td>45.8 - 0410B</td>
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<tr>
<td>FRANKLIN ELECTRIC</td>
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<tr>
<td>MOYNO CO</td>
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Catalog Compose: Cleansing Productivity Tool
# Stock Code Catalogue Data Sheet

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<th>Stock Code</th>
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<tbody>
<tr>
<td>Corporate Stock Code</td>
<td>PIGO-028721</td>
</tr>
<tr>
<td>Unit of Issue</td>
<td>EA</td>
</tr>
<tr>
<td>Object</td>
<td>VALVE</td>
</tr>
<tr>
<td>Qualifier</td>
<td>BALL</td>
</tr>
<tr>
<td>Status</td>
<td>NOT DONE</td>
</tr>
</tbody>
</table>

## Short Description
VALVE, BALL: 32MM, PUSH ON, PVC BODY, BALL & SEAT EPDM, EPDM, HANDLEVER OPERATED

## Purchase Description
VALVE, BALL: SIZE 32MM, CONNECTION PUSH ON, PVC BODY MATERIAL, TRIM BALL & SEAT EPDM, SOFTGOODS EPDM, HANDLEVER OPERATED

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODY MATERIAL</td>
<td>PVC</td>
</tr>
<tr>
<td>CONNECTION</td>
<td>PUSH ON</td>
</tr>
<tr>
<td>DESIGN RATING</td>
<td>****</td>
</tr>
<tr>
<td>OPERATED</td>
<td>HANDLEVER</td>
</tr>
<tr>
<td>SIZE</td>
<td>32MM</td>
</tr>
<tr>
<td>SOFTGOODS</td>
<td>EPDM</td>
</tr>
<tr>
<td>SPECIFICATION</td>
<td>****</td>
</tr>
<tr>
<td>STYLE</td>
<td>****</td>
</tr>
<tr>
<td>TEMPERATURE RATING</td>
<td>****</td>
</tr>
<tr>
<td>TRIM</td>
<td>BALL &amp; SEAT EPDM</td>
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</tbody>
</table>
Generate new descriptions
**Description changed**

### ERP Description Generator

<table>
<thead>
<tr>
<th>Material Number</th>
<th>Originating</th>
<th>CURRENT SAP Short Description</th>
<th>NEW SAP Short Description</th>
<th>SFD Len</th>
<th>Unsafe</th>
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<tbody>
<tr>
<td>00028640</td>
<td>12001</td>
<td>VK25</td>
<td>BEARING BALL THRUST, SINGLE, 20 MM/30 MM</td>
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<td></td>
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<tr>
<td>000286445</td>
<td>12001</td>
<td>HV125000HP, 08254</td>
<td>BEARING BALL SINGLE, 30 MM, 100 MM/27 MM</td>
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<td>00028656</td>
<td>12001</td>
<td>BEARING BALL DEEP GROOVE, SINGLE, 15 MM</td>
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<td>BEARING BALL RN 0101 With KOYO SINGLE,</td>
<td>N</td>
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</table>

### Step 4 - Gen Descr Config

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FPT</td>
<td>APPLICATION: TAKE UP Mill Feeder</td>
</tr>
<tr>
<td>MEMO</td>
<td>DUTY UCT310</td>
</tr>
<tr>
<td>OLD VALUE</td>
<td>PART NUMBER: ****</td>
</tr>
<tr>
<td>ORIGNAL</td>
<td>BEARING: TAKE UP BEARING Nach Heavy Duty UCT 310</td>
</tr>
<tr>
<td>PURCHASE</td>
<td>BEARING BALL SINGLE ROW, INSIDE DIAMETER 35 MM, OUTSIDE DIAMETER 110 MM, WIDTH 27 MM, IN 13501, APPLICATION: TAKE</td>
</tr>
<tr>
<td>SAPSTD</td>
<td>BEARING BALL</td>
</tr>
</tbody>
</table>

Record: 23 to 2011
Universal Standard Catalog Translation Model

Shell MESC
- Noun
- Modifier
- Code
- Class

Intermat SMD
- NAG
- Noun
- Noun Synonyms
- Modifier
- Characteristics

Trade Ranger
- Category
- Group
- Noun/Modifier
- Attribute 1 … 25

UN/SpSc
- Segment
- Family
- Class
- Commodity
- Item Descr.

NATO (NSN/FIIG)
- Group
- Class
- NCB
- IIG
- Item Name

eCl@ss
- Class
- Attribute Value

USC™
- Discipline
- Group
- Object
- Qualifier/Action

Attributes
- Internal Mat No
- Manufacturer/Brand
- Manufacturer Pt No
- Supplier(s)
- Supplier Part No(s)

Conversion
- Languages
- SMD changes
- Industry changes
- Company changes

RUS
- Classification
- Attributes Native
- Template Attributes
- Customer Attributes

Others
- EAN
- UDCI
- ISBN
A last word of caution

Data quality and Intellectual Property (IP)

All identifiers are copyright. They belong to the organization that issued them and their use is subject to the terms and conditions imposed by the issuer.

- Unless identifiers have been declared available for public use without a licence, they should never be used to retrieve data that was not supplied by the owner of the identifier unless you have specific permission to do so.

- In order to protect your data from claims of “joint work” you should not use proprietary identifiers as metadata.

The NCS and the eOTD concept identifiers are in the public domain.
Mr. Peter Benson is the Executive Director and Chief Technical Officer of the Electronic Commerce Code Management Association (ECCMA).

Peter is an expert in distributed information systems, content encoding and master data management. He designed one of the very first commercial electronic mail software applications, WordStar Messenger and was granted a landmark British patent in 1992 covering the use of electronic mail systems to maintain distributed databases.

Peter designed and oversaw the development of a number of strategic distributed database management systems used extensively in the UK and US by the Public Relations and Media Industries. From 1994 to 1998, Peter served as the elected chairman of ANSI ASCX 12E, the US Standards Committee responsible for the development and maintenance of EDI standard for product data.

Peter is known for the design, development and global promotion of the UNSPSC as an internationally recognized commodity classification and for the design of the eOTD, an internationally recognized open technical dictionary based on the NATO codification system.

Peter is the project leader for ISO 8000 the new international standard for data quality and for ISO 22745 the new standard for open technical dictionaries, he is also the ISO TC184/SC4 Quality Committee convener. He is an expert on the creation and maintenance of unambiguous language independent master data and the generation of high quality descriptions that are the heart of today’s ERP applications and the next generation of high speed and high relevance internet searches.

Peter is an internationally recognized proponent of open standards and public domain metadata critical to ensuring data portability and data preservation. Peter has been instrumental in focusing international attention not only on data quality issues but also on the serious intellectual property issues caused by proprietary metadata that can lead to an organization’s loss of rights in its own data.