

DEFENSE LOGISTICS AGENCY

AMERICA'S COMBAT LOGISTICS SUPPORT AGENCY



The NATO Codification System: Improving Data Quality through ISO Standards 22745 and 8000

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Overview

- The Defense Logistics Information Service (DLIS)
- The NATO Codification System (NCS)
- Basics of ISO standards 22745 and 8000
- Implementation of ISO standards 22745 and 8000
- Summary
- Useful international Web sites



The Defense Logistics Information Service





DLIS

- *Mission: To provide interoperable, integrated, quality logistics data, and enterprise IT solutions for joint warfighters, the Military Services, the Defense Department, other Federal agencies and international partners in order to optimize the effectiveness and efficiency of the DOD Supply Chain.*



Our Customers

Combatant Commanders...



The Military Services...



Other Government Agencies



NATO



International



Contractors



The NATO Codification System





Why the NCS Was Created

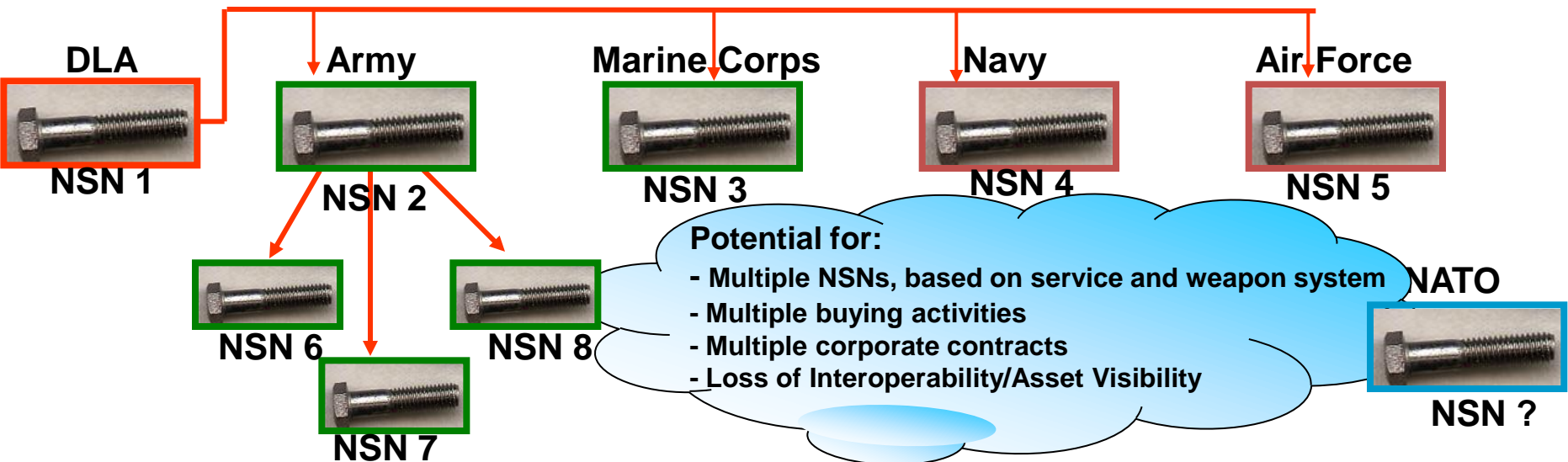


DLA NSN 1



Each military service uses their own logistics "language"

In The Days of WWII





NCS History

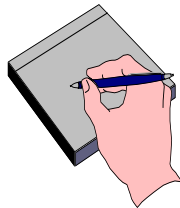


NATO

US/UK/CA
CLASSIFICATION

WWII

1945



1949

PL152

SUPPLY CLASSIFICATION

1952

PL436

CODIFICATION SYSTEM

1954

STANAG 3150

1956

STANAG 3151

1966

DLSC

1974

NCB CODE

1978



1991

PFP

1994

PACS

BASELOG

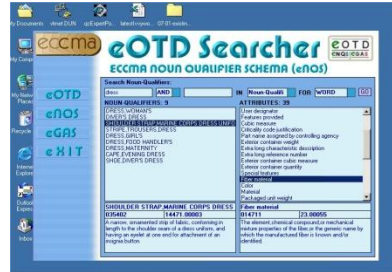
1999

eOTD / ISO

2002

e-Commerce

2009





What Is The Purpose Of NATO Codification?

- To establish a common supply language throughout all logistic operations
- To enable interoperability
- To optimize resource management by minimizing duplication in inventories

Cataloging = Codification



What Is Codified?

- Generally, military items which are repetitively used, stocked, stored, issued, ordered and procured
- National rules vary in establishing the exact criteria and range of coverage of items
- Some nations limit national codification to defense equipment items, other include selected civil items

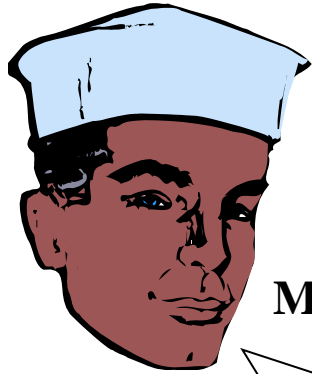


Language Independence

- **NATO codification facilitates communication by overcoming the language barrier:**
 - All participants use the same ‘language of supply’
 - All aspects of the item identification and description can be stored and exchanged in an encoded format
- **NATO codification provides a common language for national and NATO Logistics**



How Many Languages Are Spoken Here?



Malay

Help, I need NSN
4920-00-987-8835

Saya ada NSN di
dalam simpanan.
(I have the NSN in my
inventory)

English



Nie mam w zasobach
tego NSN-a (I do not
have this NSN in stock)

Polish



Bulgarian

Az ochakvam тази nomenclatura skozo
(I don't have your NSN but can order it)



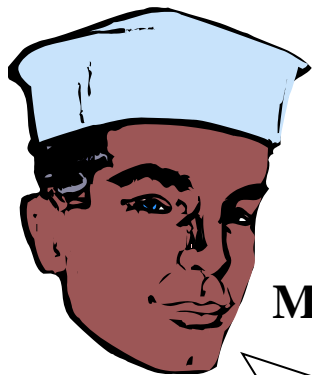
Estonian

Peaks saabuma varsti
(I expect this item soon)



How Many Languages Are Spoken Here?

Answer - 6



Malay

Help, I need NSN
4920-00-987-8835

Saya ada NSN di
dalam simpanan.
(I have the NSN in my
inventory)



Bulgarian

Az ochakvam тази нomenclatura skožo
(I don't have your NSN but can order it)

English



Nie mam w zasobach
tego NSN-a (I do not
have this NSN in stock)

Polish



Estonian



Peaks saabuma varsti
(I expect this item soon)



NSN Item Description: SCREW, MACHINE

An externally threaded fastener whose threaded portion is of one nominal diameter, No 0 (0.060 in./1.5 mm) or larger, designed to be held or driven with either a wrench or an inserted driver or both (excluding internal socket or internal multiple spline types), in sizes below No. 10 (0.190 in./5 mm). No. 10 and larger sizes must have a head designed for any type inserted driver (excluding internal socket or internal multiple spline types), but may also be designed for external wrenching. A locking feature may be incorporated in the design of the head or threads. Excludes BOLT, CLEVIS; BOLT, EXTERNALLY RELIEVED BODY; SCREW, EXTERNALLY RELIEVED BODY; and SCREW, ASSEMBLED WASHER. See also, SCREW, INSTRUMENT; BOLT, MACHINE; BOLT, INTERNAL WRENCHING; and SCREW, CAP SOCKET HEAD.



Information:

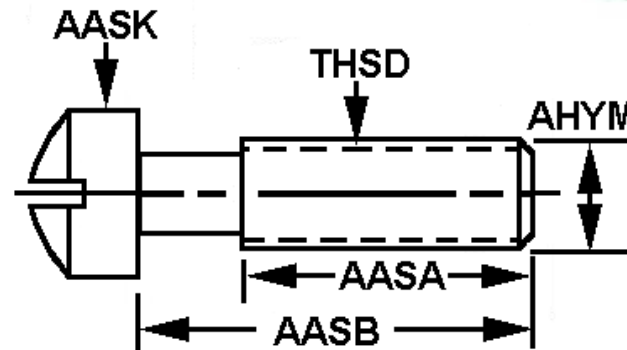
AASK: Head Style

THSD: Thread Series Designator

AHYM: Nominal Thread Diameter

AASA: Thread Length

AASB: Fastener Length



MACHINE, SCREW



What Is A NATO Stock Number?

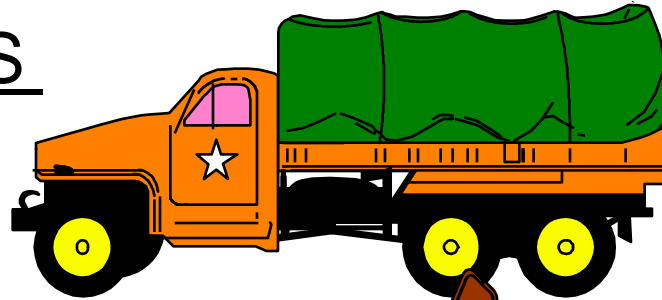
- NATO Stock Numbers represent item of supply concepts rather than an item of production
- An item of supply concept represents a cluster of characteristics related to form, fit, and function
- Many items of production may fit a single item of supply concept





NATO Stock Number (NSN)

MANUFACTURERS IDENTIFICATION SYSTEM



USERS CODIFICATION SYSTEM

DUNLOP
11-00-20SPTGM

GOODYEAR TIRE CO
11-00-20SRLER

GOODYEAR FRANCE
11-00-20UNISRL

CUP SNC
1100R20GSRT4-16PR

NAVY
ARMY
AIR FORCE
OTHER
COUNTRIES

2610-14-322-4604

Single Stock Number



Data Associated with NSNs



The NSN – more than identification

Managing items over the life cycle

- *Data Sharing*
- *Connectivity*
- *Standards*

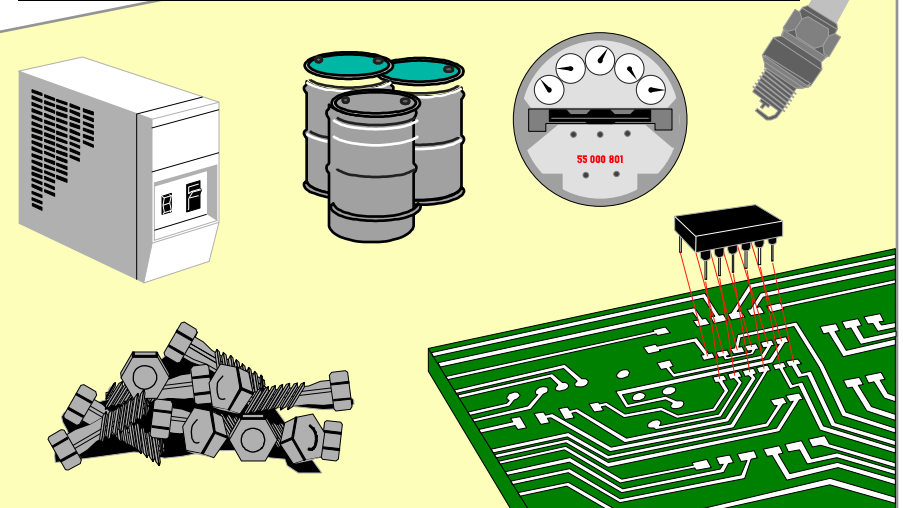
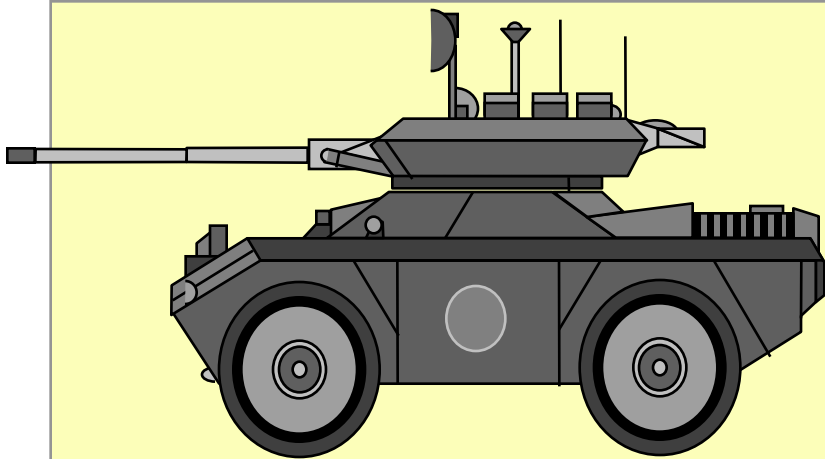
Sum of all its parts



The Costs of A Weapon System

Weapon system

Fuel, Spare parts, Work...



Acquisition Costs

Operations Costs

1/3

2/3

Political decision
=
specific budget

Operating budget
of the armed forces

Life Cycle Cost



Multinational Systems Development

	ALN		DASA
	AS		FLABEL
	BAE		TAI
	CASA		OPEN



Source: Airbus Military



Benefits of the NCS

Operational Benefits

- Having a standard language of supply promotes inventory reduction and prevents item duplication
- Standardization of material leads to faster procurement and increased readiness

International Benefits

- Interoperability among the 60 nations that officially use the NCS
- The NCS can be used in many languages because it is based on numeric codes that link to 19 different languages



Benefits of the NCS

Economic Benefits

- Inventory rationalization means fewer items need to be procured
- On new systems, 25-50% of spare parts already have NSNs assigned
- Consolidation of orders leads to lower prices
- Multiple part numbers on NSNs promotes competition among suppliers

Commercial Benefits

- The NCS allows countries to make the products of its companies visible throughout the NCS user community
- AC/135 is working with industry to develop a common language of supply through ISO standards 22745 and 8000

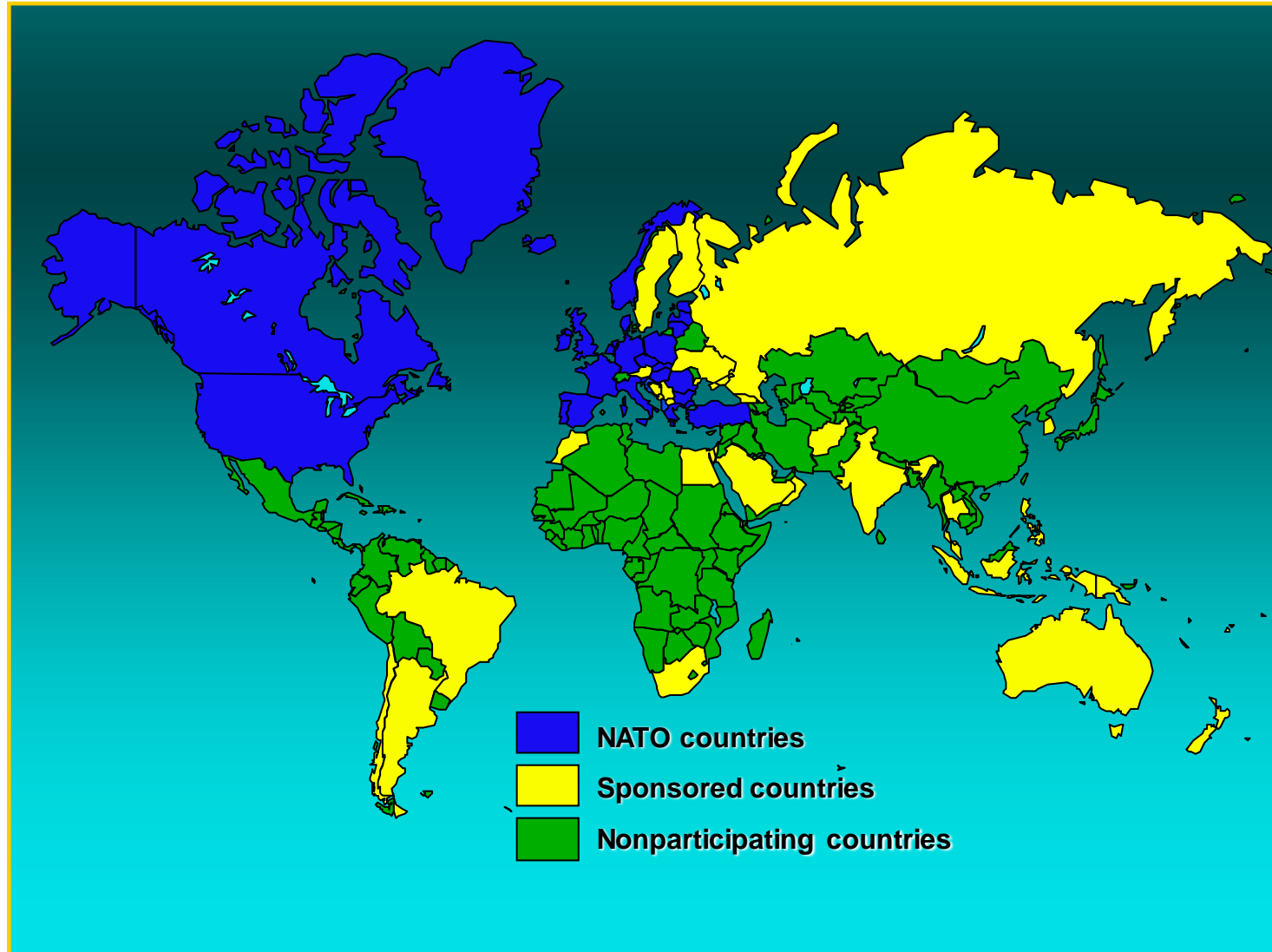


NSN Statistics

- **About 17 million NATO Stock Numbers have been assigned**
 - 34 million reference numbers have been registered on these NSNs
 - 2 million manufacturers and other organizations are registered
 - 10 million NSNs with characteristics data display
- **These NSNs contain more than 26 million user registrations**



NATO Codification System Map





Basics of ISO Standards 22745 and 8000





Aims and Objectives

- DLIS and AC/135 undertook the partnership with ISO and other standards organizations for the following reasons:
 - To automate the codification process
 - To improve the quality and availability of data
 - To help align the NCS with international standards
 - To increase cooperation with industry



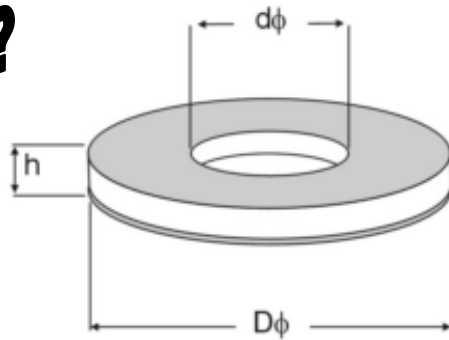
International
Organization for
Standardization



Industry's Interest

- Develop a common language for naming and describing products and services for industry

Washer?
Spacer?
Shim?



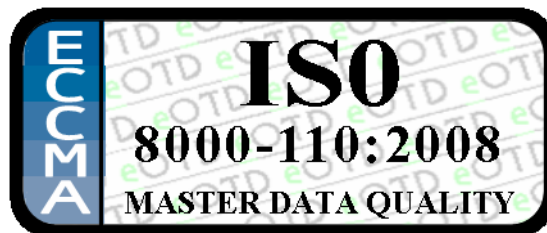
Diameter?
Height?
Material?

Adopt Government's Best Practices



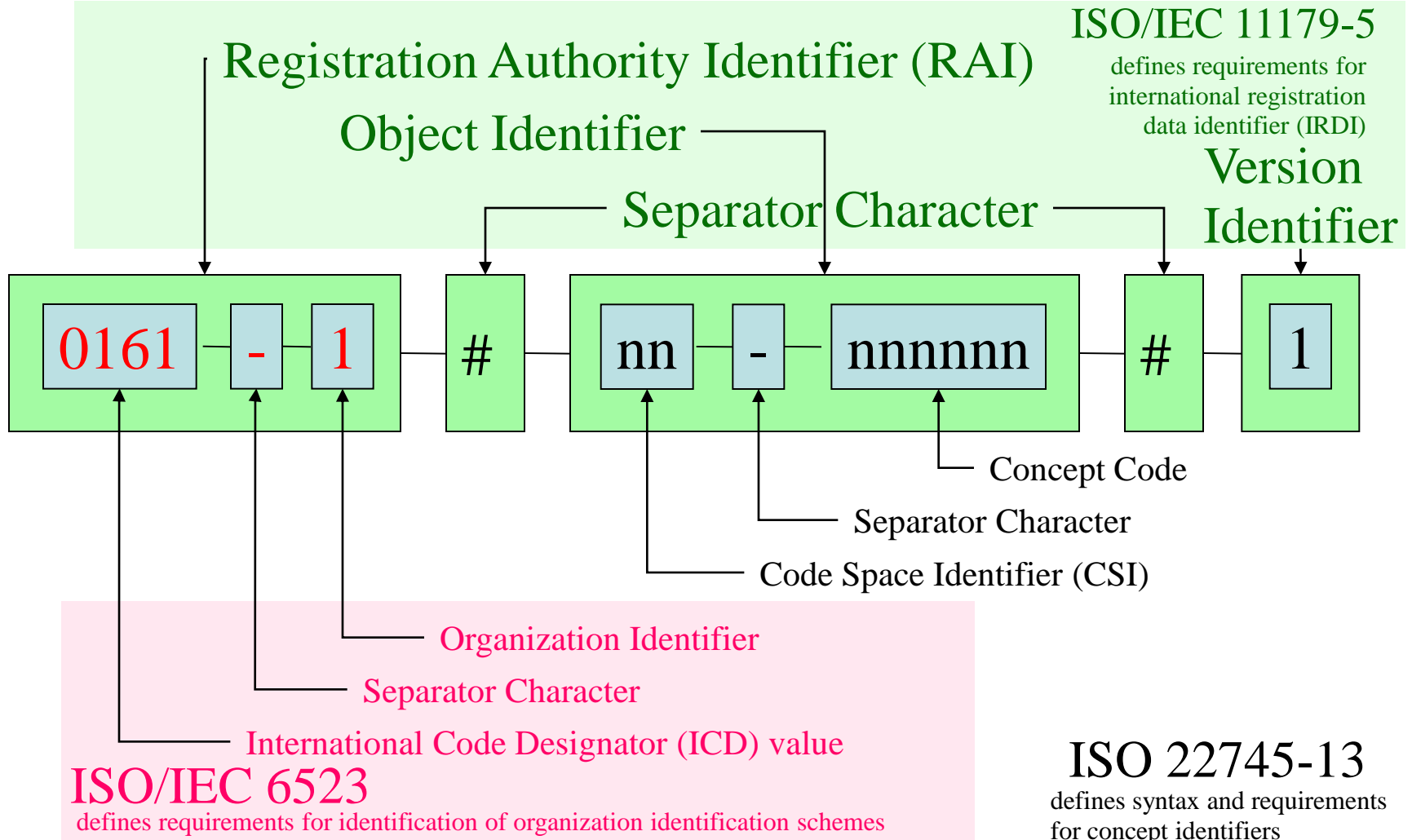
International Standards

- ISO 22745 is a standard for master data based on the NATO Codification System (NCS) but designed for industry and incorporating a modern data architecture
- ISO 8000 is a standard for measuring and certifying data quality
- ISO 22745 and 8000 are managed by ISO Technical Committee 184/Subcommittee 4 (Industrial Data)





ISO 22745 Concept Identifier



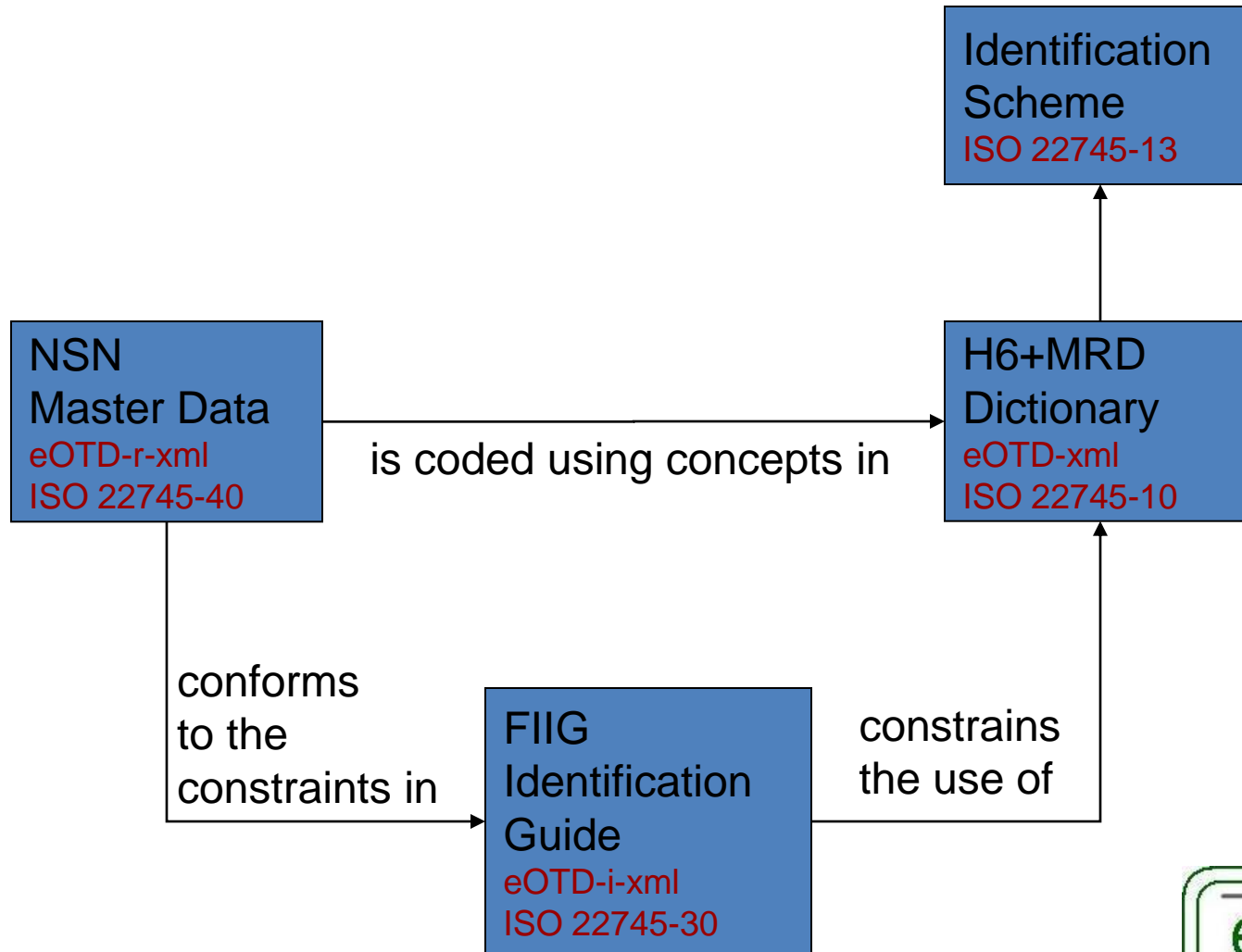


Examples of ISO 22745 Concept Types

- 01 - Class
 - machine bolt
 - self-aligning plain bearing
- 02 - Property
 - thread series designator
 - thread diameter
- 03 - Feature
 - flange
 - inner liner
 - outer ring
 - second hole
- 04 - Representation
 - string
 - decimal measure
 - rational measure
- 05 - Unit of Measure
 - degree
 - radian
 - kilogram
 - newton per square millimeter
 - bolt
- 06 - Qualifier of Measure
 - nominal
 - minimum
 - maximum
- 07 - Controlled Property Value
 - Monday
 - Tuesday
 - iron
- 08 - Currency
 - US Dollar
 - Euro



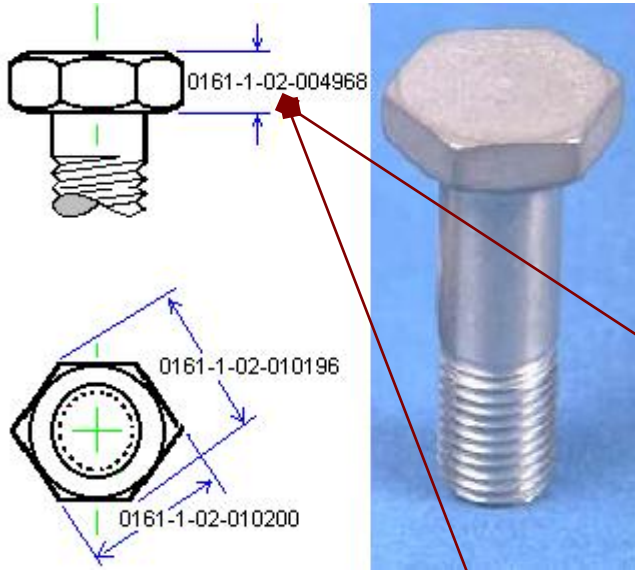
ISO 22745 Architecture



Common Terminology = Common Mapping

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

← Rendered



Property ID	Value	Measure ID
0161-1-02-046898	0161-1-07-014684	
0161-1-02-027375	3225020037	
0161-1-02-023822	1.0	0161-1-05-000798
0161-1-02-010200	1.450	0161-1-05-000798
0161-1-02-010196	1.653	0161-1-05-000798
● 0161-1-02-004968	0.591	0161-1-05-000798
0161-1-02-027376	10	
0161-1-02-027378	0.80	0161-1-08-000168

← eOTD Coded



Property term	Value	Measure term
eOTD CLASS NAME	BOLT:MECHANICAL	
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	US DOLLAR

← Identifiers Resolved

```

<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<!-- catalogue for NIIN: 995430658, INC:00248 generated by ISIS, United Kingdom based on catalogue.xsd v0.3 -->
- <ns5:catalogue xmlns="urn:x-eotd:xml-schema:data-type" xmlns:ns2="urn:x-eotd:xml-schema:identification-guide" xmlns:ns3="urn:
  xmlns:ns4="urn:x-eotd:xml-schema:basic" xmlns:ns5="urn:x-eotd:xml-schema:catalogue" xmlns:ns6="urn:x-eotd:xml-schema:qu
  schema:identifier">
- <ns5:content>
  <!-- FUSE,CARTRIDGE (INC:00248) -->
- <ns5:item class-ref="0161-1#01-017794#1">
  <ns5:reference reference-number="401-013-008" organization-ref="0161-1#OG-0K2598#1" />
  <ns5:reference reference-number="401-013-008" organization-ref="0161-1#OG-0K1020#1" />
  <ns5:reference reference-number="A525-88-1009937" organization-ref="0161-1#OG-0KD264#1" />
  <ns5:reference reference-number="CC-234010-22" organization-ref="0161-1#OG-0T4183#1" />
  <ns5:reference reference-number="265-0821" organization-ref="0161-1#OG-0K2504#1" />
  <ns5:reference reference-number="M7000E-A/KED/2" organization-ref="0161-1#OG-0C3453#1" />
  <ns5:reference reference-number="922415A" organization-ref="0161-1#OG-0K0215#1" />
  <ns5:reference reference-number="S500" organization-ref="0161-1#OG-0K0647#1" />
  <ns5:reference reference-number="S500-3.15A" organization-ref="0161-1#OG-0K0647#1" />
  <ns5:reference reference-number="TDA13-3.15" organization-ref="0161-1#OG-0K0647#1" />
  <ns5:reference reference-number="TDA13-3.15A" organization-ref="0161-1#OG-0K0647#1" />
  <ns5:reference reference-number="25411-01020" organization-ref="0161-1#OG-0K0662#1" />
  <ns5:reference reference-number="40-615-410-31" organization-ref="0161-1#OG-0K0801#1" />
  <ns5:reference reference-number="151-494" organization-ref="0161-1#OG-0K0F76#1" />
  <ns5:reference reference-number="27410-53900-11" organization-ref="0161-1#OG-0K1096#1" />
  <ns5:reference reference-number="24301-002-906" organization-ref="0161-1#OG-0K1357#1" />
  <ns5:reference reference-number="518/4/90416/315" organization-ref="0161-1#OG-0K1423#1" />
  <ns5:reference reference-number="100244-9000-219" organization-ref="0161-1#OG-0K1806#1" />
  <ns5:reference refe
  <ns5:reference refe
  <ns5:reference reference-number="803-94/2" organization-ref="0161-1#OG-0K5070#1" />
  <ns5:reference reference-number="KFL30517" organization-ref="0161-1#OG-0K5422#1" />
  <ns5:reference reference-number="VA-15-0074-019" organization-ref="0161-1#OG-0K6961#1" />
  <ns5:reference reference-number="VA15-0074-019" organization-ref="0161-1#OG-0K6961#1" />
  <ns5:reference reference-number="L635" organization-ref="0161-1#OG-0K7035#1" />
  <ns5:reference reference-number="EN60127-2-SHEET 2-3.15A" organization-ref="0161-1#OG-0K7766#1" />
  <ns5:reference reference-number="L1427B315A" organization-ref="0161-1#OG-0K7999#1" />
  <ns5:reference reference-number="922451" organization-ref="0161-1#OG-0K8236#1" />
  <ns5:reference reference-number="922451" organization-ref="0161-1#OG-0K8997#1" />
  <ns5:reference reference-number="922451/EQ" organization-ref="0161-1#OG-0K8997#1" />
  <ns5:reference reference-number="722-94/1" organization-ref="0161-1#OG-0KA753#1" />
  <ns5:reference reference-number="SR1883/10" organization-ref="0161-1#OG-0KA753#1" />

```

Manufacturers and suppliers reference data


```
<ns5:reference reference-number="40-615-139-19" organization-ref="0161-1#OG-0K5294#1" />
<ns5:reference reference-number="5019120-008" organization-ref="0161-1#OG-0K5331#1" />
<ns5:reference reference-number="99-649-6748" organization-ref="0161-1#OG-0U9199#1" />
<ns5:reference reference-number="99-755-4252" organization-ref="0161-1#OG-0U9199#1" />
<ns5:reference reference-number="99-779-7019" organization-ref="0161-1#OG-0U9199#1" />
<ns5:reference reference-number="TDS5003.15A" organization-ref="0161-1#OG-0K0647#1" />
<ns5:reference reference-number="533-233" organization-ref="0161-1#OG-0K0F76#1" />
<ns5:reference reference-number="45-615-164-15" organization-ref="0161-1#OG-0K0801#1" />
<!-- ASSIGNED NATIONAL STOCK NUMBER (NSN) (ASGND-NSN) -->
<ns5:property-value property-ref="0161-1#02-027504#1">
  <ns3:string-value>5920995430658</ns3:string-value>
</ns5:property-value>
<!-- BODY STYLE (MRC:ABQ, ModeCode:J) JLB -->
- <ns5:property-value property-ref="0161-1#02-024544#1">
  <ns3:controlled-value representation-ref="0161-1#04-000001#1" value-ref="0161-1#07-032011#1" />
</ns5:property-value>
<!-- OVERALL LENGTH (MRC:ABHP, ModeCode:J) JLB19.50$$JLC20.50 -->
- <ns5:property-value property-ref="0161-1#02-007072#1">
  - <ns3:combination>
    - <ns3:measure-number-value representation-ref="0161-1#04-000005#1" uom-ref="0161-1#05-000845#1">
      - <ns3:qualified-value qualifier-ref="0161-1#06-000002#1">
        <ns3:real-value representation-ref="0161-1#04-000002#1">19.50</ns3:real-value>
      </ns3:qualified-value>
    </ns3:measure-number-value>
    - <ns3:measure-number-value representation-ref="0161-1#04-000005#1" uom-ref="0161-1#05-000845#1">
      - <ns3:qualified-value qualifier-ref="0161-1#06-000003#1">
        <ns3:real-value representation-ref="0161-1#04-000003#1">20.50</ns3:real-value>
      </ns3:qualified-value>
    </ns3:measure-number-value>
  </ns3:combination>
</ns5:property-value>
<!-- OVERALL DIAMETER (MRC:ADAV, ModeCode:J) JLB5.00$$JLC5.30 -->
- <ns5:property-value property-ref="0161-1#02-007037#1">
  - <ns3:combination>
    - <ns3:measure-number-value representation-ref="0161-1#04-000005#1" uom-ref="0161-1#05-000845#1">
      - <ns3:qualified-value qualifier-ref="0161-1#06-000002#1">
        <ns3:real-value representation-ref="0161-1#04-000002#1">5.00</ns3:real-value>
      </ns3:qualified-value>
    </ns3:measure-number-value>
    - <ns3:measure-number-value representation-ref="0161-1#04-000005#1" uom-ref="0161-1#05-000845#1">
      - <ns3:qualified-value qualifier-ref="0161-1#06-000003#1">
```

Descriptive data including the NSN as a property/value pair



Value for Industry

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:
Tire: Pneumatic, Vehicular: Service Type for
Which Designed: Loader Tire Rim Nominal
Diameter: 25' Tire Width: 445mm Aspect Ratio:
0.95 Tire Ply Arrangement: Radial Ply
Rating: 2* Tire & Rim Association Number: E3
Tread Material: Standard Tire Air Retention
Method: Tubeless Tire Load Index and Speed
Symbol: NA Tread Pattern: VHB TKPH
Rating: 80

Standardised Short Description:
Tire Pneumatic: Loader 25' 445mm 0.95 2*



"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

Phantom

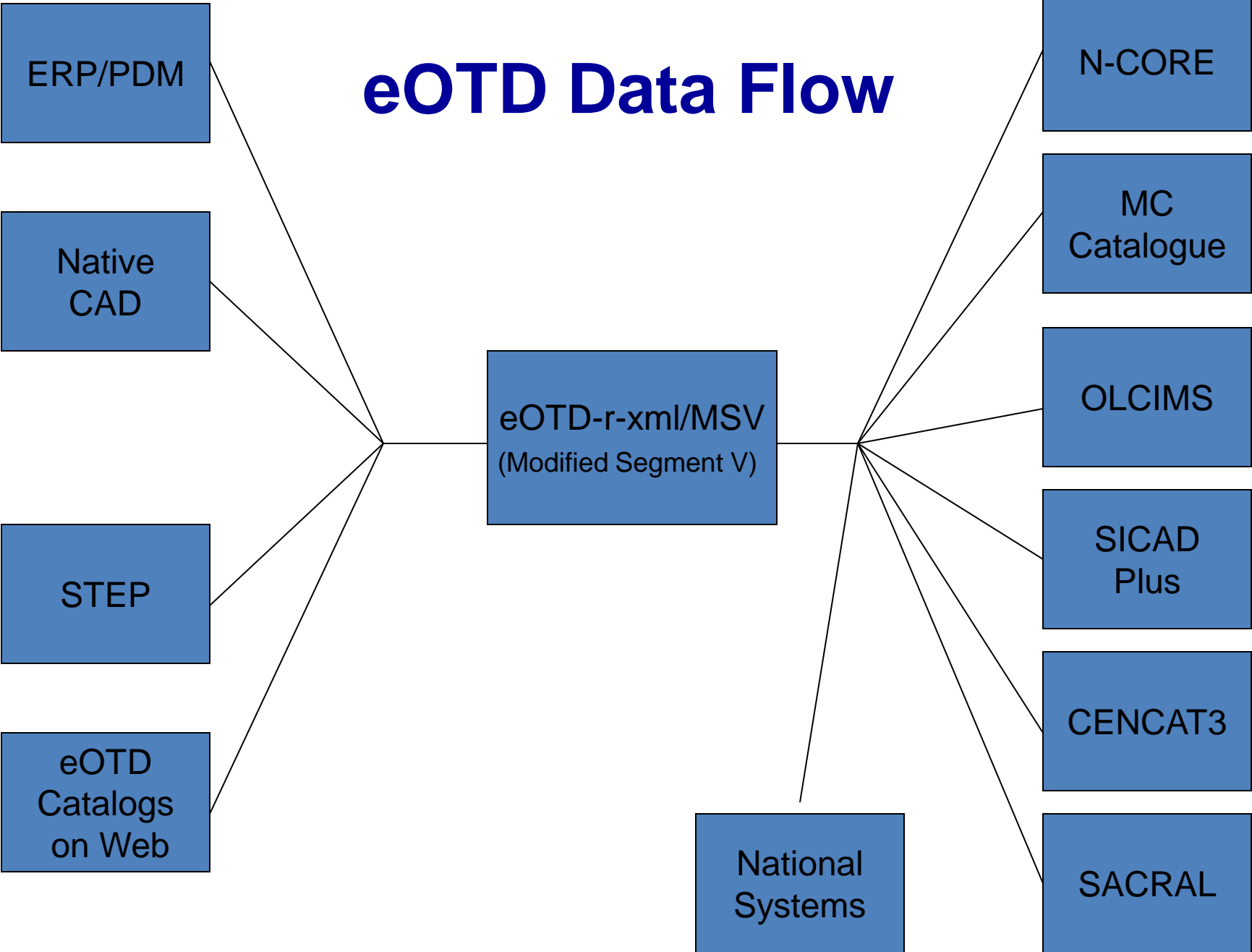
The eOTD is a foundation for design collaboration and industry standards.

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)



eOTD Data Flow



Transformation Through Automation

Before

- lack of clarity on data requirements
- disparate data format
- disparate data content
- disparate metadata
- potentially subjective human judgment
- operate as an additional process

After

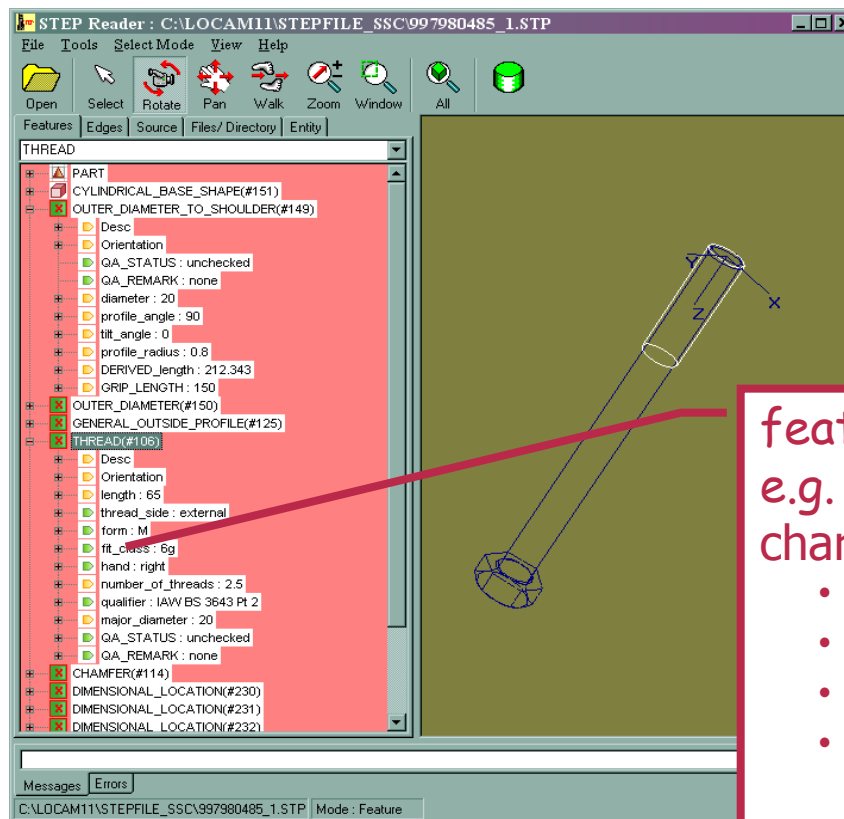
- application processable data requirement statements
- consistently mapped metadata
- standard characteristic data exchange format

impact: faster, better, cheaper



ISO 22745: Automation of Cataloging

- Mapping Catalog Data from Source Data



features
e.g. thread
characteristics including

- length (65 mm)
- form (ISO M)
- class (6G)
- diameter (20 mm)



ISO 22745: Automation of Cataloging

- Create data one time and use throughout life cycle

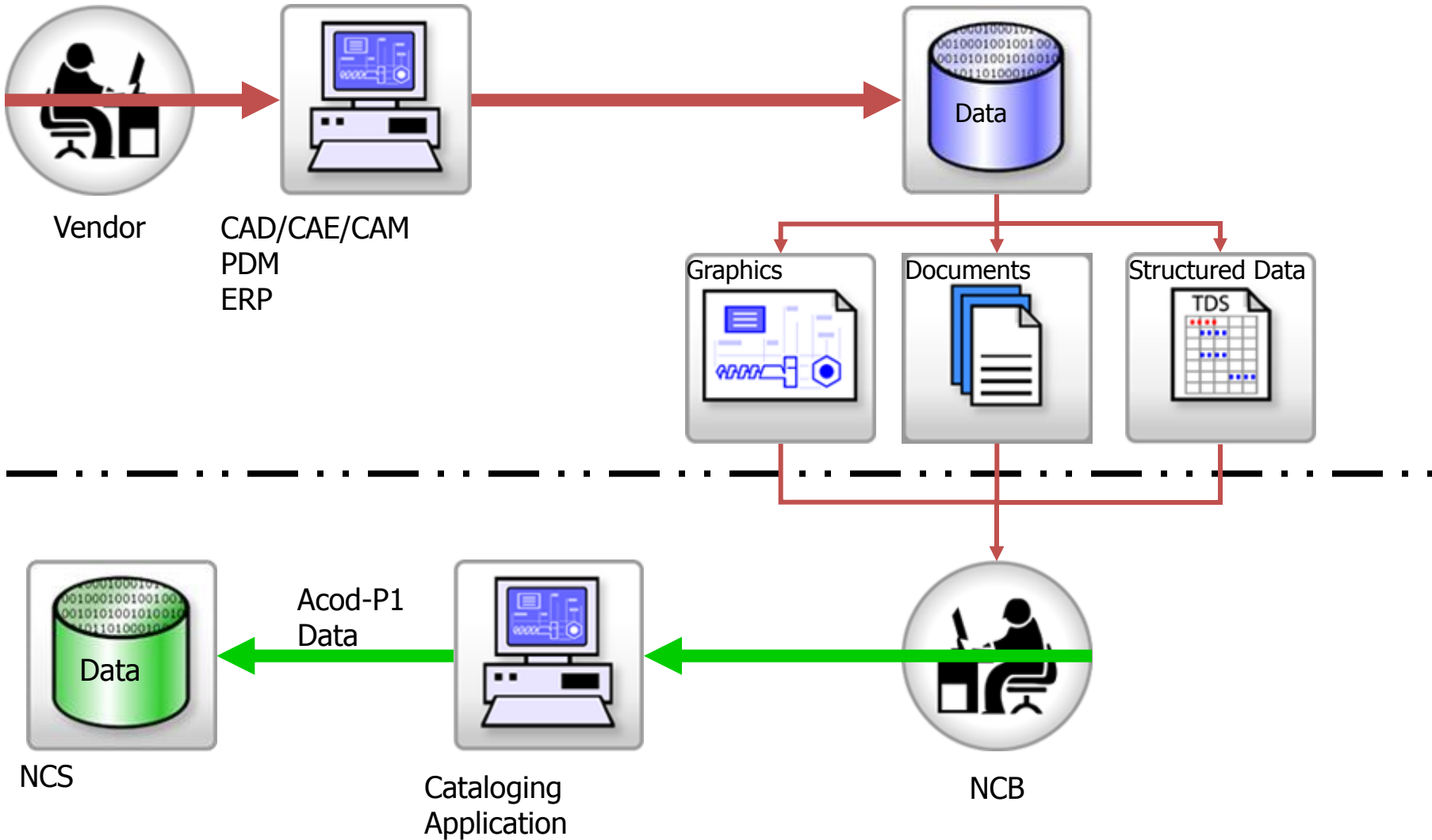
The screenshot displays the STEP Reader application window titled "STEP Reader : C:\LOCALM11\STEPFILE_UKNCB\BOLT_MACHINE.STP". The interface includes a menu bar (File, Tools, Select Mode, View, Help), a toolbar with navigation icons, and a feature tree on the left. The feature tree shows a hierarchy starting with "THREAD", expanded to show "CYLINDRICAL_BASE_SHAPE1" and "THREAD(#1029)". The "THREAD(#1029)" feature is expanded to show properties: Desc, Orientation, length: 38, thread_side: external, form: M, fit_class: 6g, hand: right, number_of_threads:, pitch_diameter: 14.5E, and major_diameter: 16. The "fit_class: 6g" property is highlighted with a red box and a callout that reads "thread class is found by browsing through the feature tree".

The main text window displays the following text: "When the source document specifies a maximum and n or within the limits of a standard class of thread, reply wi class of fits should be reflected by the similar class of th class)." A red box and callout points to this text, reading "definition of the property from the Implementation Guide".

A dialog box titled "997980485_1" is open, showing a "Please NOTE:" section. The note reads: "The Thread Class is found by expanding the THREAD Feature in the STEP Reader Feature Tree. The Thread Class is reference as 'fit_class'. The definition of Thread Class is displayed in the 'Text' tab of the STEP Reader". A red box and callout points to the text entry field in the dialog, reading "data entry field".



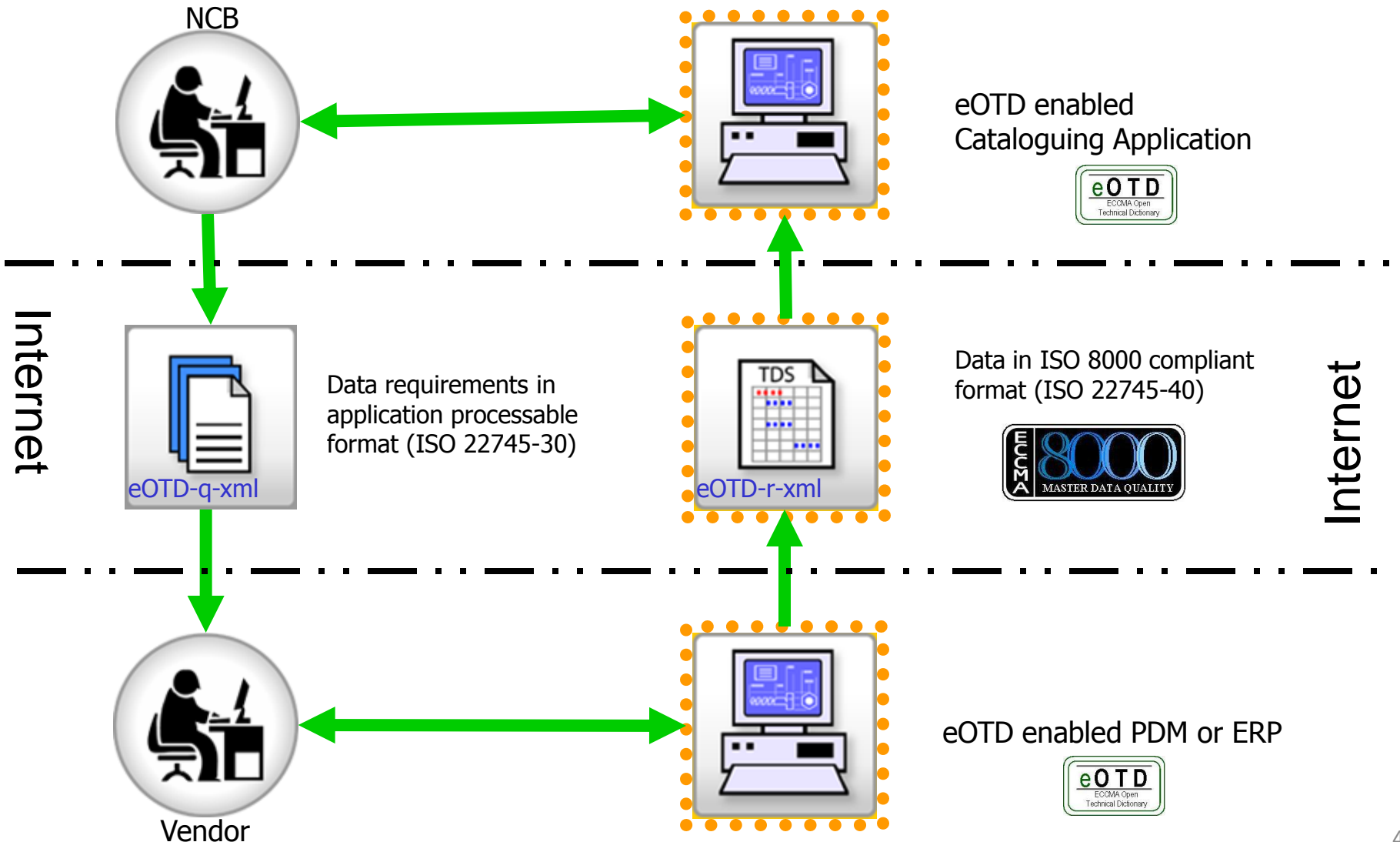
NATO Cataloging at Source Project *as is*





NATO cataloging at source project to be

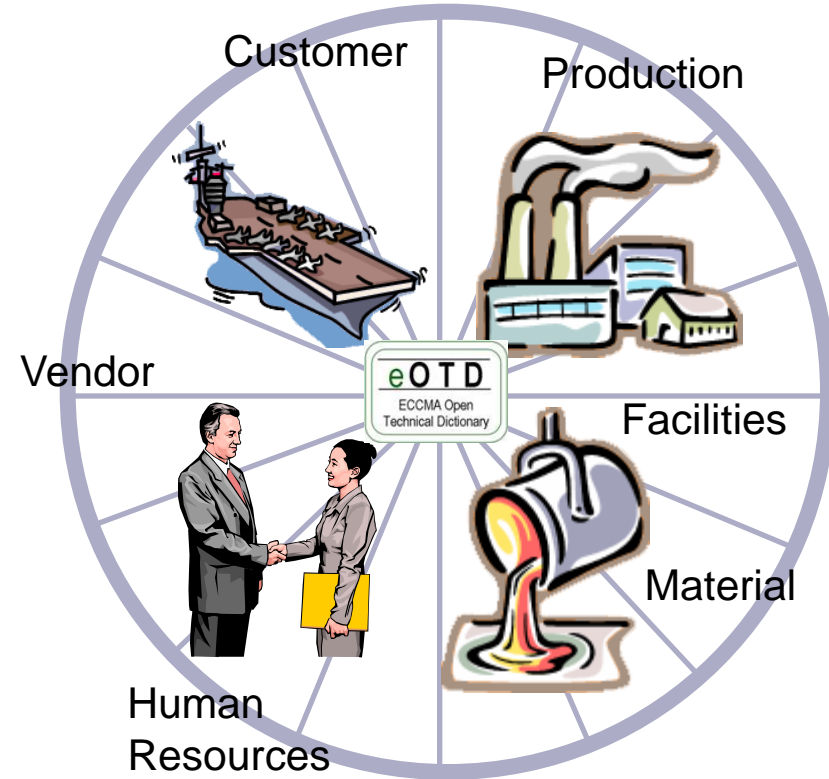
Faster - Better - Cheaper





Common Concept Encoding

- Across the supply chains
- ERP masters:
vendor/customer/material/service
- Manufacturing/production
CAD/CAM/CAE/PDM
- Facilities/raw materials
- Human Resources
- Data life cycle management: from
design through disposal



Common metadata mapping across applications



Benefits of ISO 22745 to Government

- Opportunities for improvement of NATO/DLIS system through increased industry participation
- Promotes NCS approach as an ISO standard
- Faster access to better industrial data

Goal: Electronic transfer of characteristic data from our suppliers and manufacturers to NCBs



ISO 8000: A Standard for Data Quality

- ISO 8000 incorporates all the key elements of data quality:
 - Syntax
 - Provenance
 - Completion
 - Accuracy
 - Certification





Data Quality

Problems Due to Poor Data Quality

- Extra time to reconcile data
- Loss of credibility in a system
- Extra costs
- Customer dissatisfaction
- Delay in deploying a new system
- Lost revenue
- Compliance problems

Sources of Data Quality Problems

- Data entry by employees
- Changes to root/source systems
- Data migration or conversion projects
- Mixed expectations by users
- External data
- System errors
- Data entry by customers



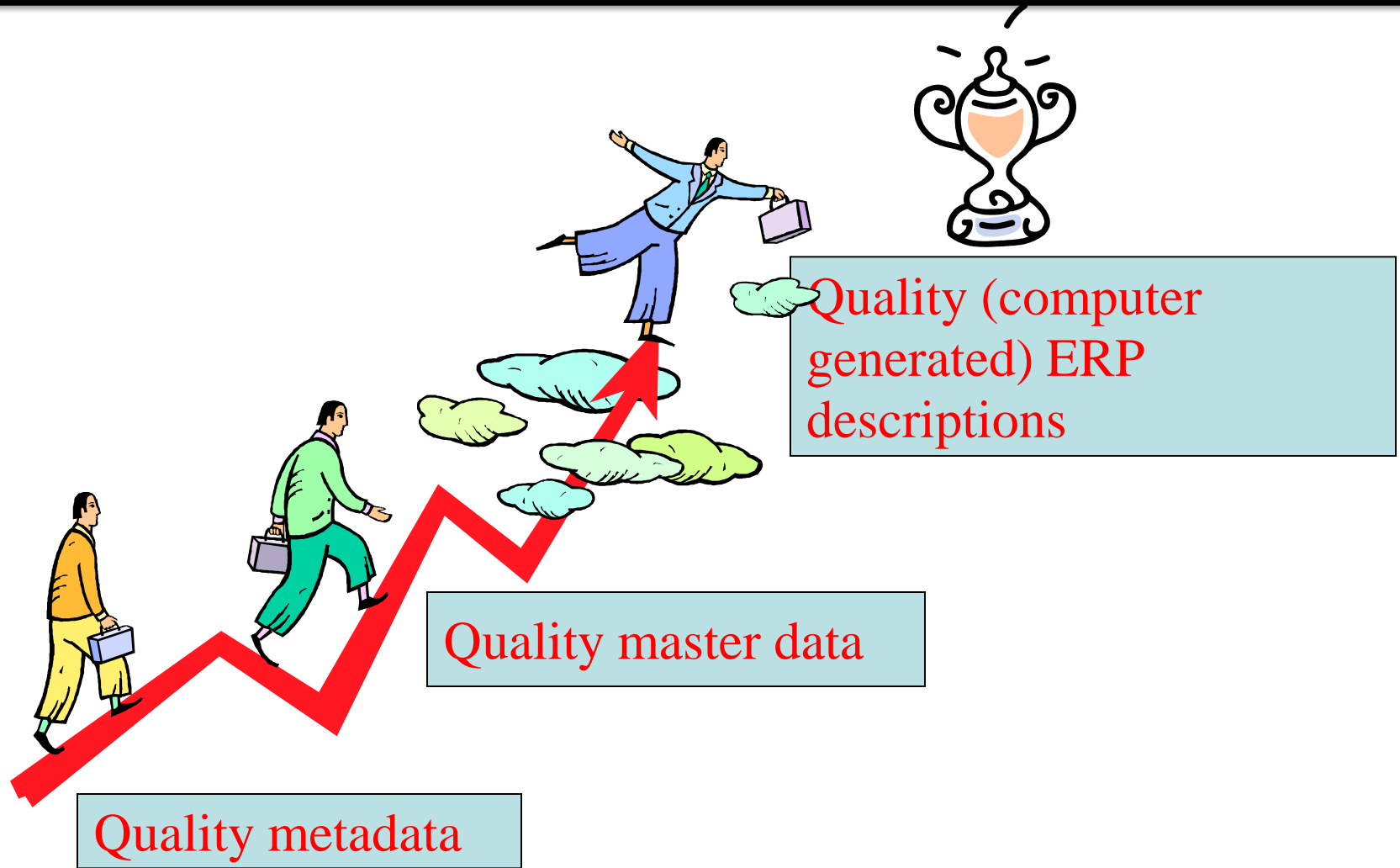


Parts of ISO 8000 Standard

- Part 1: Overview, principles and general requirements
- Part 2: Terminology
- Part 100: Master data: Overview
- Part 110: Master data: Exchange of characteristic data: Syntax, semantic encoding, and conformance to data specification
- Part 120: Master data: Provenance
- Part 130: Master data: Accuracy
- Part 140: Master data: Completeness



The Steps to Quality ERP Descriptions





ISO 8000-110

Master Data Syntax and Encoding

Providing the data necessary for the safe and efficient operation of plant, and equipment is a legal requirement in most countries

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

- The data shall be ISO 8000-110:2008 compliant.
- The data shall comply with registered ISO 22745-30 compliant Identification Guides.
- The data shall be encoded using concept identifiers from an ISO 22745 compliant open technical dictionary that supports free resolution to concept definitions.
- The data shall be provided in an ISO 22745-40 compliant Extensible Markup Language (xml) format.



ISO 8000: A Data Provider's Perspective

Data providers 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.
- *There is growing resistance to “data lock-in”*

Data providers are:

- looking to increase their visibility and understand that the best way to do this is to improve the quality of their data.
- looking for a Standard that they can use to identify the quality of their data.





Data Quality

The Process ...



Action Plan

Define – identify data Issues
 Measure – apply appropriate metrics
 Improvements – address needed enhancements
 Implement – initiate approved changes and corrections
 Monitor – re-measure for effectiveness
 Report – document status improvements and cost savings

Accuracy
 Consistency
 Currency
 Completeness

90-100% Green
 80-89% Yellow
 70-79% Orange
 60-69% Pink
 59%-0% Red
 NM Not Measured White

The Results ...

System/Program Approval/Assistance

Target Population: Example: FLIS

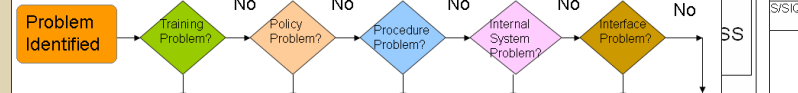
Process: Describe the process

Issues/Needs/Concerns: Address any known conflicts regarding suggested improvement; any methods or tools required; and overall concerns.

System/Product Benchmark

Example of Baselines, Benchmarks, Trends, Gaps and Quarterly Changes

Root Cause Analysis



System/Product DQ Baseline

Overall J6B quality assessment of FLIS on DLA Mgd NIINs/DRNs where FLIS or BSM is the authoritative source
 A – Accuracy CN – Consistency CR – Currency CM – Completeness NM – Not Measured

DQ ISSUES	A	CN	CR	CM	Over all	DQ ISSUES	A	CN	CR	CM	Over all
1. Shelf Life Code	86%	100%	100%	86%	92.7%	6. Quantity Per Assembly	NM	100%	NM	100%	100%
2. Jump to Code	NM	100%	NM	100%	100%	7. Federal Stock Class	NM	100%	NM	100%	100%
3. Order of Use Code	NM	100%	NM	100%	100%	8. Reference Numbers BSM Data Cleaning (ORA PED project)	100%	NM	100%	63.1%	87.7%
4. Demil Code	100%	100%	100%	100%	100%	9. Reference Number Category Code	NM	100%	NM	100%	100%
5. Precious Metal Indicator Code	NM	100%	NM	100%	100%	10. Reference Number Variation Code	NM	100%	NM	100%	100%

Grading Scale

90-100% A Green
 80-89% B Yellow
 70-79% C Orange
 60-69% D Pink
 59%-0% E Red
 Not Established - White

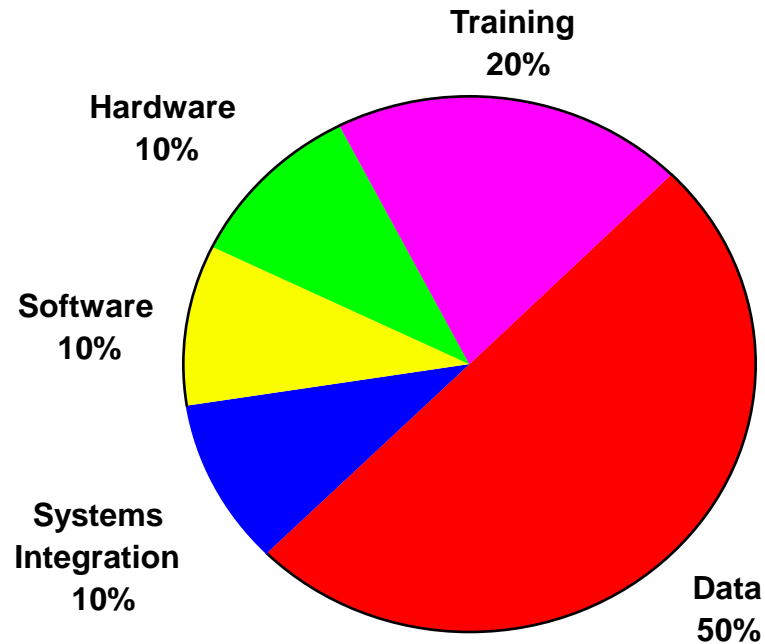
Issues/Concerns:

DCB Recommendations:
 Begin checking additional DRNs



What Does an Information System Cost?

Survey by Daratech, Inc



Hardware: The cost of additional infrastructure required for the project.

Software: The cost of licenses for the software used, or the cost of software developed.

Systems Integration: Cost of interfaces between applications in a system.

Data: The business cost of creating the data to configure and use a system.

Training: Cost of training and the 'cost' of getting accustomed to a new system.



YOUR POINTING AT IT WON'T HELP - THE COMPUTER RECORDS SHOWS NONE IN STOCK.



ISO 22745 = Accurate and Precise Data

ISO 22745/8000

states that for data to be of quality, it must have a meta data property (*which has an accurate definition*) and a value which is measurable. These **property value pairs** form the cornerstone of high quality data:

10.50 ☹️

Overall length : 10.50mm 😊

ISO 22745-30 EOTD i-XML = A list of required properties

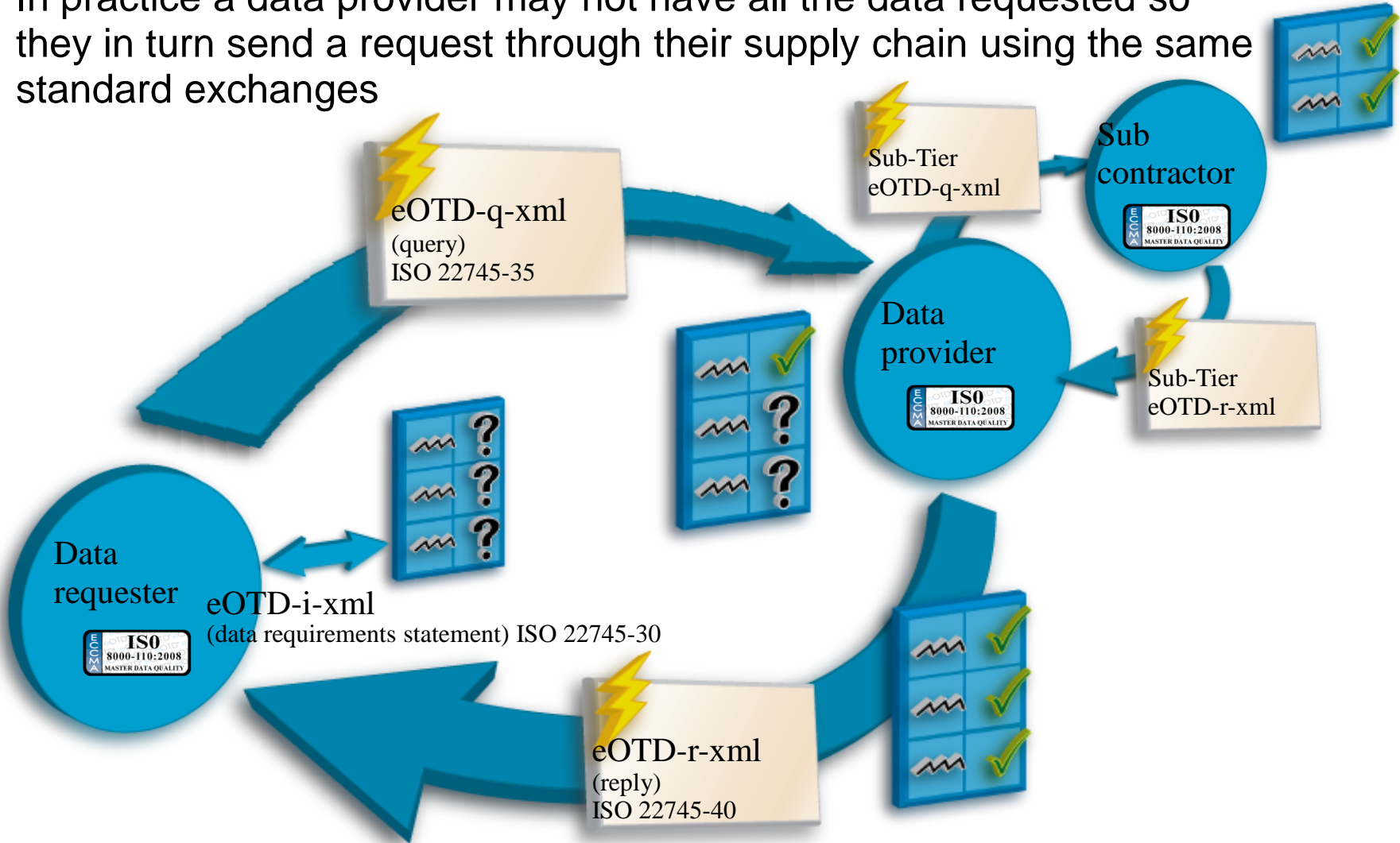
ISO 22745-35 EOTD q-XML = The transaction of those **properties** between two entities.

ISO 22745-40 EOTD r-XML = The returned transaction with **values** completed by the master data manager



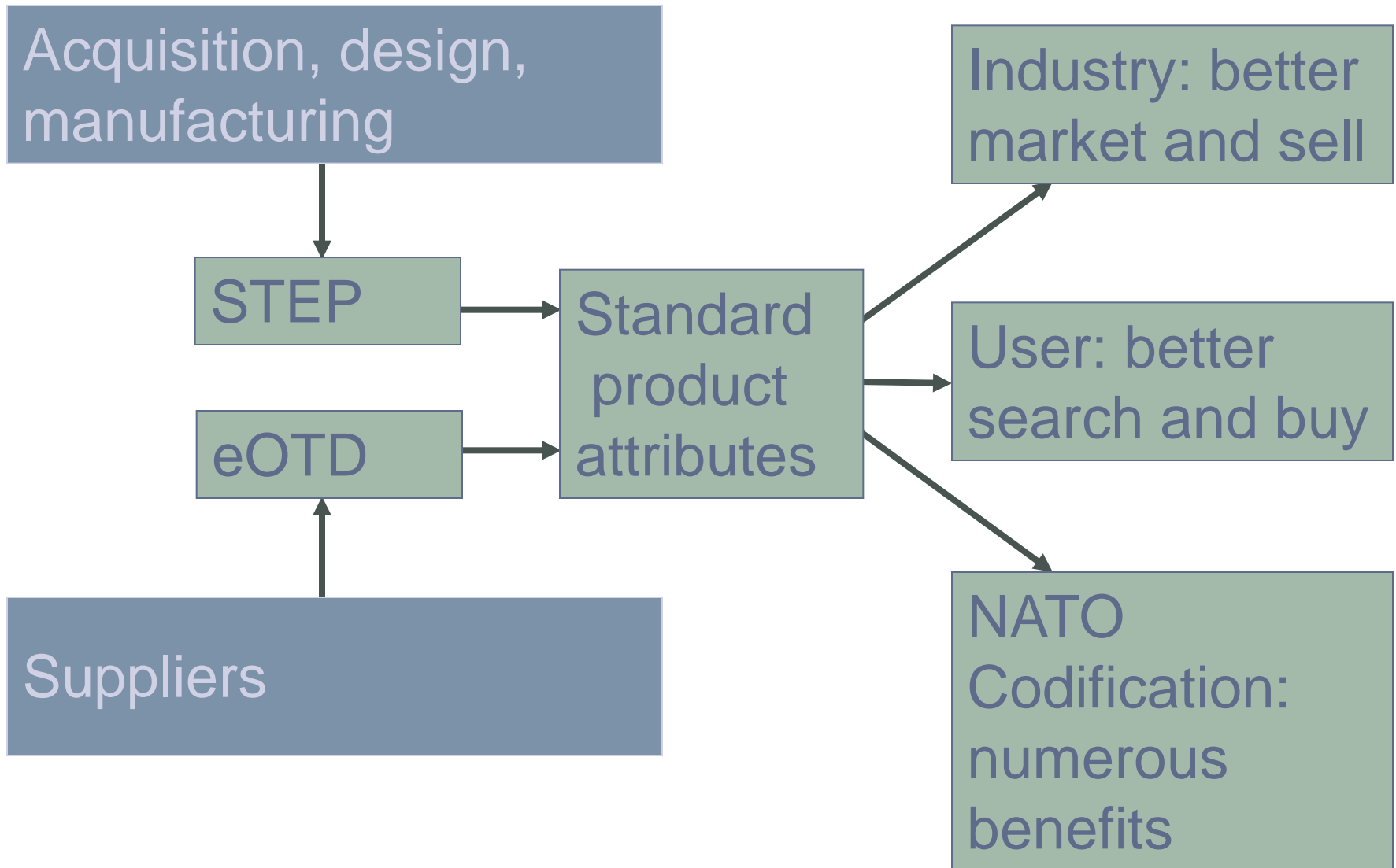
Automating the Data Supply Chain

In practice a data provider may not have all the data requested so they in turn send a request through their supply chain using the same standard exchanges





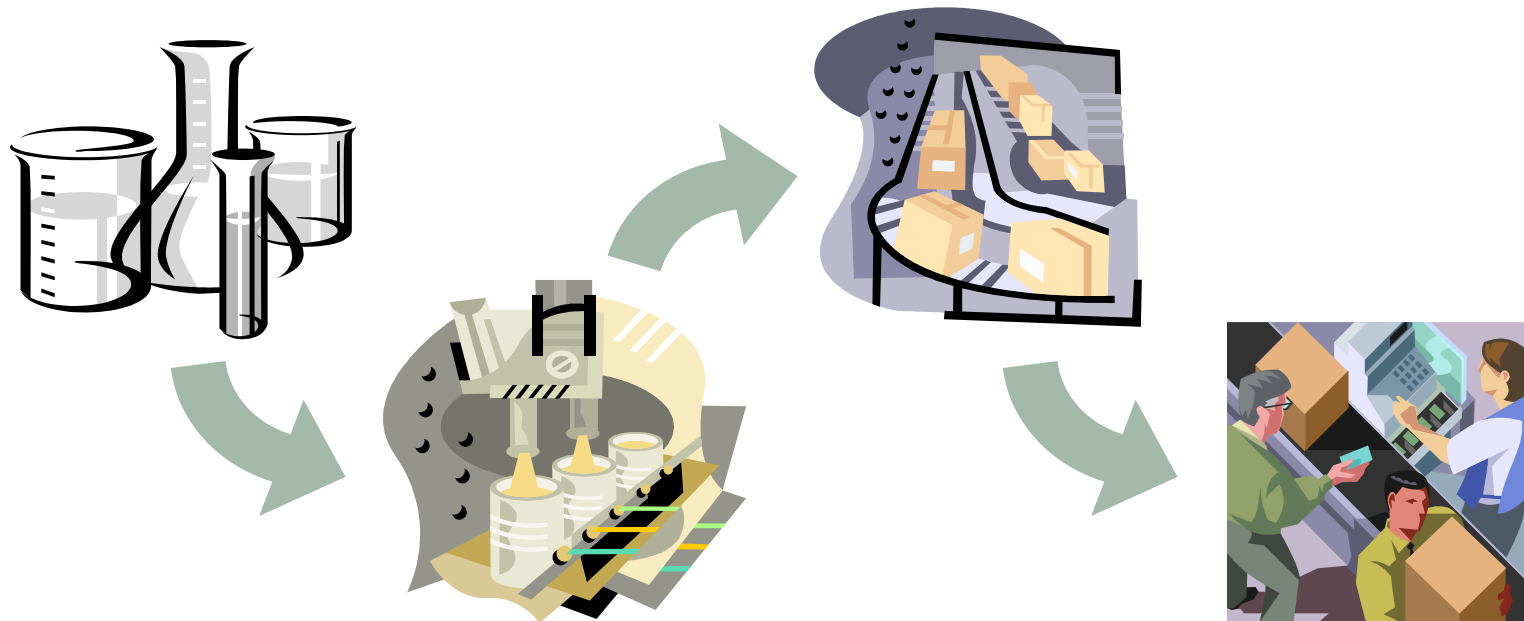
2020: A New World





2020: A New World

- The ultimate goal has been met: to provide a standard means of describing product data through the life cycle of a product – a shared resource for all





Implementation of ISO Standards 22745 and 8000



Smart Step Codification Phase 3

AC/135 have commissioned a Phase III of the SSC project

Phase I – Proved that STEP files could be used to generate codification records.

Phase II – Used SSC and ISO's 22745 & 8000 to create 100 Item of Supply Concepts for ROSOMAK.

Phase III – Will look to continue this work and develop true IT based automated data exchanges between Defence and Industry. A detailed Cost Benefits Analysis will also be produced.



The Task

To take a medium sized platform with mature enough data to be codified which is stored in an electronic Product Data Management (PDM System).

Using ISO 8000 exchange methods, create a fully codified platform direct from the PDM.

Return a copy of that data to the supplier in ISO 22745 format including the NSN as a completed field.

The successful completion of the project will result in demonstrable improvements in quality and time in the completion of a codification task and provide information on potential whole life cost savings

TERRIER is a new generation Combat Engineering Vehicle (CEV)

- Used for Early entry
- Used for Combat support
- Used for Post conflict roles



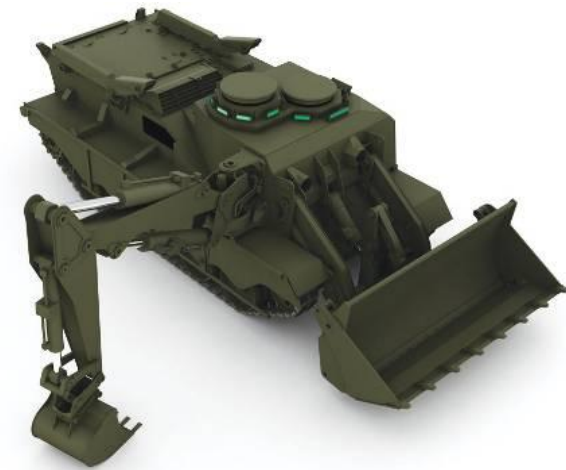
TERRIER[®] Capability

- **TERRIER Uses next generation Drive by Wire electronics**
- **Key points from TERRIER specification:**
 - **2 man crew**
 - **31.5 tonnes**
 - **700hp engine**
 - **70kph top speed**
 - **5 tonne clamshell bucket**



TERRIER[®] Capability

- **Key points from TERRIER specification:**
 - **2.5 tonne excavator arm**
 - **Thermal Imaging and low light cameras**
 - **Capable of being remotely controlled**
 - **10 tonne integrated winch system**
 - **General Purpose Machine Gun**
 - **Scatterable Mine Clearance Device**



Counter Mobility / Survivability

High capacity bucket – 2.8 m³

Excavator arm – 0.4 m³



Infantry and vehicle protective positions

Deployed Force Infrastructure

Host Nation Infrastructure



The tale of the tape

BETTER - Current NATO Average for the creation of Type 1 records is approximately 16%.

Smart Step Codification Type 1 Creation = 60%

FASTER – UK NCB Average for the allocation of an NSN on receipt of the Source Data = approximately 50 minutes.

Smart Step Codification = 10 Minutes

So what does that mean in financial terms to the supplier?

389 Items for codification so far

129 Items screened out which is 33%

BAES will put forward approximately 2000 items for Terrier by project end.

That is a cost of approximately £44,000 in hard charging for codification

33% of £44,000 is **£14,520** which would be the estimated savings on codification costs.

BAES Don't have a classification system

So what does that mean in financial terms to the supplier?

IF a supplier was to place codification at the **design stage** and be able to accept the automated import of an R-XML File:

TERRIER had 129 Items Screened out as already existing in ISIS which UK NCB produced R-XML files which BAES GCS imported into the ISO 22745 Module they had access to.

It costs BAES GCS £3000 to introduce an item in to their catalogue

In accordance with the Shell UK commissioned survey 50% of those costs are for data.

129 x £1500 = **£193,500.00**

So what does that mean in financial terms to the supplier?

The potential to BAES GCS is far greater than that as UK NCB can provide data in r-XML format for 19,000 items that can be automatically loaded into any classification system they choose with XML capabilities. This data will be in ISO 22745 format and in accordance with ISO 8000 Pt 110.

If, we can get codification introduced at the design of a platform, before the engineers start to create properties and values:

The potential is there to save hundreds of thousands of pounds

The Biggest Challenge

BAES GCS Has no classification system!

This means that at present they have no supporting data electronically that can be used for codification.

For this project it means a work around by giving BAES GCS access to the suppliers modules available from both ESG and AURA.

For BAES it shows why they would be so interested in taking part in this project.

The Cost of not codifying!

James Beer is the project manager at BAES GCS responsible for the introduction of a classification system, why?

He provided the following figures:

Cost to introduce an item into their Product Data Management Tool: **£3000**.

Average number of duplicates per item found in their PDM Tool: **10**

Each item has an un-necessary support cost of on average: **£27,000**

BAES GCS Newcastle has approximately **19,000** items registered against its NCAGE currently.

Benefits & Barriers

Benefits already apparent

The Data the supplier has access to is far greater than what is traditionally sent to NCBs.

The Supplier is in a better position to make judgement calls on the item.

Barriers still in place

It was worrying that the supplier did not have a readily identifiable and accessible repository for their data.

The willingness of commercial companies like BAES to allow 'plug in software' into their systems is very limited.





Implementation of ISO 22745/8000

- Many companies are now in the business of building ISO 22745/8000 compliant catalogs. Some examples:
 - PiLog – South Africa
 - Quadrem
 - ESG
 - AURA



Implementation of ISO 22745/8000

- Many organizations are have implemented ISO 22745/8000 compliant catalogs, are testing them, or having committed to adopting them:
 - ArcelorMittal
 - PHP Billiton
 - Severstal
 - Aramco
 - Anglo-American Inc.



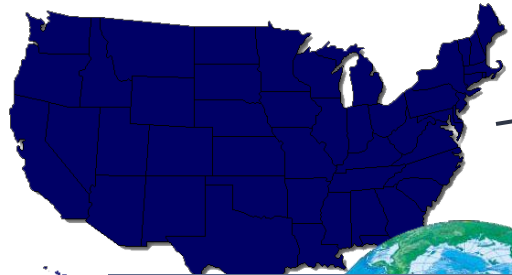
Implementation of ISO 22745/8000

Many nations within the AC/135 community are running or planning to run pilot projects to test electronic data exchange between suppliers and government offices using 22745/8000, including Belgium, Czech Republic, Finland, New Zealand, Norway, Poland, Russia, Slovakia, United Kingdom, and the United States

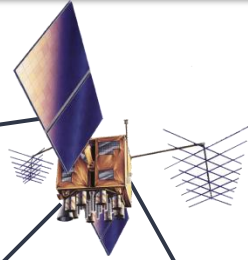




Netcentric Logistics



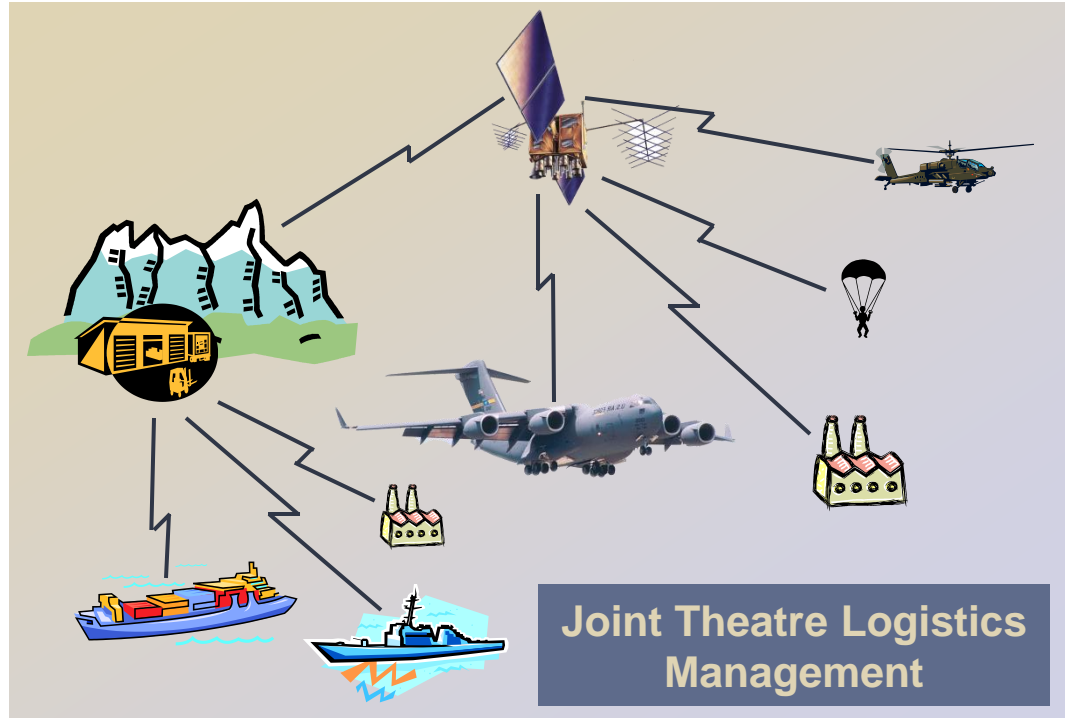
Rapid Response & Distribution



Information Fusion & Total Asset Visibility



Tailored Forces & Logistic Packages



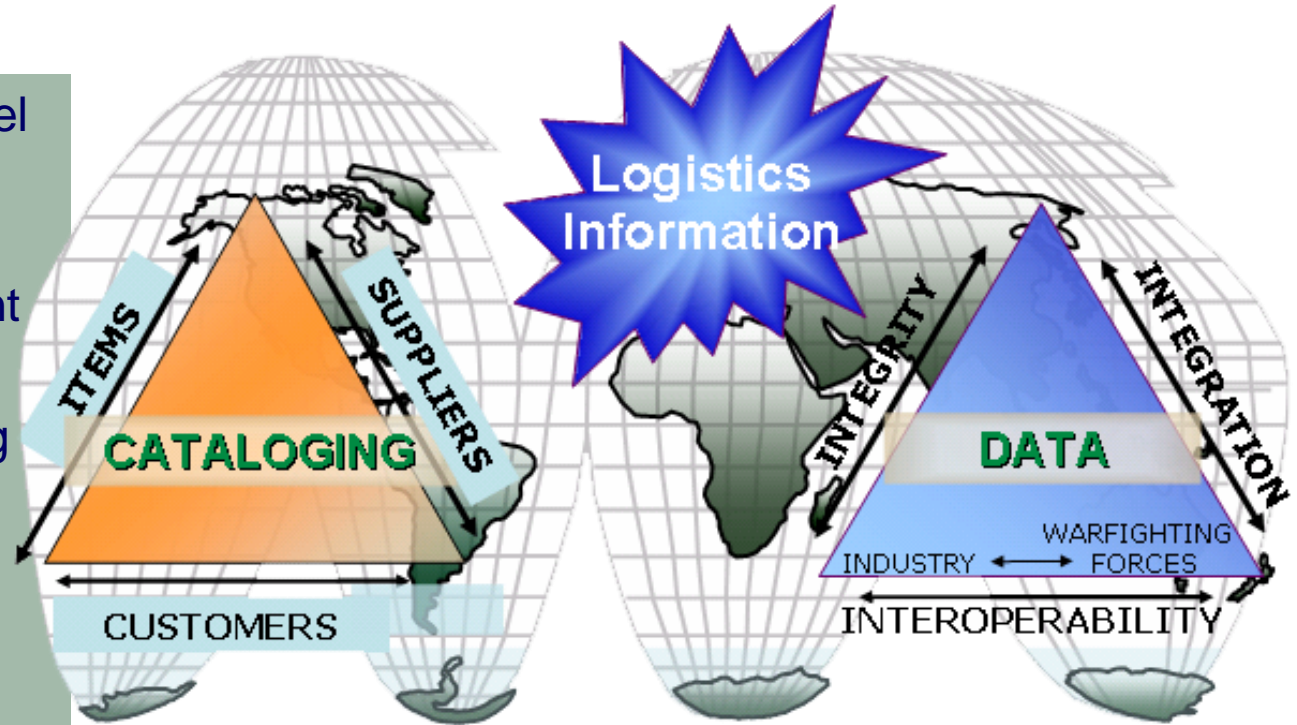
Joint Theatre Logistics Management



Data is the DNA

Data is the DNA of materiel management

- Acquisition
- Financial management
- Hazardous material
- Freight and packaging
- Maintenance
- Sustainability
- Disposal
- Demilitarization



Development



NSN

In-Storage



UID

In-Transit



RFID

In-Theater



Disposal





Summary

- The **NATO Codification System** is an international standard for exchange of catalog data in government
- **ISO 22745** is an e-catalog standard based on the NCS and **ISO 8000** ensures the quality of the data
- ISO 22745 and 8000 are working in practice and poised for wide implementation around the world

**Investment in ISO 22745 and 8000 =
Strong Return on Investment**



Useful International Web Site Addresses

- NATO CODIFICATION SYSTEM (NATO ALLIED COMMITTEE 135)
 - <http://www.nato.int/structur/AC/135/welcome.htm>
- NATO MAINTENANCE AND SUPPLY AGENCY (NAMSA)
 - http://www.namsa.nato.int/home/www.namsa_e.htm
- NATO MCRL
 - http://www.nato.int/structur/AC/135/nmcrl/nmcrl_e/index.htm
- NATO AMMUNITION DATA BASE (NADB)
 - http://www.namsa.nato.int/ammo/nadb_e.htm
- NATO HEADQUARTERS
 - <http://www.nato.int>
- PACIFIC AREA CATALOGING SYSTEM (PACS)
 - http://www.defence.gov.au/dmo/_jlc/pacs