



# Digitalization of Materials Management (using ISO standards)





International  
Organization for  
Standardization

Petrofac 





  
MROINSYTE

  
ECCMA



## BIOGRAPHY

# Peter Eales

- Independent maintenance, repair, and operations consultant
- Consultant for ECCMA (electronic commerce code management association)
- Member of ISO/TC 184/SC 4/WG 13 – Industrial data quality
- Member of ISO/TC 184/WG 6 – Oil & Gas Interoperability
- Consultant to the Kingdom of Saudi Arabia government on the Vision 2030 project
- Formerly global SME for materials management – Petrofac
- Formerly global SME for master data – BG Group

  
ECCMA



# What are international standards?



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An ISO international standard is a document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, and services are fit for purpose;

For business, ISO standards are strategic tools that reduce costs by minimising waste and errors, and increasing productivity;

Source: <http://www.iso.org/iso/home/standards/htm>



# Standards are designed to be referenced in contracts



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:

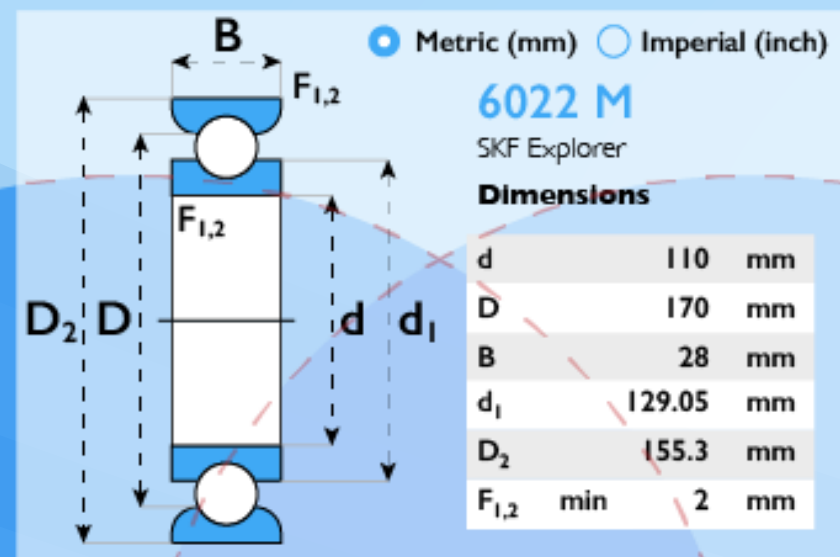
- The data shall be encoded using concept identifiers from an ISO 22745 compliant open technical dictionary that supports free resolution to concept definitions
- The data shall comply with the specified ISO 22745-30 compliant data requirements
- The data shall be provided in ISO 22745-40 compliant Extensible Markup Language (XML)
- The data shall be ISO 8000-110 compliant
- All identifiers must be ISO 8000-115 compliant





# Standards are designed to improve quality

? ISO 8000



✓ ISO 15

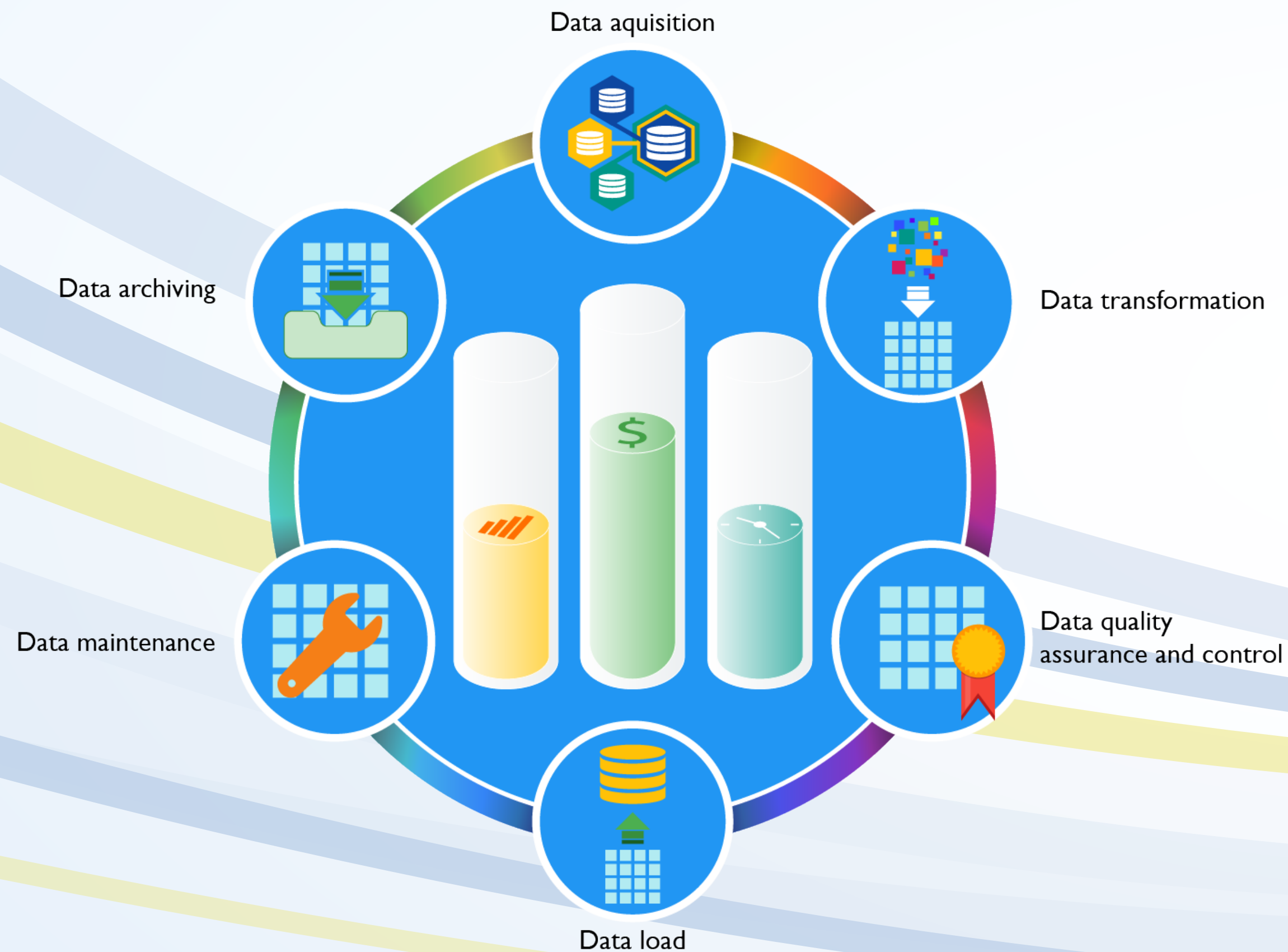


✓ ISO 9001

- The manufactured product conforms to an international standard - ISO 15
- The manufacturing process conforms to an international standard - ISO 9001
- Does the data describing the product conform to ISO 8000?

You insist on the standards for the first two - why not the third?

# Data: an asset constructed to international standards



Owner/Operators currently purchase items and equipment by specifying the relevant international standards in contracts with their suppliers;

Data is like any other asset, it is covered by international standards, it costs money to acquire, to install, and to maintain.



# Managing data throughout the life cycle of an asset



ISO 8000 is becoming a key reference in upcoming standards: that concern the life cycle of assets:

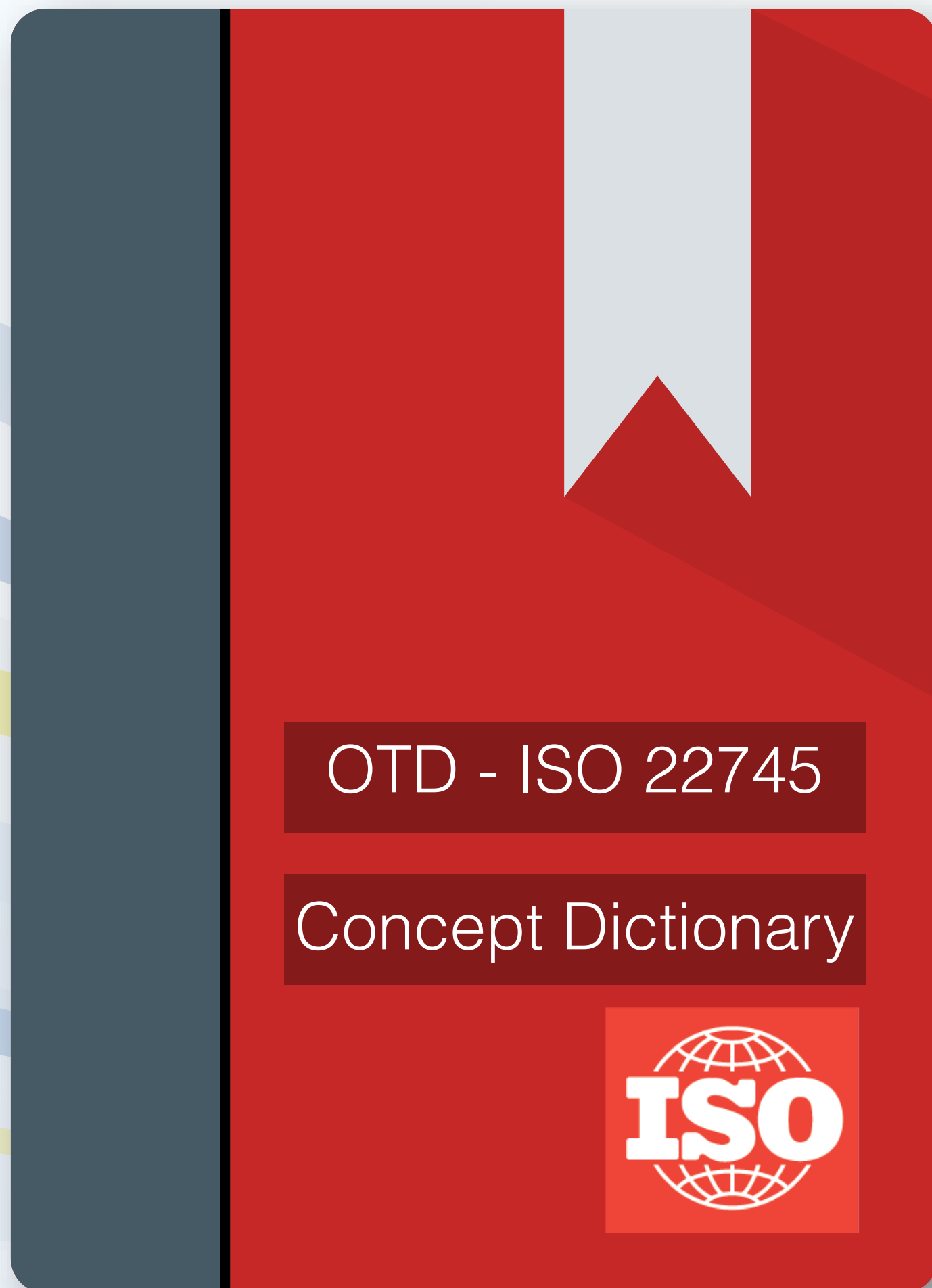
- ISO 18101 - oil and gas interoperability
- The proposed joint ISO/IEC standard on smart manufacturing, or Industry 4.0



# Standards compliant open technical dictionary

The key to digitalization of material and asset masters is an open technical dictionary.

Traditional reference data libraries are not resolvable, an open technical dictionary built according to ISO Standards, enables resolution without loss of meaning and avoids the distribution of multiple versions of the original reference data library spreadsheet.





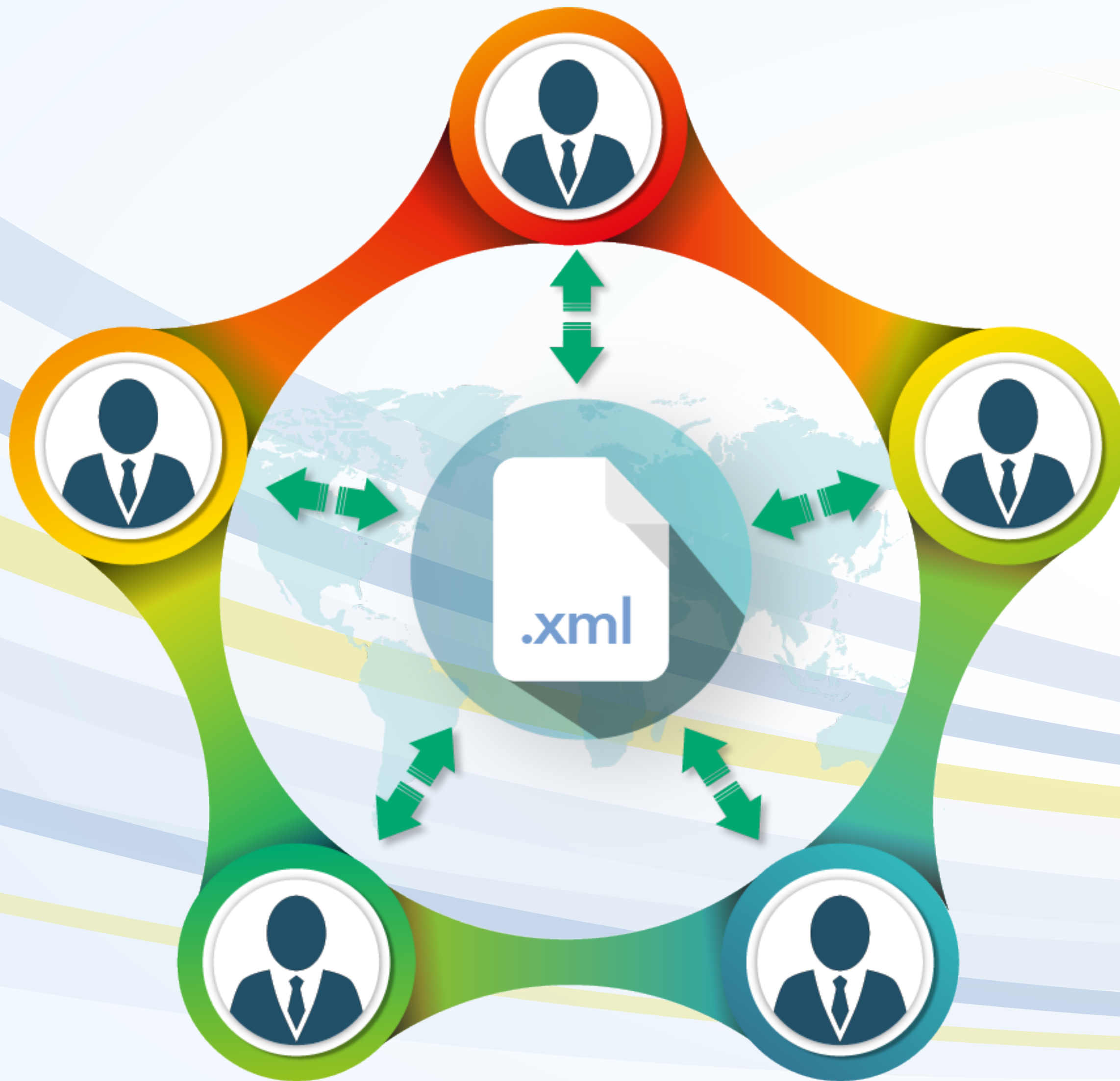
# ISO 22745 essentials

ISO 22745 does not establish a new process for standardising terminology.

Each open technical dictionary (OTD) will have a globally unambiguous identifier for each concept and provide a reference back to the original source for terminology (terms, definitions and images).

OTDs are designed to link terms and definitions with the same semantic content and to reference the original source of each term and definition. Thus, OTDs are intended not to duplicate existing standards, but to provide comprehensive collections of terminology used to describe individuals, organisations, locations, goods and services.

*Source: ISO 22745 part 1 – Introduction*



# Standards compliant material masters

ISO 8000-110 compliant material masters are:

- Derived from entries in an open technical dictionary;
- Machine readable;
- Exchangeable without loss of meaning;
- Portable between systems.



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# ISO 8000 essentials

The ability to create, collect, store, maintain, transfer, process and present data to support business processes in a timely and cost effective manner requires both an understanding of the characteristics of the data that determine its quality, and an ability to measure, manage and report on data quality;

The approach of the master data quality series of parts of ISO 8000 is to address data quality from the "bottom up", i.e., from the smallest meaningful element, the property value.

One of the key aspects of managing master data quality is managing duplication. A consistent approach to managing and eliminating inappropriate duplication is a critical part of master data management.

The number of characteristics needed to describe something will vary by business function.

*Source: ISO 8000 part 100 - Scope*



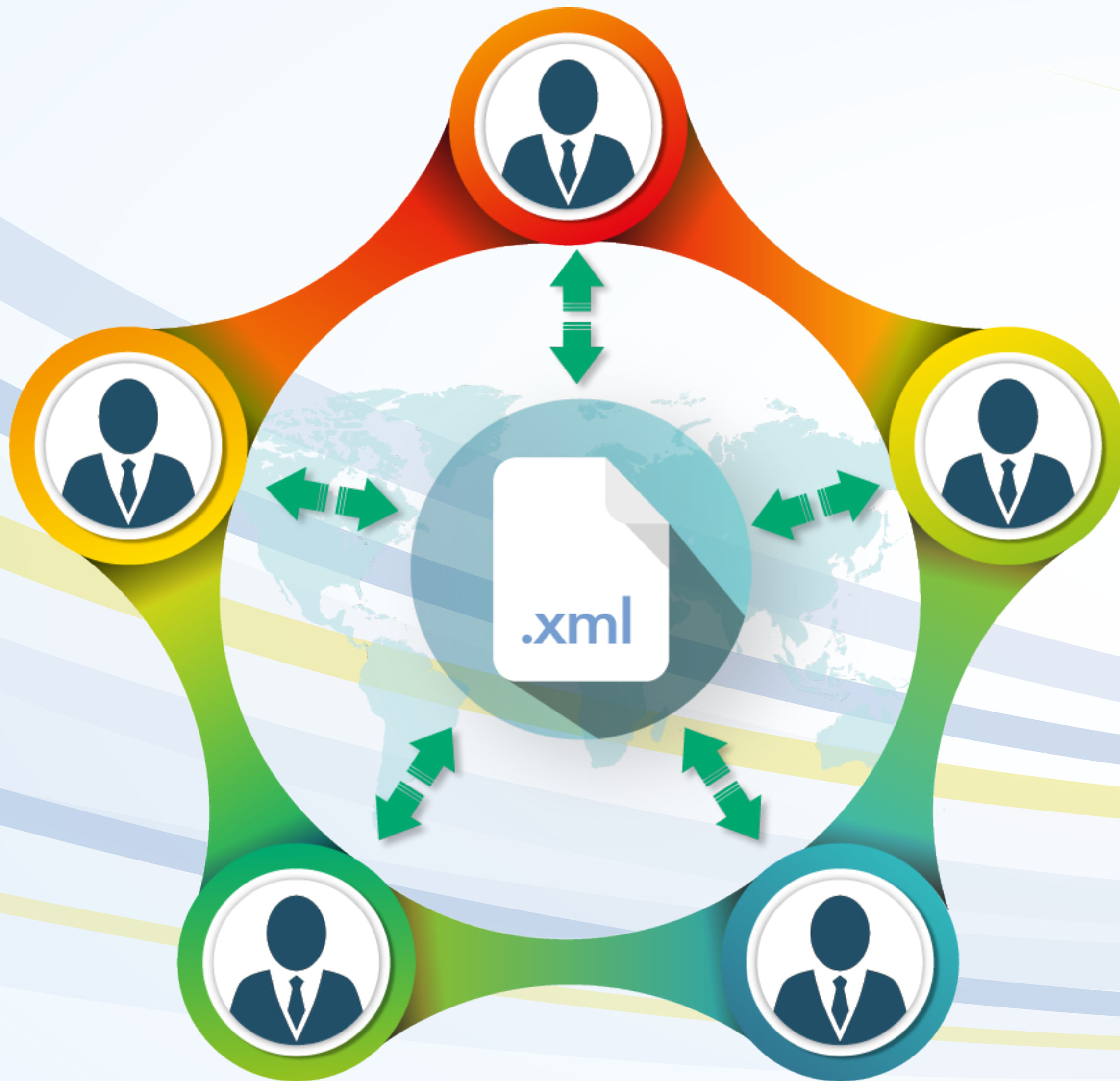


# Summary of ISO 22745 and ISO 8000

Globally unambiguous identifiers are the key to machine readable data, and to creating a data store of item specifications.

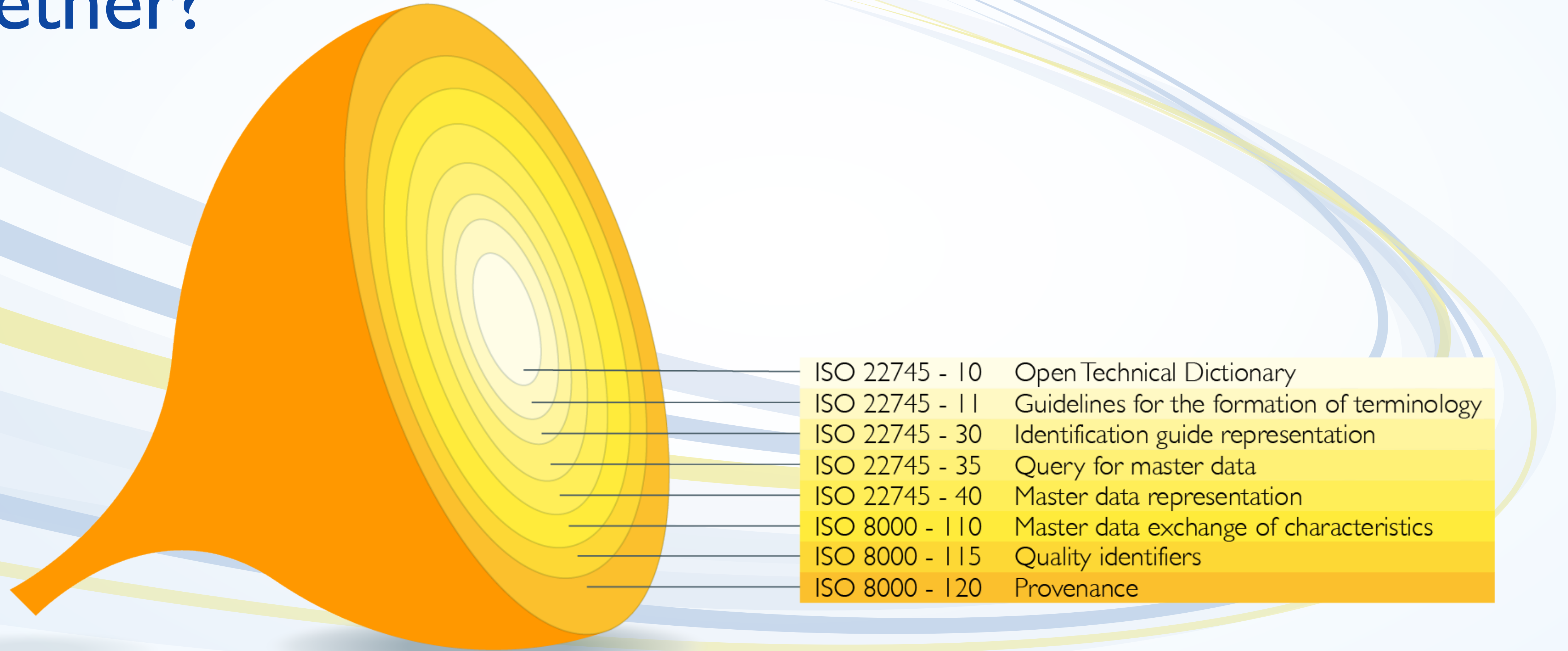
The ultimate goal of the Web of data is to enable computers to do more useful work and to develop systems that can support trusted interactions over the network. The term “Semantic Web” refers to W3C’s vision of the Web of linked data. Semantic Web technologies enable people to create data stores on the Web.

Source: <https://www.w3.org/standards/semanticweb>





# ISO 22745 and ISO 8000: how do they work together?



# Steps to creating standardized data

Exchanging technical specifications is made possible by existing, proven, international standards.

It is achieved by the manufacturer converting their existing technical specifications into ISO 8000 compliant technical specifications by following a simple series of one-off steps.

1. Add current terms and definitions to an open technical dictionary
2. Create identification guides
3. Create catalogue items

TECHNICAL SPECIFICATIONS ARE AVAILABLE  
AS PORTABLE DATA



## 6 EXCHANGE DATA WITH CUSTOMERS

By exchanging the quality identifier so that they can download from the eTSR (no fees required)

6



## 5 UPLOAD CATALOGUE ITEM

to the eTSR (no fees required)

5



## 4 CREATE CATALOGUE ITEM

Specifications consist of: Quality identifier, Class name, Characteristic name(s), Characteristic value(s), Unit(s) of measure, Date verified, Provenance, Definition

4



## 3 REPRODUCE TECHNICAL SPECIFICATIONS

Basic item specifications are built using a class name and associated property names. Create with help from the ECCMA Data Requirements Registry (eDRR)

3



## 2 REGISTER TERMS AND DEFINITIONS

Upload your corporate dictionary onto the ECCMA Open Technical Dictionary (OTD)

2



## 1 COLLECT AND DEFINE TERMS

Source and define words and terms from suppliers and existing data with help from the ECCMA Open Dictionary, or your existing definitions

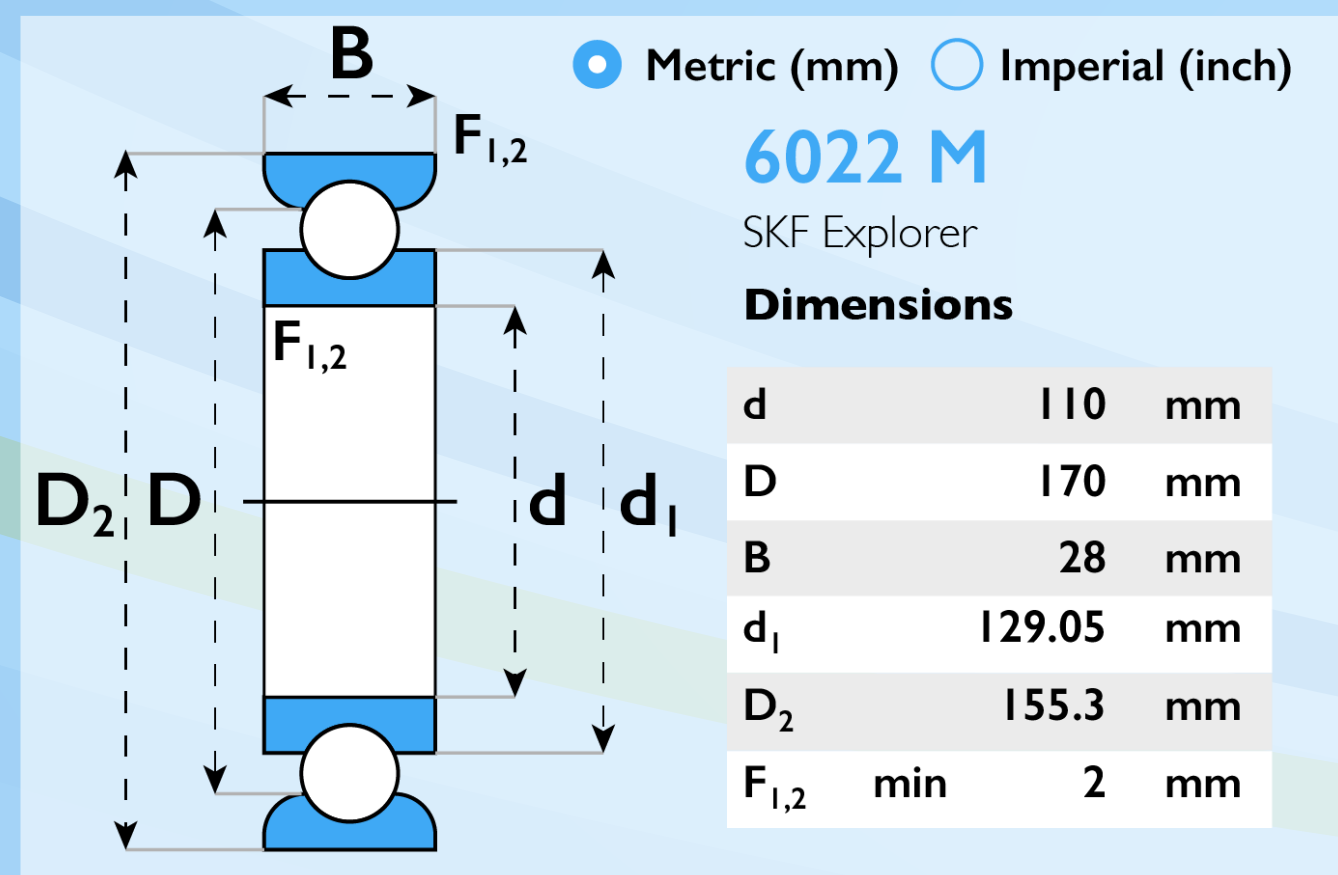
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# New standards driving digitalization in materials management

## ISO 8000-115



### Quality identifiers - ISO 8000-115

This new standard enables clear identification of an individual manufacturer's specification by the addition of a prefix, owned by, and clearly identifying, the owner of the item:

Prefix - SKF

Identifier - 6022M

Becomes SKF:6022M





# New standards driving digitalization in materials management

Global technical specification registry

- ISO 8000-110 compliant
- Free for manufacturers to upload to
- Free for buyers to download from

*The ECCMA model of a GTSR is known as the eTSR*





# What happens when the data type is not specified?



Having a process for describing a product, and a standard way of transmitting and receiving that data, in a way that can be understood and rapidly integrated by the receiver of that data, would save industry millions of dollars.



# The current process

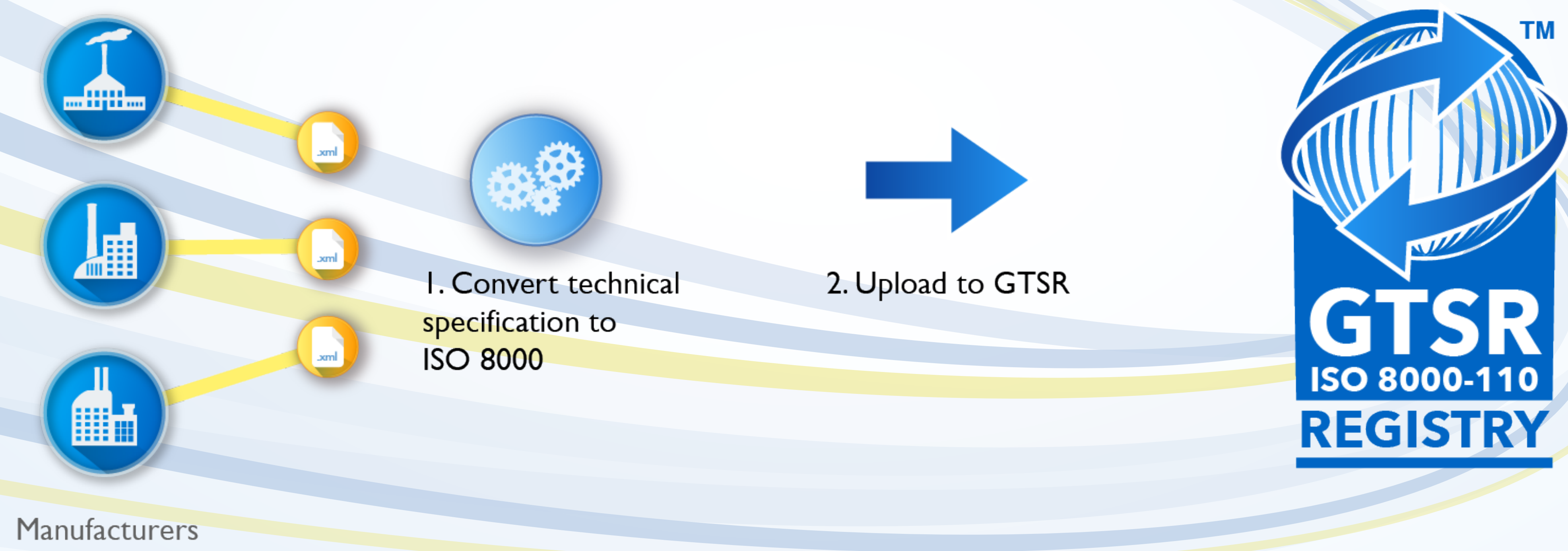




# Can we simplify the future process?



# Future process using international standards





# Future process using international standards



1. Download technical specification from GTSR

2. Render ERP short description from technical specification

3. Add technical specification to PO Text or long description in ERP



End Users

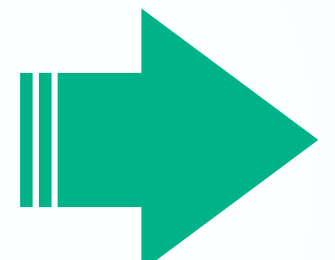
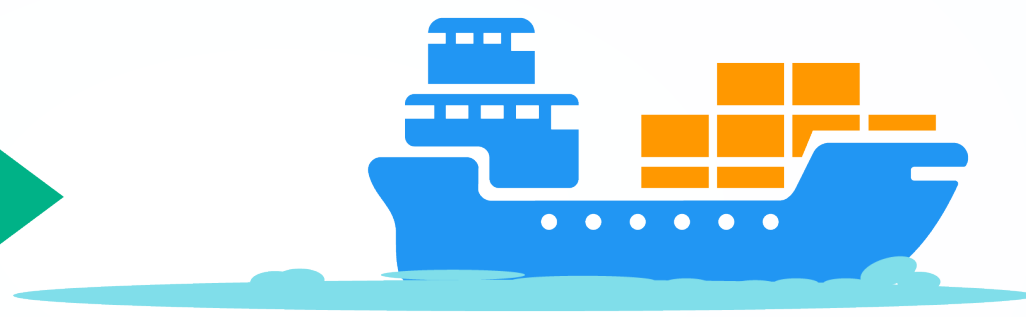
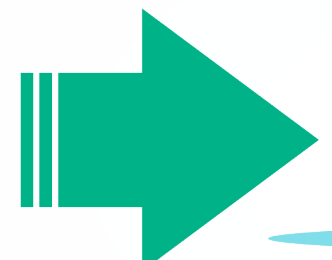
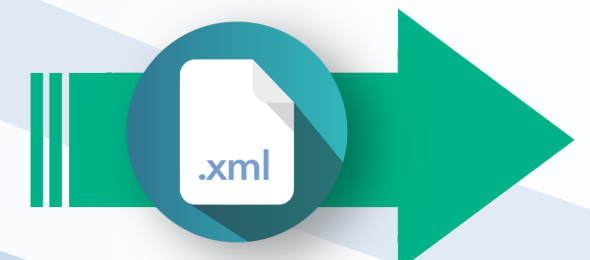


# Future import and export process

Manufacturer converts existing technical specification to ISO 8000 technical specification

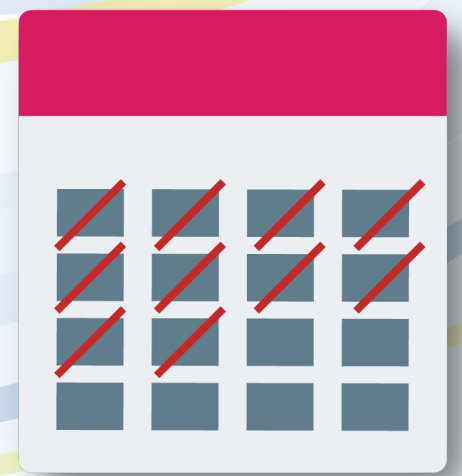
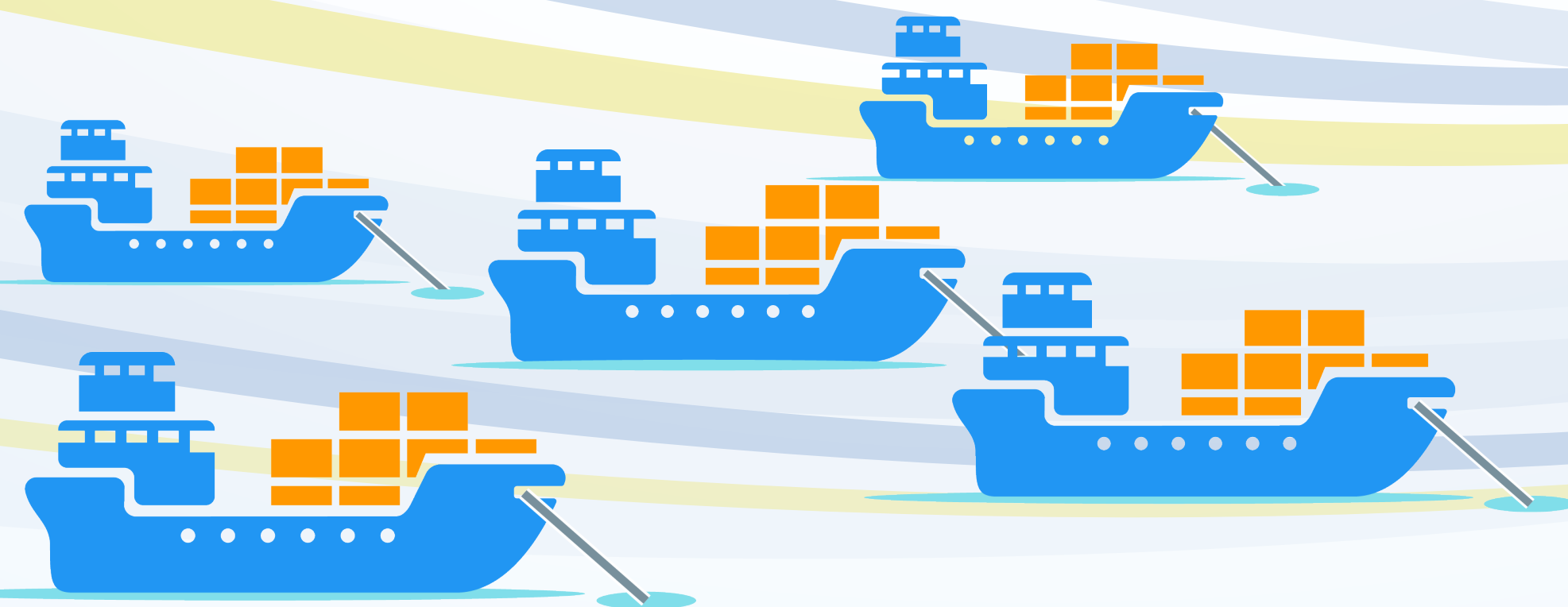
Manufacturer uploads ISO 8000 technical specification to the global technical specification registry (eTSR)

KSA customs check the eTSR to validate the description of goods. The manufacturer then successfully exports goods with the exemption from duty if applicable in the new automated system



Manufacturer does not convert existing technical specifications to ISO 8000 technical specification

Goods subject to the slower manual import process, loss of exemption, and potential 10% penalty





# Postscript from opening remarks: “trusted information”



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ISO 8000 includes:

- Quality - Parts 8 and 110 information and data quality;
- Provenance - Part 120;
- Accuracy - Part 130;





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Contact

# Peter Eales



peter.eales@eccma.org



+44 7789 881281  
+44 203 870 2790



<https://uk.linkedin.com/in/ealespeter>



% MRO Insyte Limited  
3rd Floor, 86-90 Paul Street,  
LONDON, EC2A 4NE  
United Kingdom

