

The Many Dimensions of Compliance

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From semantic technologies
to business use-cases in ISO15926

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Agenda

- Background to Semantic Technologies in ISO15926
- Other Aspects of ISO15926 and the Focus on Reference Data
- Practicalities of Compliance with ISO15926
- Summary & Conclusions

Semantics and ISO15926 compliance

- Several axes and levels of compliance to ISO15926
- Semantic Web technologies can be used as a way of reducing ambiguity
- Some compliance categories relate directly to the application of Semantic Web technologies
 - e.g. representation, interface, change management

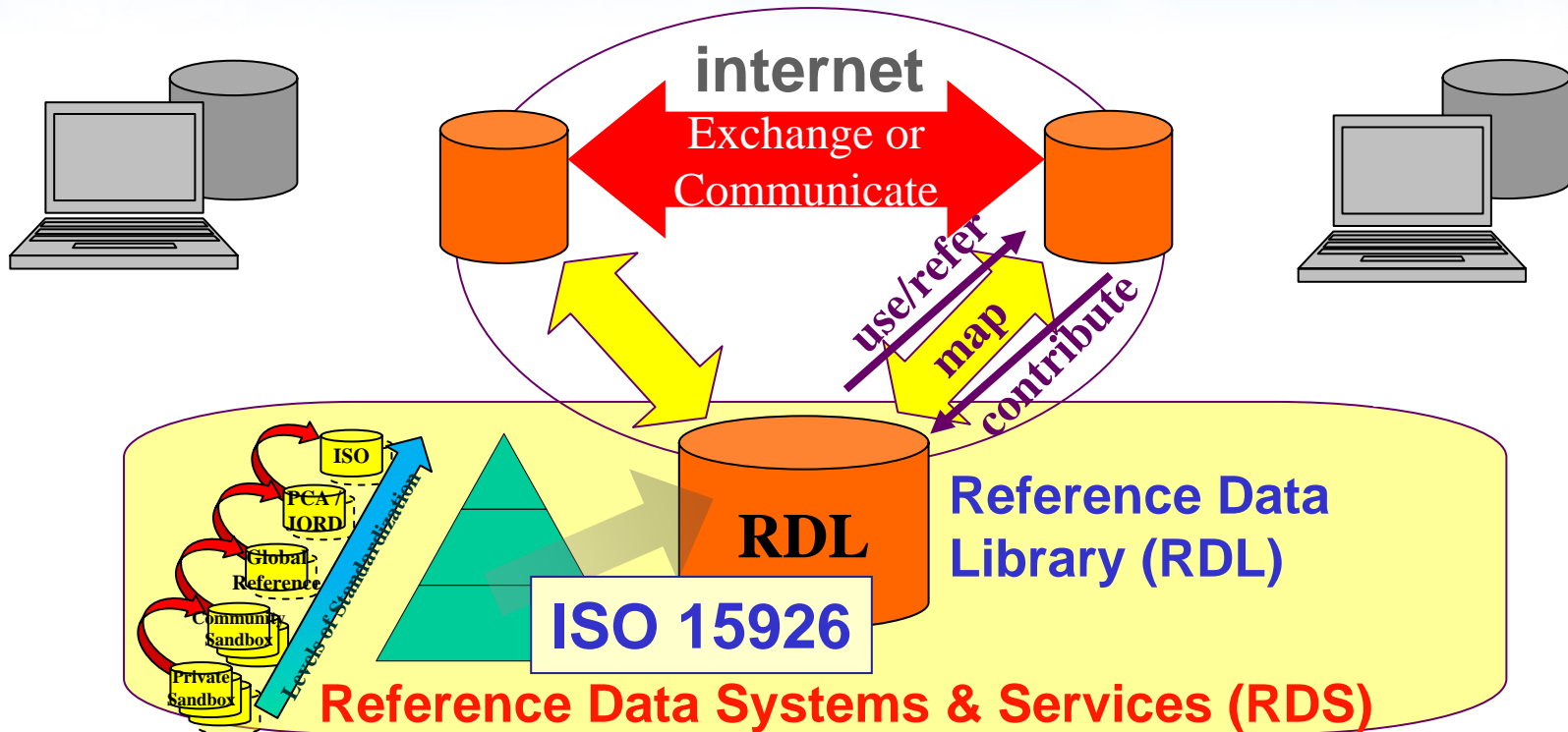
Semantic Technology Components of ISO15926

- Part 1-7 of ISO 15926 are technology neutral and give freedom to choose implementation technologies
- Part 8 (RDF/OWL) and Part 9 (SPARQL) are technology dependent reference implementations
 - Representation technology – syntax for writing
 - P8: Based on RDF and OWL which are W3C recommendations
 - Interface technology - way to access/read/modify/expose your data
 - P9: Distribution & Federation – access, queries, rules, reference data/URI's
- Level of compliance will vary dependent on approach taken

ISO 15926 Integration of life-cycle data for process plants *including* oil & gas production facilities.

- ISO 15926 – 1: Overview and fundamental principles.
- ISO 15926 – 2: Data model. [Highly generic-entity based ontology.]
- ISO 15926 – 3: Ontology for geometry & topology. [Representing other ISO Stds.]
- ISO 15926 – 4: **Initial** reference data. [Actual Ref Data managed in database(s).]
- ISO 15926 – 6: Scope and methodology for developing additional reference data
- ISO 15926 – 7: **Template** methodology. [Templates also in reference data.]
- ISO 15926 – 8: **OWL** representation.
- ISO 15926 – 9: Implementation methods for the integration of distributed systems – **Façade** implementation.
- ISO 15926 – 10: Abstract Test Methods.
- ISO 15926 – 11: Simplified Industrial Usage. (New work Item, based on existing draft industrial usage best practices.)
- **ISO 15926 – 5:** has been replaced by an **annex to ISO TC184/SC4 MA : Procedure for development and maintenance of reference data in database format. (ie promoted to a higher level across wider industrial data standards.)**

ISO15926 interoperability at its simplest



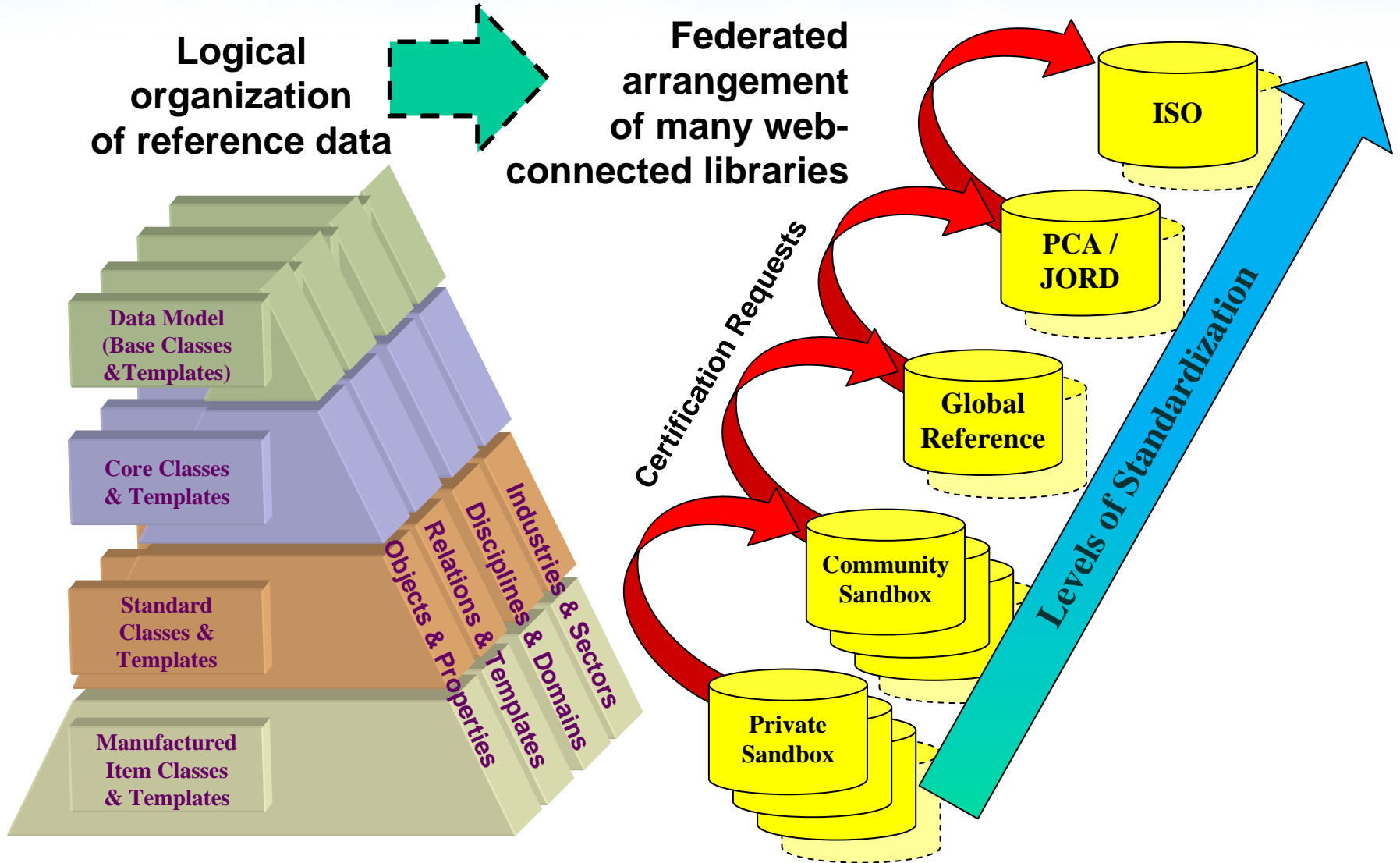
Using shared references & sharing the references used,
reduces business ambiguity & reduces mapping overheads.

Makes interoperability easier *and* reduces risk & cost.

Result of much recent collaboration with FIATECH, iRING and
many others since mid-1990's.

Many business-cases – you need one to call your own.

Federated RDL across many domains



COMPLIANCE - Technical Aspects

<p>JORD - Joint (POSC-Caesar / FIATECH) Operational Reference Data Project – to enhance PCA RDS, including Compliance Validation & Certification</p>		<p>MATURITY CHECKLIST OPTIONS</p>
<p>COMPLIANCE LEVELS CHECKLIST (V7ed)</p>		<p>(Brief designation only. Refer to relevant specification paragraphs.)</p>
<p>Technical</p>	<p>Modelling & Mapping - PART 7 Semantic Precision</p>	<p>DICTIONARY&TYPING LEVEL - Identification, Specialization & Classification template signatures only.</p>
		<p>SHORT-CUT RELATIONS LEVEL - As Dictionary Level plus CoRwS or other (eg <i>Gellish</i>) "Short-Cut" template signatures.</p>
		<p>FULL ONTOLOGY LEVEL - Any / all valid template signatures supported.</p>
	<p>Implementation- Representation Technology</p>	<p>Implicit / document / formatted / tabular / spreadsheet / non-XML schema.</p>
		<p>Explicit Proprietary XML Schema</p>
		<p>RDL Registered XML Schema</p>
		<p>PART 8 RDF/OWL Representation</p>
	<p>Implementation – Referencing Technology</p>	<p>RD URI's resolved and copies self-contained in schema representation.</p>
		<p>Dependency on RD Item URI's being resolvable in shared RDL</p>
	<p>Implementation – Interface Technology</p>	<p>File Exchange only</p>
		<p>Specific API or Query other than Part 9 / SPARQL</p>
		<p>PART 9 SPARQL Façade</p>

COMPLIANCE - Business Capability

Business	Industrial Standardization Level	Sandbox Level (Community or individual organization with no externally certified management.)
		Industry Level (Global certifying authority other than PCA/JORD)
		PCA/JORD Level
		ISO Level
	Domain / Payload Subject-Matter Scope	Explicit Scope (Per Business Interfaces Definition Guide or Handover Guide or otherwise declared interface or use-case scope. " <i>Data set for a purpose</i> ")
	Change Management Meta-Data Scope	Identity - all data elements & sets identifiable / explicitly addressable
		Version - identification of succeeding / superceding versions of data elements & sets explicit
		Status - business status (<i>including quality, validity, revisioning, etc</i>) explicitly associated with each identified & versioned data element & set.
	Change Management Functional Capability or "interface contract"	Export - Component interface publishes or permits read / query of internal content
		Import - Component interface accepts write to internal content, or reads external content.
		Seed - Component populates empty instance with imported content losslessly
		Consolidate - Component populates existing instance with new imported content losslessly, correctly handling versions and consolidating duplicates.
Reconcile - Component maintains reconciliation of external identifiers when updating existing instance internally.		

Summary & Conclusions

- ISO15926 is highly generic and flexible basis for integration and interoperability between businesses and systems
- ISO15926 exploits W3C standard semantic web technologies (eg RDF/OWL and SPARQL), even though major aspects of the standard are entirely technology neutral
- Compliance in the real capital assets & projects world needs to consider a wide range of business and content issues beyond the technology
- However using the semantic technologies not only enables the web distributed / federated reference data approach to interoperability & integration It greatly enhances the possibilities for rigorous compliance validation.
(& JORD aims to deliver that capability in the PCA RDS)