Report on ISO/TC 184/SC 4

W3C/WoT meetings, 28th June, 2021

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Chairman, International Standards Committee/ENAA
(Mitsubishi Heavy Industries, Ltd.)

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ISO/TC 184/SC 4 structure

ISO/TC 184/SC 4	Title	Convenor
AG 0	Change management advisory group	Kenneth Swope
AG 2	Implementation Forum	Paul van Exel
PPC	Policy & planning committee	Kenneth Swope
QC	Quality committee	Hikmet Hussain
AHG 1	Core industry data set of terms	Nils Sandsmark
AHG 2	Nuclear digital ecosystem specification	Christophe Mouton
WG 3	Oil, gas, process, and power	Paul van Exel
WG 8	Manufacturing process and management information TC 184/SC4 –TC 184/SC5	Anne-Françoise Cutting-Decelle
WG 11	Implementation methods and conformance	David Loffredo
WG 12	STEP product modeling and resources	Keith Hunten
WG 13	Industrial data quality	Tim King
WG 15	Digital manufacturing	Martin Hardwick
WG 21	SMRL validation team	Keith Hunten
WG 22	Reference data validation team	Nils Sandsmark
WG 23	Vocabulary validation team	Tim King
JWG 16	Joint ISO/TC 184/SC 4 - ISO/IEC JTC 1/SC 24 - ISO/TC 171/SC 2 WG: Formats for visualization and other derived forms of product data	Soonhung Han
JWG 24	Joint ISO/TC 184/SC 4 - IEC SC3D WG: Use of IEC CDD for ISO data dictionaries and ontologies	Hiroshi Murayama

ISO/TC 184/SC 4 structure

774

PUBLISHED ISO STANDARDS *

under the direct responsibility of ISO/TC 184/SC 4

39

ISO STANDARDS UNDER DEVELOPMENT *

under the direct responsibility of ISO/TC 184/SC 4

18

PARTICIPATING MEMBERS

14

OBSERVING MEMBERS

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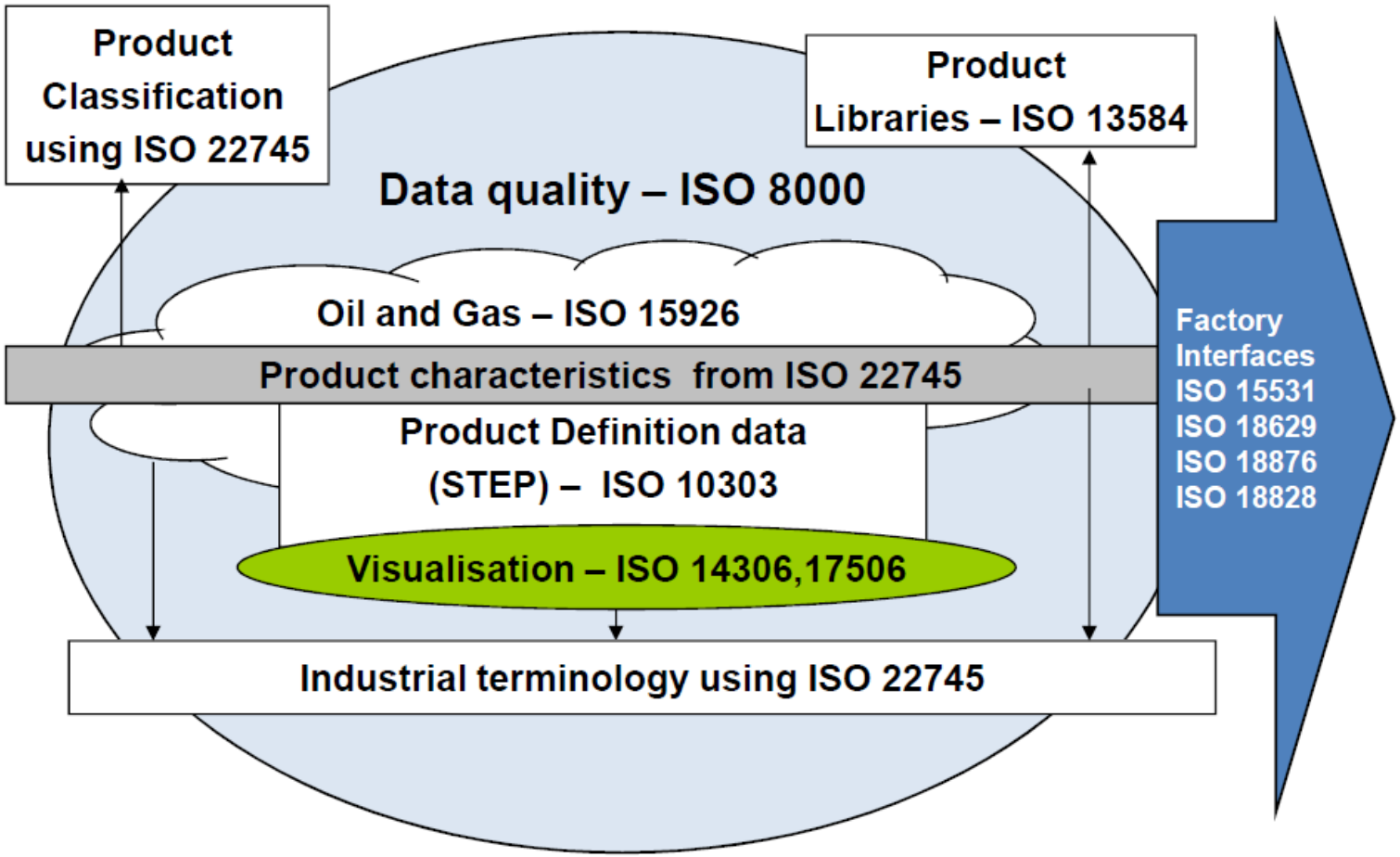
ISO/TC 184/SC 4 structure



Living Lab: Jira & Git hosted by ISO
Living Lab: URL mapping on iso.standards.org
STEP Extended Architecture

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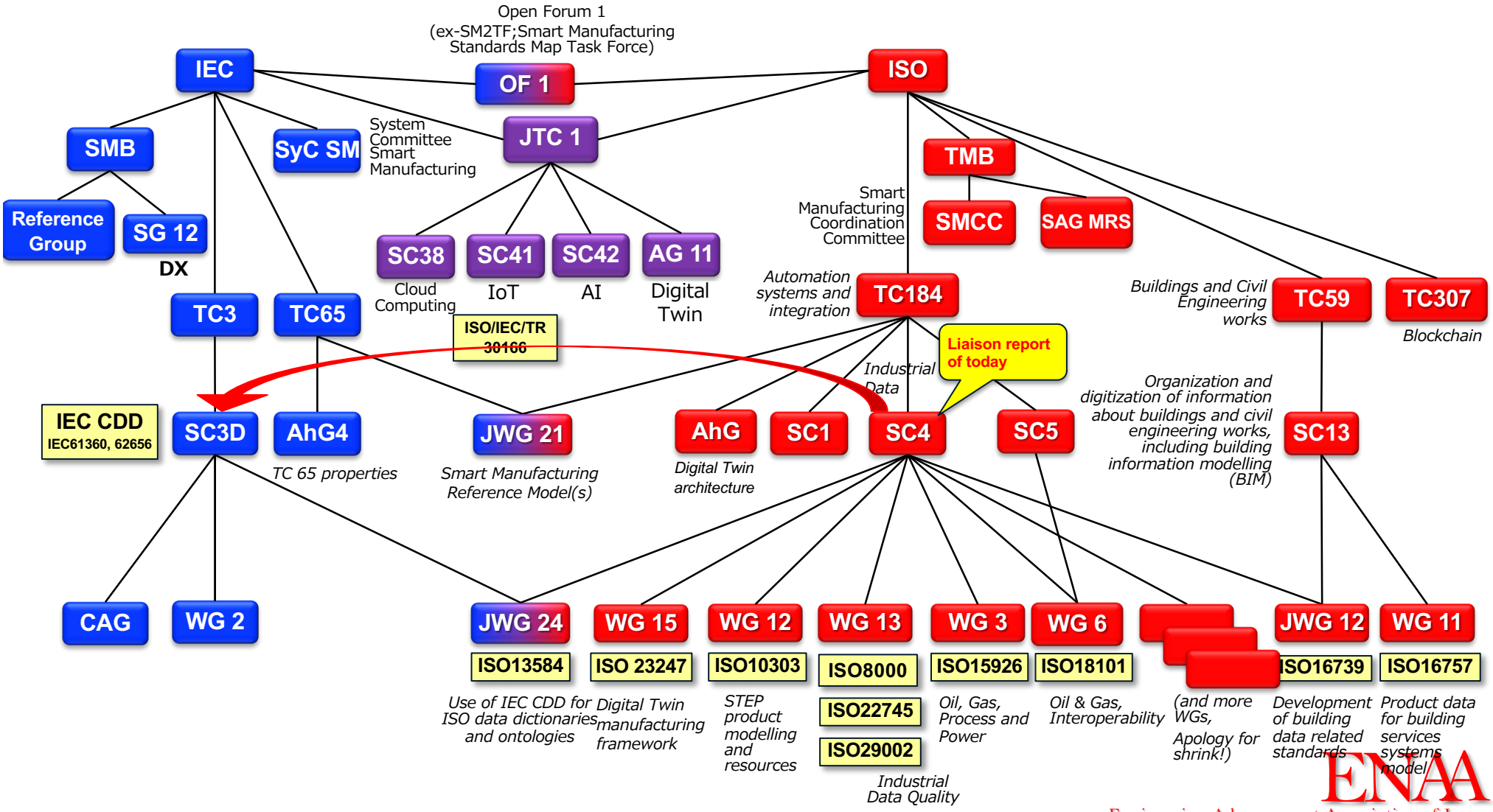
ISO/TC 184/SC 4 and IEC SC 3D

(in terms of DX, SM, Digital Twin, IoT)



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WG 3

WG 3 : Interoperability for product life cycle data

13 *Published*

4 *Under development (New/Revise)*

TC 184/SC 4/WG 3

Oil, gas, process, and power

Formal scope:

Develop and maintain ISO 15926: *Industrial automation systems and integration—Integration of life-cycle data for process plants including oil and gas production facilities*

Develop and maintain guidance for the implementation and use of ISO 15926

Establish liaison with other standards activities working on relevant information models and reference data

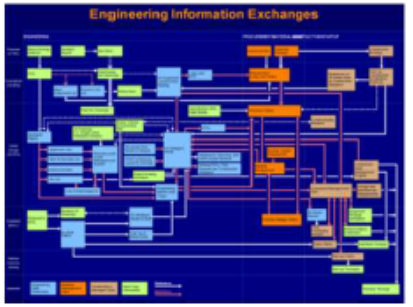
Long term objectives:

Interoperability of data and documents across the process industry plant engineering supply chain.

Data and information of plants and installations in the process industries to be complete, correct and consistent.

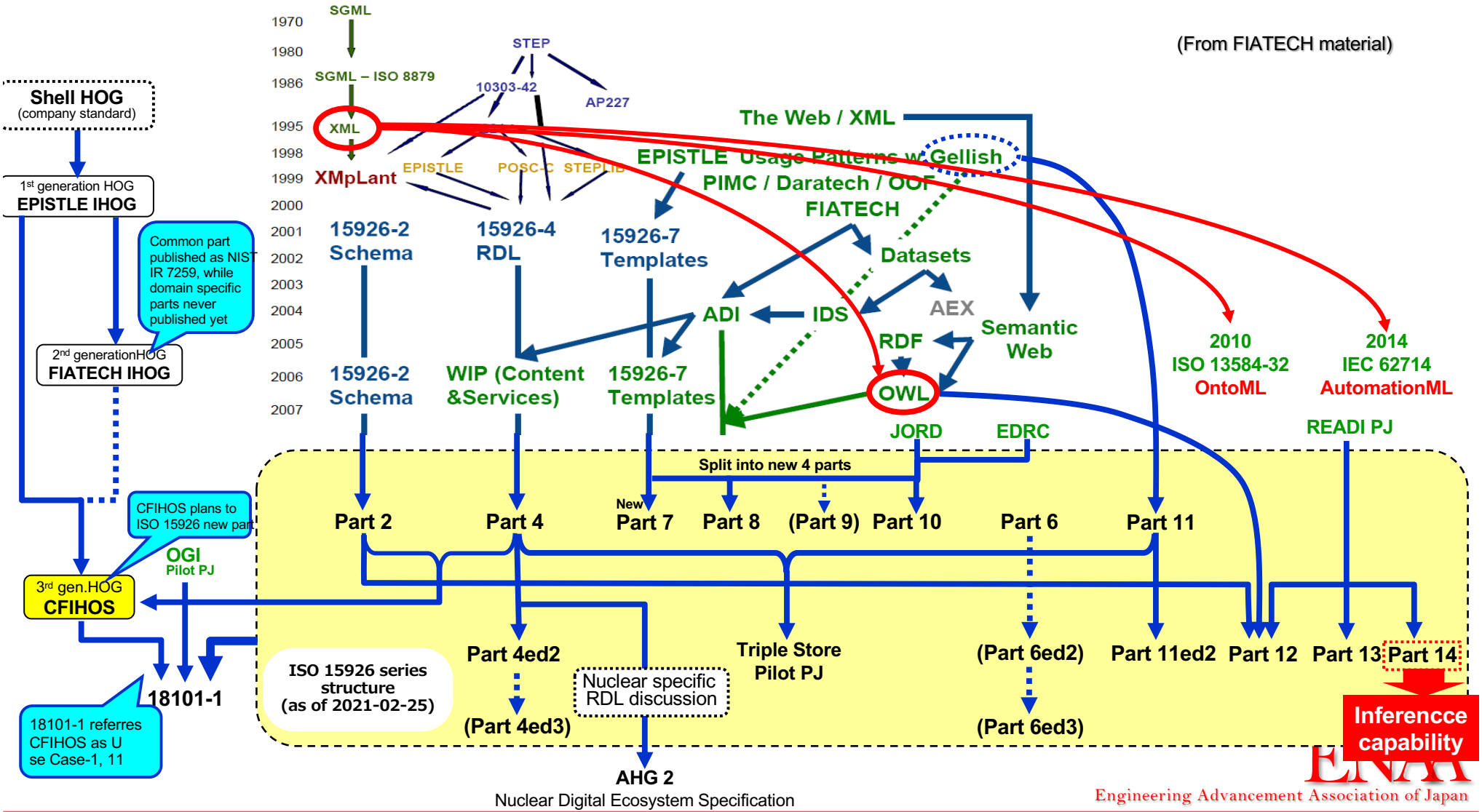
Define and capture the WG 3/22 knowledge base in a framework and achieve global consensus to have critical mass and focus.

Leave a useful legacy for the experts of the next generation.



WG 3

Provenance of ISO 15926 series



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※ IHOG ; Information Handover guide

WG 3

ISO 15926 series

Part	Type	2016				2017				2018				2019				2020				2021			
	TS/IS	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1	IS													SR											
2	IS												SR												
3	TS																								
3ed2	TS																								
4ed2	TS								NP								PU								
4ed3	TS	Running project																	NP						
4ed4	TS	Planned																							
6	TS				SR																				
6e2	IS	Running project																					NP		
7	TS								SR																
8	TS								SR																
9	TS	Planned																							
10	TS				CD							DIS		PU											
11	TS										SR														
11ed2	NP	Running project																							
12	TS		CD					DI				PU													
13	TS		CD					DI				PU													
14	TR																			PU					
10x		Planned																							

PWI ; Preliminary Work Item, TO; Terms of Reference, NW; New Work Item, BA; Ballot, CD ; Committee Draft, DIS ; Draft International Standard, PUB ; Publication, SR; Systematic Review

WG 3

ISO 15926-4ed3

NEW PROJECT (Running)

ISO 15926-4ed3 “Initial reference data”

- NP approved 2020-06-05
- Publication 2022 May

・Major updates

- Extension of RDL (From 11000 to 20000 classes) based on CR 0006 by PCA, Norway
- Improved structure as agreed earlier in WG 3/22
- Work on spread-sheets is continuing by Onno Paap

・Key issues

- MT/VT have not worked since 2012.
- Need to re-establish of SC 4/MT, VT for “SC 4 reference data” along with SC 4/Annex ST
- Also need corporation with ISO 15926-6ed2 project team lead by Japan for consistency
  (P4 is RDL, and P6 is for validation rules for extension of P4 RDL)

WG 3

ISO 15926 series

NEW PROJECT (Planned)

ISO 15926-6e2 “Methodology for the development and validation of reference data”

- NP submission 2021 Q2 (81st plenary)
- Publication 2023 Q1

・Background

- NP for P6e2 was approve in 2015-01
- Failed resolution for a variety of technical reasons and project was canceled
- Issues; Including new RDLs in the scope other than P4 RDL and adopting OWL.
- WG 3 agreed to split document, and restart new P6e2 project.

・Discussion points

- Scope should be limited to ISO 15926-4 maintenance
  - ✓Not other parts of ISO 15926, not proprietary libraries, not **any** reference data library
  - ✓Put the valuable theory on those libraries in a separate knowledge document
  - ✓Add to “not in scope” language versions by National Bodies
- OWL representation of rules tables to be done after an agreement on of P6e2 scope
  - ✓Metadata to be clearly defined as per other international standards and in line with ISO 15926
  - ✓All fields of the spreadsheet representation table to have foundation in ISO 15926-2
  - ✓Content: inconsistency between P4e2 and P6e2
  - ✓Logging of source of class name and definition
  - ✓How to keep consistency between the sources referred and the definitions in class definitions

WG 13

WG 13 : Industrial Data Quality

17 *Published*

10 *Under development (New/Revise)*

TC 184/SC 4/WG 13

Industrial data quality

Scope of WG 13

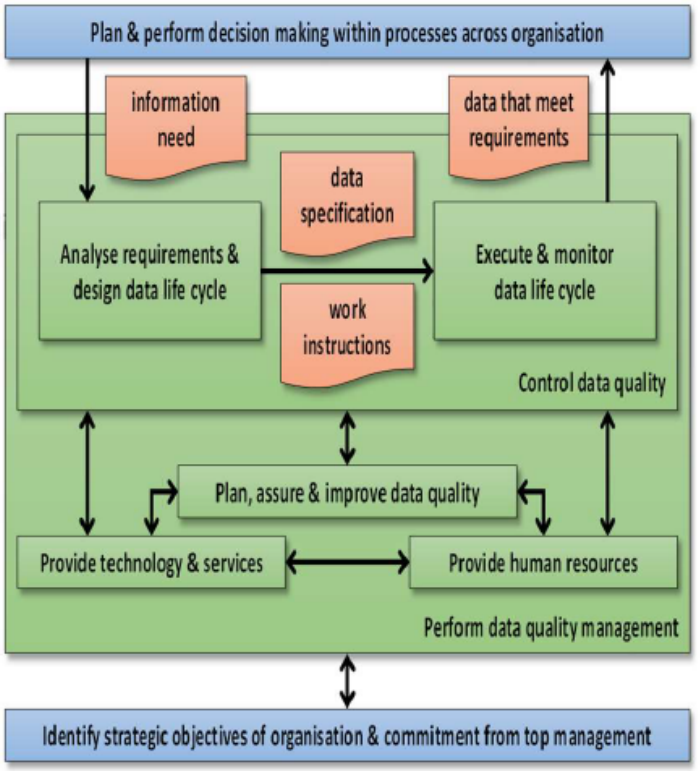
- systematic & systemic data quality management
- exchange of master data
- fundamentals of measuring data quality, including verification & val
- quality of specific types of engineering data

Active work

- data quality management maturity assessment
- data governance

Connection to Smart Manufacturing

- all decisions are based on data
- increasing data volumes from IoT & other technologies



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WG 13

ISO 8000 series

Part	Cat.	Status	Publish	Development Stage	Title
General aspects of data quality					
1	TS		2011/12		Overview
1ed2	TS			NP ballot closed on 2020/9/8, not approved	
2ed4	IS		2020/6/8	ed4(icld.CR7&8) published	Vocabulary
3	canceled				(taxonomy)
8	IS		2015/11		Information and data quality: Concepts and measuring
Data governance					
51	IS	AWI		approved on 2019/8/22	Exchange of data policy statements
Data quality management					
60	TS		2017/10/13		Overview
61	IS		2016/11/17		Process reference model
62	IS		2018/9/12		Organizational process maturity assessment: Application of standards relating to process assessment
63	IS		2019/12/18		Process measurement
64	IS	CD		CD approved on 2020/12/26	Organizational process maturity assessment: Application of the Test Process Improvement method
65	TS		2020/6/25		Process measurement questionnaire
66	IS	DIS		DIS registered on 2020/11/30	Assessment indicators for data processing in manufacturing operations
150	TS		2011/12/7		Quality management framework
150ed2	TS	CD		CD ballot will be closed on 2021/2/12	Roles and responsibilities
Data quality assessment					
81	TS	PRF		Registered for for formal approval on 2	Data profiling
82	TS	DTS		CD ballot started on 2020/12/12	Creating data rules

WG 13
ISO 8000 series

Part	Cat.	Status	Publish	Development Stage	Title
Quality of master data					
100	IS		2016/10		Exchange of characteristic data: Overview
100ed2	IS			NP ballot closed on 2020/5/27	Exchange of characteristic data: Overview
110	IS		2009/11		Exchange of characteristic data: Syntax, semantic encoding, and conformance to data specification
110ed2	IS			DIS ballot closed on 2020/7/22	
115	IS		2018/04		Exchange of quality identifiers: Syntactic, semantic and resolution requirements
116	IS		2019/9/2		Application of ISO 8000-115 to the formatting of Authoritative Legal Entity Identifiers (ALEI) for individuals and organizations
117	IS			NP ballot closed on 2020/9/8, not appr	Identifiers on blockchains
120	IS		2016/10		Exchange of characteristic data: Provenance
130	IS		2016/10		Exchange of characteristic data: Accuracy
140	IS		2016/10		Exchange of characteristic data: Completeness
Quality of industrial data					
311	TS		2012/4/12		Guidance for the application of product data quality for shape (PDQ-S)

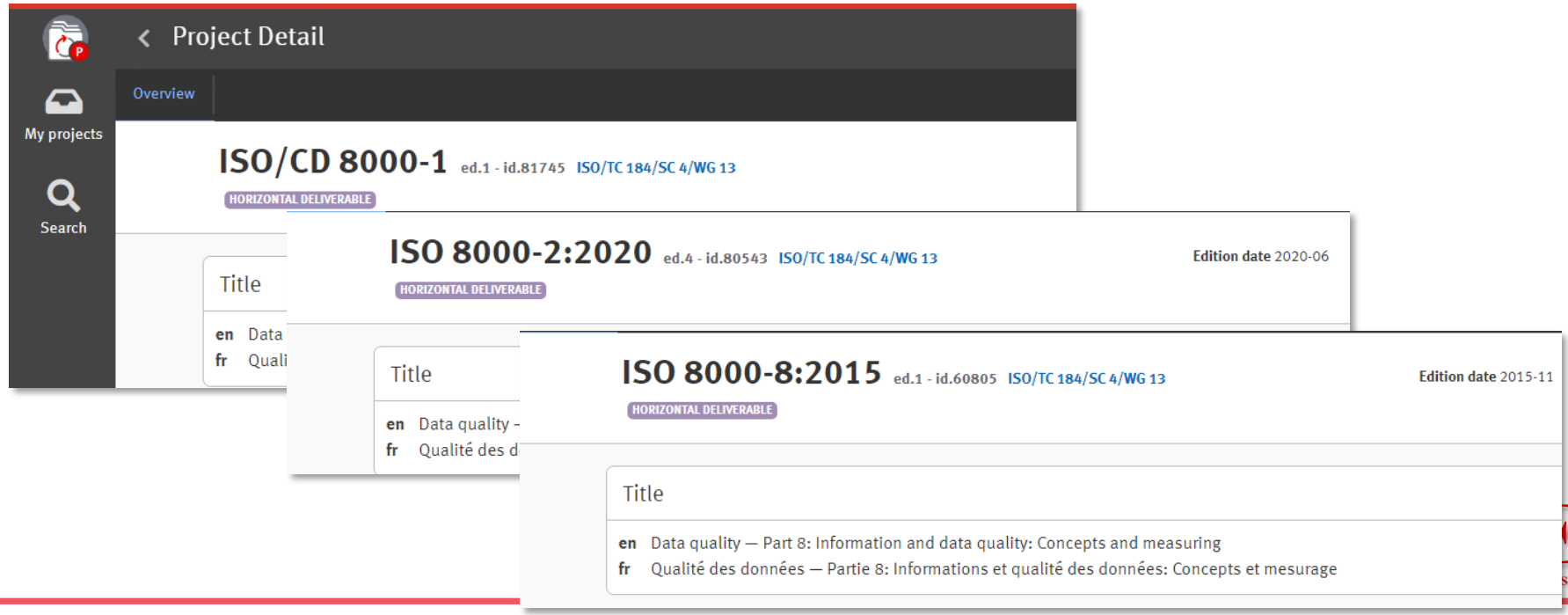
WG 13 ISO 8000 series

- Authorized as “**Horizontal deliverables**” (submitted on 2020-11-16)

Horizontal deliverable (definition is same with **IEC Guide 108** “Horizontal publication”)
Deliverable dealing with a subject relevant to a number of committees or sectors or of crucial importance to ensure coherence across standardization deliverables

NOTE 1 Horizontal deliverables may provide fundamental principles, concepts, graphical symbols, terminology or general characteristics.

NOTE 2 Some horizontal deliverables provide the foundations of workable, fair and responsible oversight of new innovative technologies.



ISO 8000-117

ISO 8000-117 Quality Blockchain

Data quality — Part 117: Master data: Exchange of quality identifiers: Application of ISO 8000-115 to Quality Blockchains

- **NP approved on 2020-09-08**
- **Scope**
  - terms related to quality blockchains
  - the syntax requirements for identifiers contained in a quality blockchain
  - the syntax, semantic encoding and encryption requirements of referenced data sets
- **Requirements for data sets** referenced by an identifier in a quality blockchain
  - a) The data set shall conform to a published syntax
  - b) The metadata and the reference data contained in the data shall be concept encoded using an open technical dictionary
  - c) The data set shall be encrypted
- **Requirements for an identifier** contained in a quality blockchain
  - a) An identifier contained in a quality identifier shall conform to **ISO 8000-115**
  - b) An identifier shall be associated with the **encryption key** required to decrypt the referenced data set

ISO 8000-117

- **Feature of this standard**
  - Using "**off-chain**" mechanism to secure large-scale industry data
- **Discussion with TC 307**
  - Patrick CURRY (liaison rep. from TC 307 to SC 4) joined WG 13 meeting on Feb.18, 2021
  - Active TCs on Blockchain technology in ISO
    - ✓ TC 68 - Financial services
    - ✓ JTC/1 - Information technology
  - TC 307 focus is privacy, security and
  - Especially for privacy topic, Joint Working Group was established with ISO/IEC JTC 1/SC 27 - Information security, cybersecurity and privacy protection
  - Recommendation to co-ordinate the work programmes (i.e. including SC 4).
  - Current debates around on-chain versus off-chain; How to avoid too much on chain.

ISO 8000-114

ISO 8000-114 Portable Data

Data quality — Part 114: Master data: Portable data: Application of ISO/IEC 10646, ISO/IEC 21778 and ISO 8000-115 to the exchange of master data

- **NP under preparation**
- **Scope**
  - The extension used to designate a file containing characteristic data formatted in accordance with this document.
  - the syntax of a characteristic data set
  - the character set encoding of the characteristic data,
  - the semantic encoding of the characteristic data
- **What is "Portable data" ?**
  - **"ECCMA/Q4 N 002 Portable data"** DRAFT STANDARD FOR TRIAL USE (DSTU)
  - **Portable data** – information that is encoded in a form that can be stored and exchanged without loss of meaning, which require a filename, character encoding, a syntax and explicit semantic encoding by;
  - **Concept dictionary (**referenceable concept by a unique identifier, like IEC CDD) and **Concept encoding (**process of replacing metadata or reference data with identifiers from a concept dictionary)

ISO/IEC 10646 Information technology — Universal Coded Character Set (UCS)
ISO/IEC 21778 Information technology — The JSON data interchange syntax
ISO 8000-115 Data quality — Part 115: Master data: Exchange of quality identifiers: Syntactic, semantic and resolution requirements

ISO 8000-114

Structured data format shall be

- ”standard data format” (.sdf)
- ”UTF-8” character encoding
- formatted by JSON (ISO/IEC 21778:2017)
- ”concept encoded” with ISO 8000-115
  (Dictionary concept identifier is also formatted with ISO 8000-115)

Then machines can exchange data with meaning without human intervention.

Dictionary concept identifier example 1:

Legal owner short name	ECCMA
Concept dictionary short name	eOTD
Identifier	01-068756
Dictionary concept identifier	**ECCMA.eOTD:01-068756#1**

Dictionary concept identifier example 1:

Legal owner short name	IEC
Concept dictionary short name	CDD
Identifier	0112/2///61360_4#AAA002#002
Dictionary concept identifier	**IEC.CDD: 0112/2///61360_4#AAA002#002**

JSON without Concept encoding

Not portable

```
{
  "PARTY":{
    "LEGAL NAME":"CODE MANAGEMENT ASSOCIATION",
    "TRADE NAME(S) (DBA)":"ECCMA, ELECTRONIC COMMERCE CODE MANAGEMENT ASSOCIATION",
    "DATE OF FORMATION":"1999-04-20",
    "COUNTRY OF INCORPORATION":"USA",
    "STATE OF INCORPORATION":"DELAWARE"
  }
}
```

ECCMA-4 Portable data (JSON with eOTD concept identifiers only)

Portable

```
{
  "PARTY":{
    "ECCMA.eOTD:02-159235 [LEGAL NAME]":"CODE MANAGEMENT ASSOCIATION",
    "ECCMA.eOTD:02-160660 [TRADE NAME(S) (DBA)]":"ECCMA, ELECTRONIC COMMERCE CODE MANAGEMENT ASSOCIA-
  TION",
    "ECCMA.eOTD:02-162606 [DATE OF FORMATION]":"1999-04-20",
    "ECCMA.eOTD:02-162879 [COUNTRY OF INCORPORATION]":"ECCMA.eOTD:07-374528 [USA]",
    "ECCMA.eOTD:02-159237 [STATE OF INCORPORATION]":"ECCMA.eOTD:07-374795 [DELAWARE]"
  }
}
```

Reference: ECCMA(DSTU) /Q4 N 002

AHG 2

AHG 2 Nuclear digital ecosystem specification

AHG 2

- **Established at 78th SC 4 meeting (Marina Del Rey, US) on Nov. 2019.**
  Resolution "S" to draft **NWI Nuclear Digital Ecosystem(NDE) Specification**
  - Korea team had proposed "**Nuclear RDL**" since 2013.
  - MBs agreed to develop Nuclear Power specification as TR.
- **Tasks**
  - Define final purpose and scope of the NWI TR for a Nuclear Digital Ecosystem
  - Document the state of the art of standardization of information management of nuclear installations over their life cycle.
  - Do a survey among the nuclear stakeholders about their interests on NDE.
  - Define the business case with use cases of developing and adopting such information standards.
  - Draft the NWI TR documentation before the next meeting in May 2020
    ➡ extended until May, 2021, next SC 4 plenary
- **Outcomes**
  - A half more year extension until 81st SC 4 plenary, May 2021, for NP/TR
  - 28th meeting held on Feb. 25, 2018
  - Survey reports from each MB on Nuclear digital ecosystem activities (GB, JP, KR, NL, FR)

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JWG 24 : IEC CDD for ISO data dictionaries and ontology

JWG 24

Tasks

- Resume of ISO DB procedure as Committee Specific (based on IEC Annex SL)
- Registration of ISO ontology dictionaries (e.g., ISO 15926-4 RDL)
- Development/Maintenance of ISO 13584 series
- OpenCDD PJ

・Outcomes

- "Committee Specific Procedure" CIB closed on 2021-01-01,
- 8-Yes ()/ 4-No / 6-Abs
- Comments arose mainly because of confusion on the term "IEC CDD".

・What does "CDD" now stands for ?

- CDD as DB-based standardization process
  CSP for ISO data dictionaries convertible to CDD by TC184/SC4/JWG24.
  (Based on ISO/IEC Directives – Part 1, IEC Supplementary Annex SL)
- CDD as contents (domains)
  IEC 61360-4, and IEC 61987-11 , IEC 62720, IEC IEC61382.,…
  There will be also ISO 13584-501, ISO13584-511,…
- CDD as container
  Container for database based standards (listed above) is also identified as IEC 61360-4 DB

JWG 24 : OpenCDD pilot project (1/3)

What is OpenCDD?

- OpenCDD is **a pilot project** driven by experts from TC184/SC4/JWG24.
- OpenCDD is **not a replacement** of current IEC CDD, but multiply and maximize its capability for our society.
- OpenCDD as a **CDD kernel** based on Open Source technologies, not on proprietary or closed source codes, to achieve reliable, scalable and sustainable dictionary service.
- OpenCDD as a **container** for wide range of ontology models and dictionaries based on IEC 61360 and IEC 62656(POM) (which partially implemented as current IEC CDD)
- OpenCDD as a **reference implementation**, which can be used by any organizations, e.g., IEC itself, eCl@ss, etc., who wish to provide similar services internally and externally.

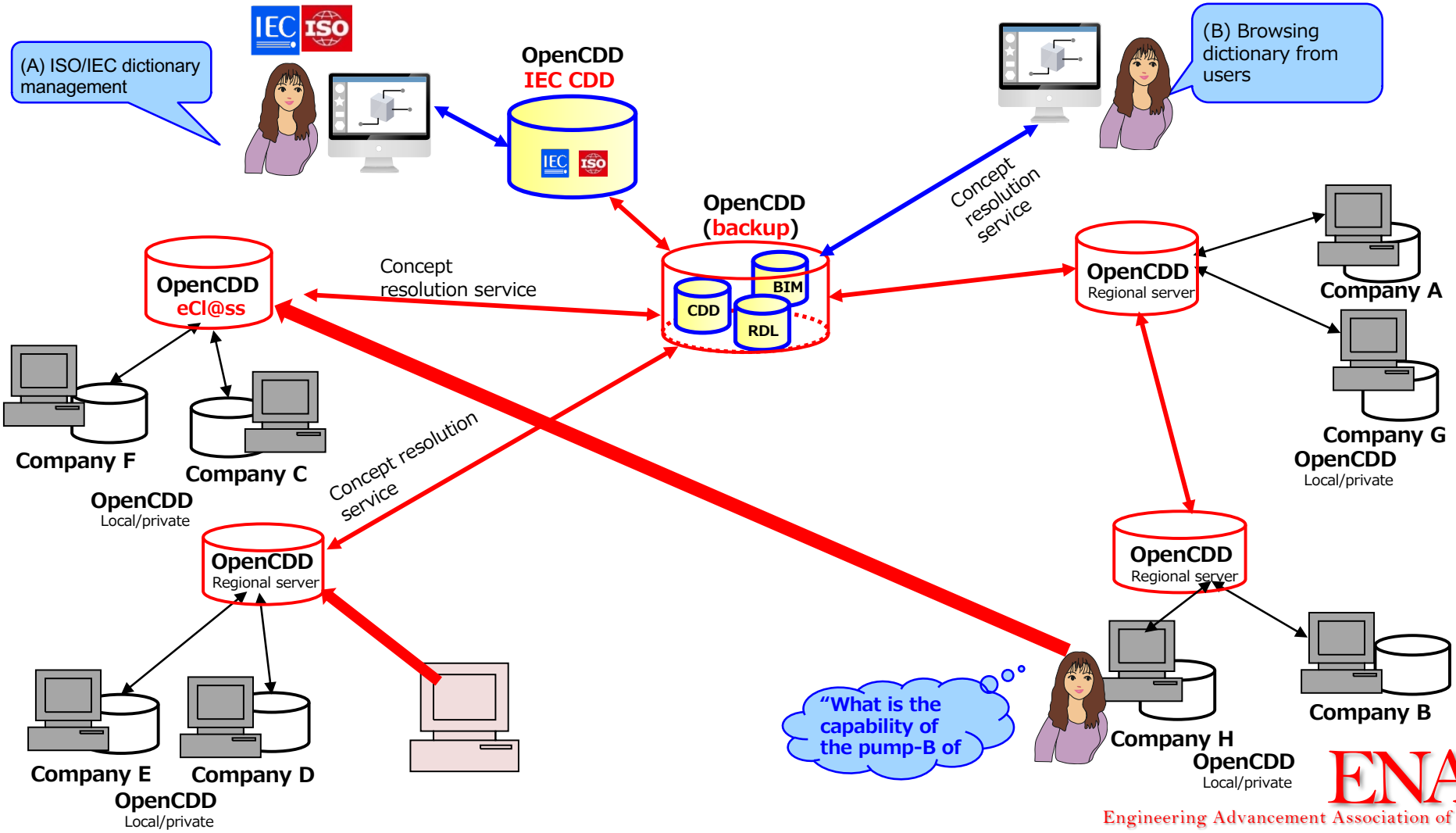
Market needs

- A variety of industries are trying to achieve DX by semantic interoperability with machine readable standards.
- Rise of cutting-edge technologies, e.g., Semantic Web, Ontology, Blockchains, requires easily referenceable, reliable and distributed dictionary service for their foundations based on global consensus.
- Many of trials are now facing the issue of silos. (Apparently open, but truth is closed.)
- Such a dictionary service should support a variety of ontology models.

JWG 24

JWG 24 : OpenCDD pilot project (2/3)

(The distributed structure below is just one example to show flexibility of OpenCDD, and does no intend to specify any fixed structure)



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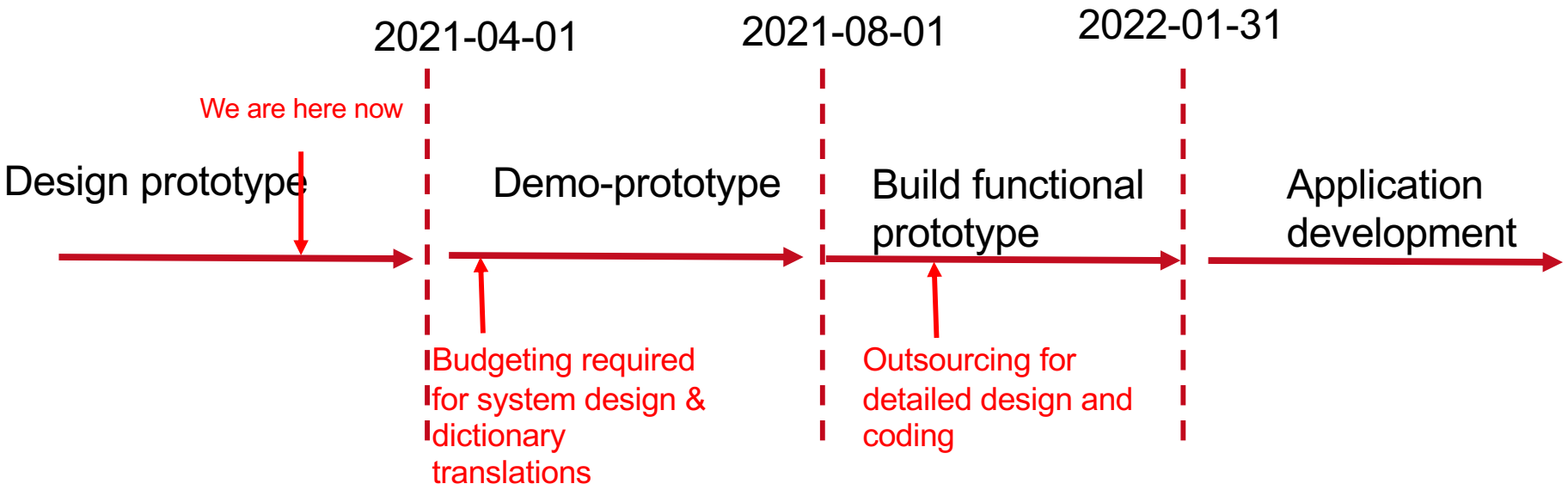
JWG 24 : OpenCDD pilot project (3/3)

Current status

- The project has been dormant for a little while, but restarted late last year(2020).
- Some companies and communities are interested in the pilot.
- Seeking funds to move project forward.



Thank you

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