DATAWEEK

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IoT and Digital Twins with Data Spaces in ISO SC41

Antonio Kung, Trialog

EUHUBS4DATA

BDV BIG DATA VALUE ASSOCIATION

Speaker

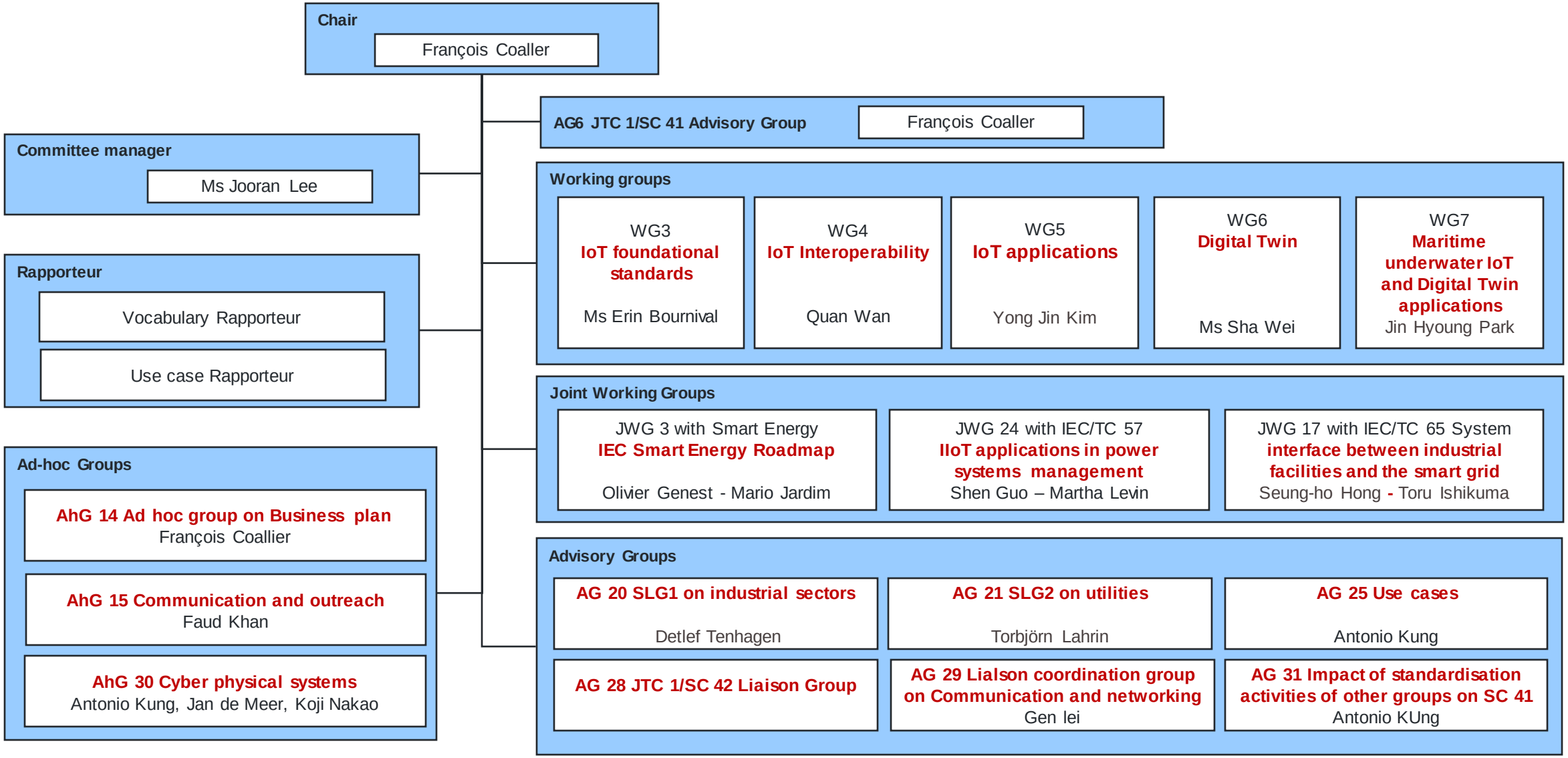
- CEO Trialog – IoT systems
  - Smart meters
  - Vehicle charging
  - Connected vehicles
  - Health
- Involved in
  - AIOTI
  - BDVA
- Involved in
  - ISO/IEC
  - ISO
  - ITU-T
  - CEN-CENELEC
- Standardisation topics
  - Architecture
  - IoT, Digital twin, AI
  - Security and Privacy

- AG8 - Meta Reference Architecture
  - **Best practices and guidance for reference architectures (RA)**
- SC27 and PC317 – Security and privacy
  - 27091 AI systems - Privacy protection (WD)
  - 27115 Cybersecurity evaluation of complex systems (NP)
  - 27550 Privacy engineering
  - 27556 Privacy preference management
  - 27561 POMME – Privacy operationalisation (DIS)
  - 27563 Security and privacy in AI use cases (under publication)
  - **27568 Security and privacy of digital twins**
  - 27570 Privacy guidelines for smart cities
  - 31700 Privacy-by-design for consumer goods and services
- SC41 - Internet of things, digital twins
  - 21823 Interoperability
  - 30141 IoT reference architecture (DIS)
  - 30149 IoT trustworthiness principles (CD)
  - **30188 Digital twin reference architecture**
  - **Integration of IoT and digital twin in data spaces (report)**
- SC42 AI
  - 5392 Knowledge engineering reference architecture (DIS)
- TC215 Health informatics
  - Application of AI Technologies in Health Informatics (Ahg2 report)
- TC22 Automotive
  - 21434 Road vehicle cybersecurity engineering
  - 5112 Guidelines for auditing cybersecurity engineering

ISO/IEC JTC 1/SC 41 Internet of Things

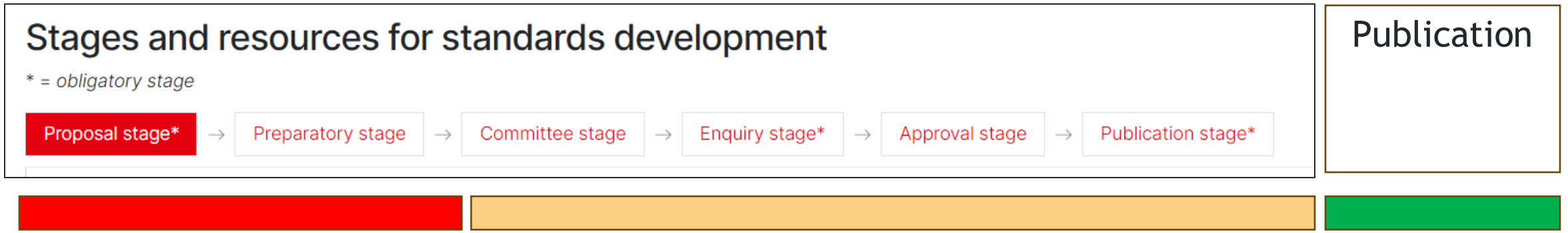
- History (https://jtc1info.org/sd-2-history/jtc1-subcommittees/sc-41/)
  - November 2016
    - Creation of SC41: IoT and related technologies
  - November 2020
    - Adding Digital Twins in the scope
- Scope (https://www.iec.ch/dyn/www/f?p=103:7:16160045003496:::FSP_ORG_ID,FSP_LANG_ID:20486,25)
  - Standardization in the area of Internet of Things and Digital Twin, including their related technologies.
    - Serve as the focus and proponent for JTC 1's standardization programme on the Internet of Things and Digital Twin, including their related technologies.
    - Provide guidance to JTC 1, IEC, ISO and other entities developing Internet of Things and Digital Twin related applications.

ISO/IEC JTC 1/SC 41 structure

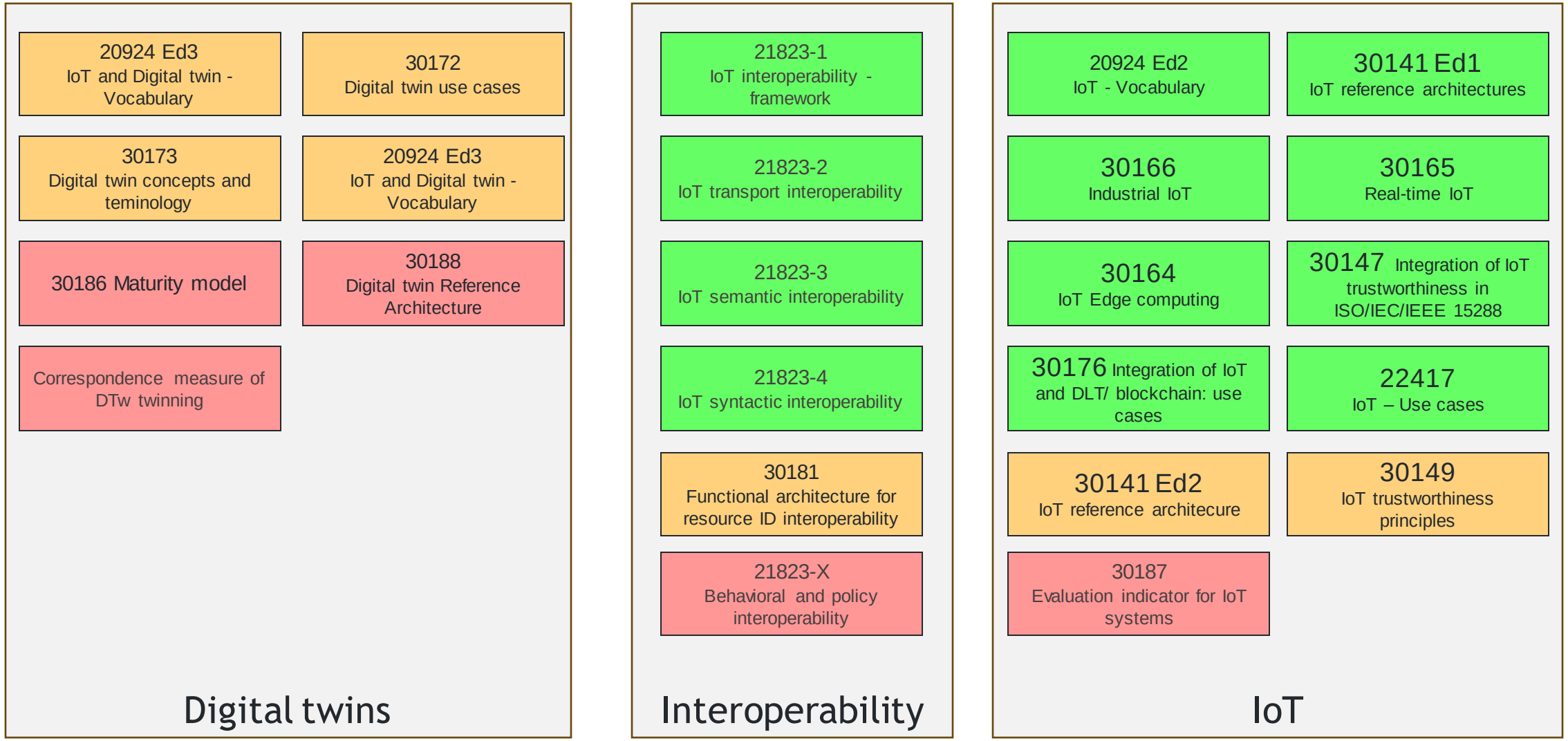


Standards lifecycle and conventions

- Conventions
  - Green = published
  - Orange >= CD
  - Red < CD)



SC41 landscape (partial)



ISO/IEC JTC 1/SC 41/WG 6 Digital Twin
Current projects

- 30173 Digital Twin - Concepts and terminology
- DTR 30172 Digital Twin - Use cases
- 30186 Maturity model and guidance for a maturity assessment
- 30188 Digital Twin - Reference Architecture
- PWI Guidance for IoT and Digital Twin use cases (2023-11)
- PWI Correspondence measure of DTw twinning (2025-06)

DTR Draft Technical Report PWI Preliminary Work Item

SC 41/AG31 Work on digital twin/data space report

- Guidance on the integration of IoT and digital twins in data spaces

5 Introduction on data spaces 4
5.1 Stakeholders .....
5.2 Principles for data spaces .....
5.2.1 General .....
5.2.2 Principle 1: data spaces are ecosystems of systems .....
5.2.3 Principle 2: data usage require provisioning from connecting devices .....
5.2.4 Principle 3: data spaces support data lifecycle .....
5.2.5 Principle 4: data interoperability is enabled by a common language .....
5.2.6 Principle 5: data usage is enabled by common data models .....
5.2.7 Principle 6: data curation .....
5.2.8 Principle 7: trust in data sharing .....
5.2.9 Principle 8: governance for ethical usage of data .....
5.2.10 Principle 9: Decentralisation .....
5.2.11 Principle 10: Integrated data management .....
5.2.12 Principle 11: Extensible data spaces .....
5.2.13 Principle 12: User-centricity .....
5.3 Lifecycle in data spaces .....
5.3.1 Component extraction and decoupling .....
5.3.2 Public listing .....
5.3.3 Data pricing .....
5.3.4 Transaction aggregation .....
5.3.5 Delivery and settlement .....
5.3.6 Transaction evaluation .....
5.3.7 Distribution of proceeds .....

6 Integrating IoT systems in data space ecosystems 7
6.1 IoT systems 7
6.2 Considerations for integration 8
6.2.1 General concerns 8
6.2.2 Data provenance and trustworthiness 10

7 Integration of digital twins in data space ecosystems 10
7.1 Digital twins 10
7.2 Using digital twins in application and trading 11
7.2.1 Data managed by digital twins 11
7.2.2 Data ownership stakeholders 13
7.2.3 Data owners and data users 13
7.2.4 Value creation by stakeholders 14
7.2.5 Trustworthiness 14

8 Recommendations 15

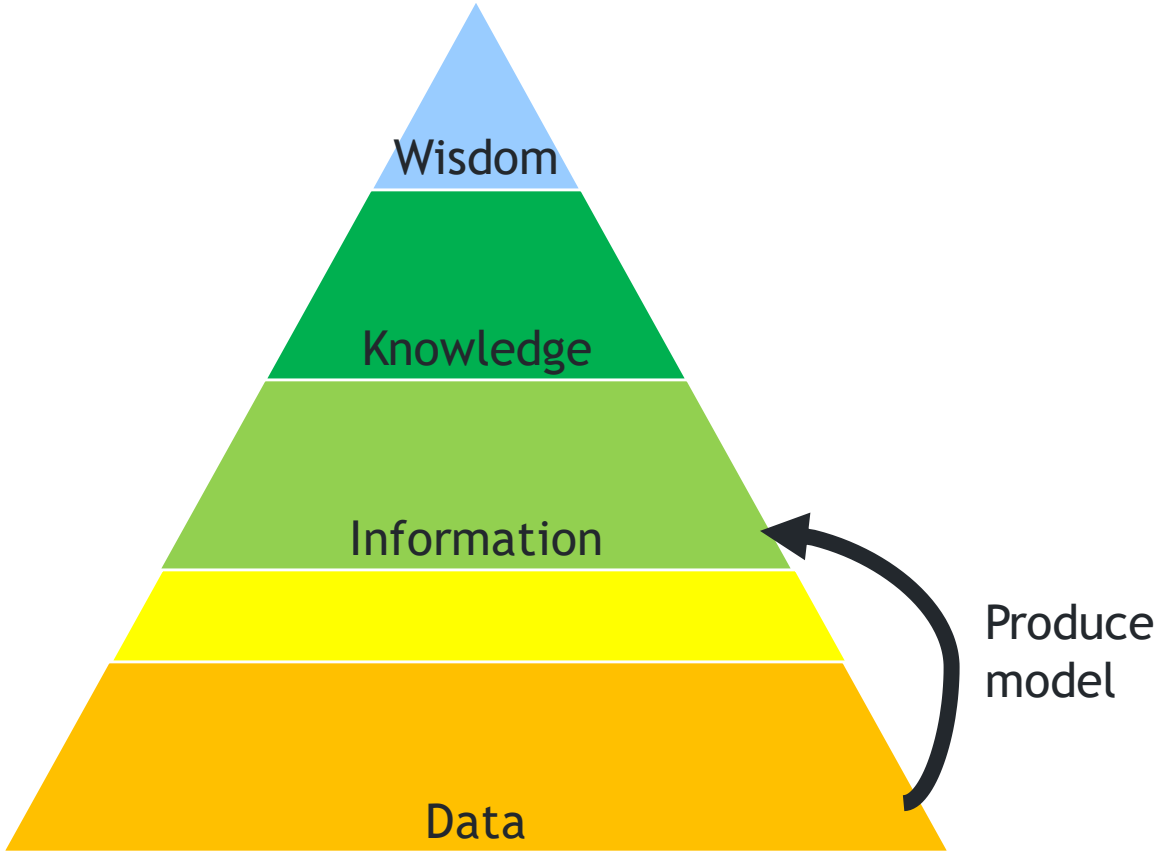
Annex A Architecture and use case example 16
A.1 Introduction 16
A.2 Reference architecture example 16
A.3 Energy use case example 17
A.4 Data space usage example 19

Bibliography 20

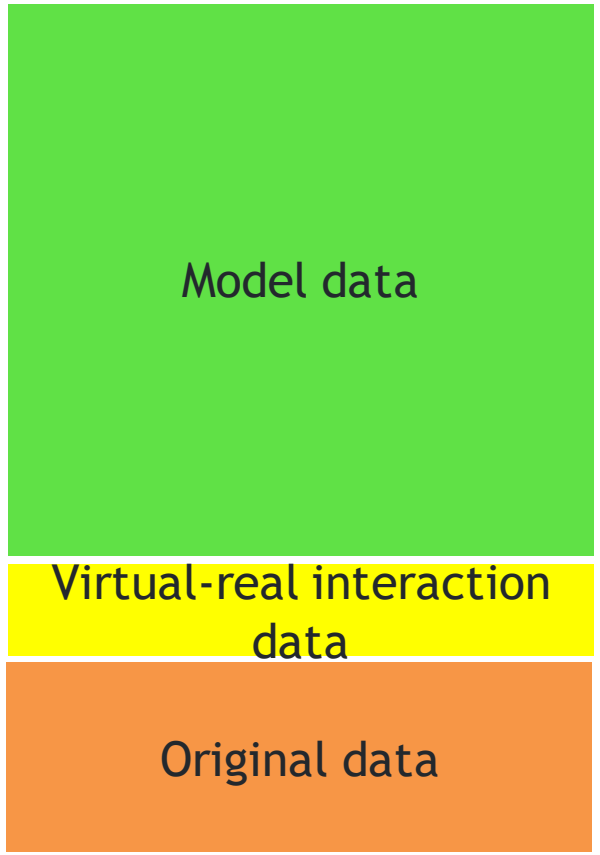
DIKW (Data Information Knowledge Wisdom)

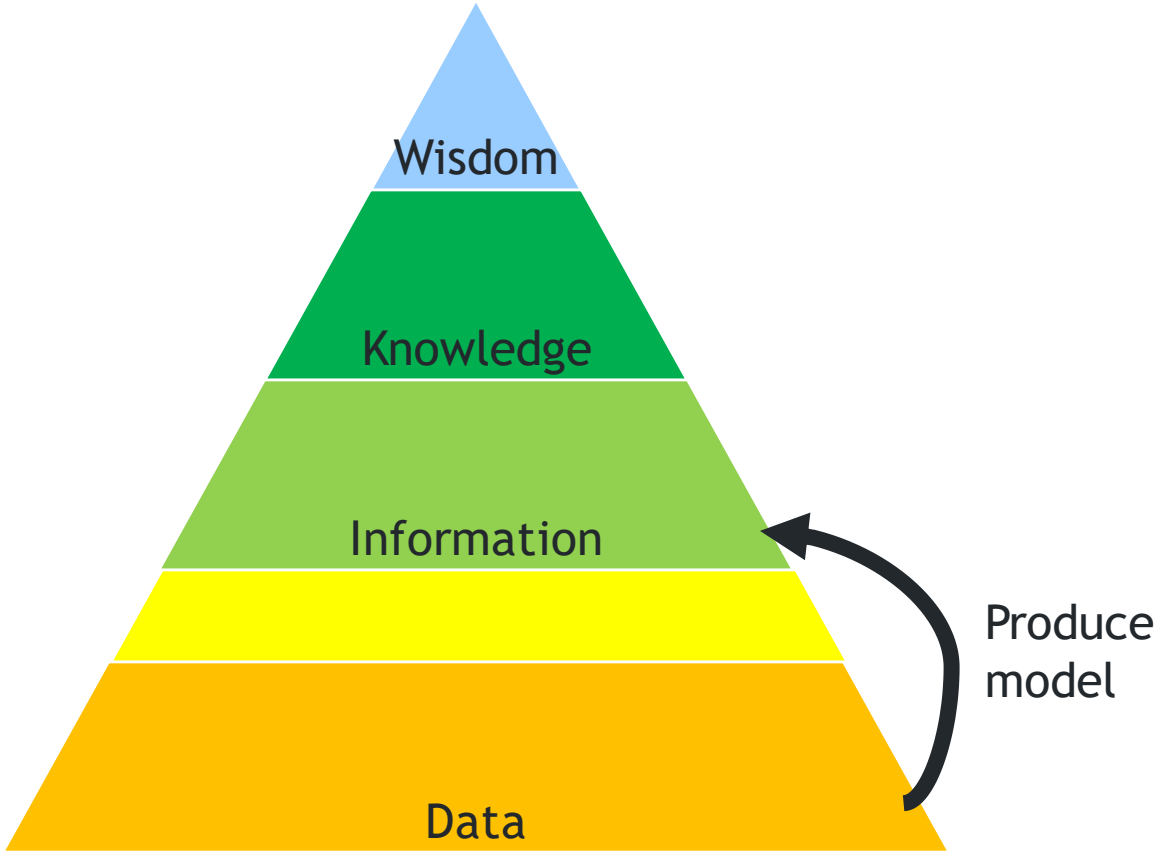
Produce model

ISO/IEC/IEEE 24641:2023
Methods and tools for model-based systems and software engineering (MBSE)



DIKW and Digital Twins





SC 41/WG4 Policy and Behavioral interoperability

- Guidance on the integration of IoT and digital twins in data spaces

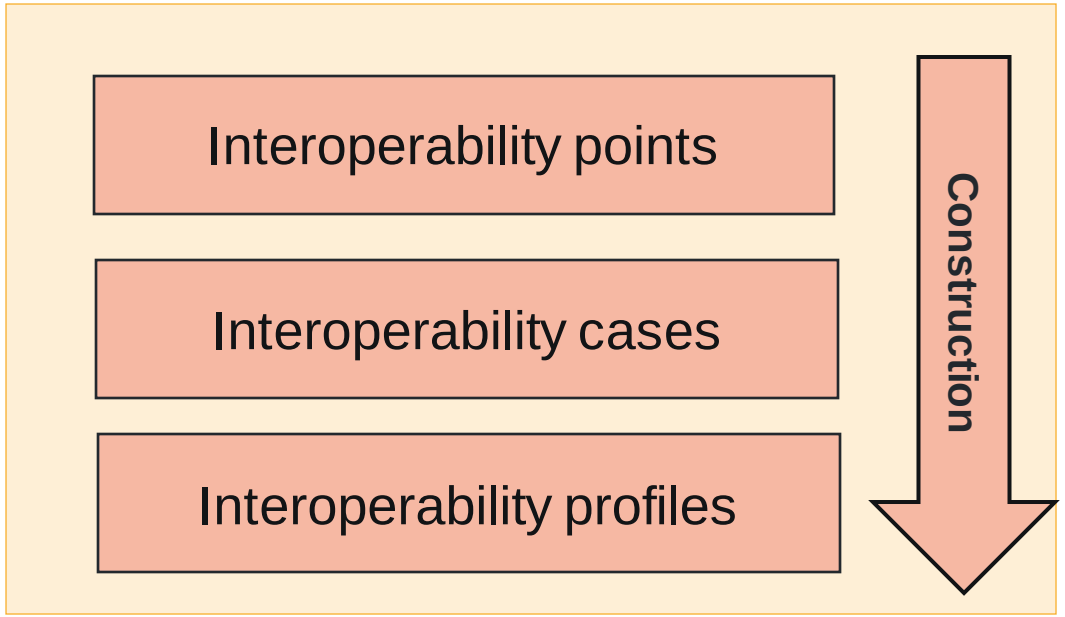
Contents

1 Scope of PWI 2
2 Normative references 2
3 Terms and definitions 2
4 Interoperability framework 2
4.1 Building interoperability 2
4.2 Interoperability language 3
4.3 Interoperability points 4
4.4 Interoperability cases 6
4.5 Interoperability profiles 9
5 The case of CPS 12
5.1 Semantic rule-based approach for CPS control 12
5.2 Smart grid interoperability 12
6 Conclusions 13
Bibliography 14

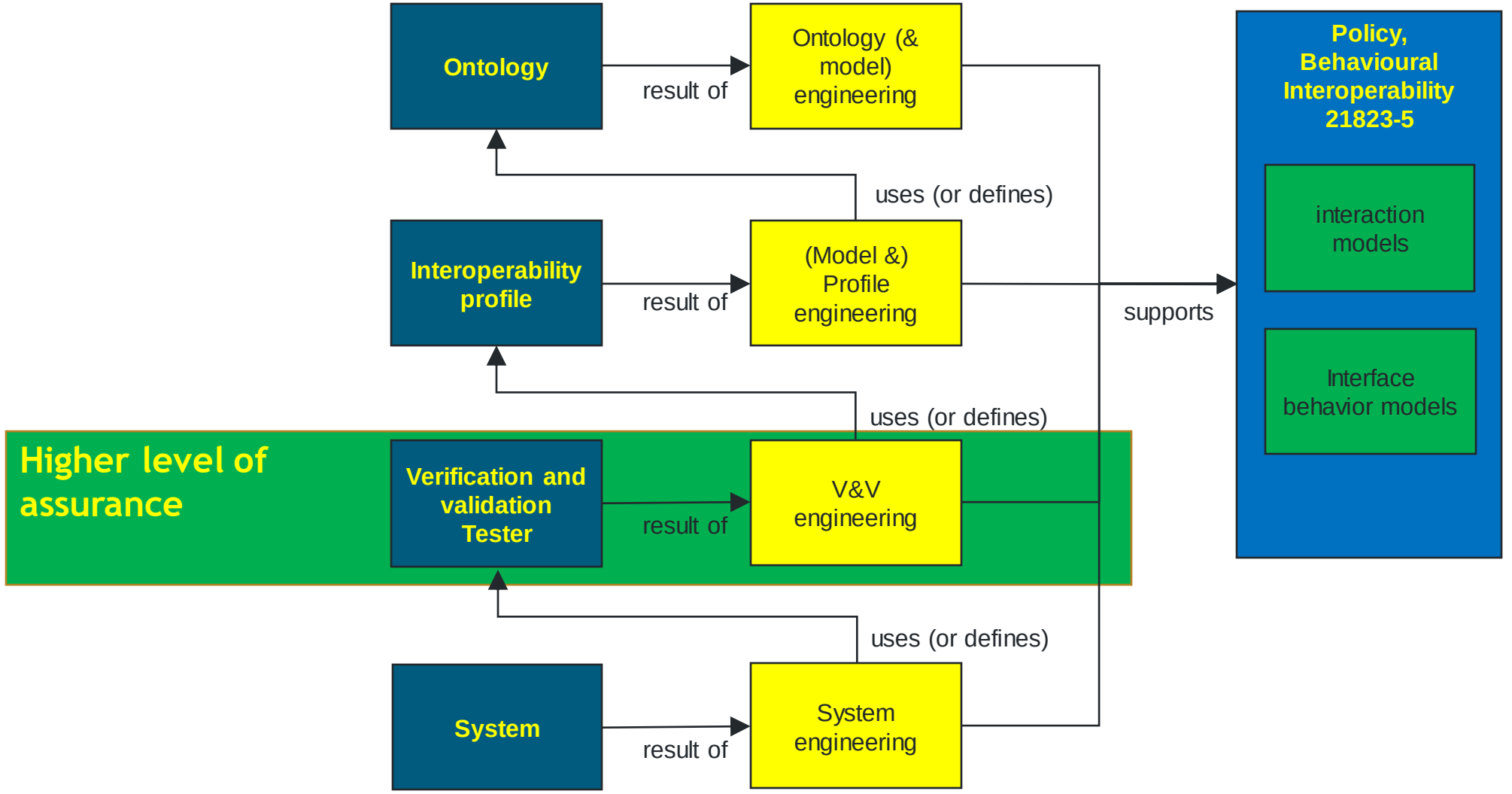
Constructing interoperability

Process based on framework developed by **ISO/IEC JTC 1/SC41**

- **interoperability points** (where - when)
- **interoperability cases** (why)
- **interoperability profiles** (what - how)



Strategic vision: higher level of assurance



THE DATA IS OUT THERE

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Thank you!

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