



WEBINAR

**APLICACIÓN DE ONTOLOGÍAS
EN LA ACREDITACIÓN**

**APPLYING ONTOLOGIES IN
ACCREDITATION**

Daniel Hutzschenreuter
Giacomo Lanza
Maximilian Gruber



AGENDA

WELCOME
BIENVENIDA

IAAC Technical Secretary

**Introduction to Semantic Web Technologies for
Ontologies**
**Introducción a las tecnologías de la web
semántica para ontologías**

**PTB experts (Max Gruber,
Giacomo Lanza)**

Q & A - Preguntas

Moderador

**Glimpse into the digital future: Ontologies in
(accredited) metrological services.**
**Una mirada al futuro digital: Ontologías en los
servicios metrológicos (acreditados).**

**PTB experts (Daniel
Hutzschenreuter et al.)**

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Closing remarks
Comentarios finales

TF Lead

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Physikalisch-Technische Bundesanstalt
Braunschweig and Berlin
National Metrology Institute

Ontologies and Knowledge Modelling

An Introduction with Examples.

Giacomo Lanza, Maximilian Gruber

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Video call participants:

- AAAI
- Ana Barré
- Maximilian Gruber
- Giacomo Lanza (PTB, Braunschweig)
- Ferney Chaparr...
- Ferney Chaparro -IAAC

APPLYING ONTOLOGIES IN ACCREDITATION

→ Ontologies play an important part in achieving this!

IDEAS

A4DT

WEBINAR

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Maximilian Gruber

A4TD

TRANSFORMACION DIGITAL

PTB

DEUTSCHE VEREINIGUNG DER ANGEWANDTEN PHYSIKALISCHEN WISSENSCHAFTEN

IAAC

INTERNATIONAL ASSOCIATION OF ACCREDITED CONFERENCERS

Ferney Chaparro - IAAC

Ana Barrera

Maria Paola Marsico

Giacomo Lanza (PTB, Braunschweig)

Maximilian Gruber

Enrique Gaytan

Alexis Valqui

Daniel Hutzschenreuter (PTB)

Janett Acha Pare...

Interpretation E...

Interpreter - Sol...

laura.rios

Alejandro Giral...

rodrigo.gomez

Ana Maria B, IAAC

Interpreter - Sol Torres-Fry

laura.rios

Alejandro Giraldo López

rodrigo.gomez

Ana Maria B, IAAC

Mauricio Rodrig...

Diego Rodriguez...

Eduardo Ceballo...

Rocio Jiménez -...

Elvira Camasita -...

Mauricio Rodriguez (ONAC)

Diego Rodriguez Joleanes - ONAC

Eduardo Ceballos, INN

Rocio Jiménez - ONAC

Elvira Camasita - INACAL-DA

Jimena Gimenez...

Juan Guillermo...

Hortencia Dávila...

Paola Mársico

Catharina Kulka...

Jimena Gimenez - OAA

Juan Guillermo Hernandez - EMA

Hortencia Dávila, DTA Bolivia

Paola Mársico

Catharina Kulka-Peschke

2024-04-26

<https://web360.org/ontologies/knowledge-modelling>

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A4DT Webinar: Ontologies and Knowledge Modelling

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Diustin Paredes M.

Janett Acha Pare...

Daniel Hutzschenreuter (PTB)

Janett Acha Paredes-INACAL-DA

Alejandro Giraldo...

rodrigo.gomez

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Hortencia Dávila...

Paola Mársico

Mirta Leiva

guillermo.giraldo

2024-04-26

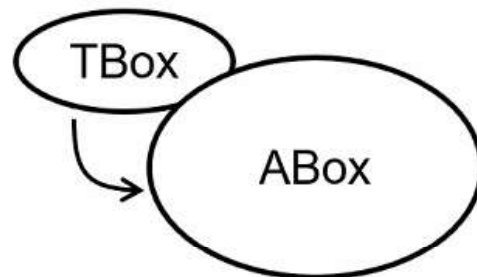
<https://web360.org/ontologies/knowledge-modelling>

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A4DT Webinar: Ontologies and Knowledge Modelling

(Advanced) Ontology Aspects

Terminology vs. Assertions



Serialization

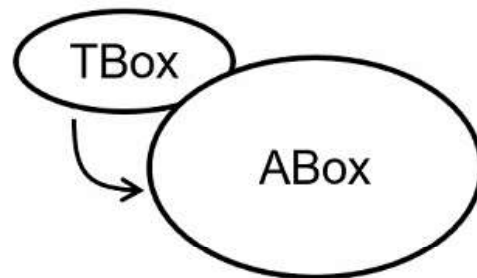


Reasoning



(Advanced) Ontology Aspects

Terminology vs. Assertions



Serialization

.ttl

xml



Reasoning



OWL Profiles

reduced set of reasoning capabilities (supported relationship properties) at benefit of reduced computation complexity

Knowledge Graph Querying

```

SELECT ?parent ?child
WHERE
{
    ?parent hasChild ?child
}
    
```



Direct Semantics / Set Expressions

e.g., `rdfs:subClassOf` property means:
 $\text{SubClassOf}(CE_1 \ CE_2) \iff (CE_1)^C \subseteq (CE_2)^C$

<https://www.w3.org/TR/owl-direct-semantics/>



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Example 2: SI Reference Point (beta)



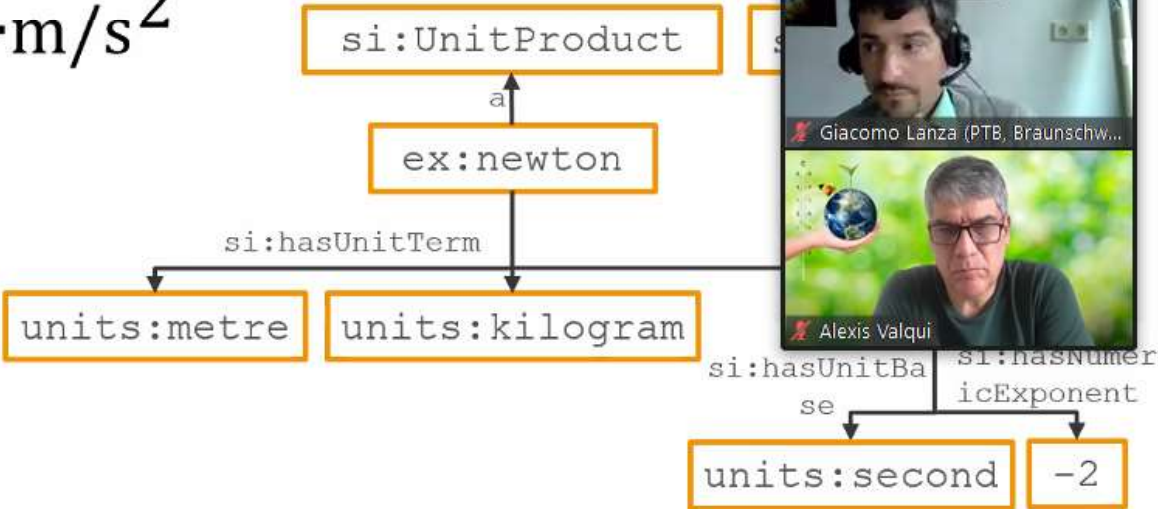
Implied Graph:

Unit Equation:

$$1\text{ N} = 1\text{ kg}\cdot\text{m}/\text{s}^2$$

Turtle Syntax:

```
ex:newton a si:UnitProduct ;
  si:hasUnitTerm units:metre ;
  si:hasUnitTerm units:kilogram ;
  si:hasUnitTerm [
    a si:UnitPower ;
    si:hasUnitBase units:second ;
    si:hasNumericExponent -2
  ] .
```



Grabando



Questions and Discussion :-)

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Discussion :-)

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2024-04-26-Webinar-Ontologies-Part-1-knowledge_modelling...

Suchen

Maximilian Gruber

Überf

Übergänge

Animationen

Bildschirmpräsentation

Aufzeichnen

Überprüfen

Ansicht

Hilfe

A

A

A

Textrichtung

Text ausrichten

In SmartArt konvertieren

Schrittart

Absatz

Zeichnen

Anordnen

Schneidformatvorlagen

Formkontur

Formeffekte

Aufzeichnen

Präsentieren in Teams

Suchen

Ersetzen

Markieren

Bearbeiten

Diktieren

Sprache

Add-Ins

Designer

12

11

10

9

8

7

6

5

4

3

2

1

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1

2

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9

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11

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Giacomo Lanza (PTB, Braunschweig)


Alexis Valqui

Building Blocks of the Semantic Web





addition of formal logic to the web



integration with existing standards



available collections of information

- express data and rules
- reason about content
- describe and express complex properties
- remain decidable

- build on accepted tools
- use (hidden) annotations in *XML*
- describe meaning and relations with *RDF*
- identify concepts globally using a *URI*

- capture domain specific knowledge
- ontologies define concepts and relations
- interrelate concepts between ontologies

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Applying Ontologies in Accreditation

Glimpse into the digital future: Ontologies in
metrological services

Daniel Hutzschenreuter, Sascha Eichstädt, 2024-04-26, A4DT Webinar

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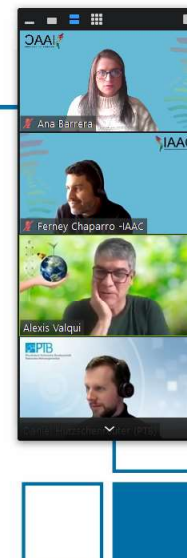


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Digital Transformation*



Digitize



paper → image, PDF file,...

Digitization



analogue process → digital form

Digitalization



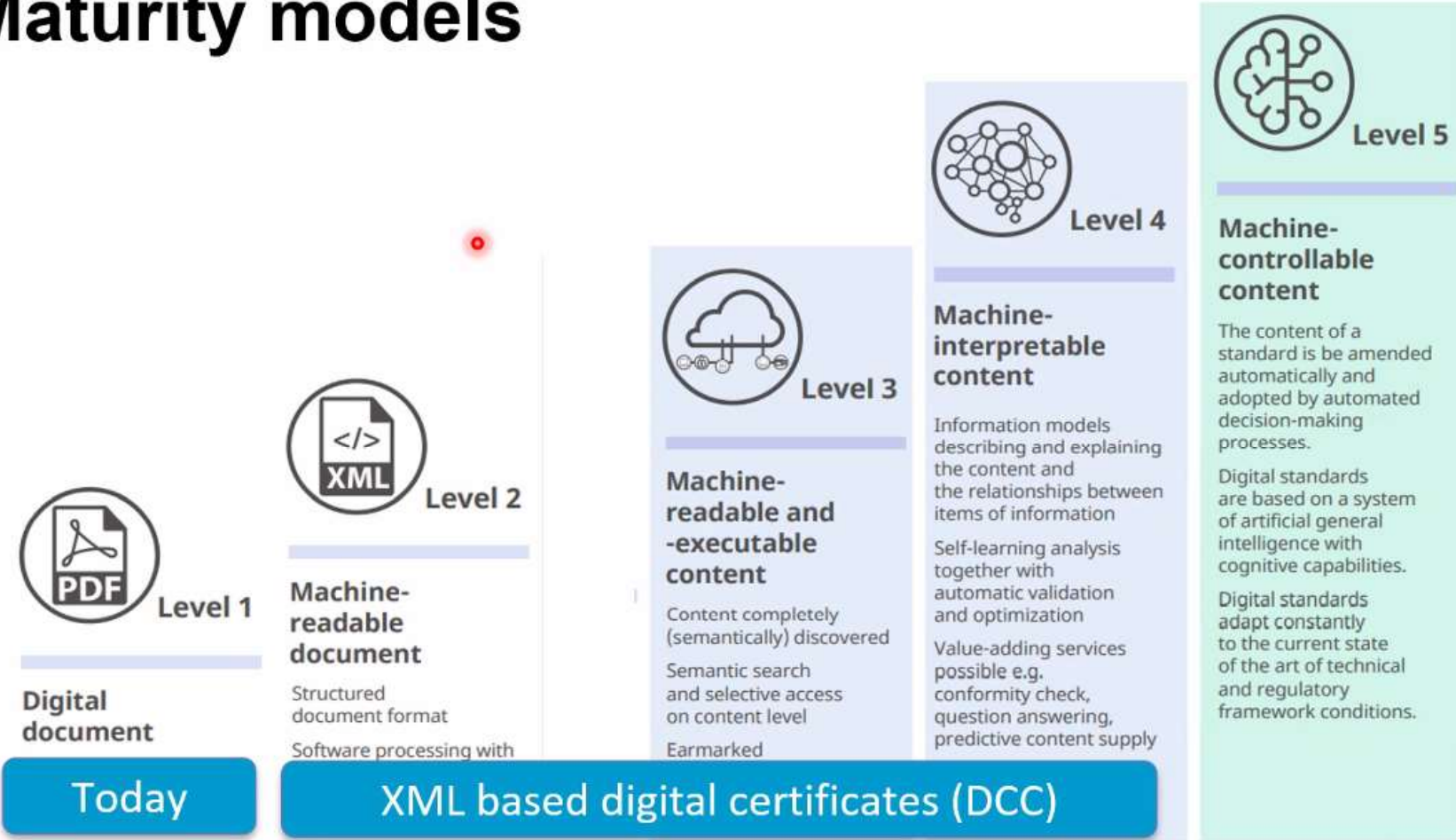
digital technologies → change business models, new revenue

* terms Gartner IT glossary



CIPM Vision SI Digital Framework
Digital & FAIR certificate in metrology
Thesauri, Ontologies, ...

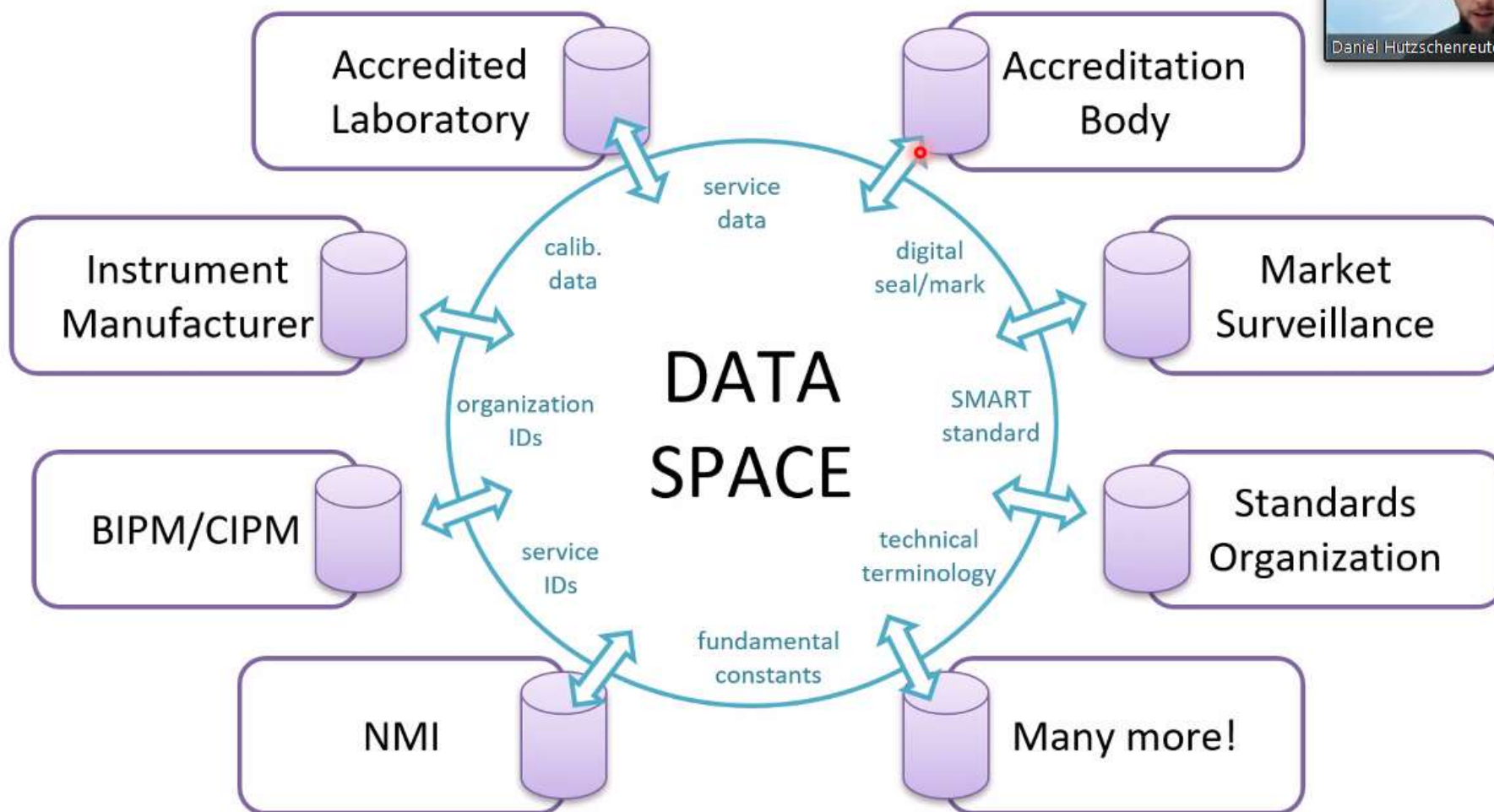
Maturity models



from
DIN/DKE IDiS
whitepaper
2021

SMART standards development →

Distributed digital QI – level 3, 4,5,...



Ontologies in Digital Calibration Certificates



Digital vocabularies (technical terminology)



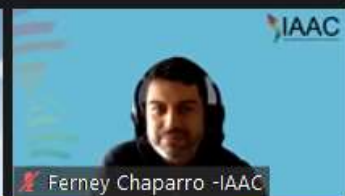
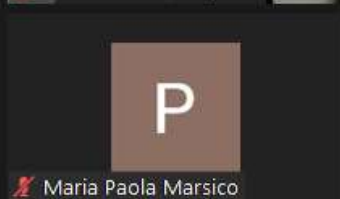
Identification of quantity
kinds in **D**-SI



Controlled vocabulary for
common terms (refTypes)



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 Giacomo Lanza (PTB, Braunschweig)	 Ana Barrera, IAAC	 Alexis Valqui	 Daniel Hutzschenreuter (PTB)	 Ferne Chaparro -IAAC
 Janett Acha Paredes-INACAL...	 Enrique Gaytan	 rodrigo.gomez	 Diego Rodríguez Joleanes - ...	 Mauricio Rodríguez (ONAC)
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