

Session 2: Standardization, testing and certification – keeping pace with change

Keynote
**Digitalization of standardization –
already started**

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VDE/DKE, Germany



Agenda

- Motivation
- Digitalisation of standardization – what does it mean?
- Standard Development
- Content Management
- Standard delivery and publication
- Outlook – Machine interpretable standards

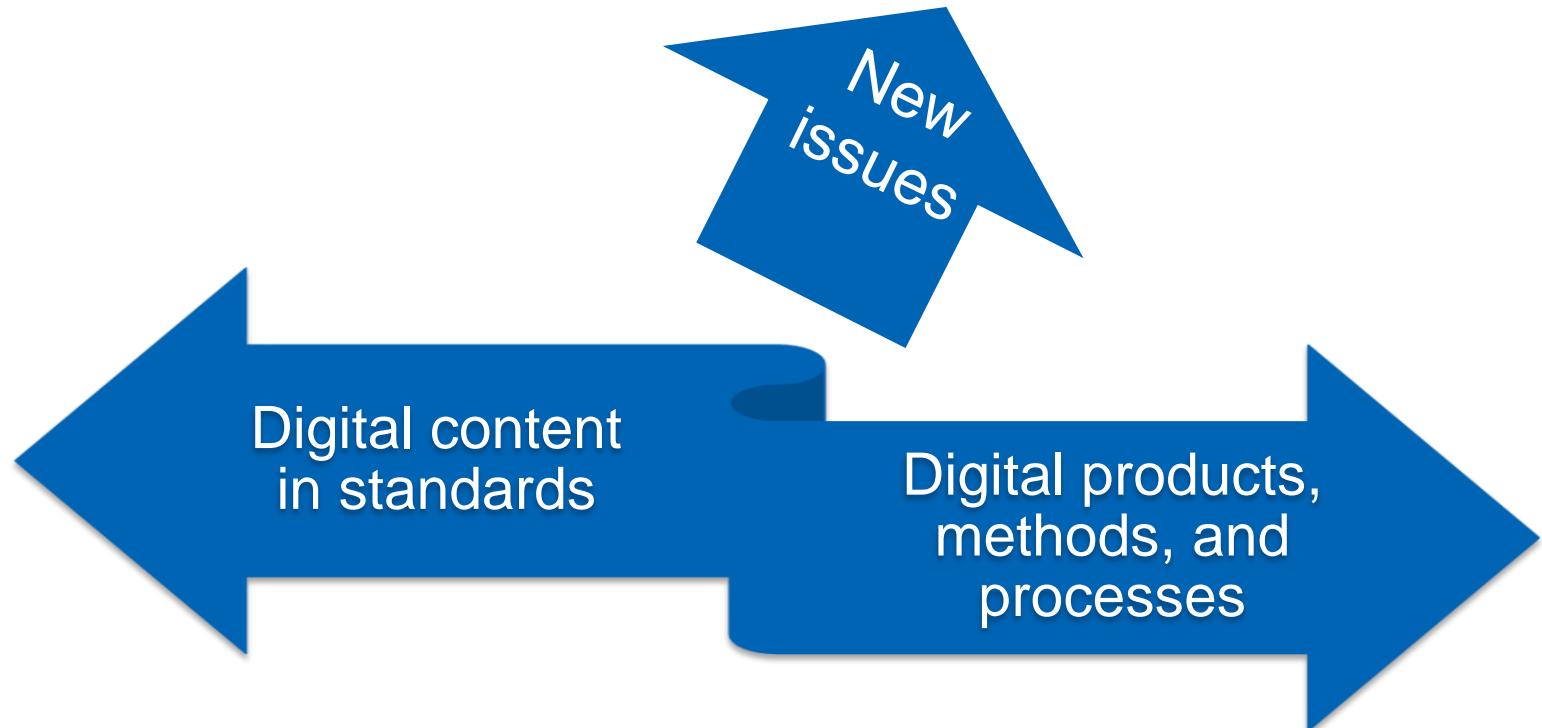
Therefore, our point of view is clear ...

Standardization must also reinvent itself and break
new ground in order to
gain additional relevance.

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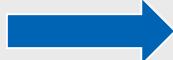
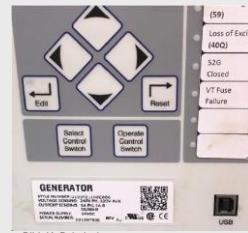
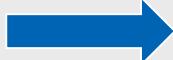
Different levels of digitalization of standardization



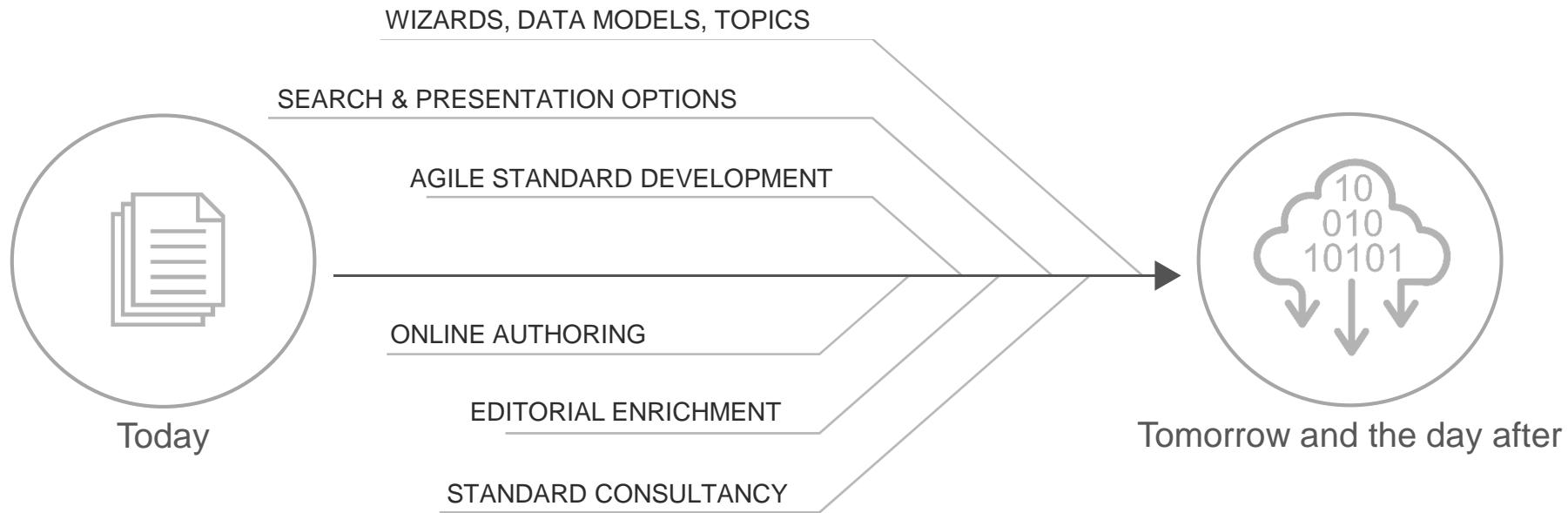
Digital content in standards – example: digital name plate

Challenge:

- The declaration of product approvals has now reached a scope that makes it very difficult to map this information on name plates.
- In the age of Industry 4.0, all relevant information should be provided paperless in digital form and available from anywhere.
- The use of a networked information and communication infrastructure within the framework of Industry 4.0 has not yet reached at the name plates.



Digital products, methods, and processes: From document to intelligent services



New Issues



The first IT security platform in Germany for
industrial SMEs

In cooperation with

BECKHOFF



PILZ

THE SPIRIT OF SAFETY

Endress+Hauser EH
People for Process Automation

PHÖNIX CONTACT

f PEPPERL+FUCHS

Miele

WAGO

Weidmüller EX

DKE
VDE DIN

Overview: Digital Products, Methods, and Processes

- How to write a standard?

- Management of input from expert groups
e.g. meetings
- Collaborative work and content
e. g. team site for documents
- Management of decisions
e. g. voting

Standard Development

- Management of standard content

- Storage of content and related metadata
e.g. relation of documents, history
- Translation
- Preparation of publication
- Derived content from standards

Content Management

- Publication of standard content for use

- Publication
e. g. Print, Online, PDF
- Sales
e. g. web shop
- Services around standards
e. g. information service

Standard Delivery and Publication

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Standard Development – today, tomorrow, and the future - Overview

Management of input from expert groups

- Enquiry for meeting dates, Online meeting registration, Database
- Draft for enquiry publicly and freely available

Collaborative work and content

- SharePoint Teamsites, IEC's new Collaboration Platform
- Web conference

Management of decisions

- Support:
Public Commenting
- Voting (IEC, CENELEC)

Management of input from expert groups

- Online registration for profiles

Collaborative work and content

- *Online Authoring* with Authoring Support Features
- Standard wizards

Management of decisions

- Support by Online Authoring

Management of input from expert groups

- User generated content, crowd-based

Collaborative work and content

- Semantic enrichment of content
- Topic-oriented standard content
- Machine interpretable content
- Software as a standard

Management of decisions

- New processes for standard content – not interrupted

Today

Tomorrow

Future

Digitalization today – Example Online Authoring

Successful Proof of Concept (PoC) with ISO/IEC

In addition, support functions for the committees are currently being tested:

- Discussion/commenting
- Control of references
- Control/support style guide
- Display changes
- ...
- Basis for new content delivery and methods such as Topic orientation

The screenshot displays the DKE online standardization software interface. The top left features the DKE logo with the text "DKE VDE DIN online standardization". To the right, a banner reads "DKE lighthouse project for the IEC General Assembly 2016". The interface is divided into several sections: a top navigation bar with "START", "STRUCTURE", "INSERT", "REFERENCE", and "TOOLS"; a "CONTENT AREA" containing a document structure like "FRONT MATTER", "TITLE WRAPPER", and "FOREWORD"; a "SIDEBAR" on the right showing a hierarchical tree of topics such as "AUDIO, VIDEO AND RELATED EQUIPMENT", "Foreword", "Introduction", "Scope", "Normative references", and "1 Specifications of operating modes and funct..."; and a bottom "ELEMENT BREADCRUMBS" bar showing the path "Standard > Front matter > Foreword > Paragraph". Labels with arrows point from the text to each of these interface components.

Source: FontoXML/IEC – Interface User Guide – during PoC end of 2018

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Content Management – today, tomorrow, and the future - Overview

Storage of content and related metadata

- File based, SharePoint
- Standard database for metadata

Storage of content and related metadata

- CMS, SharePoint
- Standard database for metadata

Storage of content and related metadata

- *Topic-oriented* storage
- With additional classification metadata

Translation

- Translation Management System (TMS)

Translation

- TMS
- Optimization of quality and process

Translation

- Machine Translation (MT)

Preparation of publication

- WORD, PDF

Preparation of publication

- PDF, XML
- Different products with additional services

Preparation of publication

- XML
- Machine-interpretable content, database standards, Software



Today

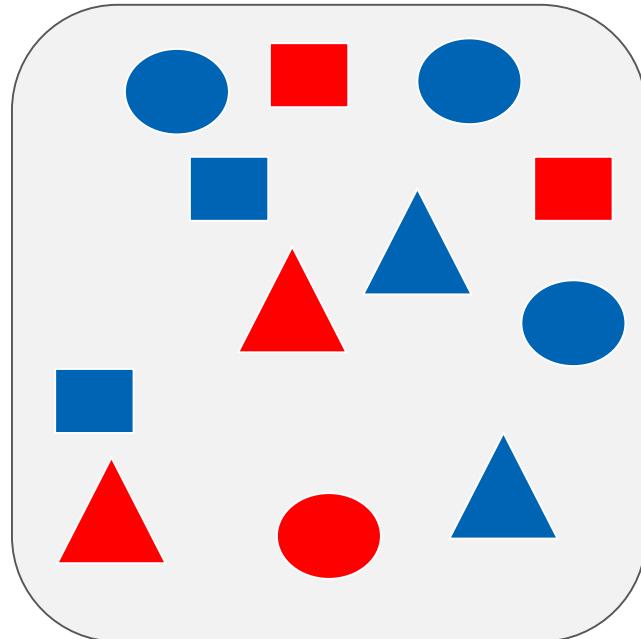
Tomorrow

Future

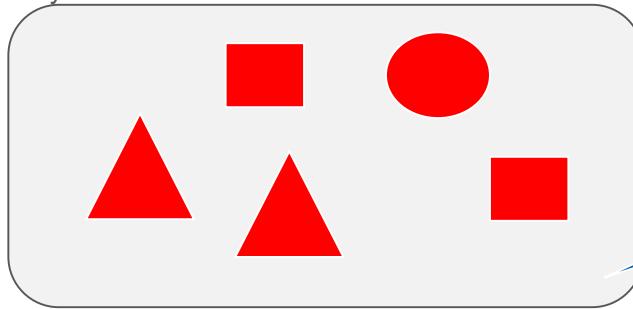
„From document to information“ – Topic-oriented writing

What are the benefits?

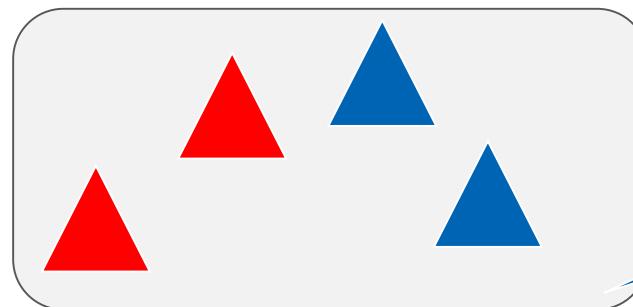
Collection of topics – Shape and color represent different metadata



Topics ranked by metadata/classification system



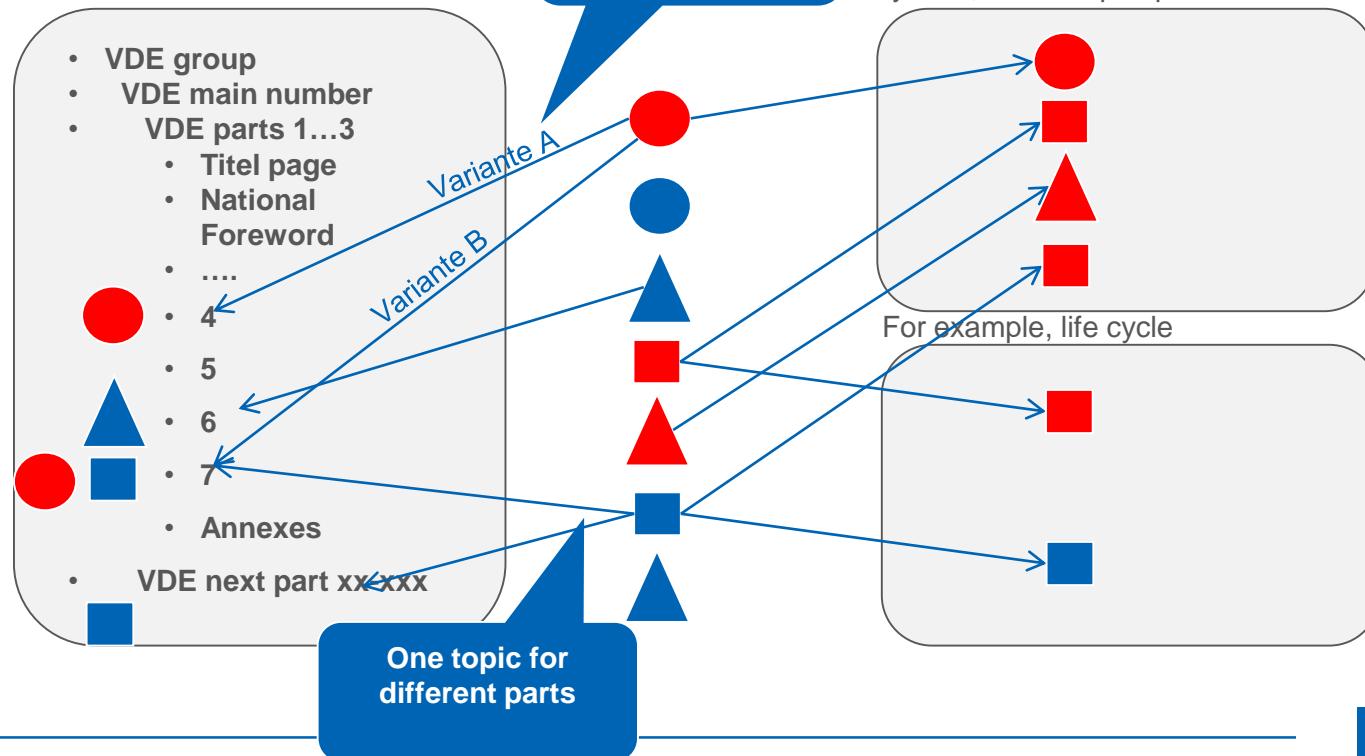
For example, all topics on a place (mapping) or any to a use case



For example, all topics on a product

Topics in structures

Document/standard



Examples from other industries – web shops with faceted search

Faceted search

Metadata: Tire size, frame size, men, ladies, etc.

Objective:
Accurate results based on metadata and search level for the **customer**.

Filter by:

Color

red

blue

black

Tire Size

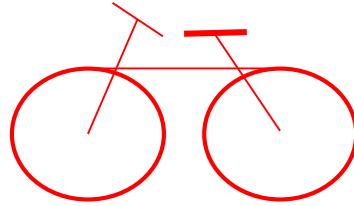
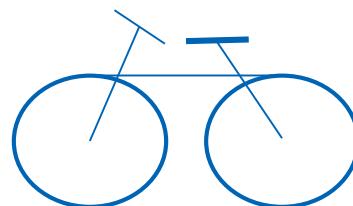
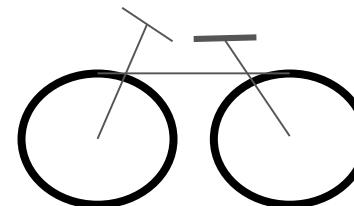
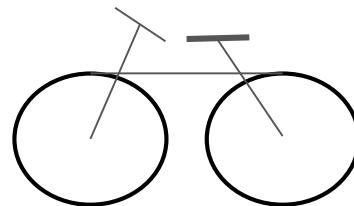
26'

27,5'

29'

Frame Size

56 cm



Examples from other industries – web shops with faceted search

Faceted search

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Tire size,
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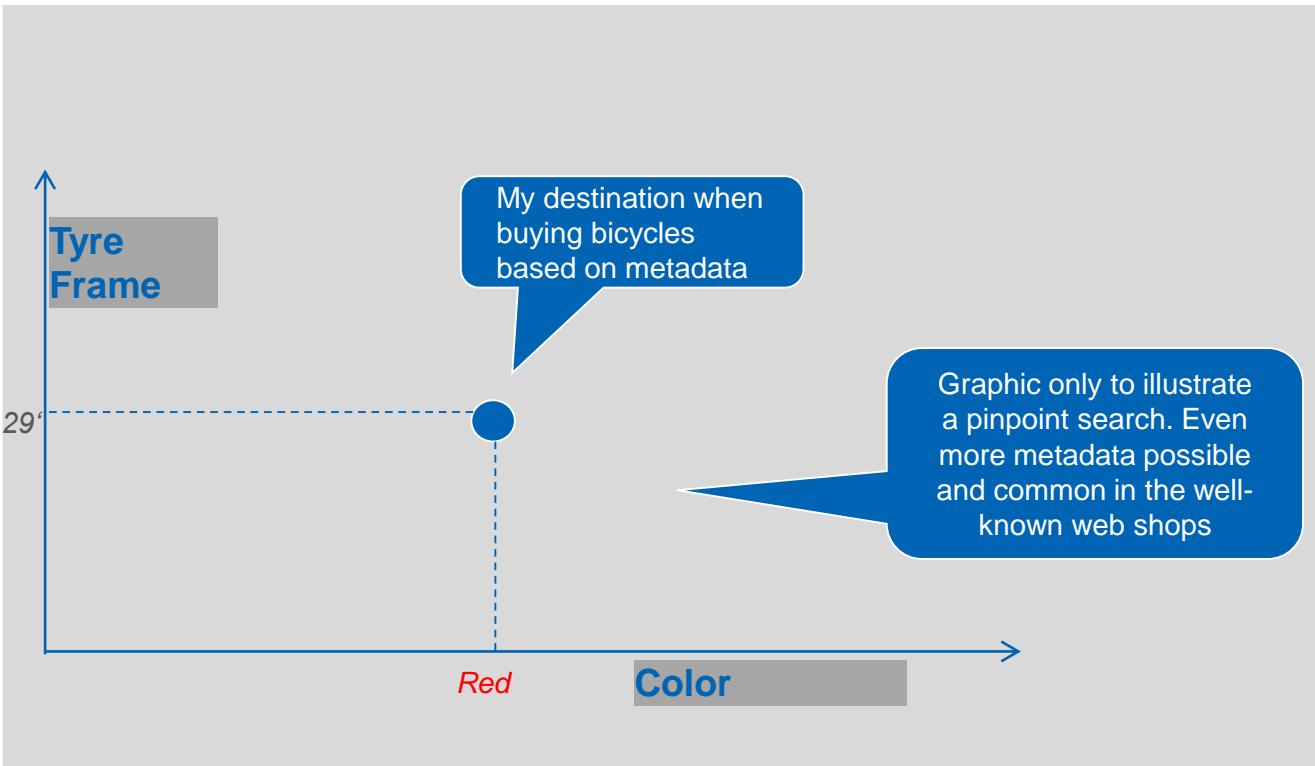
black

Tire Size

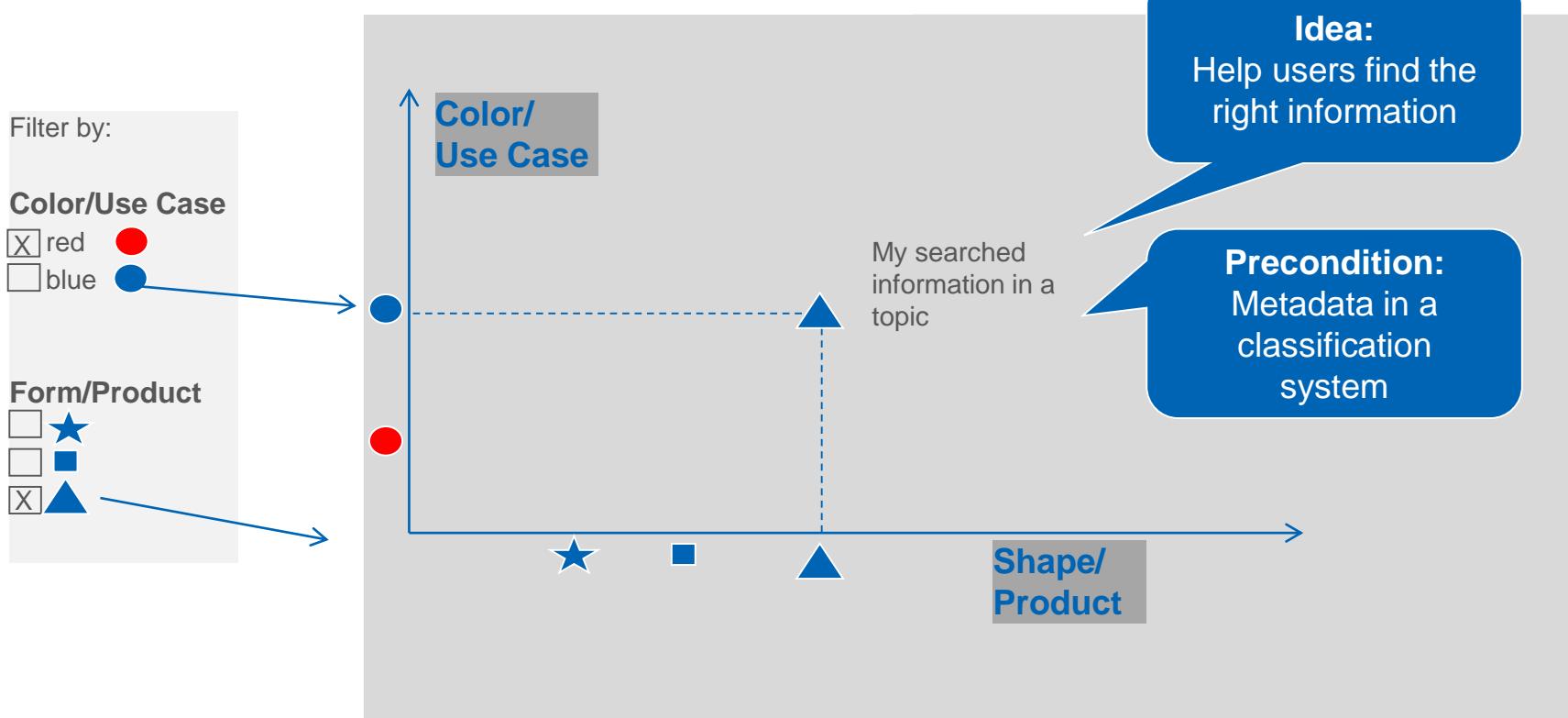
26'

27,5'

29'



Using faceted search also for information



Web shop example based on Prof. Ziegler

Master Thesis: Classification System as a first step

Filter by:

Aim

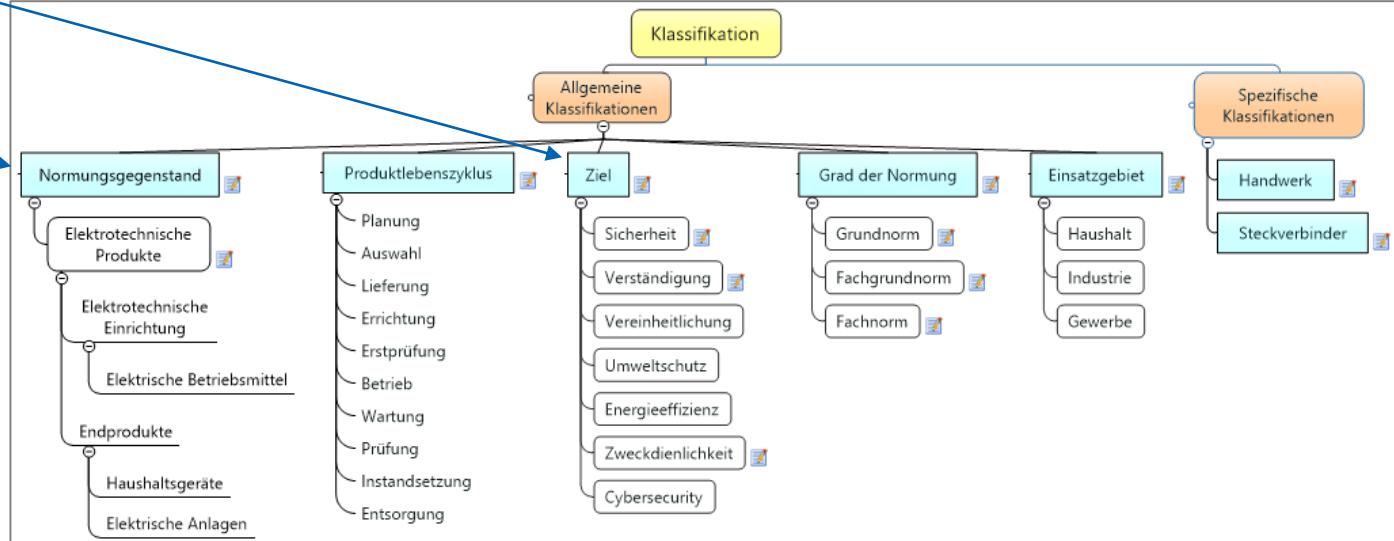
red

blue

Objective of standard



....



Source: Master Thesis Eva Nauerth

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Standard delivery and publication – today, tomorrow, and the future

Overview

Publication

- NormenBibliothek – Online Browsing Platform
- also as mobile version
- Free online browsing platform for drafts and commenting
- Free IEV - terminology

Publication

Sales

Sales

- Web shop

Services around standards

- Newsletter, feedback/question
- Standard Information App
- Video tutorials, Webinars (DKE)
- Online information about publications and results

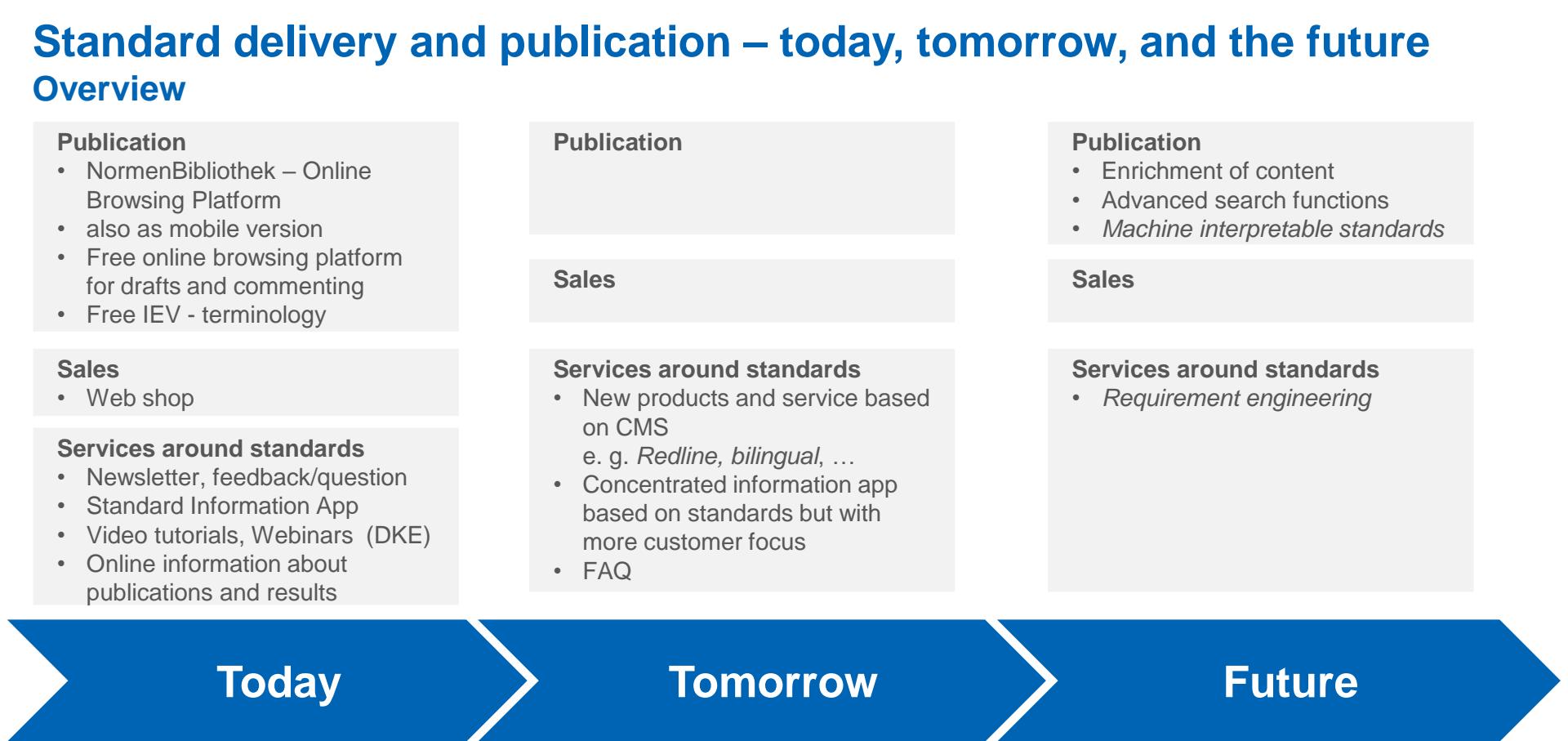
Publication

- Enrichment of content
- Advanced search functions
- *Machine interpretable standards*

Sales

Services around standards

- *Requirement engineering*



Today

Tomorrow

Future

Two simple examples – bilingual publication

- Standard is published in two languages
- The languages are issued in a two-column presentation
- Paragraphs/elements of the two languages are side-by-side
- In a further development step, the language might be switched between German and English or other languages

Hintergrund

Das traditionelle Netzmödell wird mit steigendem Energiebedarf und dem Anschluss von Betriebsmitteln für verteilte (erneuerbare) Energiequellen zunehmend ineffizient werden.

Um diese Probleme zu umgehen, muss die Architektur herkömmlicher Netze um ferngesteuerte verteilte Lasten und Energiequellen erweitert werden, was eine bidirektionale Kommunikation erfordert. Dies ist das sogenannte "Smart Grid".

Smart Grids beruhen auf einer anpassungsfähigen Energieerzeugung und/oder einem anpassungsfähigen Energieverbrauch, um Unsymmetrien und Überlastung des Netzes ausgleichen, die beispielsweise verursacht werden durch:

- höheren Strombedarf durch das Laden von Elektrofahrzeugen;
- wachsende Zahl erneuerbarer Energiequellen, deren Energieerzeugung weniger planbar/steuerbar ist als die herkömmlicher Kraftwerke.

Die Verwendung von Geräten und Betriebsmitteln in Heim und Gebäuden, die in der Lage sind, ihren Energieverbrauch oder ihre Energieerzeugung (entweder lokal oder mittels Fernwirkung) zu steuern, erhöht die Anpassungsfähigkeit eines Smart Grids wesentlich.

Energetische Anpassungsfähigkeit kann definiert werden als die Fähigkeit, gezielt von der normalen Energieerzeugung und/oder den normalen Verbrauchsmustern in Abhängigkeit von der Zeit und/oder dem Leistungspegel abzuweichen. Diese Anpassungsfähigkeit darf von Dritten genutzt werden, um Ungleichgewichten oder Engpässen entgegen zu wirken.

Background

The traditional model of the grid will lead to increased inefficiencies as electricity energy consumption and the connection of distributed (renewable) energy resource equipment is increased.

In order to combat these problems, the architecture of traditional grids is being extended to include remote control of distributed loads and energy resources, requiring bi-directional communication. This is the "Smart Grid".

Smart grids rely on flexibility in energy production and/or consumption to compensate for imbalance and congestion in the grid, for example caused by:

- Increasing electricity demand by electric vehicle charging;
- Increasing numbers of renewable energy sources that are far less predictable/controllable than traditional power plants.

The use of devices and equipment in homes and buildings that are able to control their energy consumption or generation (either locally or remotely) greatly enhances the flexibility capability of a smart grid.

Energy flexibility can be defined as the ability to willingly deviate from the normal energy production and/or consumption pattern over time and/or power level. This flexibility may be used by third parties to help alleviate imbalance or congestion.

DIN EN 50491-12-1 (VDE 0849-12-1):201x-xx
(in Veröffentlichung)

Differential version (Redline)

- Visual representation of the differences to the previous version
- Comparisons can be offered in the following versions
 - Current version to the previous one
 - Current published version to the draft version

1 Anwendungsbereich¶

Diese Europäische Norm gilt für bordseitige Kommunikationsdienste und zwischen Bord und Boden auf dem Fahrzeug sowie vom Fahrzeug zur Landseite, d. h. es behandelt sie umfasst die Datenübertragung Datenkommunikation über digitale Schnittstellen.¶

- a) zwischen den innerhalb des Energiemesssystems (EMS) implementierten Funktionen;¶
- b) zwischen der EMS-Funktion und anderen bordseitigenfahrzeugseitigen Teilsystemen;¶
- c) zwischen dem EMS und den Kommunikationsdiensten am Boden auf der Landseite.¶

Die bordseitigenfahrzeugseitigen Kommunikationsdienste des EMS beziehen sich auf umfassen den Datenaustausch zwischen FunktionenFunktionen des EMS und auf den Datenaustausch zwischen dem EMS und anderen bordseitigenfahrzeugseitigen Einheiten, wobei denen Daten mit einem Kommunikationsprotokollstapel über eine eigene physikalische Schnittstelle oder ein gemeinsames Netz gemeinsam genutztes Kommunikationsnetzwerk übertragen werden.¶

Die Kommunikationsdienste zwischen Bord und Boden betreffen vom Fahrzeug zur Landseite umfassen die drahtlose Datenkommunikation zwischen dem Datenverarbeitungssystem (DHS) und dem Server am Boden auf der Landseite.¶

Darüber hinaus sind in diesem Schriftstück Dokument die Anforderungen für an die Konformitätsbewertung enthalten.¶

Vergleich der Ausgabe DIN EN 50463-4 (VDE 0115-480-4):2018-03
zu DIN EN 50463-4 (VDE 0115-480-4):2013-06

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Maturity steps in digitalization of standards



Step 4

Machine interpretable content modeling

- Information modeling that expresses content and relation between elements
- Self learning analysis and validation cycles to improve content handling and access
- Interruption-free data flow within the value chain
- Automatic question answering or predictive content supply

Step 3



Machine readable content as a service

- Semantic enrichment of content for selective access
- Receive content of multiple standards for a given purpose
- APIs for service oriented (web/clo) access

Step 2



Machine readable document

- Structured content of standard documents
- Content can be processed by software

Step 1



Open digital format

- Read and search on screen

Step 0



Paper

Providing first content in machine-readable form

Example: MathML – "machine-readable" formulas

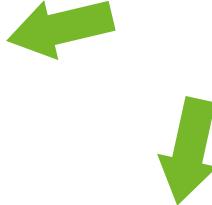
```
<!-- Presentation MathML -->
<m:math display='block'>
  <m:mrow>
    <m:mfrac>
      <m:mrow>
        <m:mi>R</m:mi>
        <m:msub>
          <m:mi>e</m:mi>
        </m:msub>
      </m:mrow>
    </m:mfrac>
    <m:mrow>
      <m:mi>R</m:mi>
      <m:msub>
        <m:mi>m</m:mi>
      </m:msub>
    </m:mrow>
  </m:mrow>
</m:math>
```

Content MathML

```
<apply><eq /> arg1 arg2 </apply>

<apply>
  <quotient />
  numerator
  denominator
</apply>

<cn>0.8</cn>
```



- MathML extracts can be readable from standard and can be used for own calculations and controls

MathML (Mathematical Markup Language) is a document format for the representation of mathematical formulas and complex expressions.

Presentation MathML

- Graphical representation of formulas and expressions

Content MathML

- Semantic representation
- Structure of the formula in machine-readable form

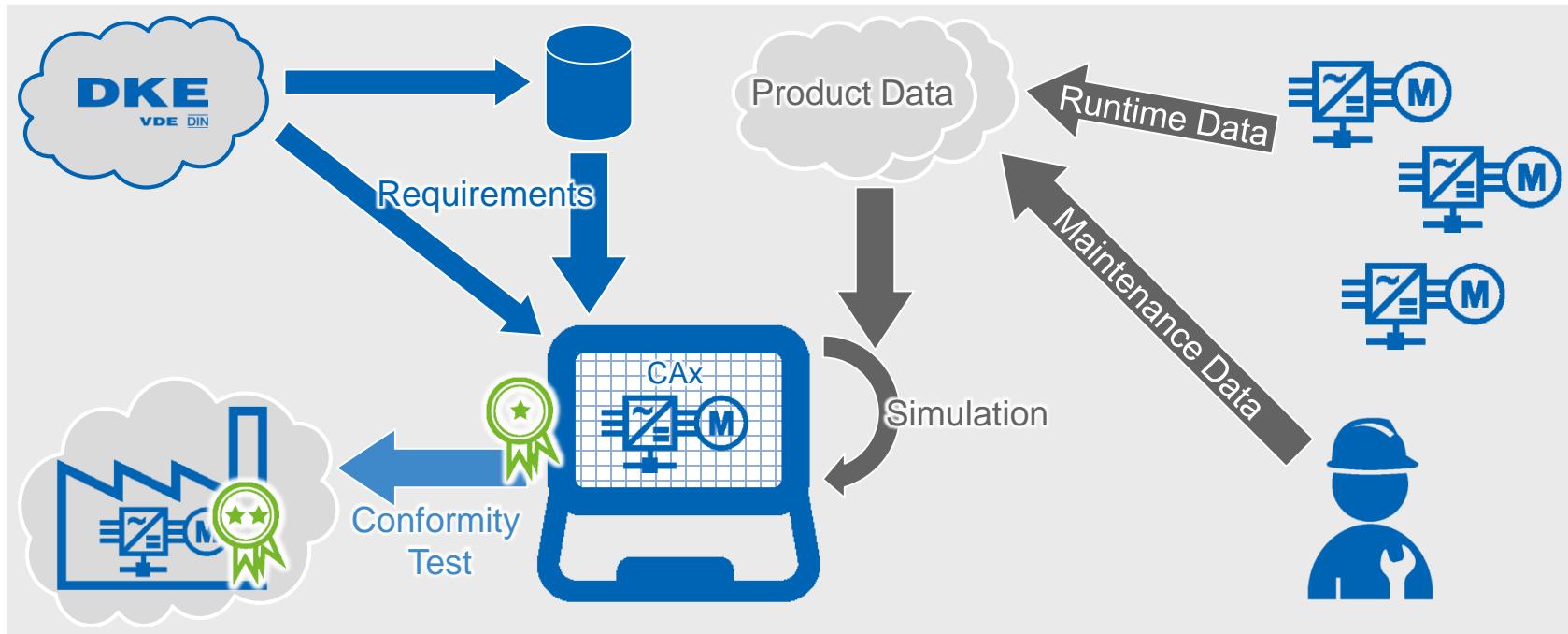
Example from EN 50068, High-Voltage Switchgear and Controlgear – Gas-filled wrought steel enclosures (Formel: Material strength of bolts)

Other possible examples, available in XML

- Graphics
- Tables
- Checklists, forms
- Code
- Data models

Future opportunities – use case as example

Preliminary automatic standard conformity test



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Thank you very much for your attention!

We shape the e-dial future.
Come and join us.

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Production

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