

Content Management & Content Delivery

for Digital Information Services

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Wolfgang Ziegler

- Karlsruhe University of Applied Sciences, Germany
„Communication und Media Management“ (HKA)
 - » Knowledge, information, content, data modelling
 - » Information processes and systems in TC
- Institute for Information and Content Management (I4ICM)
 - » Research Transfer (PI-Class, CVM, REx, CDP, CoReAn, microDocs/SCR)
 - » System evaluation & introduction, process analysis/(re-)engineering, CMS/CDP analytics & optimizing classification

Agenda

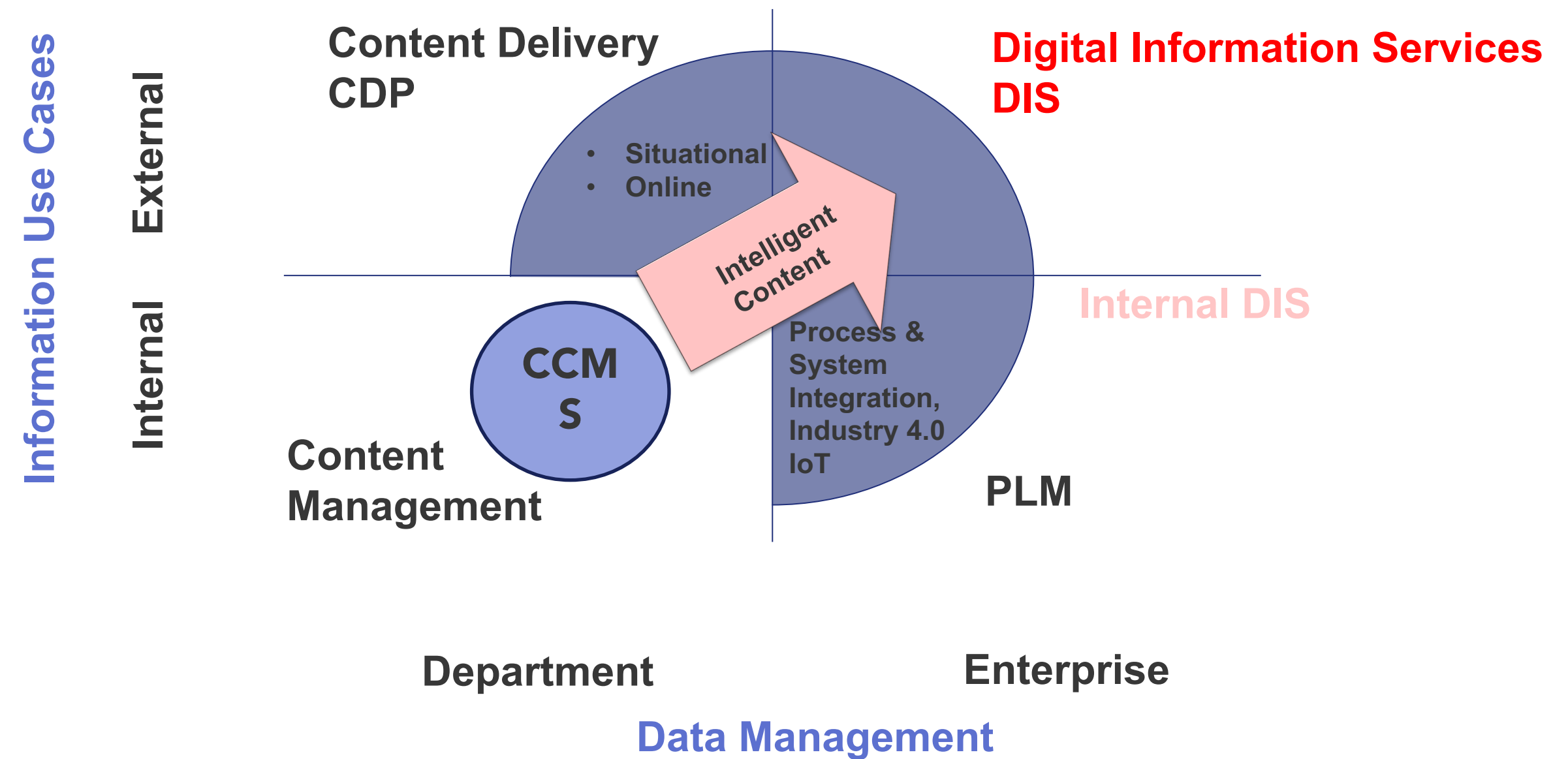
- Introduction
- Content Management Concepts
- Content Delivery Concepts
- Content Management Deep Dive
- Delivery for Digital Information Services

Introduction

Content Technologies and Digital Information Services

Introduction

Evolution of (Technical) Information Perspectives



Introduction

What is the (state-of-the-art) focus of content management and related technologies?

- Granular Information: topic-based content
 - Metadata enrichment (of topics) according to product or media variants
-
- Support of content-related processes
 - Automization of CMS processes (generating, publishing)

CMS

Introduction

Manuals & data on
configurable products

CMS



The depiction of the products may differ from the actual specific design.



[Web](#)

Downloads

下载

所有

所有语言

数据表

	描述	文件大小	语言 / 国家
	Type 8139 data sheet radar level measurement device	2 MB	EN / EU
	Typ 8139 Datenblatt Radar-Füllstandsmessgerät	2 MB	DE / DE
	Type 8139 fiche technique Niveaumètre radar	2 MB	FR / FR

用户手册

	描述	文件大小	语言 / 国家
	Operating Instructions Type 8139 Level measuring device	6 MB	EN / EU
	Quickstart Type 8139 Level measuring device	1 MB	EN / EU
	Bedienungsanleitung Typ 8139 Füllstandsmessgerät	6 MB	DE / EU
	Manuel d'utilisation type 8139 Appareil de mesure de niveau	6 MB	FR / EU
	Quickstart Typ 8139 Füllstandsmessgerät	1 MB	DE / EU

[更多详情](#)

Introduction

Manuals & data sheets
for highly
configurable products

CDP

CMS
(Publishing)

Complexity for Content
users: Collection of variants
depending on parameters

Application area

3.2 Principle of operation

LEVEL TRANSMITTER 8139 is a radar sensor for continuous level measurement of liquids.

The small process fittings offer particular advantages in small tanks or tight mounting spaces. The very good signal focusing ensures the use in vessels with many installations such as stirrers and heating spirals.

The LEVEL TRANSMITTER 8139 is available with different antenna systems:

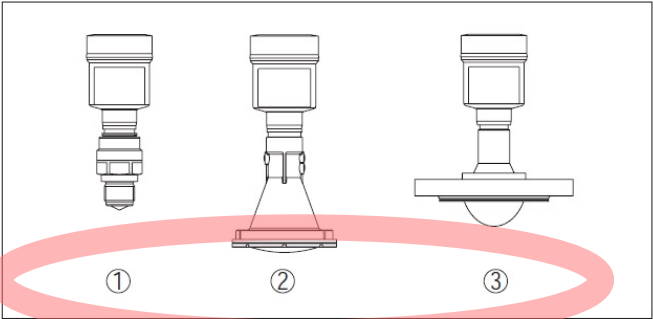


Fig. 2: Antenna systems LEVEL TRANSMITTER 8139

1 Thread with integrated horn antenna
2 Plastic horn antenna
3 Flange with encapsulated antenna system

You will find recommended values for socket heights in the following illustration or the tables. The values come from typical applications. Deviating from the proposed dimensions, also longer sockets are possible, however the local conditions must be taken into account.

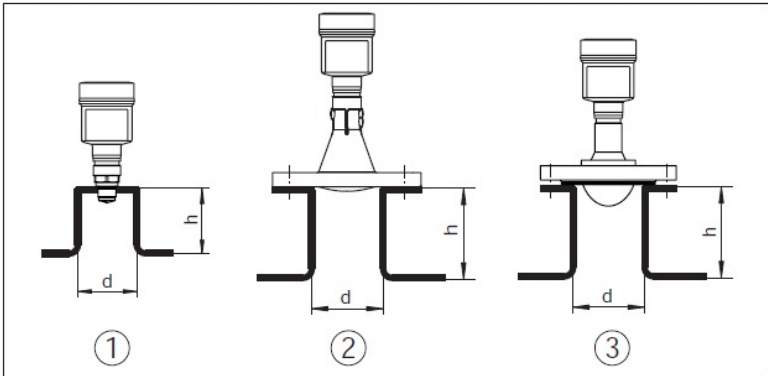


Fig. 17: Socket mounting with deviating socket dimensions with different versions of LEVEL TRANSMITTER 8139

1 Thread with integrated horn antenna
2 Plastic horn antenna
3 Flange with encapsulated antenna system

Thread with integrated horn antenna			
Socket diameter d		Socket length h	
40 mm	1½"	≤ 150 mm	≤ 5.9 in
50 mm	2"	≤ 200 mm	≤ 7.9 in

10 Supplement

Version	Material	Seal	Process temperature (measured on the process fitting)
Thread with integrated horn antenna	PEEK	FKM (SHS FPM 70C3 GLT)	-40 ... +130 °C (-40 ... +266 °F)
			-40 ... +200 °C (-40 ... +392 °F)
		FFKM (Kalrez 6230)	-15 ... +130 °C (5 ... +266 °F)
			-15 ... +200 °C (5 ... +392 °F)
		FFKM (Kalrez 6375)	-20 ... +130 °C (-4 ... +266 °F)
			-20 ... +200 °C (-4 ... +392 °F)
Flange with encapsulated antenna system	PTFE and PTFE 8 mm	PTFE	-40 ... +130 °C (-40 ... +266 °F)
			-40 ... +200 °C (-40 ... +392 °F)
			-196 ... +200 °C (-320.8 ... +392 °F) ⁸⁾
	PFA	PFA	-40 ... +130 °C (-40 ... +266 °F)
			-40 ... +200 °C (-40 ... +392 °F)
Hygienic fitting with encapsulated antenna system	PTFE	PTFE	-40 ... +200 °C (-40 ... +392 °F)
		FKM (A+P 75.5/VA/75F)	-20 ... +130 °C (-4 ... +266 °F)
		EPDM (A+P 70.10-02)	-40 ... +130 °C (-40 ... +266 °F)
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Derating, ambient temperature

Introduction

CDP

DIS

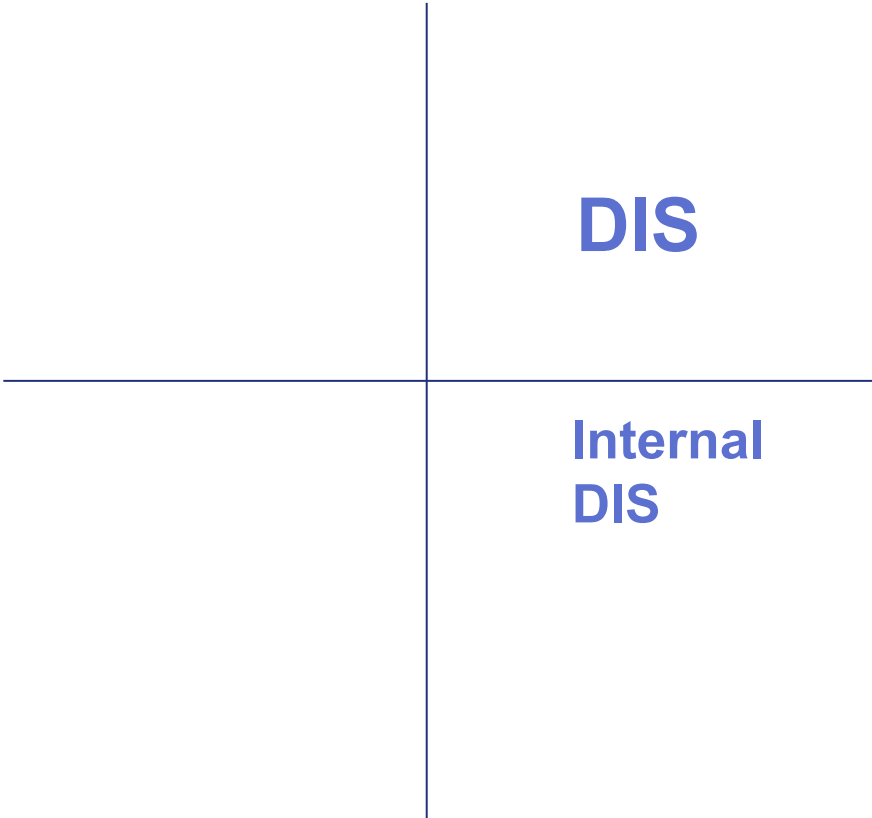
Content Delivery Objectives (User side)

- **Create and deliver more and better user-centered information**
 - situational (according machine and user situation)
 - case-based (following predefined use cases)
 - product-/variant-specific (as most as possible)
 - accessible (searchable, available and managed)
 - suitable media
- Create new business cases / Digital Information Services

Introduction

Use Case Dependencies & Requirements for Deliverables & Services

- **Sales process / Information & Product Search:**
 - Overview data and summarized tables
 - Specific: Data sheet, technical data, dependency information
- **Product Planning:** specific envisaged configuration
- **Set-up /Installation:** specific context and configuration setting
- **Service/Repair planning:** specific existing configuration
- **Operation/Customer services:** Detailed information



DIS

Internal
DIS

Introduction

External Perspective (regarding information)

So, we need to ...?

- ... improve customer satisfaction / user experience (also by reducing complexity)
- ... i.e. provide information more specific to product and features (variants, configuration)
- ... integrate information into IoT processes
- ... use modern electronic media (Apps, Search, Delivery)
- ... make information exchangeable on a digital basis
- ... offer new product services (or, at least, enable new services)

Content Management

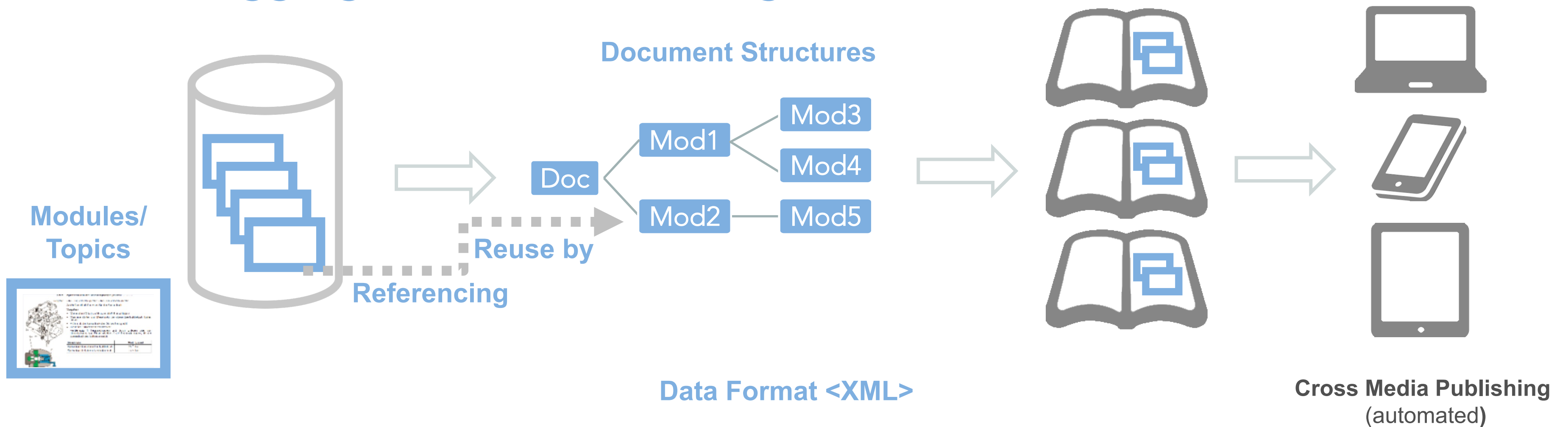
Creating (native-) intelligent content

CM Methods

Referencing modules/topics

- permits controlled processes
- avoids uncontrolled redundancies
- defines and populates document structures by topics

Reuse, Aggregation and Publishing



CM Methods

CMS drivers and demands from industry

Products from industrial engineering and manufacturing are characterized by „mass customization“ and „globalization“ :

- Short-time development cycles
- Many changes within development phase
- Frequent and rapid changes within time of use (software updates, servicing for manufacturing/machines)
- Use of standard parts & components (mass production) and reuse of parts
- Adapting products to customer needs (customization & variant management)
- Adapting products to addressed markets (globalization issues for export-oriented industries)
- Comply with regulations and standards
- **Software similar, but different** (software functions , more software variants/branches, license management; in many cases more individual customizing; influence agile development)

CM Methods

Grundfos:

AEM environment

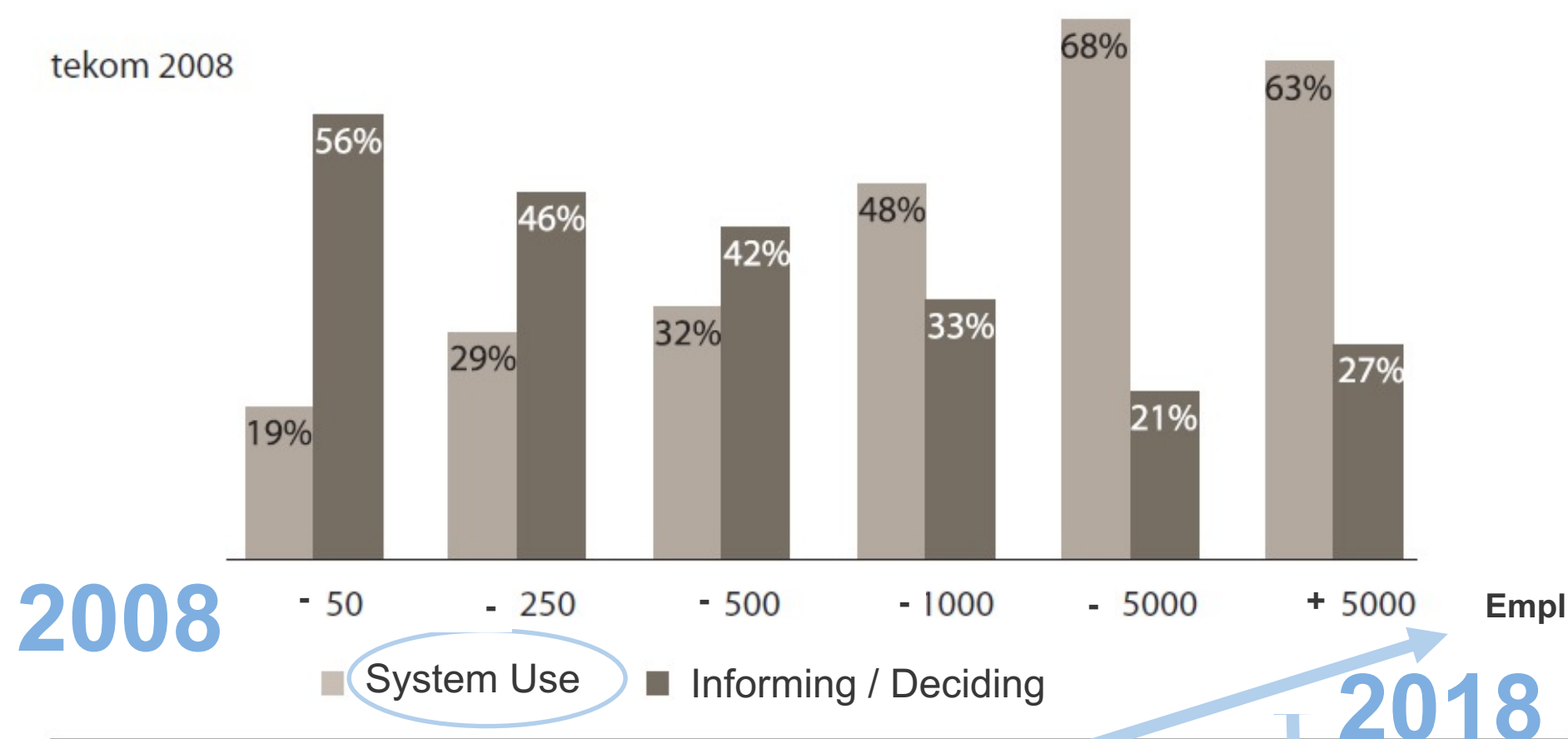
Basic CM Concepts in TC

- **CMS principles**

Controlled reuse of content modules (topics) in multiple delivery structures, documents or media using metadata

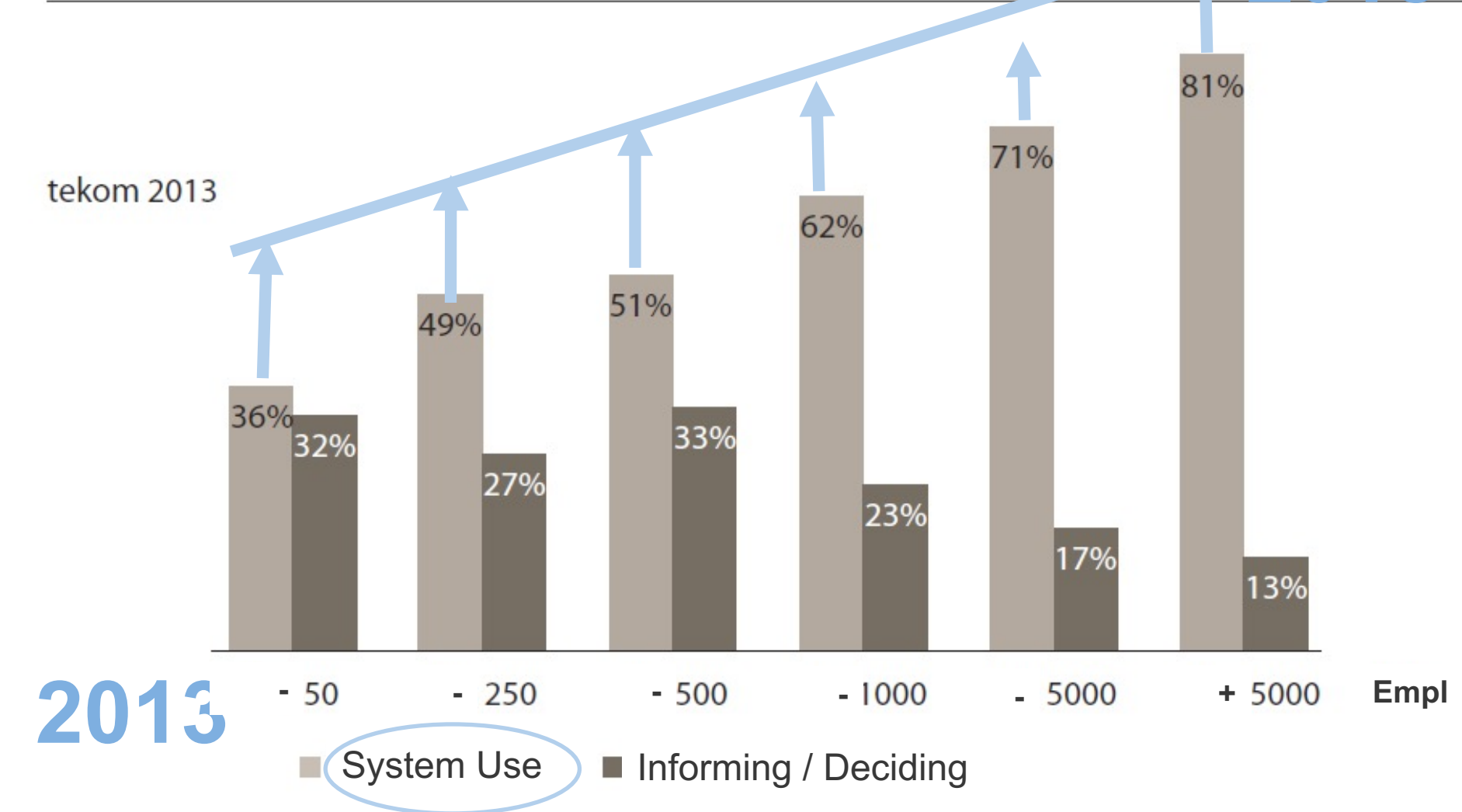
- **CMS offer technologies for**

- Variant management (product & media variants, configuration)
- Version management (change Management)
- Translation management (internationalization, globalization)
- Cross media & publishing management



Increasing Use of CMS

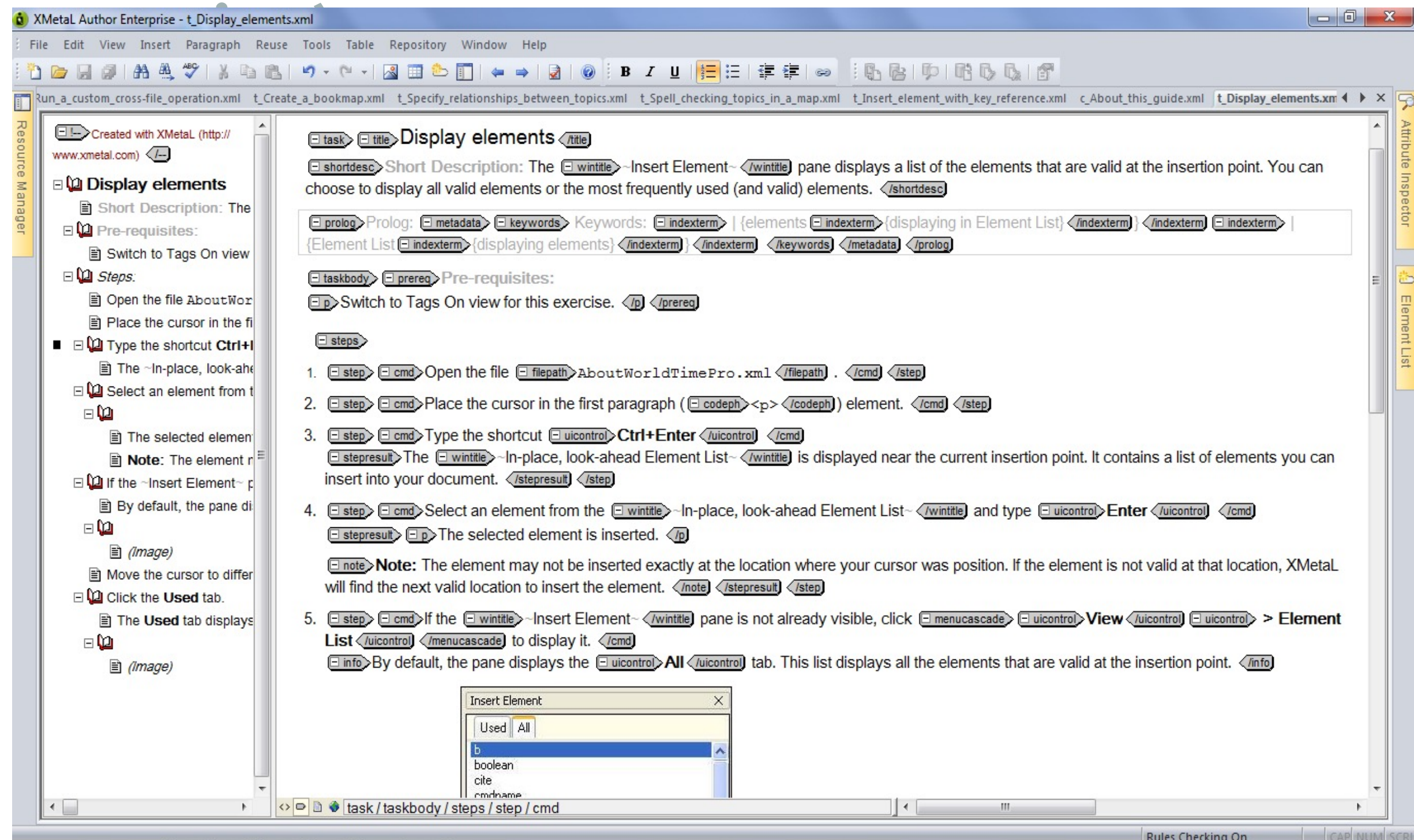
Evolution of CMS distribution in German speaking countries for various company sizes



Small and mid size companies started to use CMS for improving efficiency of document creation and for creating new media

CM Methods

XML Authoring environments (for content



CM Methods

What is TC focussing for authoring & structuring?

- Comprehensive, minimalistic writing
- Rules-based writing
- Consistent terminology
- Writing for international markets (translation, localization)
- Self-contained information: topic-based writing
- Structured and standard information models (XML, DITA)

CM Methods

How to turn topics into intelligent content

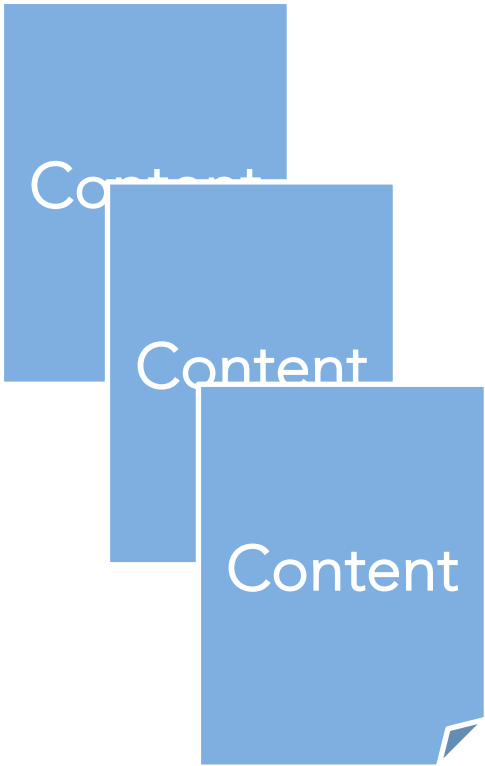
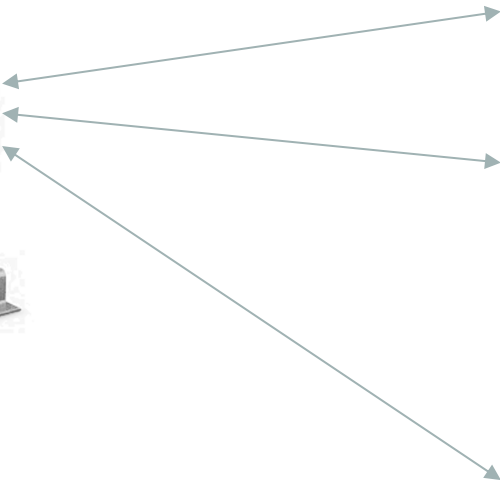
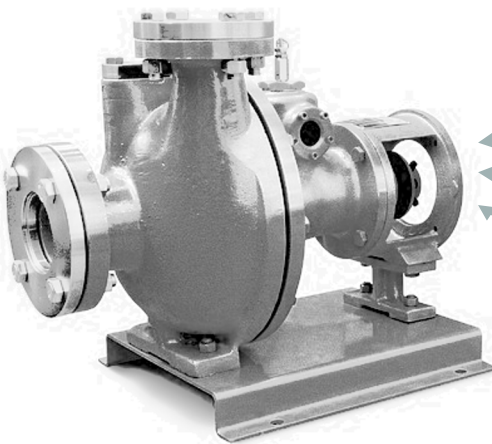
Metadata Enrichment by Semantic Metadata for Modular Content (PI-Classes®)

Product Classes

Physical & Virtual Objects
(Product Components)

Content Objects
(Modular Topics)

Information Classes



Operation

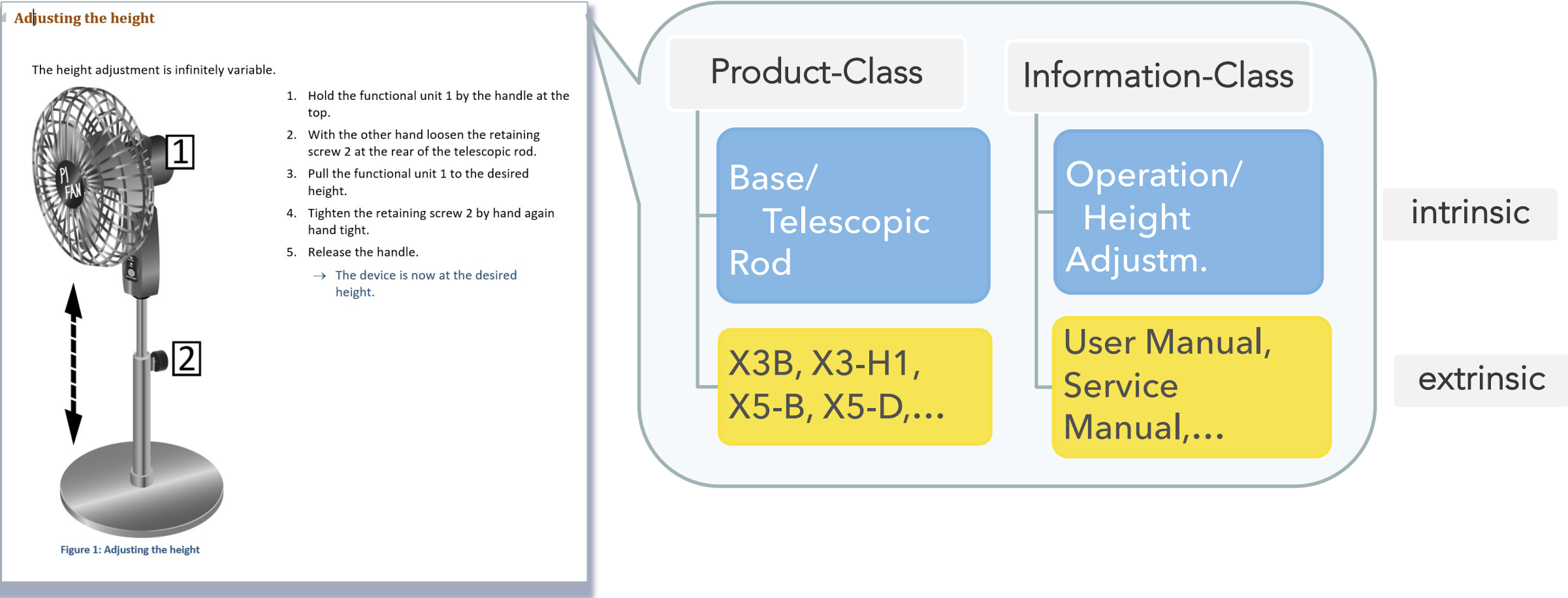
Dismount

Repair

CM Methods

Metadata
for identifying
and addressing
modules/topics

Basic Dimensions of Topic Classification (PI-Class®)

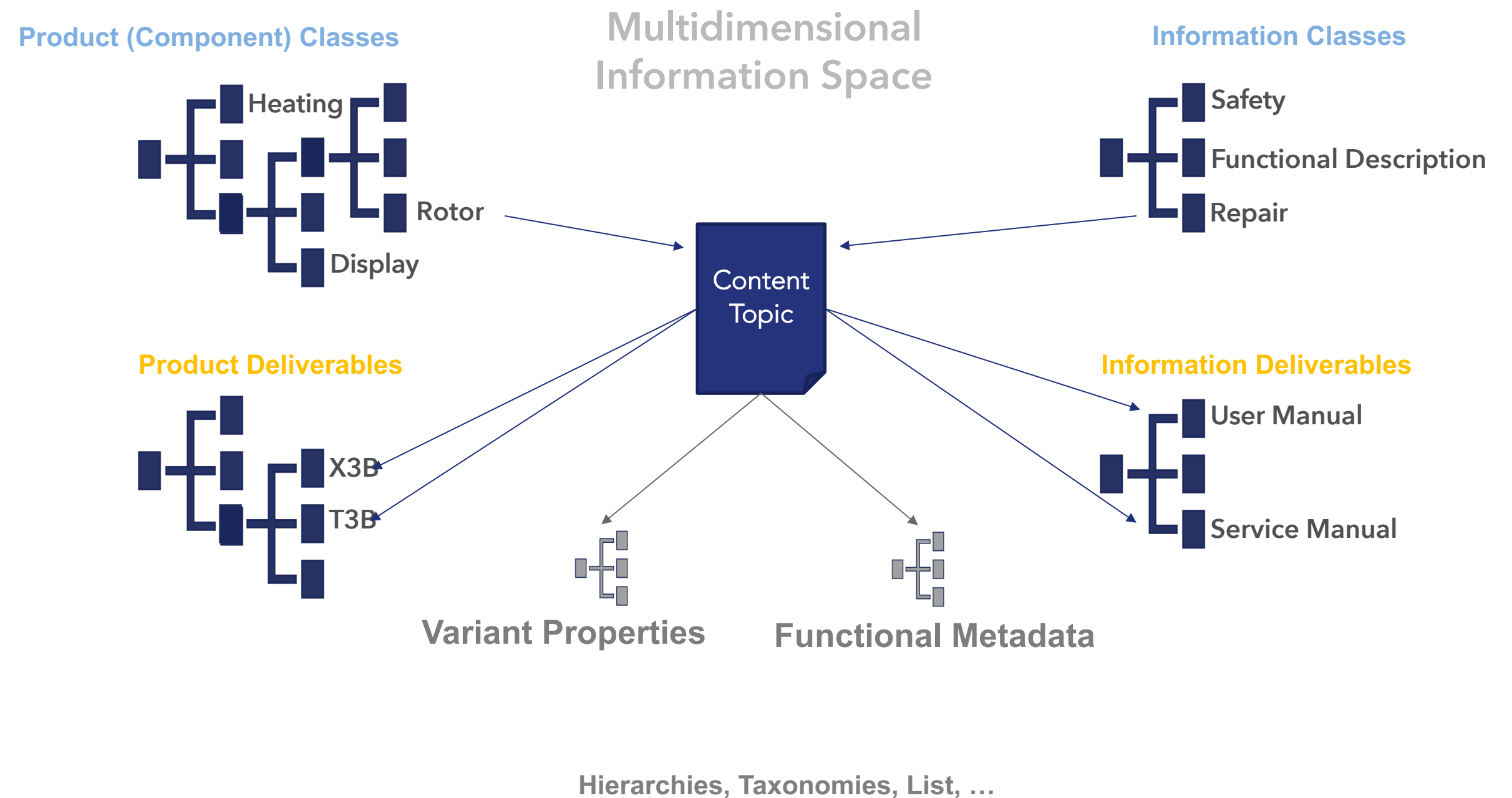


Topic: self-contained information unit;
topic concept and content is defined by (intrinsic) PI-
classes

www.pi-fan.de

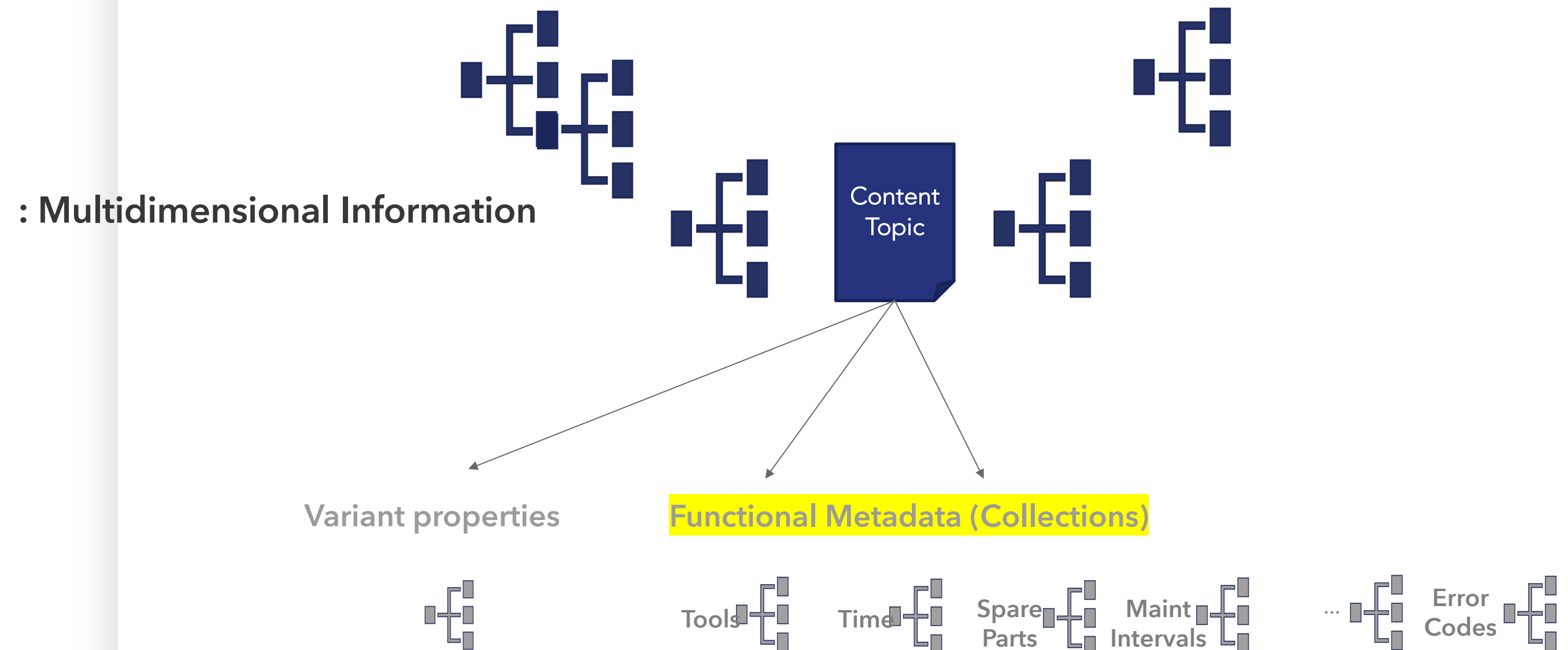
CM Methods

CMS „Taxonomies“ from Topic Classification (Basic PI-Class)



CM Methods

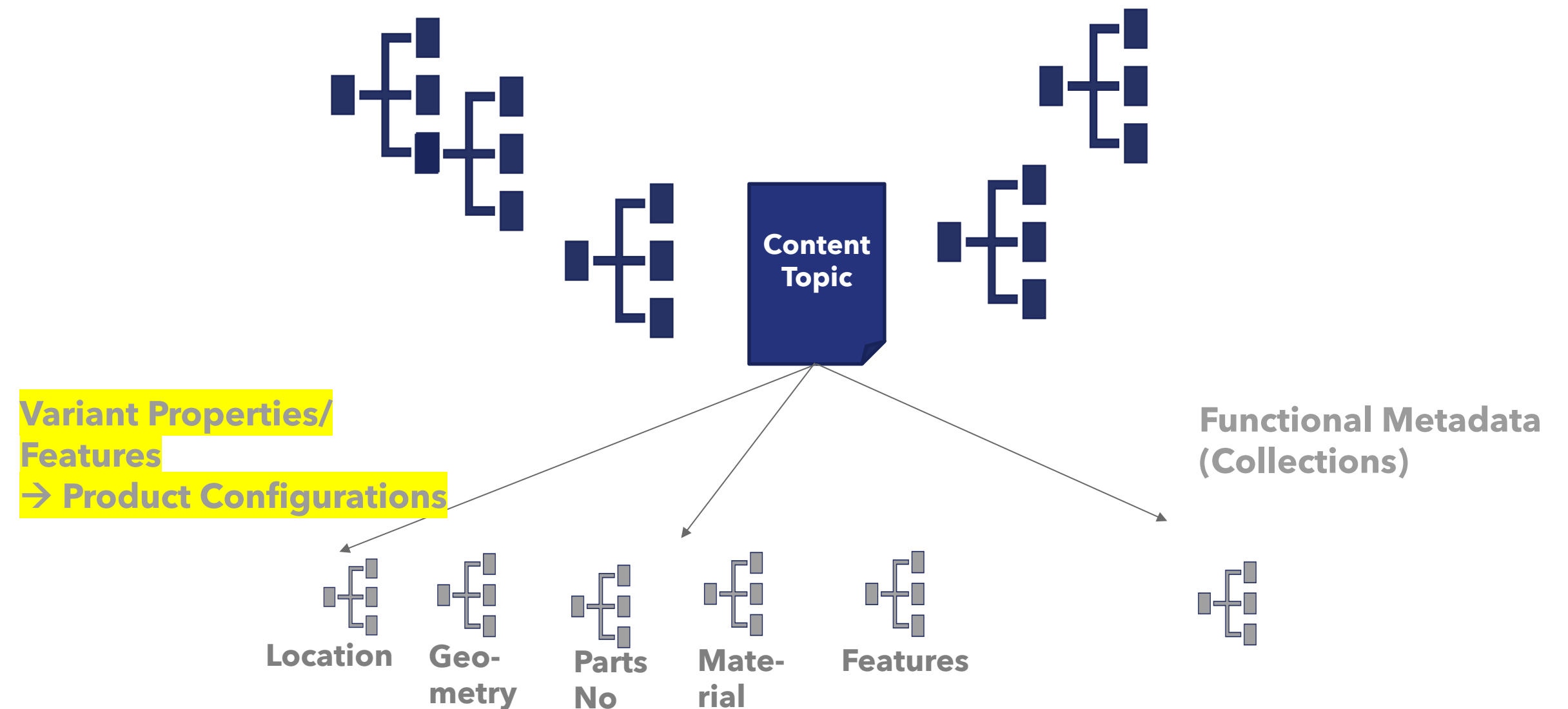
CMS „Taxonomies“ from Topic Classification (Extended PI-Class)



CM Methods

CMS „Taxonomies“ from Topic Classification

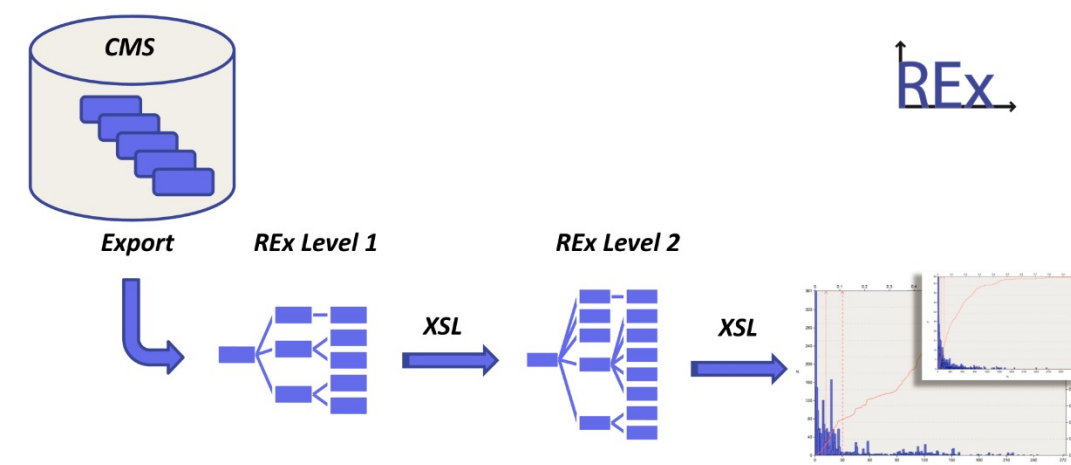
Extended PI-Class: Multidimensional Information Space



CM Methods

e.g. Report Exchange
(REx)

Methodology



Analyzing CMS processes and use of CM methods

- System development & improvement can be proven & tracked by KPI
 - Reuse numbers of modules, fragments, media, ...
 - Reuse rates of deliverables (documents, ...)
 - Efficiency / cost indicators (Sharing factors per publication)
 - Change rates and new content rates (per publication)
 - Document fingerprints (module reuse rates from doc's)
 - Variant management (number of variants, complexity)

Content Management

Summary I (CMS)

- Technology and methods are available in CMS for topic-based and configuration-specific information creation, document assembling, publishing and provisioning (packaging). Deliverables rely strongly on taxonomic classification of topics.
- Limiting factors are often data quality / process integration within companies and human factors (complexity of information structures; „lost in metadata“ of different configurations) as well as a lack of information planning! (Therefore, also analytics is needed...)
- Planning, analysis and management of processes (like variant management) depend on metadata quality

Content Management

Summary /Vision II (CMS)

- Highly structured content, enriched by semantic metadata has been created, but often only used for (automated) PDF/print production.
(Even though CMS can produce all types of media)
- Latest delivery technologies benefit from and require such structured content packages
- New media (e.g. chatbots, training, animations, AR/VR/MR) demand additional or new types of accessible information structures and content objects.

Intelligent Content Delivery

Making use of native intelligence of content

CD Methods

Webshop

Bürobedarf & Schreibwaren

Bestseller

Büromaterial

1-16 von 125 Ergebnissen in Bürobedarf & Schreibwaren

Filtern nach

< Alle Kategorien

< Bürobedarf & Schreibwaren

< Büromaterial

Präsentationszubehör

Presenter (95)

Overhead-Projektoren & Folien (5)

Memoboards (1)

Schaumstoffboards (1)

Weißwandtafeln (1)

- Weniger anzeigen

Verwandte Suchbegriffe

Präsentationszubehör

Presenter (95)

Overhead-Projektoren & Folien (5)

Memoboards (1)

Schaumstoffboards (1)

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- Weniger anzeigen

Versandoption (Was ist das?)

Prime

Kostenlose Lieferung ab EUR 29 Bestellwert

Liefertag

☐ Lieferung Heute

☐ Lieferung Morgen

Marke

☐ Hama

☐ August

☐ Logitech

☐ Incutex

☐ BlueBeach

☐ Infiniter

☐ Rii

☐ Xgeek

☐ SPEEDLINK

☐ Linkte

☐ REFLECTS

☐ DODOCOOL

☐ Mondpalast

☐ Nobo

☐ CSL-Computer

+ Weitere

Durchschn. Kundenrezension

★★★★☆ & mehr (36)

★★★★☆ & mehr (50)

★★★★☆ & mehr (57)

★★★★☆ & mehr (58)

See FAQs on the Coronavirus (COVID-19) and Alibaba.com shipments learn more >

All Products Customization Ready to Ship

CATEGORIES

Laser Pointers
Flashlights & Torches
Laser Equipment Parts
Scopes & Accessories

Supplier Types

- ☐ Trade Assurance
- ☐ Verified Supplier
- ☐ ≤1h response time

Product Types

- ☐ Ready to Ship
- ☐ Paid samples
- ☐ Fast dispatch
- ☐ Delivered Duty Paid

Min. Order

less than OK

Price

min - max OK

Supplier Country/Region ▾

Q search

- ☐ Hong Kong S.A...
- ☐ India (80)
- ☐ Italy (5)
- ☐ Japan (44)
- ☐ Pakistan (8)
- ☐ Russian Feder...
- ☐ Singapore (24)
- ☐ South Korea (26)
- ☐ Taiwan, China (...)
- ☐ United States (28)

Past Export Country/R... ▾

Management Certi... NEW ▾

Q search

assessment, certification, inspection and/or related examination related to any authenticity of certificates are



ALS 150lm Rechargeable LED Pen Light
Laser Pointer Portable Flashlight
Ready to Ship Led Led Light Source
\$17.99-\$44.99 / Piece
2 Pieces (Min. Order)

CN AEC Lighting Solutions Co., Ltd.
2 YRS Verified 5.0 ★ (9) "amazing service"

Contact Supplier



2.4GHz Laser Pointer Remote Slideshow
Presenter Wireless Presentation Control
\$5.69-\$6.99 / Piece
200.0 Pieces (Min. Order)

TW SHENG YIH TECHNOLOGIES CO., ...
3 YRS 5.0 ★ (5) "fast delivery"

Contact Supplier



Hot Selling USB Rechargeable Long
Distance 50mw 532nm Tactical Green 303
Remote Control Long Distance
\$2.55-\$3.85 / Piece
50 Pieces (Min. Order)

CN Ningbo Alite Lighting Technology...
7 YRS Verified 4.7 ★ (59) "fast delivery"

Contact Supplier



Drop Shipping 5 in1 Long Distance High
Power Burning 450nm 1600mw 3000mw
Ready to Ship High Power Long Distance
\$20.00-\$24.00 / Piece
1 Piece (Min. Order)

CN Chengdu Shencantong Trading C...
2 YRS 4.6 ★ (34) "good service"

Contact Supplier



3 KG high-accuracy metal fiber pointer laser
head made in japan
6 months warranty
\$21,900.00 / Piece
1 Piece (Min. Order)

JP Micro Edge Process Co., Ltd.
2 YRS

Contact Supplier



High Power Rechargeable Red Blue Green
Laser Pointer 303 50mW
Ecommerce goods
\$3.00-\$4.50 / Piece
1 Piece (Min. Order)

CN Ningbo Topcom Lighting Co., Ltd.
11 YRS Verified 4.8 ★ (59) "excellent service"

Contact Supplier



Professional 303 Green Red Laser Po
With Star Head 532nm Lazer Flashlight
Fast dispatch Remote Control
\$3.40-\$3.80 / Piece
10 Pieces (Min. Order)

CN Yiwu Zhangkun E-Commerce
2 YRS Verified 4.9 ★ (51) "customer service"

Contact Supplier



Logo Custom Wholesale 1mw 5mw 4
Red Green Blue Violet Purple uv Lase
Ready to Ship
\$0.80-\$0.90 / Piece
10 Pieces (Min. Order)

CN Ningbo Topcom Lighting Co.
2 YRS 4.9 ★ (7) "Good service"

Contact Supplier

Content Delivery Portals (CDP)

(Definition 2013)

Basic definition and functionalities

Systems offering web-based access to modular, aggregated content or other information for various user groups (or applications) by related search & retrieval mechanisms (or services).

Basic functionalities

- Access or import content from relevant data sources and corresponding systems
- Manage and update content within the content lifecycle
- Retrieval functionalities including user interfaces for content searching and indexing
- Web-based display of content on a modular or document-based level
- Web services handling requests from other applications and events.

CD Methods

GUI principle of CDP

Facetted search/request and topic delivery

Component

- Hydraulic system
- Oil Pump

Information

- Procedure
- Testing

Machine

Z-006

Document

Service

Hydraulic system

The hydraulic oil sample is taken via a test connection on the variable displacement pump.

Fig. 250: Sampling point for hydraulic oil

- ▶ Start the engine and wait 3 minutes.
 - ▷ The hydraulic oil is circulated.
- ▶ Engage the parking brake and secure the machine against rolling away.
- ▶ Connect the test line to the test connection G.
- ▶ 0.2 l Drain the hydraulic oil into the receptacle.
- ▶ Fill the sample container.
- ▶ Remove the test line and seal the test connection.

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CD Methods

Facetted search/request and topic delivery

Customer-
dependent
Configuration !

Component

- Hydraulic system
- Oil Pump

Machine

Z-006

Konfiguration

$a_1 | b_3 | \dots | x_5 | y_1 | z_5$

Information

- Procedure
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CD Methods

Need for changing
concepts of topic creation
and metadata handling

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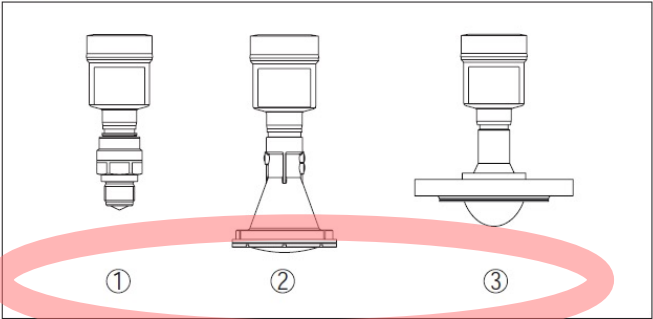


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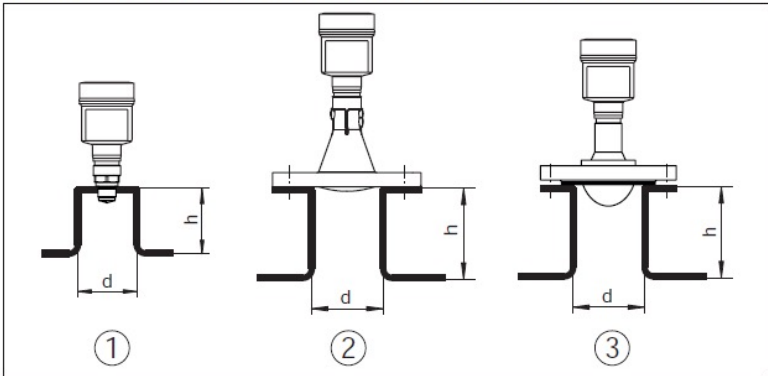


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Selection/Generating of
publication depending
on parameters

10 Supplement

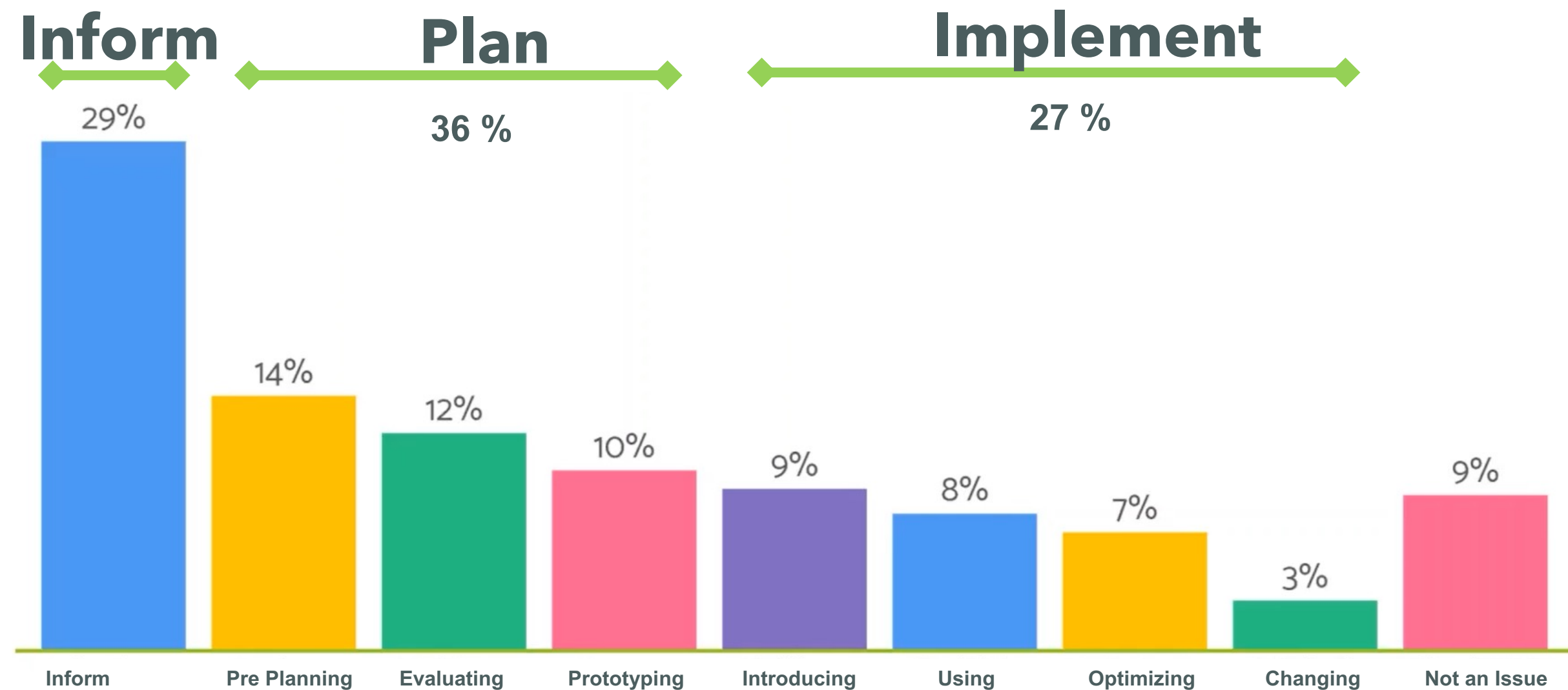
DUKKEIL

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Derating, ambient temperature

CDP Market

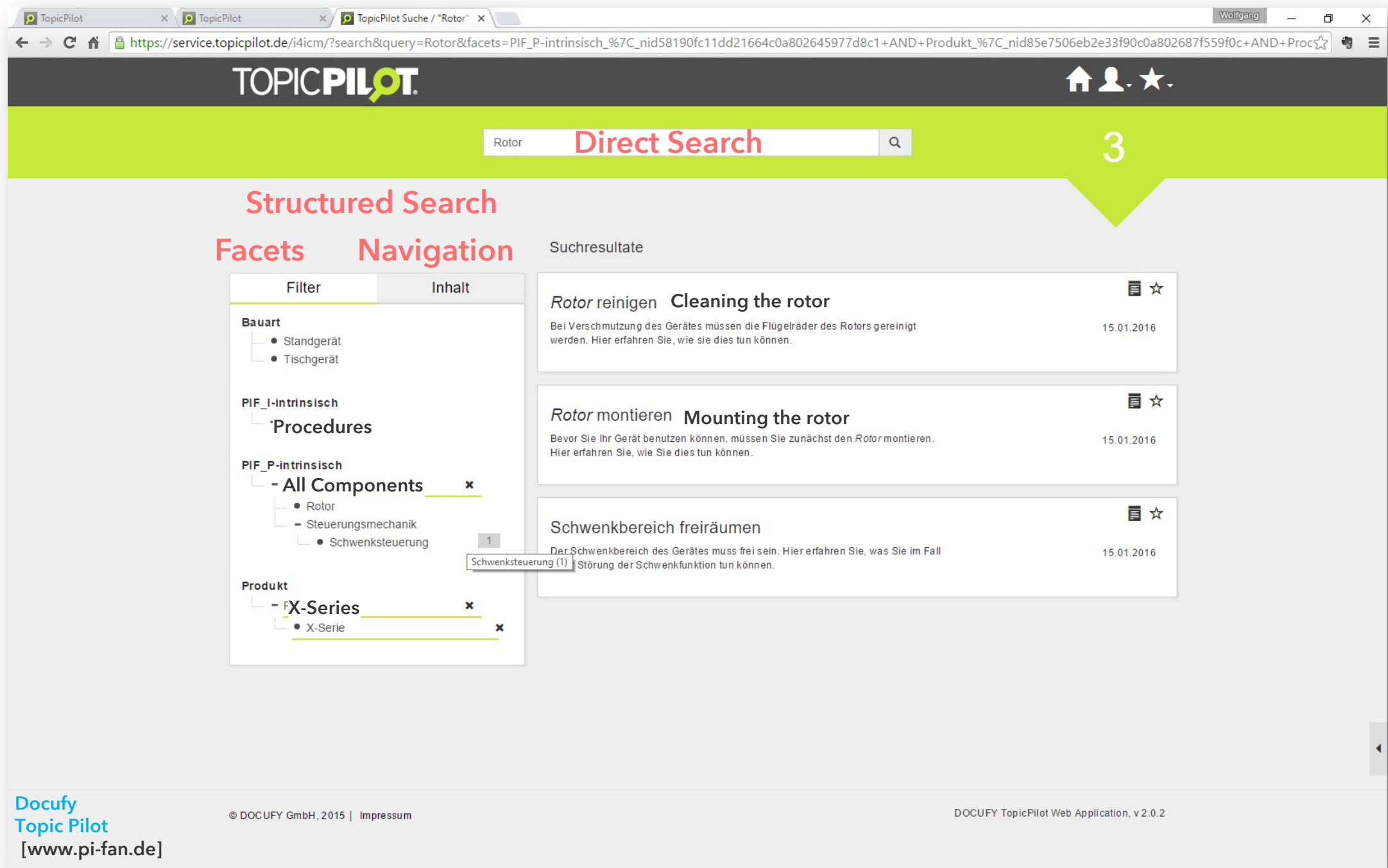
Content Delivery: System Introduction Phases



CD Methods

(Demo
PI-Fan reference model)

Content Delivery Portal (PI-Fan)



CD Methods

Content Delivery Portal (PI-Fan)

[Alles Anzeigen](#)

2

Navigating the document structure (before/after faceted search)

PI-Fan T3-B	Content
Ventilator „PI-Fan“ T3-B	
• Allgemeine Sicherheitshinweise - Produktbeschreibung • Bestimmungsgemäße Verwendung • Vorhersehbarer Fehlgebrauch • Technische Daten - Montage Adjusting the tilt • Inbetriebnahme - Bedienung • Neigung einstellen • Einschalten und Geschwindigkeit einstellen • Schwenkfunktion ein-/ausschalten - Wartung • Rotor reinigen + Fehlerbehebung • Kontaktdaten • Entsorgung	

Suchresultate

Adjusting the tilt

03.02.2016

Der Ventilator hat einen Neigungswinkel von -15° bis +35°. Diesen können Sie schrittweise in 5° Schritten einstellen.

Neigung einstellen

1. Greifen Sie den Ventilator am Griff auf der Oberseite.
2. Neigen Sie den Ventilator, bis er den gewünschten Neigungswinkel erreicht hat.

i

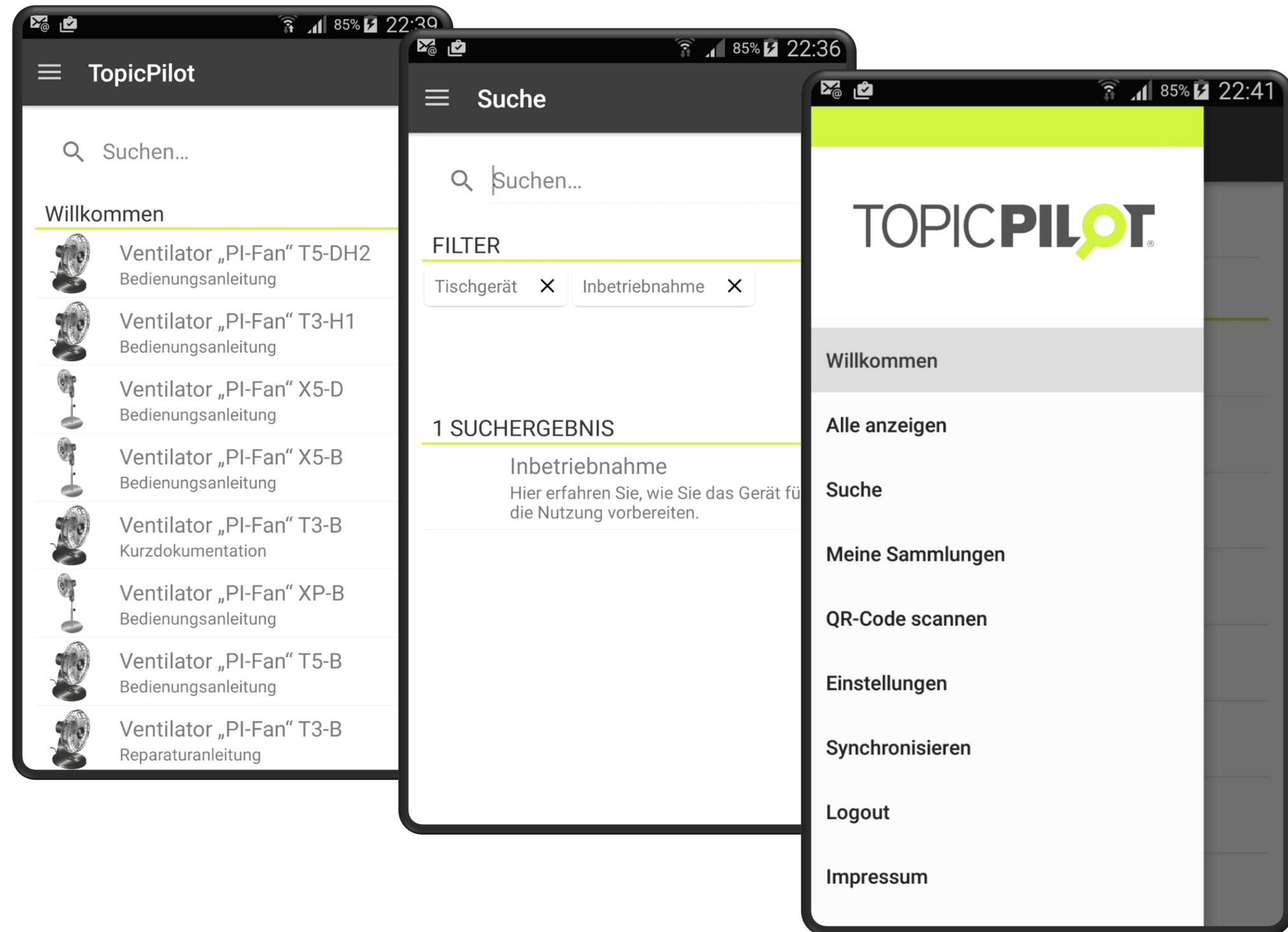
Notiz

Ein deutlich hörbares Einrastgeräusch signalisiert, dass sich der Neigungswinkel um eine Stufe geändert hat.

[Weiterführende Informationen](#)

CD Methods

App Delivery Application including Search



CD Methods

Content Request & Delivery

Object Recognition and CDP

CDP Request:
Deep Link /
Parameter Call

SIG Augmented Reality

FÜLLSTATION > Übersicht POIs

Füllguttank

01 Funktion

Funktion

Der Füllguttank enthält das Füllgut vor de
Abfüllvorgang (siehe TopicPilot: Füllgutta

SIG

Vodafone.de 09:27 51 %

Zurück Füllguttank

In Augmented Reality Darstellung Öffnen

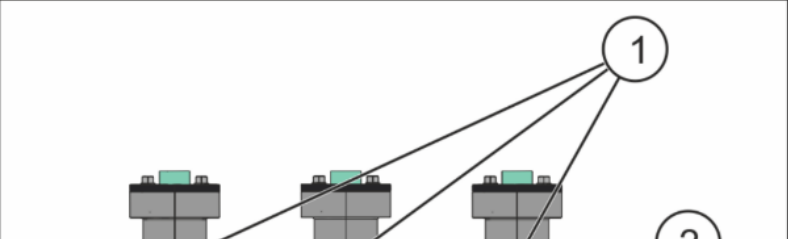
Funktion

Der Füllguttank hat zwei Funktionen. Er nimmt zum einen das Füllgut für die Füllstation auf und beinhaltet zum anderen die innenliegende Dosiereinrichtung. Der Tank ist luftdicht verschlossen. Der Füllstand im Tank wird durch eine kontinuierlich messende Sonde erfasst und durch das Tankregelventil V01.1 konstant gehalten.
Bei Unterschreiten des Füllstandminimums wird die Mantelentnahme automatisch unterbrochen. Das Volumen des Tanks ist so ausgelegt, dass noch alle in der Maschine befindlichen Packungen einwandfrei gefüllt werden, wenn das Füllstandminimum erreicht wird.
Der Füllguttank wird nach SIG-Vorgabe mit steriler Druckluft beaufschlagt:

- zur Kühlung des Füllsystems nach der Dampfsterilisation,
- zur Vermeidung von Gewichtsschwankungen während der Produktion und
- zur Aufrechterhaltung eines sterilen Überdrucks während der Produktion.

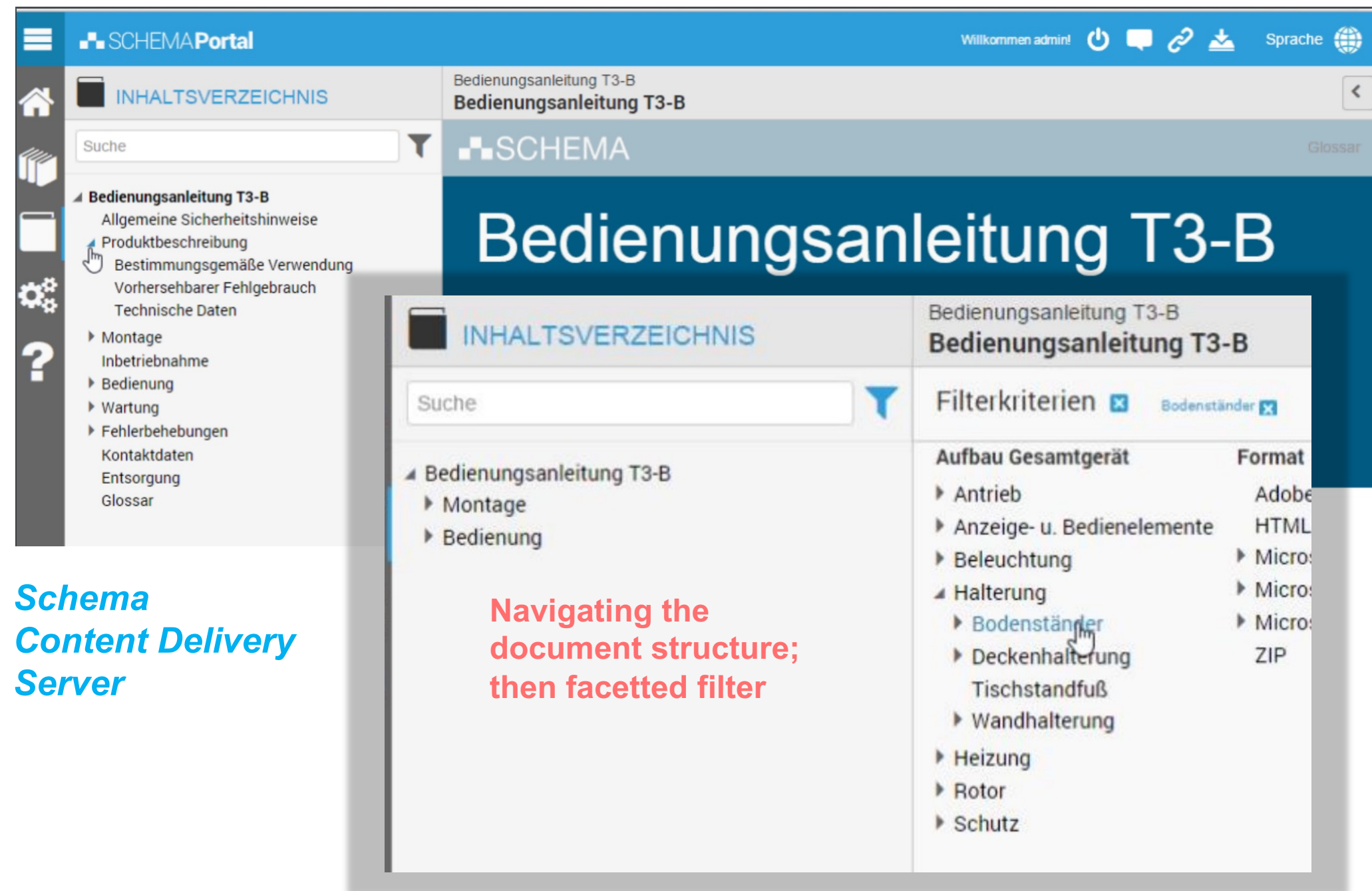
Zur Erzeugung der sterilen Druckluft wird ölfreie Druckluft mit dem Sterilfilter gereinigt. Über die Überlaufleitung wird der Füllguttank beaufschlagt. Das Sicherheitsventil V50.1 begrenzt den maximalen Tankdruck (3,5 bar). Bei höherem Druck öffnet das Sicherheitsventil und es erfolgt ein Druckabbau durch die Rohrleitung zur Entsorgungsleitung.

Übersicht



CD Methods

CDP: Facets in Documents



www.pi-fan.de

CD Methods

Content Delivery Portal (PI-Fan)

INHALTSVERZEICHNIS

Suche

Bedienungsanleitung T3-B

Montage

Teleskopstange und Standplatte montieren

Bedienung

Höhe einstellen

[www.pi-fan.de]

Schema

Content Delivery Server

Bedienungsanleitung T3-B

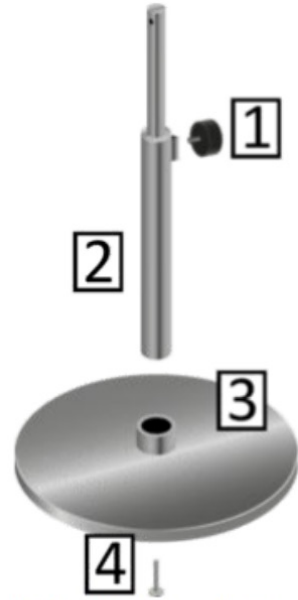
Teleskopstange und Standplatte montieren

SCHEMA

Glossar

Bedienungsanleitung T3-B / Montage / Teleskopstange und Standplatte montieren

Teleskopstange und Standplatte montieren



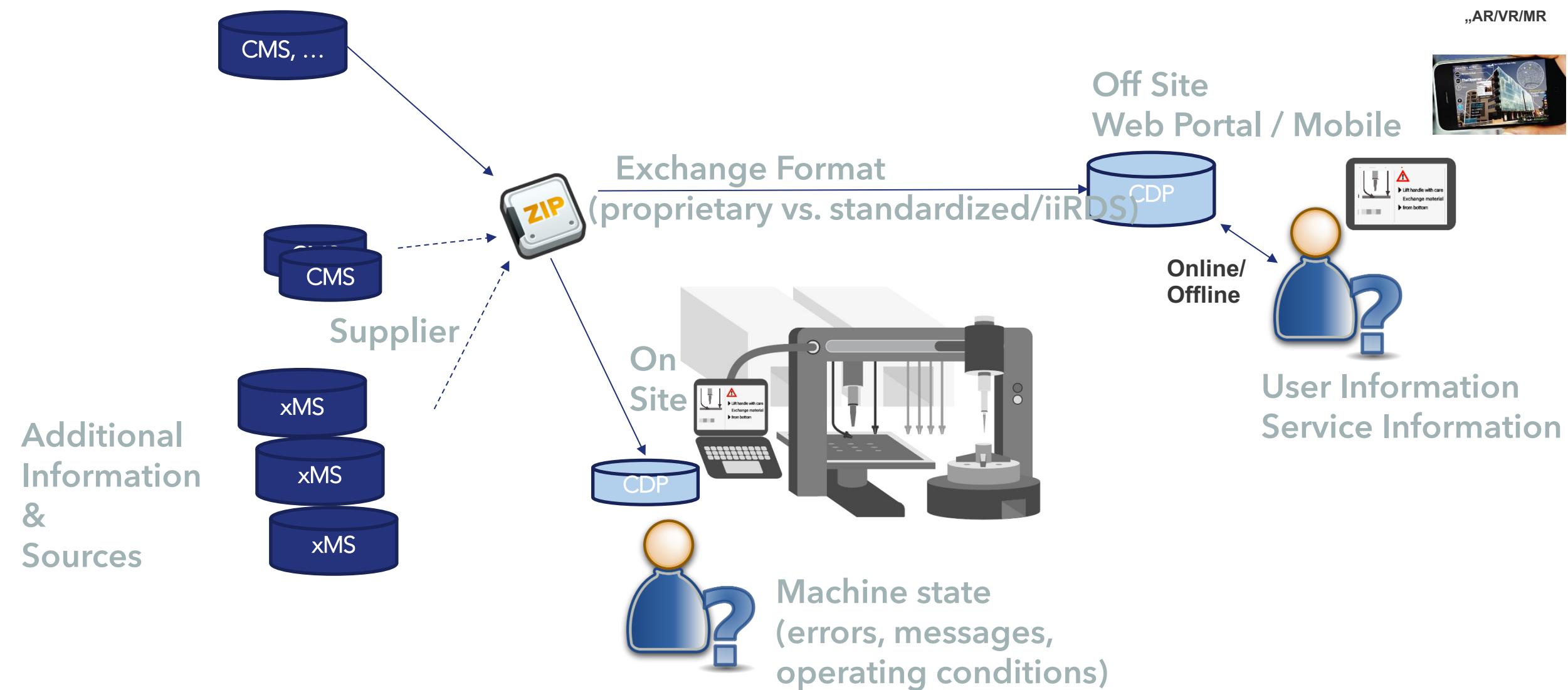
Bodenständer montieren

1. Befestigen Sie die Justierschraube 1 an der Teleskopstange 2, wie in Abbildung 1 zu sehen und ziehen Sie die Justierschraube handfest an.
2. Stecken Sie die Teleskopstange 2 in die runde Aussparung an der Oberseite des Bodenständers 3.
3. Befestigen Sie die Teleskopstange 2 am Bodenständer 3, indem Sie die Befestigungsschraube 4 durch den Bodenständer stecken, und handfest anziehen.

→ Die Teleskopstange ist nun am Bodenständer befestigt.

CD Methods

CDP environments in industrial applications



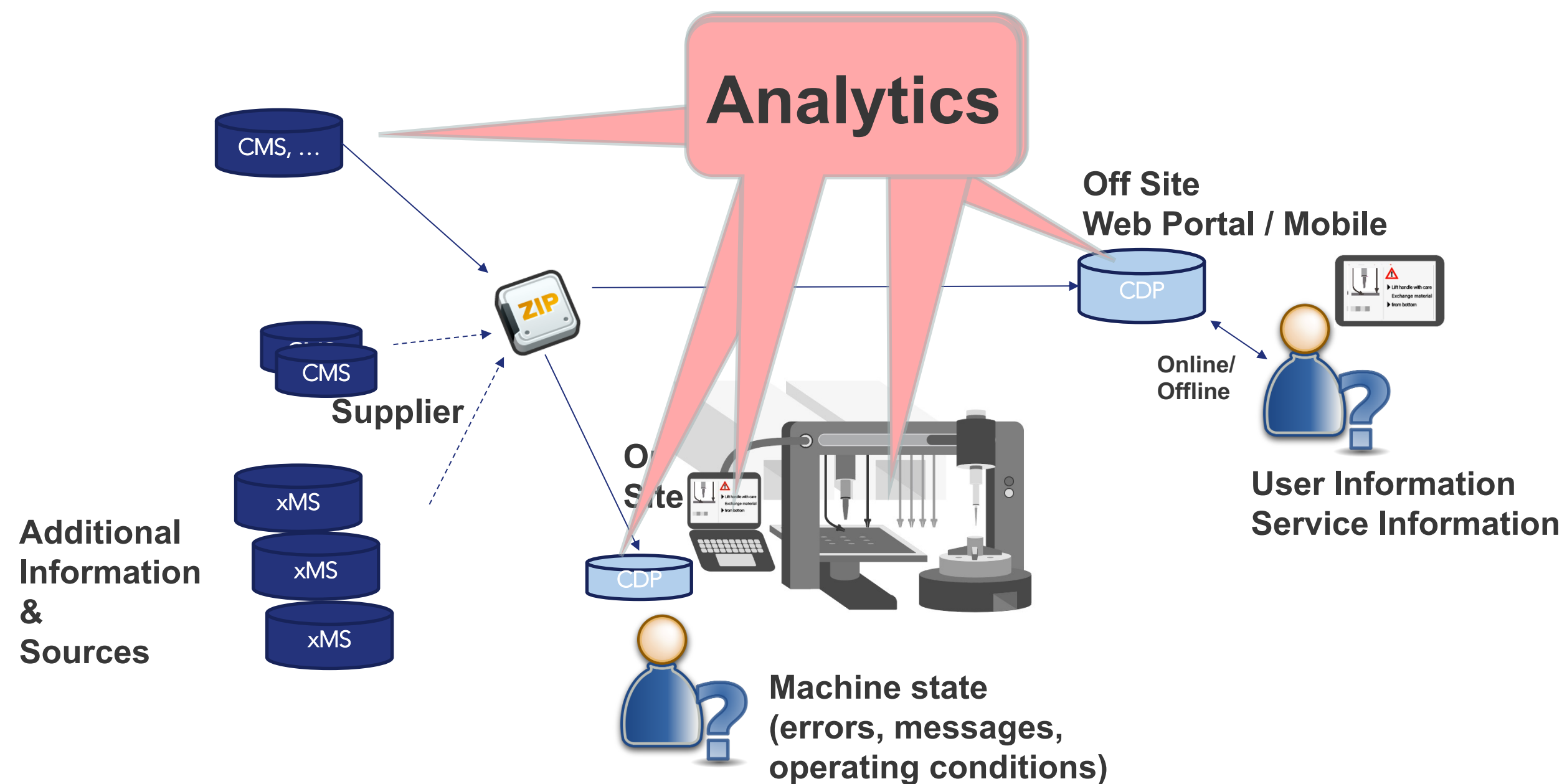
CD Methods

- Content provisioning for data integration
- Web interfaces /API
- Standard Formats (XML, HTML, PDF, iiRDS)
- Requires classified topic based on variants and configurations!

CD Environment

Analytics

CDP and analytics in industrial applications



CMS & CDP Analytics

Analytics

Overview of Content System Analytics

CMS Analytics (REx)

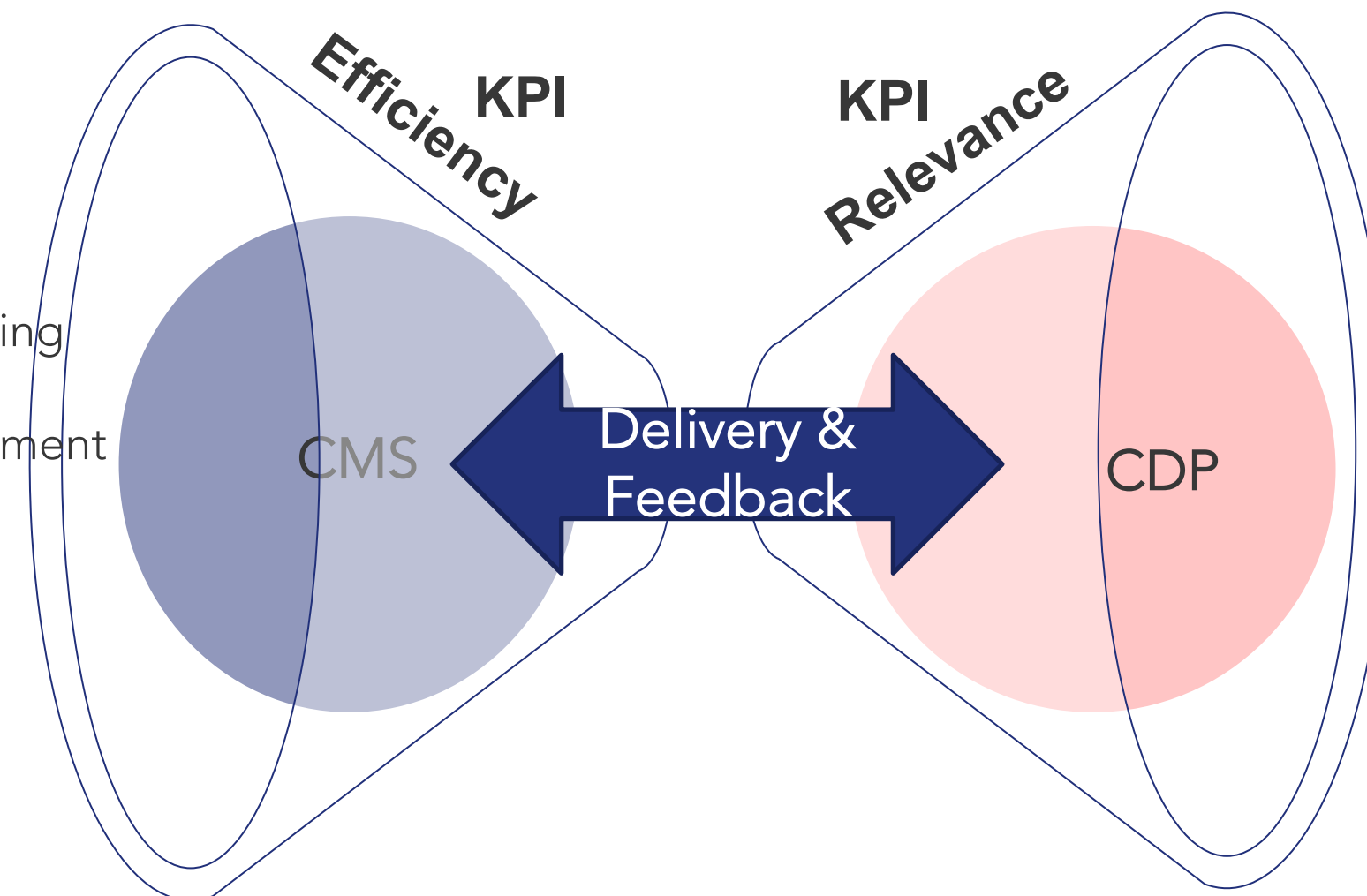
- Metrics:
- Reuse Rates (Abundance)
 - Redundancy
 - Document Sharing factor
 - Variant management
 - Correlations; Distributions

...

Artificial Intelligence

- Quality assurance:
- Similarity analysis
 - Classification quality

...



CDP Analytics (CoReAn)

Indirect feedback

→ Metrics:

- visiting time,
- Visit frequency
- search behaviour
- search terms
- ...

Direct feedback

- Rating
- Satisfaction

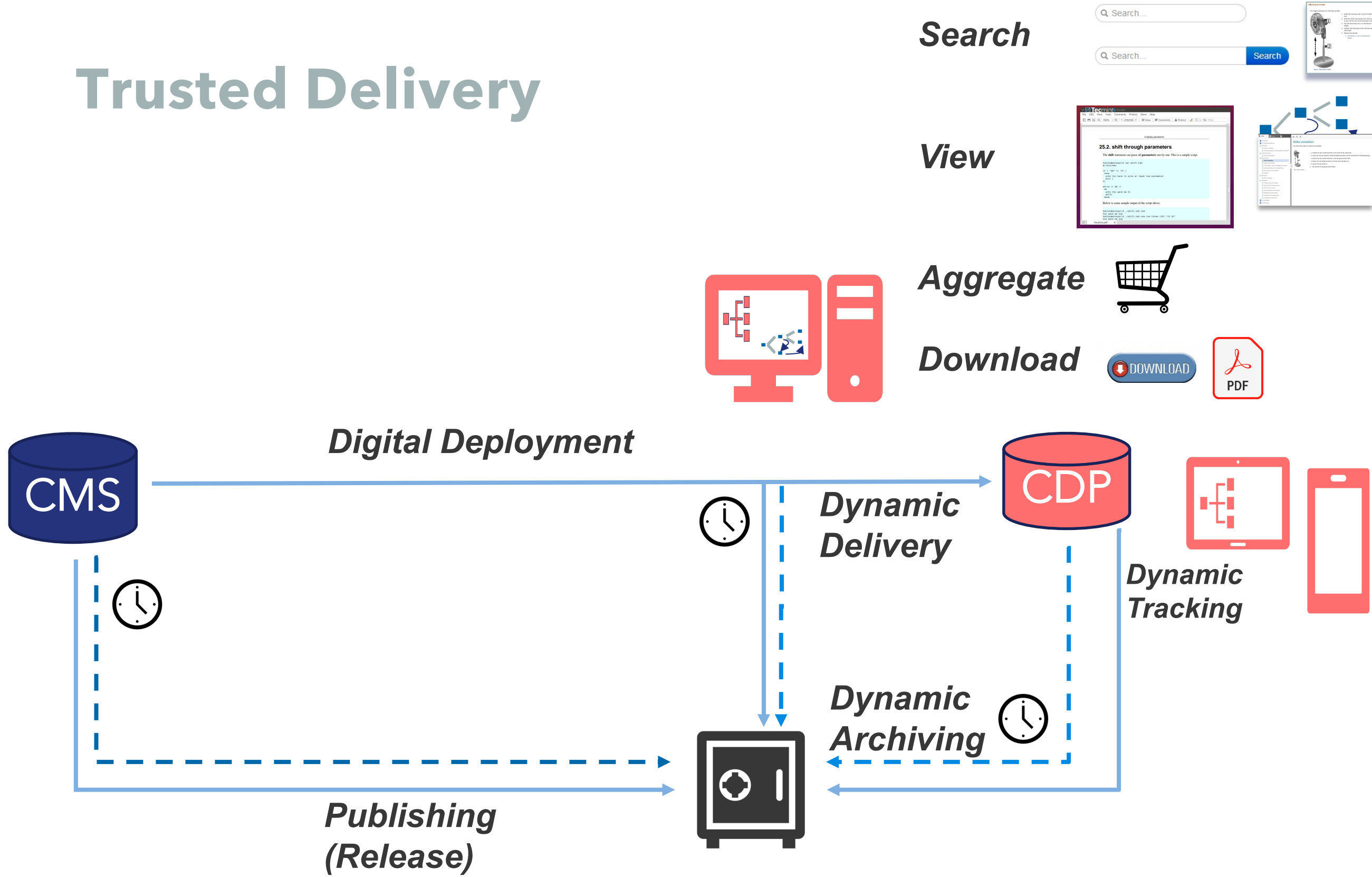
→ Improve:

- Product
- Information
- Terminology (Harvesting)

CMS - CDP

Archiving Services

Trusted Delivery



Content Delivery

Summary (CDP)

- Technology of CDP is available for delivery of document packages and faceted search for contained topics and documents;
Source of **facets are mostly taxonomies** from **CMS**
- Remark**:Dynamic aggregation, **variant management** is (at the moment) mostly done in CMS, not in CDP; **configuration management** needs new approaches because of its more dynamic and complex structure
- Delivery use cases for successful applications have to be clearly explored and defined
- Delivery can be developed in addition as **Digital Content Service** (DCS) for various external and internal applications and media

Content Management & Delivery for Digital Information Services

Deep(er) dive into Metadata

- How to handle complexity of content by methods & systems
 - reduce external complexity for information users



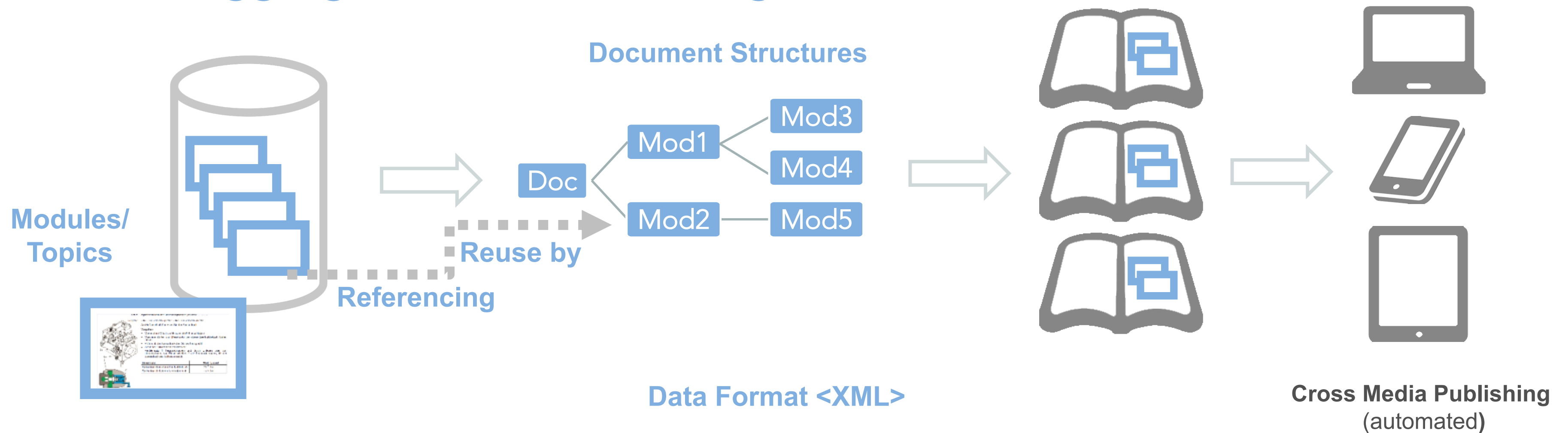
- manage internal complexity for information engineers & architects

CM Methods

Referencing modules/topics

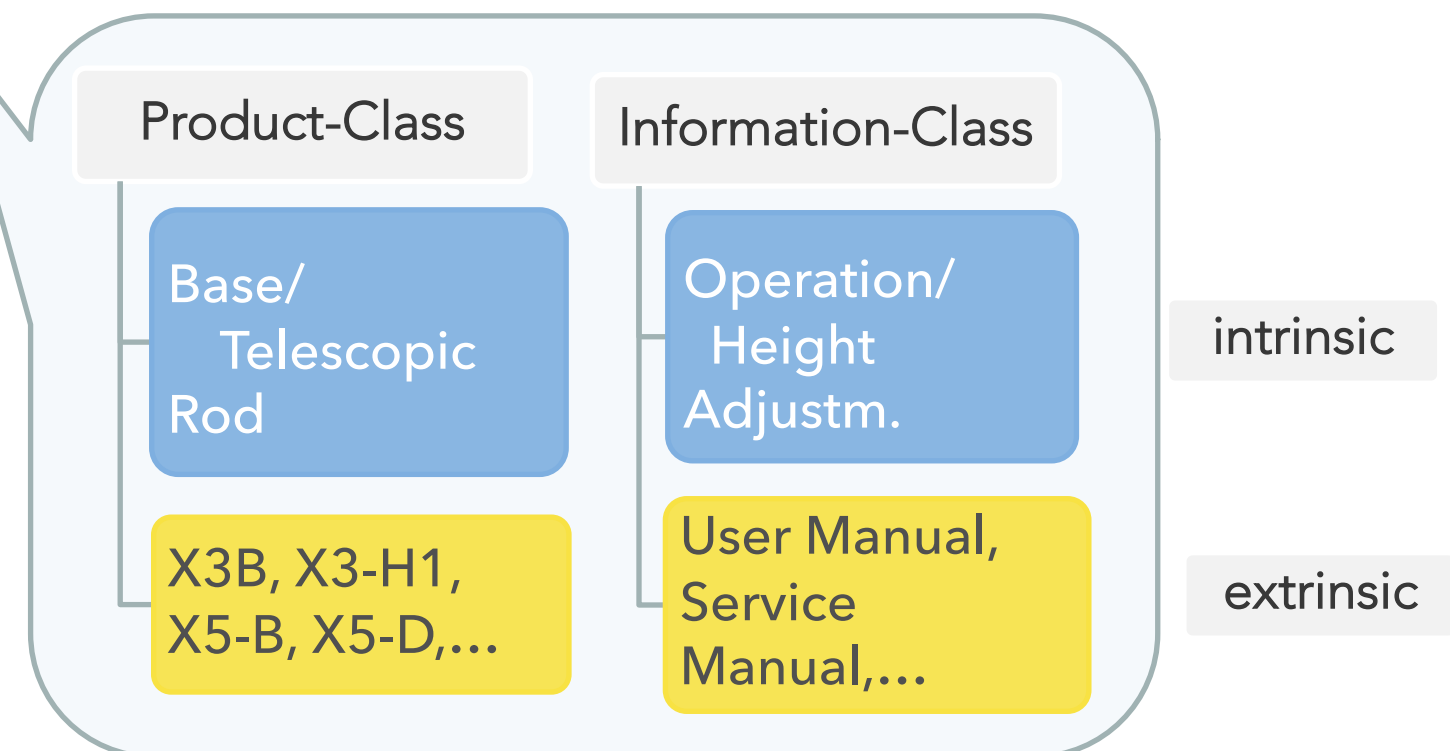
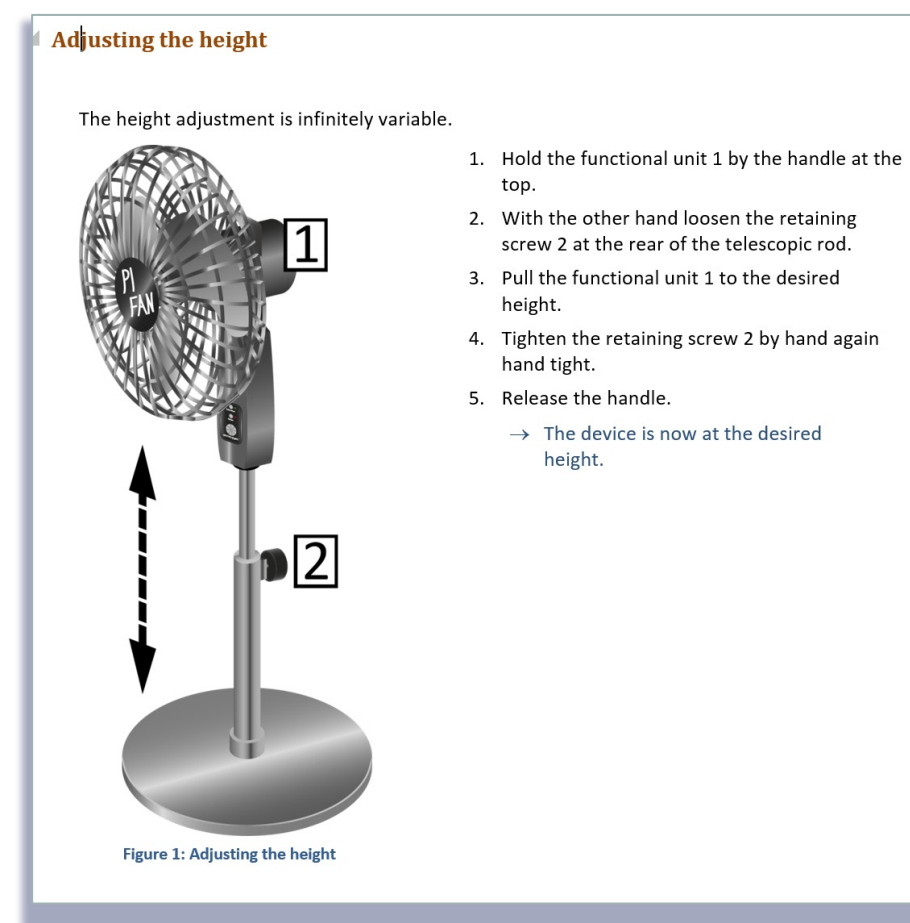
- permits controlled processes
- avoids uncontrolled redundancies
- defines and populates document structures by topics

Reuse, Aggregation and Publishing



CM Methods

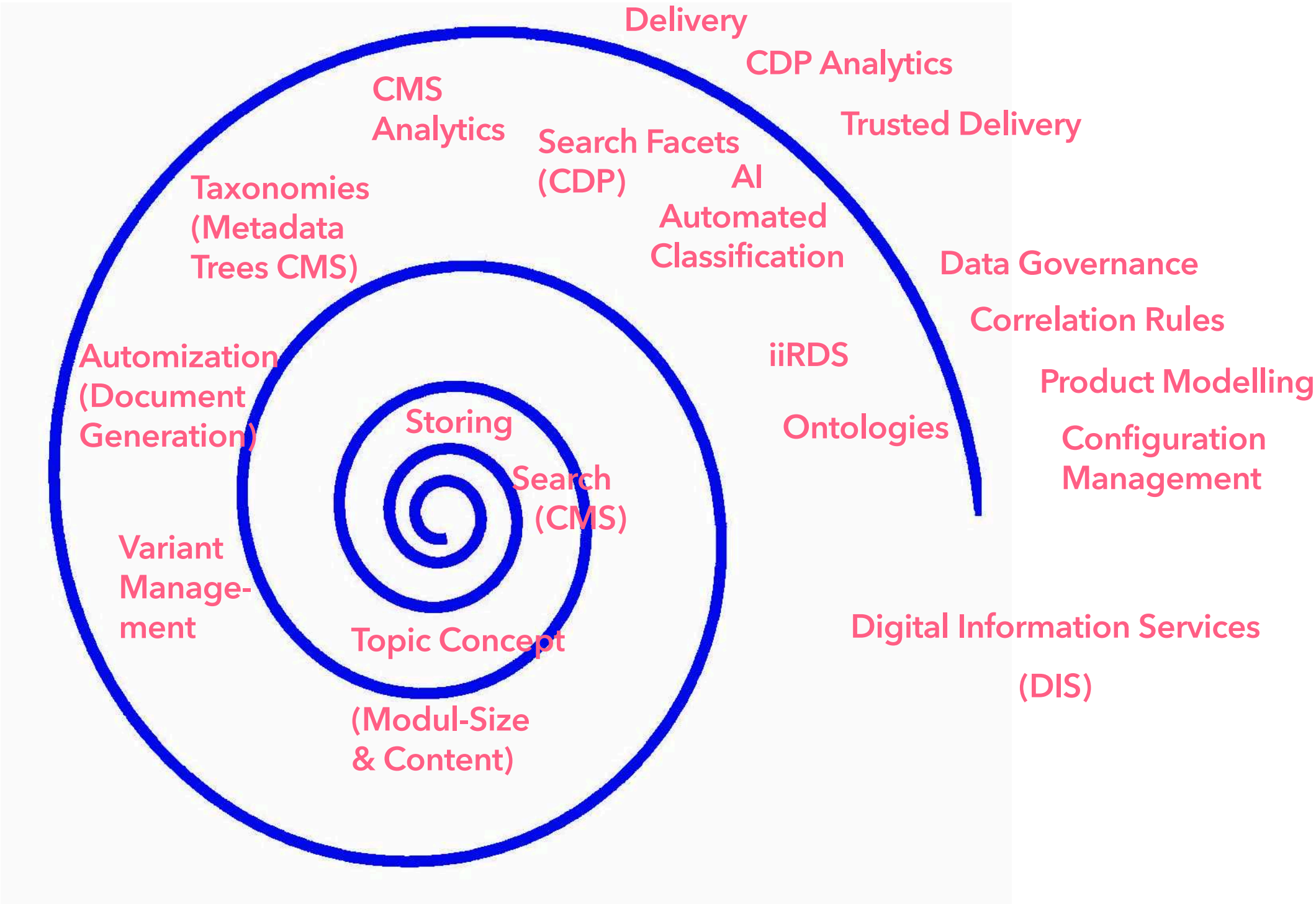
Basic Dimensions of Module Classification (PI-Class®)



Topic: self-contained information unit;
topic concept and content is defined by (intrinsic) PI-
classes

Metadata Evolution

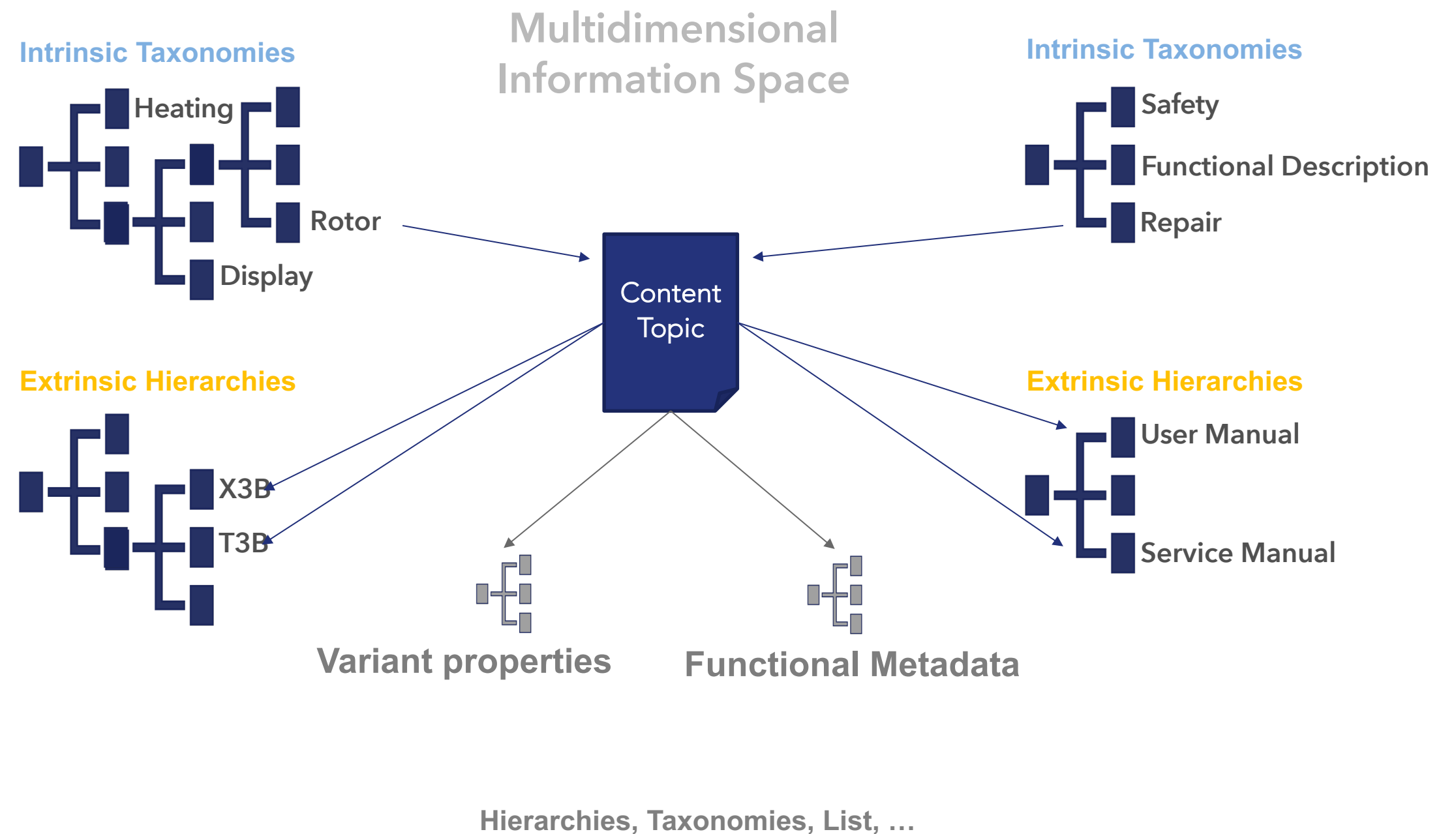
Overview: From CMS via CDP to DIS



CM Methods

Metadata
for identifying
and addressing
modules/topics

CMS „Taxonomies“ from Topic Classification



CM Methods

Dependency on:

- Stake Holder
- Process Owner & Driver
- Information Sources & Systems

Information Environment and Dependencies

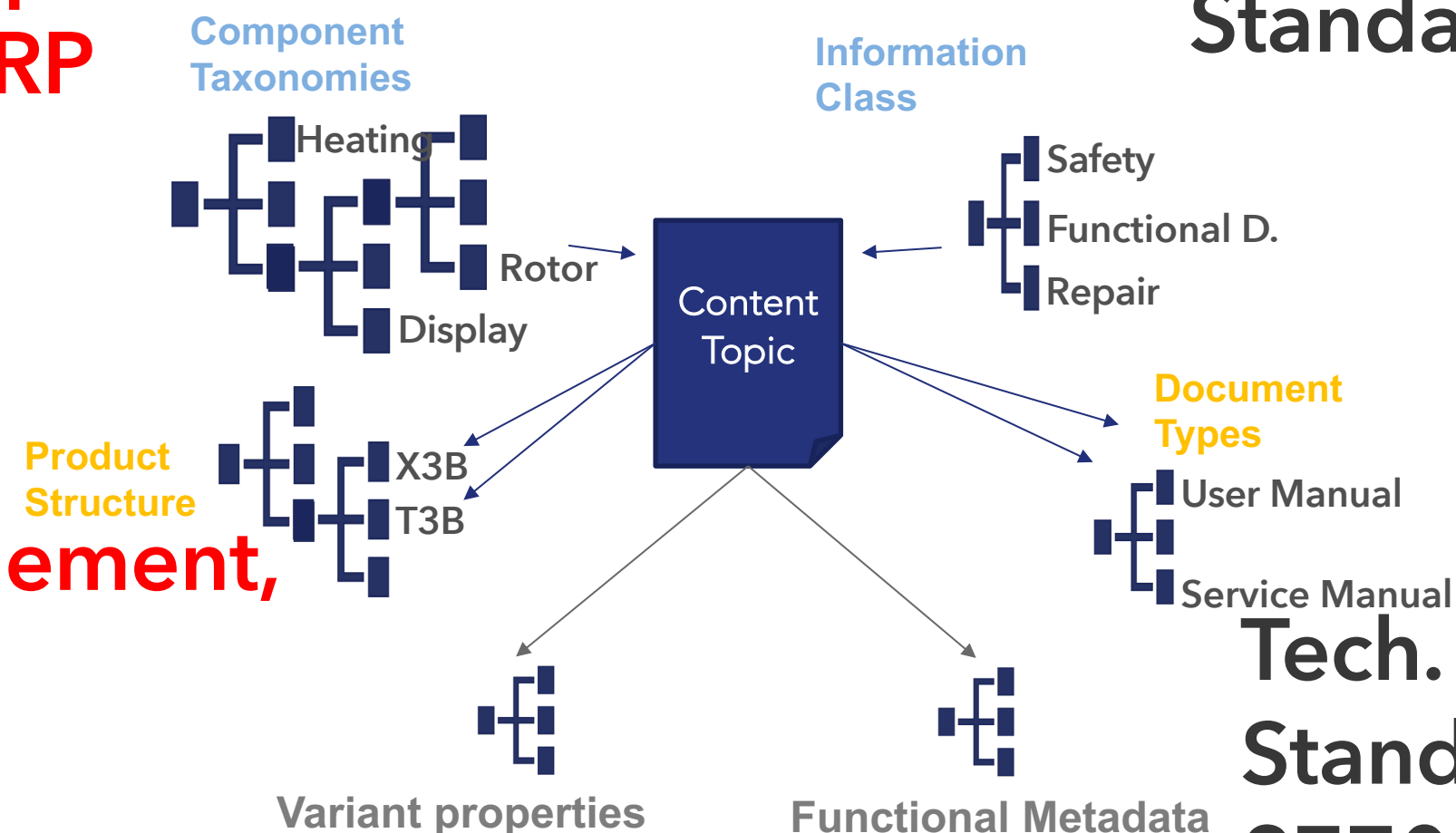
**Engineering,
Development,
PLM, ERP
or TC**

**Tech. Comm.
Standards, iiRDS**

**Prod.
Management,
Sales
or Tc**

**ERP, Engineering,
PLM, PIM/PDM**

**Service, Production,
Software Dev., ... IoT!**

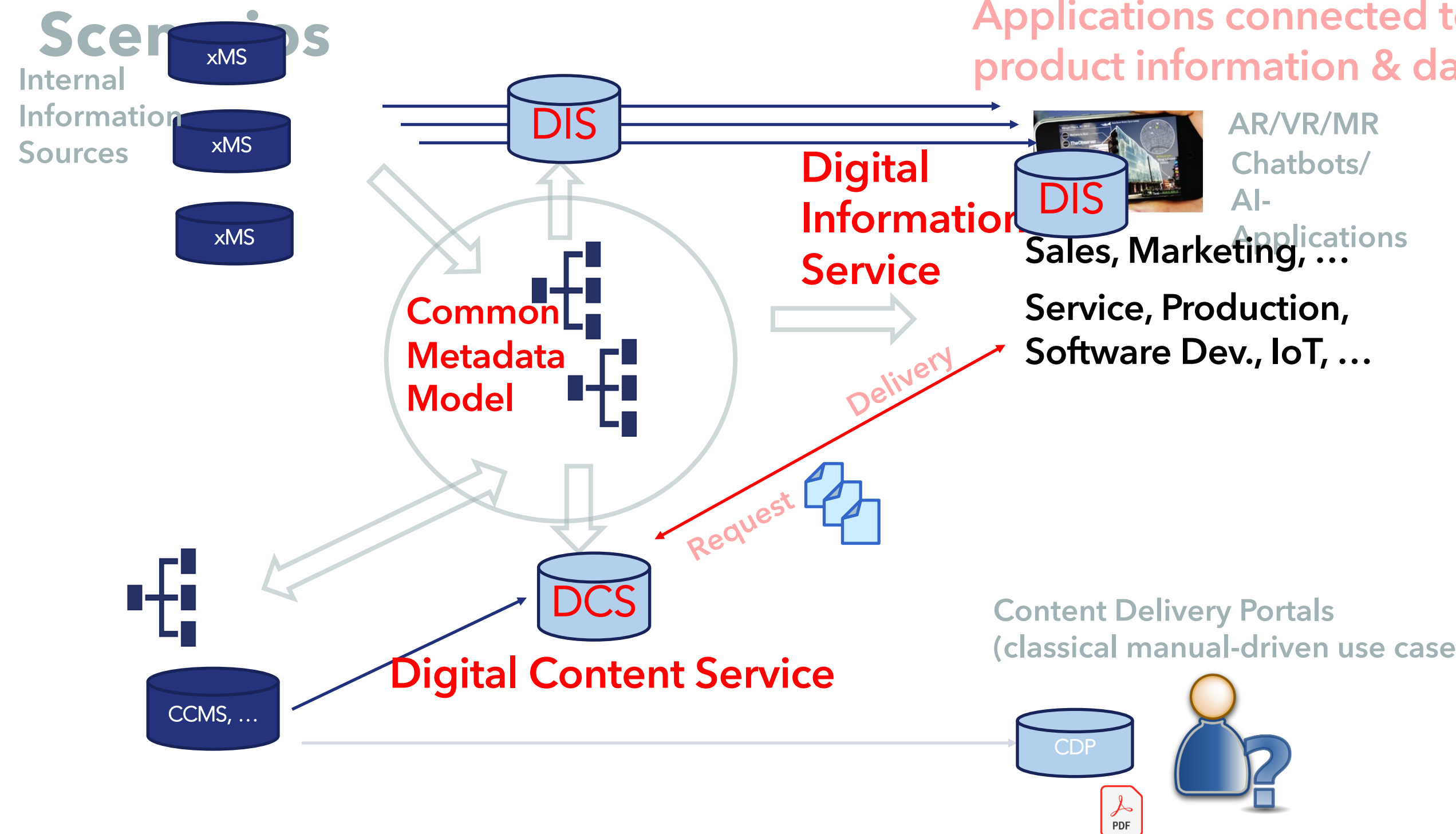


**Tech. Comm.
Standards, VDI
2770**

CD Methods

- Content provisioning for data integration
- Web interfaces /API
- Standard Formats (XML, HTML, PDF, iRDS)
- Requires classified topic based on variants and configurations!

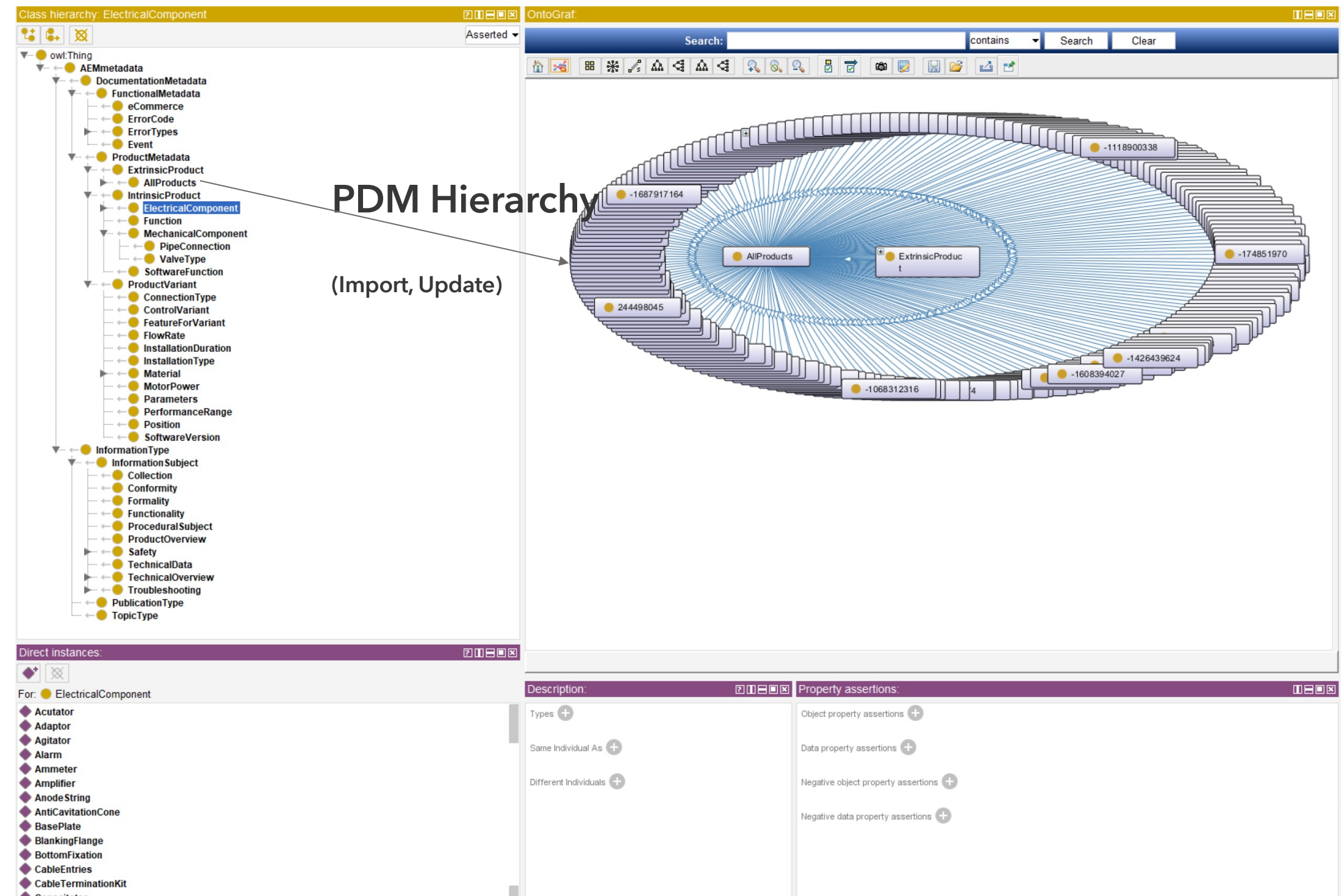
Digital Content Services in Integrated



CM Methods: Metadata Model

Application of
PI-Class Method

Process Integration: Data Governance



CM Methods

Metadata exactness
and company awareness
influences also
variant handling of topics
in CMS

Configuration-specific Information by Features

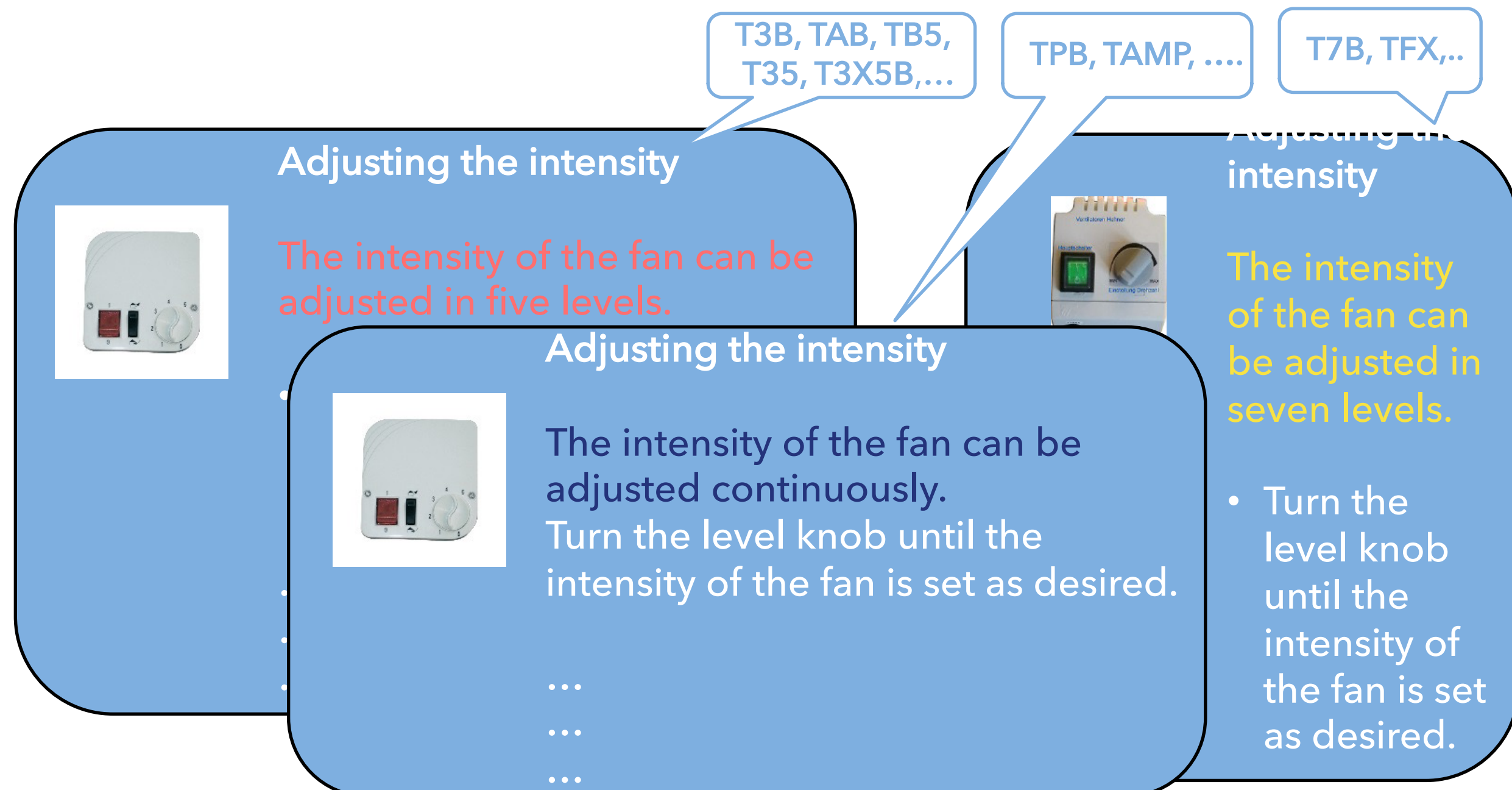
- Product features included or in addition to (extrinsic) product classes / names: T3B, TP-DH2,
- Example PI-Fan: Type TP-DH2 (Combination type)
 - Table Fan (T)
 - Continuous Switch (P)
 - Display (D)
 - Heating (H)
 - 2-Level Heating (2)
- Goal: Facilitate planning of new variants/configurations and metadata handling in CMS

CM Methods

Extrinsic product variant
retrieved by usage
or described by product
types (for retrieval)

Variant Management (Topic variants)

Extrinsic Classification as variant property



CM Methods

Extrinsic product variant
collection (of all products)
for filtering

Variant Management (sub-modular; one topic)

Extrinsic Classification as Variant Property



Adjusting the intensity

The intensity of the fan can be adjusted in five levels.
The intensity of the fan can be adjusted continuously.
The intensity of the fan can be adjusted in seven levels.

- Turn the level knob until the intensity of the fan is set as desired.

...
...
...

T3B, TB5,
T445, TX5B,...

TPB, TAMP,

T7B, TFX,...

CM Methods

Topic **planning** according to configuration variants

Variant Management by Properties (submodular)

Product features as variant property



levels = 5

levels = Cont

levels = 7

Adjusting the intensity

The intensity of the fan can be adjusted in five levels.

The intensity of the fan can be adjusted continuously.

The intensity of the fan can be adjusted in seven levels.

- Turn the level knob until the intensity of the fan is set as desired.

...

...

...

CM Methods

(„Profiling“) →
variant management on sub topic level

Where does system complexity appears
for writers?

→
Handling of content variants
systemetically by
classification and var. parameters

System examples for handling complexity in CMS

task ▶ taskbody ▶ steps ▶ step

– taskbody

– steps

1. – step – cmd Put on the stipulated personal protective

2. – step – cmd Set adjusting knob to 0 %.

3. – step – cmd Switch off the power supply.

4. – step – cmd Set pump to "Stop" operating state using

5. – step – cmd Make system pressureless.

6. – step – cmd Take suitable steps to ensure that the re

7. – step – cmd Empty dosing head and flush it if necess

8. – step – cmd Press the [Start/stop] and [100%] keys a

– substeps

a. – substep – cmd If the "Stop after power failure" al

Otherwise the diaphragm cannot be moved.

– substeps

– stepresult Symbol ("Diaphragm position out") must be

– step

9. – step – cmd Dismantle inlet, outlet and deaeration lin

10. – step – cmd Unscrew valves on inlet and outlet side.

1. Put on the stipulated personal protective equipment.

2. Set adjusting knob to 0 %.

3. Switch off the power supply.

4. Set pump to "Stop" operating state using the [Start/stop] key.

5. Make system pressureless.

6. Take suitable steps to ensure that the returning liquid is safely collected.

7. Empty dosing head and flush it if necessary.

8. Press the [Start/stop] and [100%] keys at the same time to put the diaphragm into "out" position.

a. If the "Stop after power failure" alarm is active, acknowledge the alarm by opening the "Alarm" main menu. Otherwise the diaphragm cannot be moved.

STEP RESULT:
Symbol ("Diaphragm position out") must be displayed

9. Dismantle inlet, outlet and deaeration lines.

10. Unscrew valves on inlet and outlet side.

11. Disconnect FlowControl signal connection.

this control variant is not available for the DDE. it has to be manually de-selected, automatic is preferable.

12. Disconnect DLD signal connection.

this step is only valid for the DDA with control variant AR, not the DDE-AR. the added "@product=DDA" leads to this step being output for the DDA even if controlvariant:AR is not selected and for the DDE-AR if AR is selected.

13. Remove screws.

14. Remove dosing head together with cover plate.

15. Remove screws together with washers.

16. Remove dosing head.

CONDITIONS

Product

☑ T DDE

☑ T DDA

Otherprops

☑ T controlvariant:FCM

☑ T controlvariant:AR

☑ T feature:DLD

☑ T dosingheadmaterial:PVC

☑ T dosingheadmaterial:PV

☑ T dosingheadmaterial:stainl

☑ T performance-range:60-1

☑ T performance-range:120-

☑ T performance-range:200-

☑ Highlight conditions text.

Tracking:

No Markup

Show Diff:

Current

CM Methods

How to Aggregate Documents

- Manually assembling (67%)
- Filtering of master documents (by reduced set of meta data) ** (44 %)
- Copying and modifying documents / templates * (41 % / 23%)
- Automated Assembling (by full set of metadata) *** (27%)

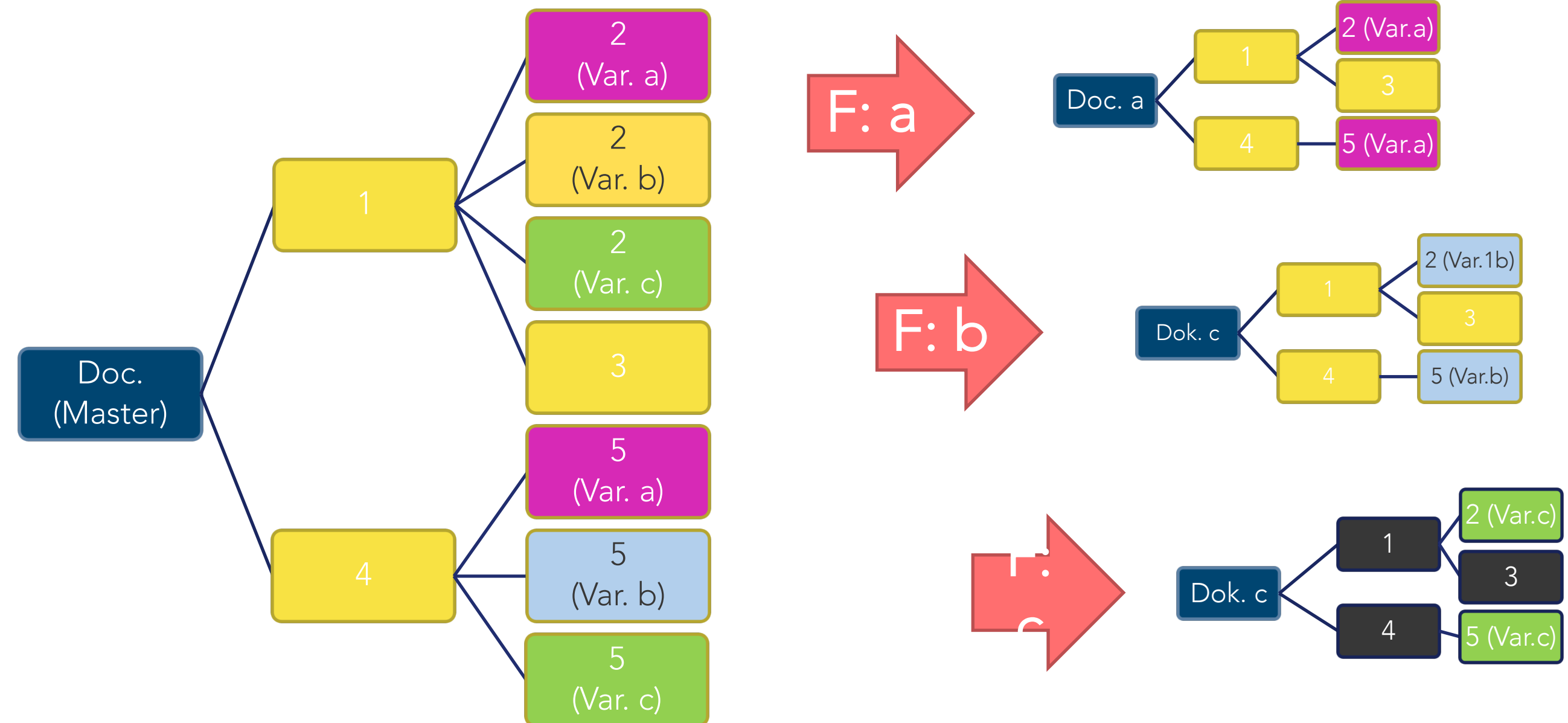
*, **, *** systemized, rules-based, automatized

(x%) according to tekcom CMS Study 2018

CM Methods

Document Filtering

Filter criteria in many cases correspond to extrinsic classification (validity for end-products: **T3B**, **X5B**, **X5-DH2**)



CM Methods

Filtering of sub-topic elements

DE German (Germany) .xml_1425885888178.xml

Datei Bearbeiten Suchen Ansicht Einfügen Entities Tabelle Extras Formatieren Fenster Hilfe LIRS AcrolinxIQ

text _comment B I U

docu langcode="zh"

descriptive-info

safety

prod-safe-desc func="general"

text

_comment S _comment

heading 设备的使用范围 heading

paragraph emphasis 规定使用 emphasis paragraph

_comment WTN, WKN _comment

paragraph valid="EWTN305610237 EWTNes305610213 EWTNes305610237 SWTNes3010101 SWTNes301020001 SWTNes301020057 SWTNes301020088 SWTNes301020103 SWTNes301020106 SWTNes301020136 SWTNes301020137" 似于家庭的环境中用于红酒或食品的冷却。包括在下列情况中的使用 paragraph

_comment WTN _comment

paragraph valid="VTI205021136" 设备仅适合在家庭或类似于家庭的环境中用于红酒的存放。包括在下列情况中的使用 paragraph

_comment alle außer Weingeräten _comment

paragraph valid="" 设备仅适合在家庭或类似于家庭的环境中用于食品的存放。包括在下列情况中的使用 paragraph

_comment S _comment

list listtype="marked"

item paragraph 在私人餐厅, 早餐店中; paragraph item

item paragraph 在别墅、宾馆、旅店和其他宿营地中供客人使用; paragraph item

item paragraph 在承办酒席时, 和类似的批发服务 paragraph item

list

_comment integriert Unterbau _comment

paragraph valid="UIG1313237 UIG131340001 UIG131340136 UIG1323101 UIG132320001 UIG132320136 UIK144440001 UIK1510147 UIK1550001 UIK1550101 UIK1620101 UIK1640137 UIK164040001 UIK164040136" 设备适用于集

_comment S _comment

paragraph 仅在普通的家用范围内使用该设备。不允许其他的使用方式。 paragraph

_comment S _comment

paragraph emphasis 可预见误用 emphasis paragraph

paragraph 严禁下列应用: paragraph

list listtype="marked"

Extrinsic classification on sub-topic level

CM Methods

Rules-based publishing

Document structure =
Set of
Classification Selectors
(Rules)

Automized document creation (metadata

Classification (extrinsic, Var. Parameters)

Classification (intrinsic)

Classified Module/Topic Are referenced by metadata: Automized population of document structure (map)

Dokumentstruktur	L	556	556_1289	BA_EMtec_LBH_L...
EG-Konformitätserklärung				
Vorwort	400016, 1, de_DE			
Produktbeschreibung	400008, 1, de_DE			
Sicherheitshinweise, Schilder	400011, 1, de_DE			
Bedienung, Betrieb	400003, 1, de_DE			
Betriebsstörungen	400005, 1, de_DE			
Wartung	400017, 1, de_DE			
Orientierung				
Wartungs- und Inspektionsplan	400018, 1, de_DE			
Füllmengen, Schmierplan	400006, 1, de_DE			
Schmier- und Betriebsstoffe	400009, 1, de_DE			
Wartungstätigkeiten				
Richtlinien				
Sicherheitshinweise				
Wartung - vorbereitende Tätigkeiten	154968, 1, de_DE			
Gesamtmaschine	89110, 2, de_DE			
Antriebsgruppe	90593, 1, de_DE			
Dieselmotor - Ölstand prüfen				124747, 10, de_DE
Dieselmotor - Öl wechseln				107980, 8, de_DE
Dieselmotor - Ölfilter wechseln				124751, 9, de_DE
Dieselmotor - Keilrippenriemen prüfen				124809, 5, de_DE
Dieselmotor - Keilrippenriemen wechseln				145671, 4, de_DE
Dieselmotor - Steuergeräte auf Lagerung				
Dieselmotor - Ventilspiel prüfen / einstellen				124829, 7, de_DE
Dieselmotor - Starterzahnkranz am Schw.				
Dieselmotor - Ölabscheider - Filtereinsatz				124831, 7, de_DE
Dieselmotor - Entlüftungssystem vom Ku				
Dieselmotor - Vorglühanlage prüfen				
Dieselmotor - Heizflansch wechseln				
Dieselmotor - Drehschwingungsdämpfer				
Dieselmotor - Drehschwingungsdämpfer				
Kraftstofftank, Kondensat und Bodensatz				124757, 6, de_DE
Kraftstoff-Vorfilter Separ - Kondensat able				124754, 9, de_DE
Kraftstoff-Vorfilter - Kondensat ablassen				124752, 9, de_DE
Kraftstoff-Vorfilter Separ - Einsatz wechse				124753, 7, de_DE
Kraftstoff-Vorfilter wechseln				
Kraftstoff-Feinfilter wechseln				
Schaum- und Filterelement der SCR Harn				124756, 3, de_DE
Kraftstoffsystem entlüften				124758, 8, de_DE
Luftfilter - Servicedeckel und Staubaustra				124851, 4, de_DE
Luftfilter - Unterdruckschalter auf Funktio				124759, 9, de_DE
Luftfilter - Hauptelement bei Anzeige des				

CD Methods

Facetted search/request and topic delivery

Customer-
dependent
Configuration !

Component

- Hydraulic system
- Oil Pump

Machine

Z-006

Konfiguration

$a_1 | b_3 | \dots | x_5 | y_1 | z_5$

Information

- Procedure
- Testing

Hydraulic system

The hydraulic oil sample is taken via a test connection on the variable displacement pump.



Fig. 250: Sampling point for hydraulic oil

- ▶ Start the engine and wait 3 minutes.
 - ▷ The hydraulic oil is circulated.
- ▶ Engage the parking brake and secure the machine against rolling away.
- ▶ Connect the test line to the test connection G.
- ▶ 0.2 l Drain the hydraulic oil into the receptacle.
- ▶ Fill the sample container.
- ▶ Remove the test line and seal the test connection.

ahl laufen

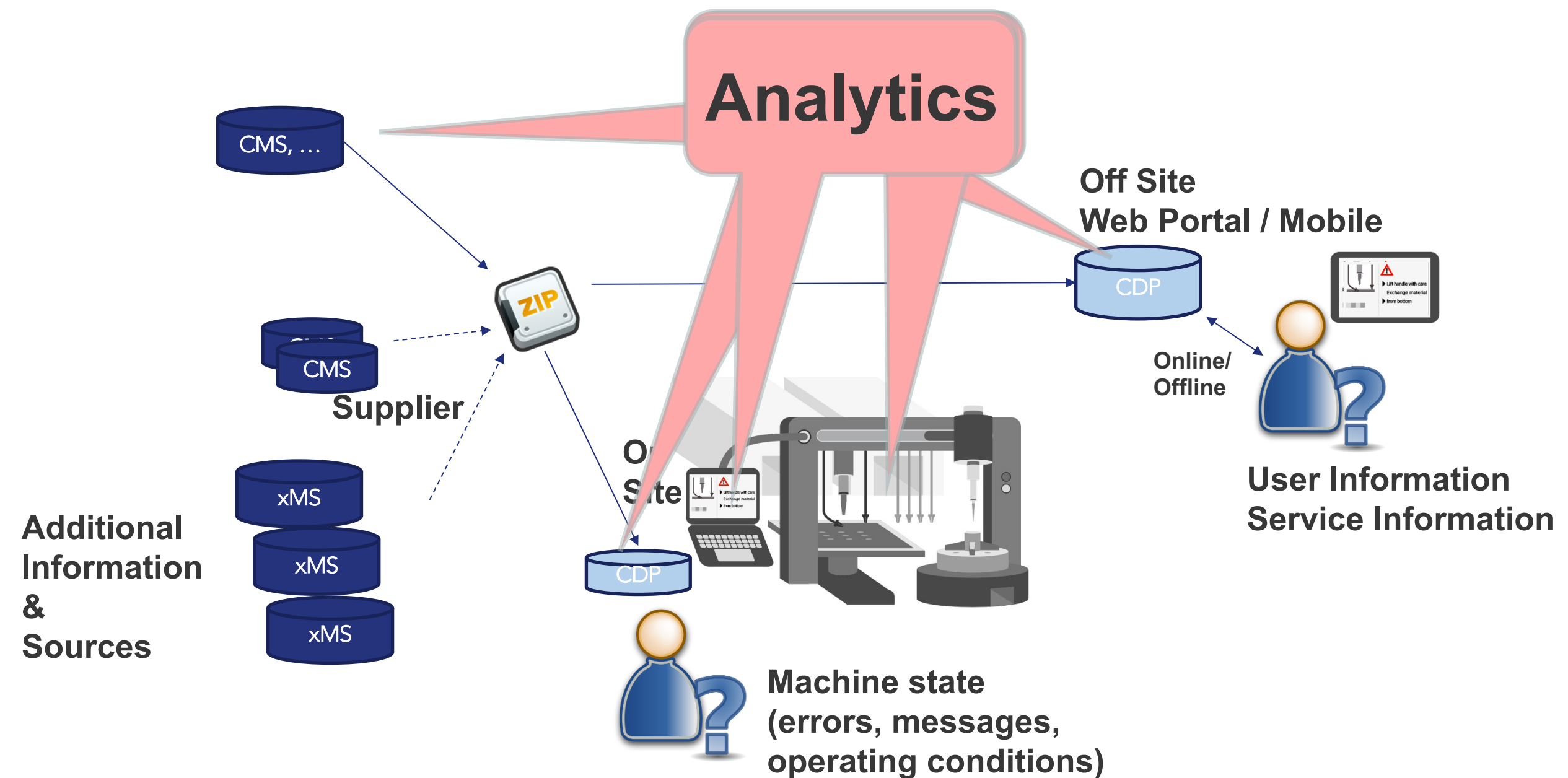
oder von
n, bis der

heit

CD Environment

Analytics

CDP and Analytics in Industrial Applications



• Analytics

CMS & CDP Analytics

Overview of Content Intelligence

CMS Analytics (REx)

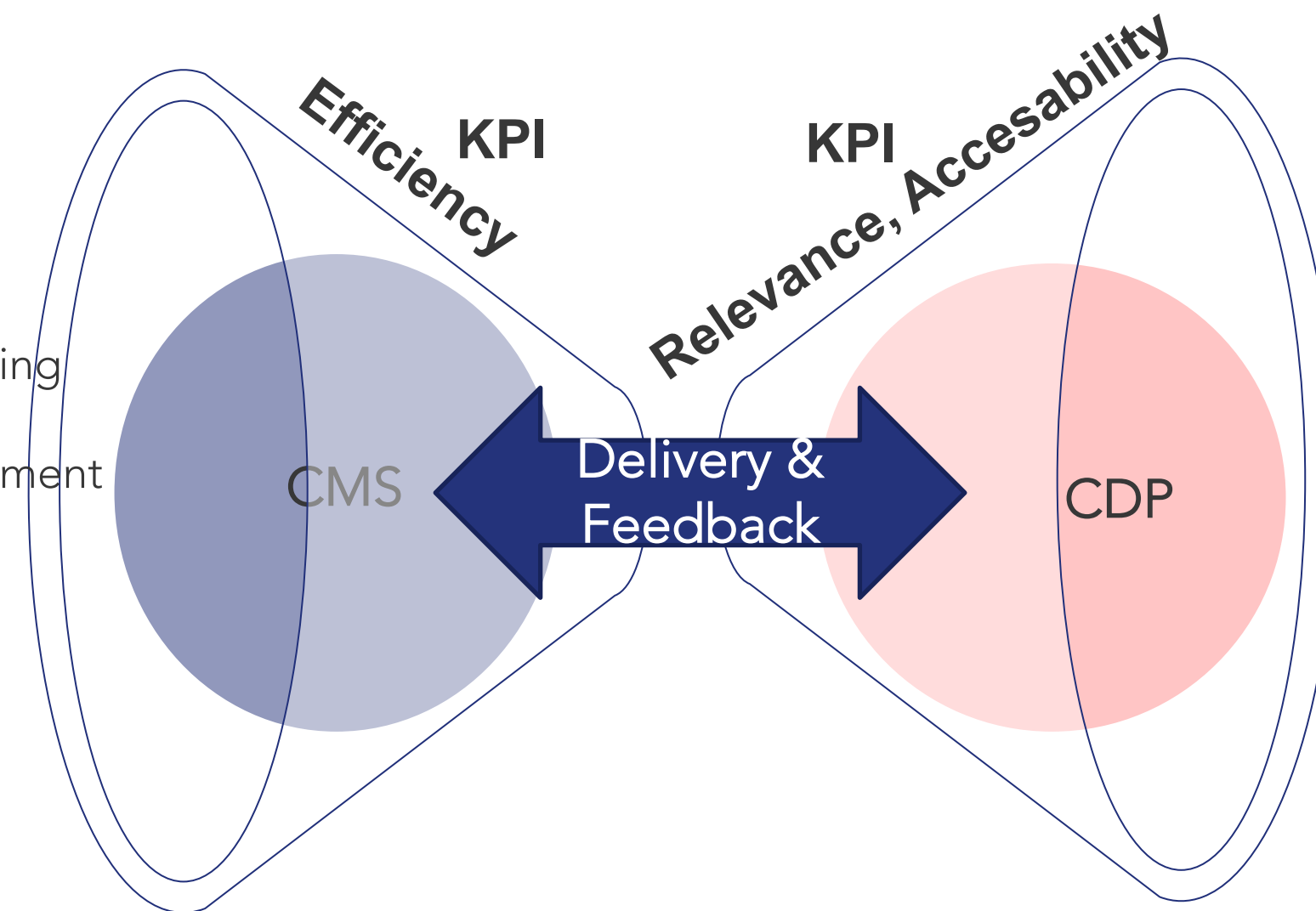
- Metrics:
- Reuse Rates (Abundance)
 - Redundancy
 - Document Sharing factor
 - Variant management
 - Correlations; Distributions

...

Artificial Intelligence

- Quality assurance:
- Similarity analysis
 - Classification quality

...



CDP Analytics (CoReAn)

Indirect feedback

→ Metrics:

- visiting time,
- Visit frequency
- **search behaviour**
- **search terms**
- ...

Direct feedback

- Rating
- Satisfaction

→ Improve:

- Product
- Information
- Terminology

CM Methods

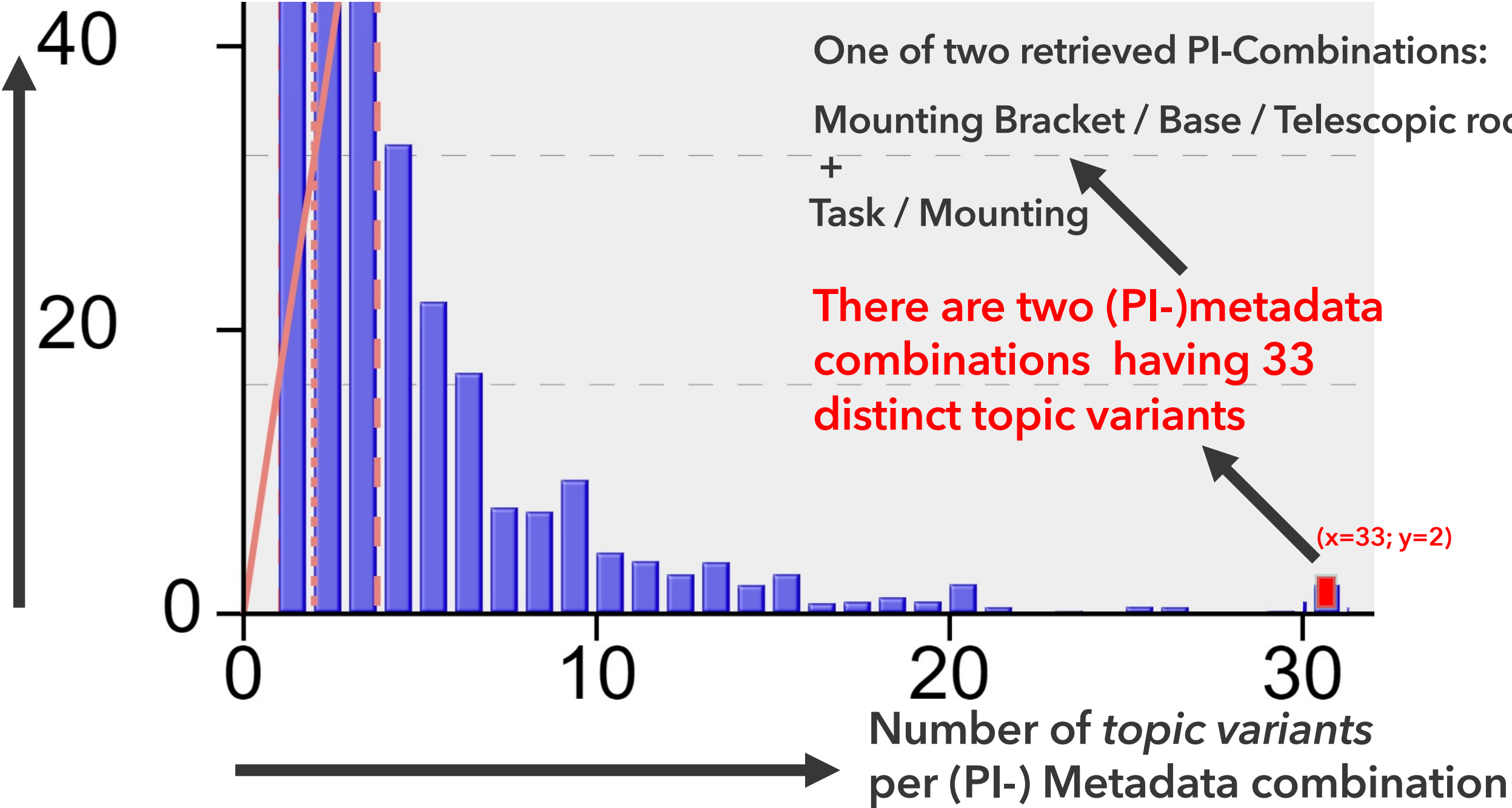
Analyzing the origins of large numbers of topic variants



Driver of product complexity and / or (necessary?) content complexity

Systematic Variant Analysis

Number of (PI-) metadata combinations



CM Methods

Example detected by REx method:

All topics have the same (intrinsic) classification but differ in (extrinsic) **product classes**

Analyzing Content Variants (by content)

Objektgültigkeit: **Produkt A**
I-Klassifizierung: Reinigung
ID

1 Reinigung



Bei der Reinigung die Schutzklasse beachten.

Zugelassene Reinigungsmittel:

- Ethanol 95%ig
- Wasserstoffperoxid 5%ig

Objektgültigkeit: **Produkt B**
I-Klassifizierung: Reinigung
ID 7

1 Reinigung

Zur Pflege:

- Das Produkt außen mit einem weichen Lappen reinigen.

Objektgültigkeit: **Produkt C**
I-Klassifizierung: Reinigung
ID 3

1 Reinigung



HINWEIS!

Sachschaden durch unsachgemäße Reinigung.

- Führungselemente nicht reinigen.
- Produkt nur mit werkstoffschonenden Reinigungsmitteln und weichen Lappen reinigen.

P_
Objektgültigkeit: **Produkt D**
I-Klassifizierung: Reinigung
ID

1 Produkt reinigen

V_
Objektgültigkeit: **Produkt E**
I-Klassifizierung: Reinigung
ID

1 Reinigung

1. Zur äußeren Reinigung folgende Energiequellen abschalten:

Y_
Objektgültigkeit: **Produkt F**
I-Klassifizierung: Reinigung
ID 1

1 Reinigung



HINWEIS!

Sachschaden durch unsachgemäße Reinigung.

- Führungselemente nicht reinigen.
- Produkt nur mit werkstoffschonenden Reinigungsmitteln und weichen Lappen reinigen.

Die Reinigung der Einzelkomponenten des Bausatzes ist in den mitgeltenden Dokumenten beschrieben.

CM Methods

New Roles and Competencies (beside linguistics)

- Metadata modeling (driver for model-based authoring)
- Interface & communication with data sources and SMEs
- CCMS configuration & implementation architecture
- Variant manager (tracking and dev. of rules for creating variants)
- Analytics (CCMS, CDP)
- Delivery Experts:
Interface & communication with information sinks (apps) and SMEs

Digital Information Services

Business and Use Cases for Content Delivery



Smart Fields



Digital
Information
Service
(for maintenance

CDP and CMS information
is connected to
maintenance processes

Maintenance planning and tracking

HEIDELBERG

Home / Review Work Order

Review Work order

Work Order	Equipment	Serial Number	Status	Planned execution date
921	Hero Demo Equipment	ID0002_2	CREATED	Mon, Jun 21, 2021 10:17 AM

Overview

Activities Details

Report Details

Parts Consumption

	Maintenance Point	Activity ID	Activity type	Status	Condition
+	Printing unit 1 » Automatic non-stop device » Automatic	WT1FS.B04.0032-00001DEU	Cleaning	Created	
+	Printing unit 2 » Automatic non-stop device » Drive chain	WT1FS.B04.0034-00000DEU	Cleaning, Lubrication	Done	1
+	Printing unit 2 » Automatic non-stop device » Auxiliary paper	WT1FS.B04.0042-00000DEU	Check-up	Done	
+	Feeder » Suction head » Suction head	WT1FS.B04.0050-00000DEU	Check-up	Created	
+	Printing unit 2 » Automatic non-stop device » Drive chain	WT1FS.B04.0035-00000DEU	Check-up, Adjustment	Done	
+	Printing unit 1 » Pile guidance and pile transport » Pile guidance	WT1FS.B04.0013-00000DEU	Cleaning, Lubrication	Done	
+	Printing unit 1 » Pile guidance and pile transport » Side guide	WT1FS.B04.0006-00000DEU	Lubrication	Done	
+	Printing unit 2 » Automatic non-stop device » Auxiliary paper	WT1FS.B04.0041-00000DEU	Cleaning, Lubrication	Done	
+	Printing unit 1 » Preloading device » Lateral sheet stops	WT1FS.B04.0001-00000DEU	Check-up	Done	

Printing unit 10/2

Preloading device0/2

Printing unit 20/2

Automatic non-stop device0/2

Feeder0/2

Ionizing unit (StaticStar)0/2

Finish Work Order0/2

☐ Finish Work Order

Back to Overview

viewed

Retrieval/request by
(PI-)Classification

Source: Docufy

Digital Service Information Service

Access to granular service information & data

The screenshot displays the PRISMA web application interface. The top navigation bar includes menu items: Datei, Bearbeiten, Ansicht, Chronik, Lesezeichen, Extras, Tabs mit Zugriff auf Gerät, and Hilfe. The browser address bar shows the URL: https://prisma-demo.star-group.net/taskplan-viewer/RT-123456_2017-12-08-17-08-08-6477029-01-00. The main content area is titled "PRISMA" and features a sidebar with navigation icons. The task list includes:

- Materials (1)
- Objects (3)
- Control block for Z-Kinematics: Check and adjust the secondary pressu...
- Checking Air Cleaner Filter
- Checking Oil Level in Turntable Gear Box

The detailed view shows a hydraulic system diagram with numbered components (1, 2, 3, 4, 5). The interface includes a pressure measurement section with the text: "(PA) Measured pressure: 300 bar". A red error message states: "The measured value is out of tolerance." Below the diagram, the text reads: "6. Measure high pressure (PA) for function lifting the boom (1)". The high pressure at the function lifting the boom is indicated as "381 ±5 bar". The pressure measurement section also shows "300 bar" with a red error message: "The measured value is out of tolerance." The bottom of the interface shows the text: "6.1 Fully extend and lower the boom".

Interactive Data from
CMS & Engineering:
Sensing & archiving
of data setting

Source: STAR AG

Digital services as an extended product portfolio

Source: Voith Hydro

<https://www.youtube.com/watch?v=nyDZ7Q4AFu8>

Interactive data from system sensors;
Content integration from
various sources;

Service Information and AR (Hololens)



DIS

Maintenance

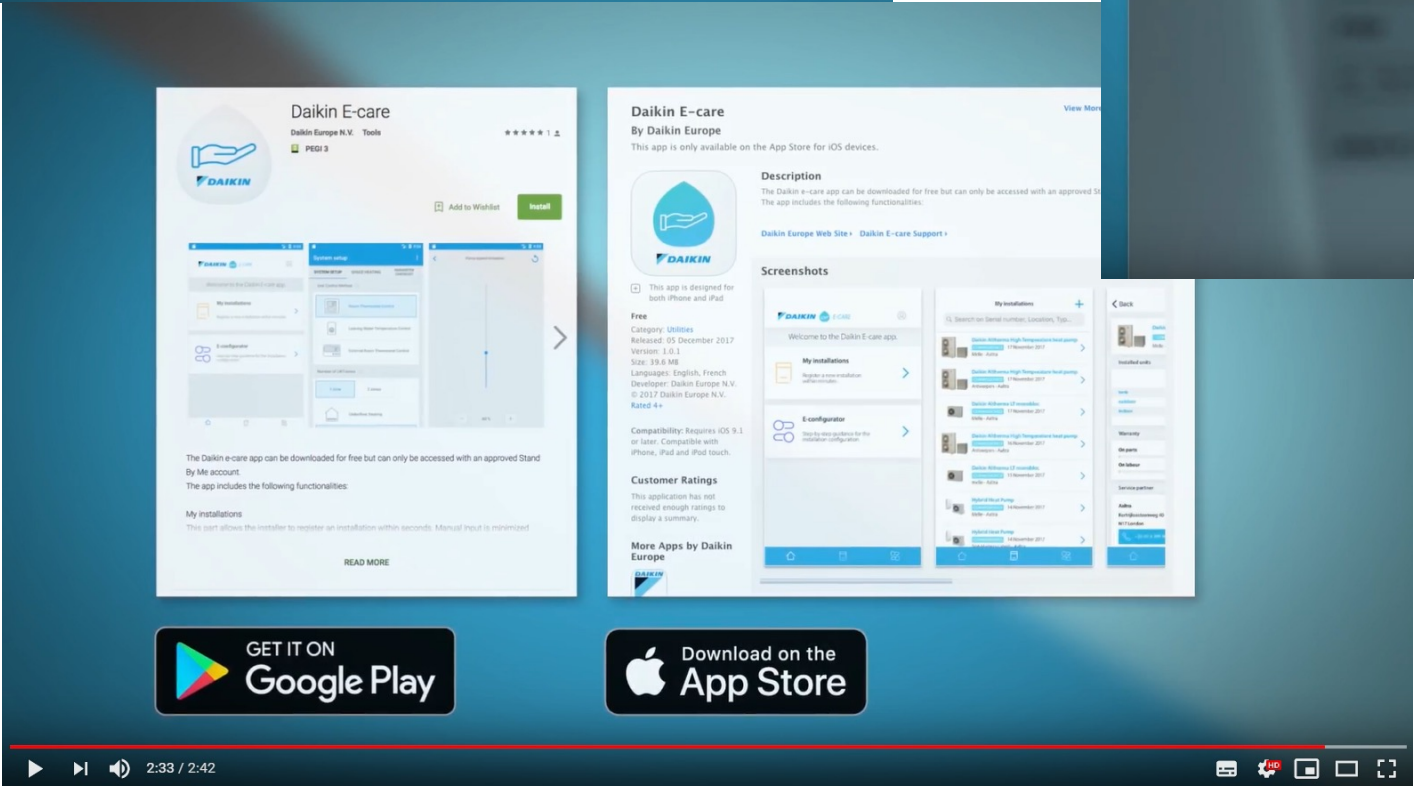
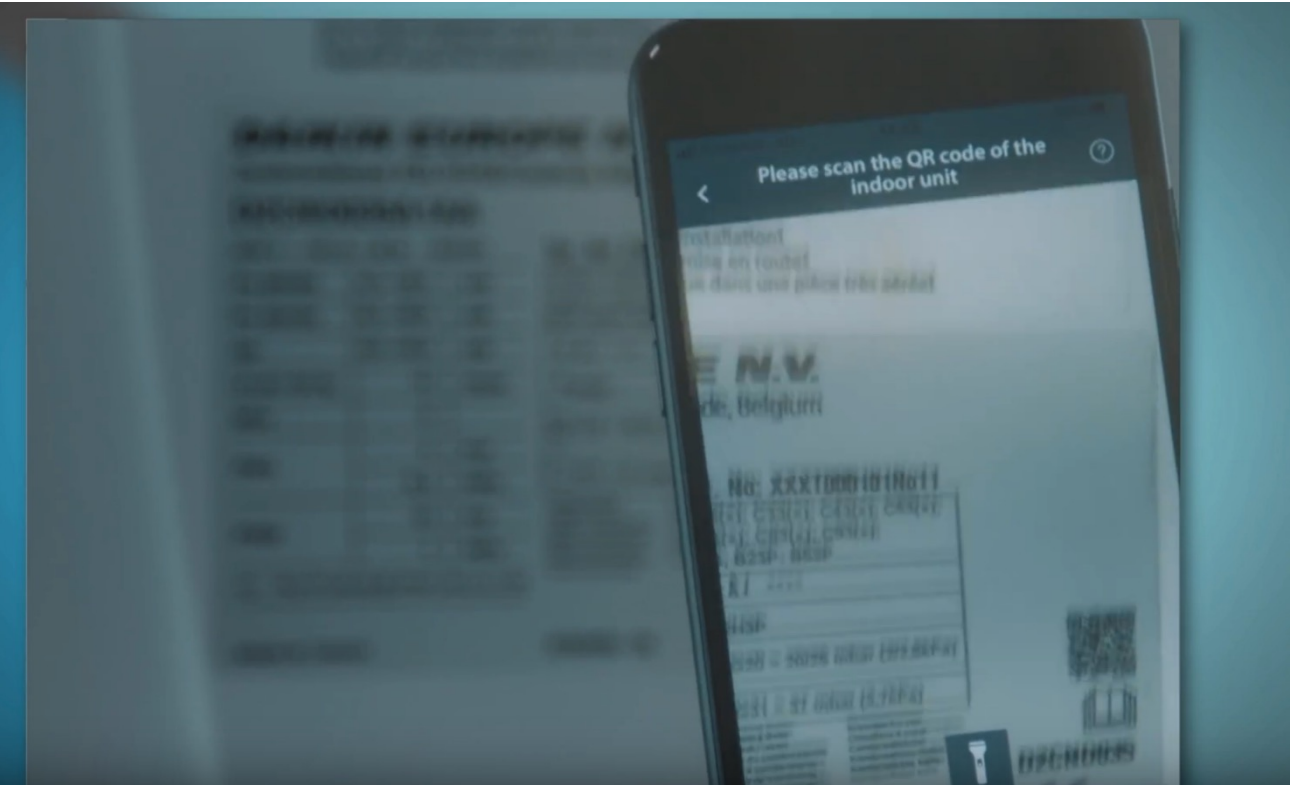
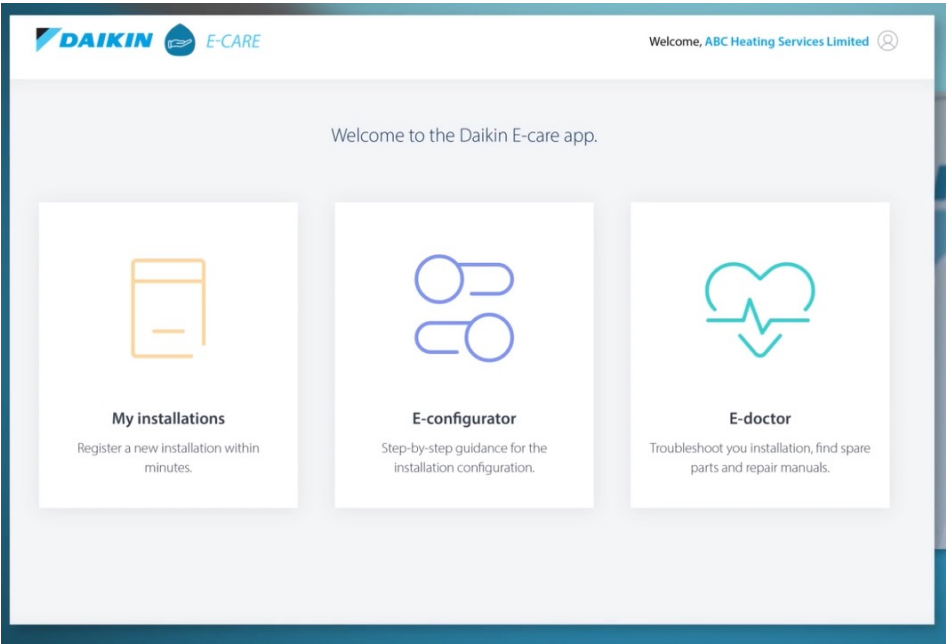


<https://www.youtube.com/watch?v=VGtCQWROytw>

DIS

Reseller support
(Heating, AC)

Installation, Configuration, Troubleshooting

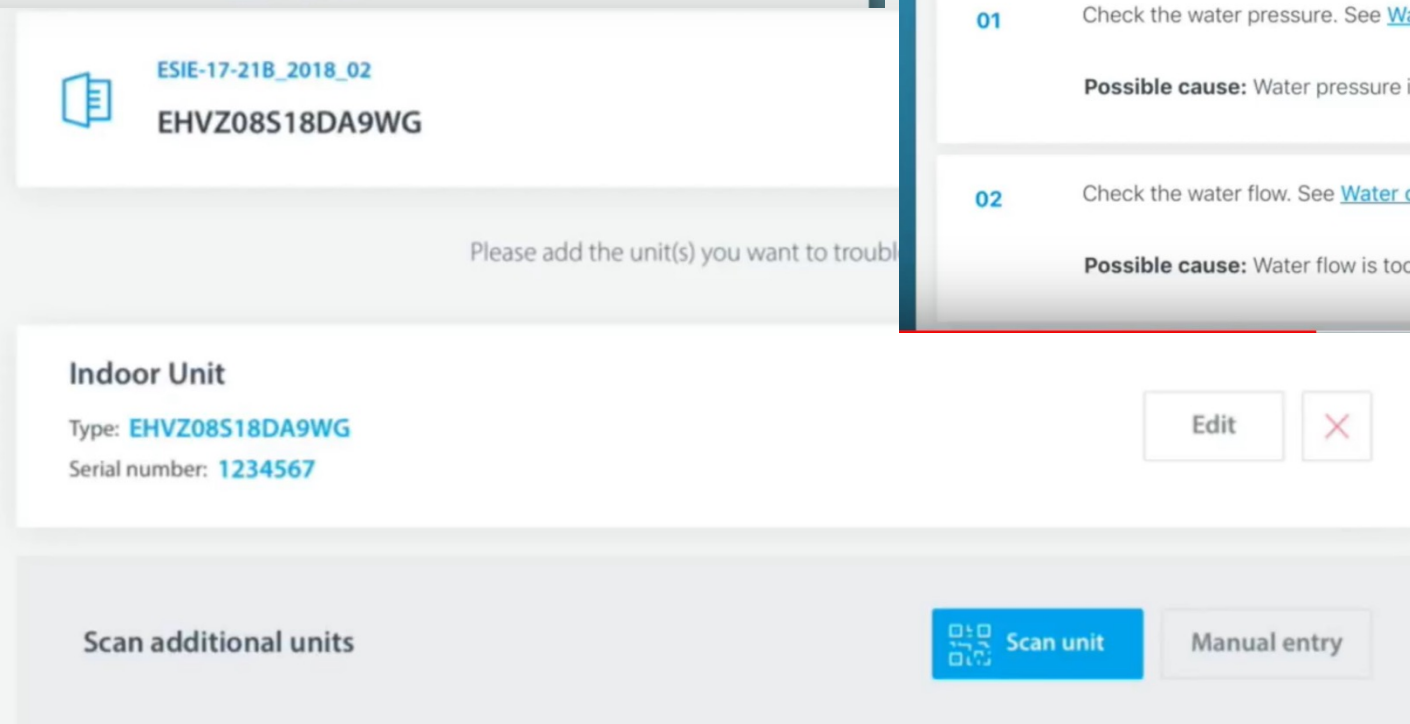
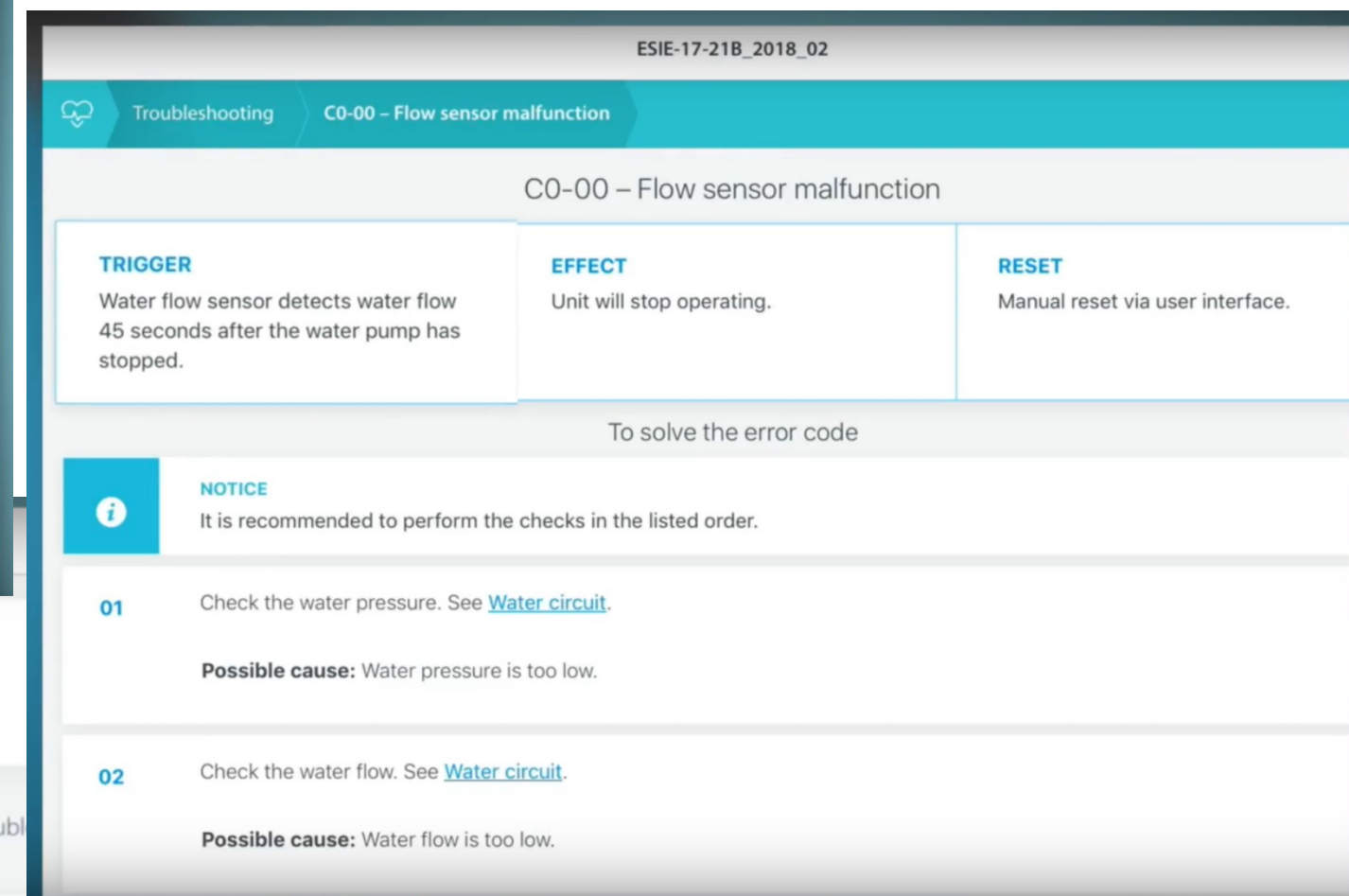
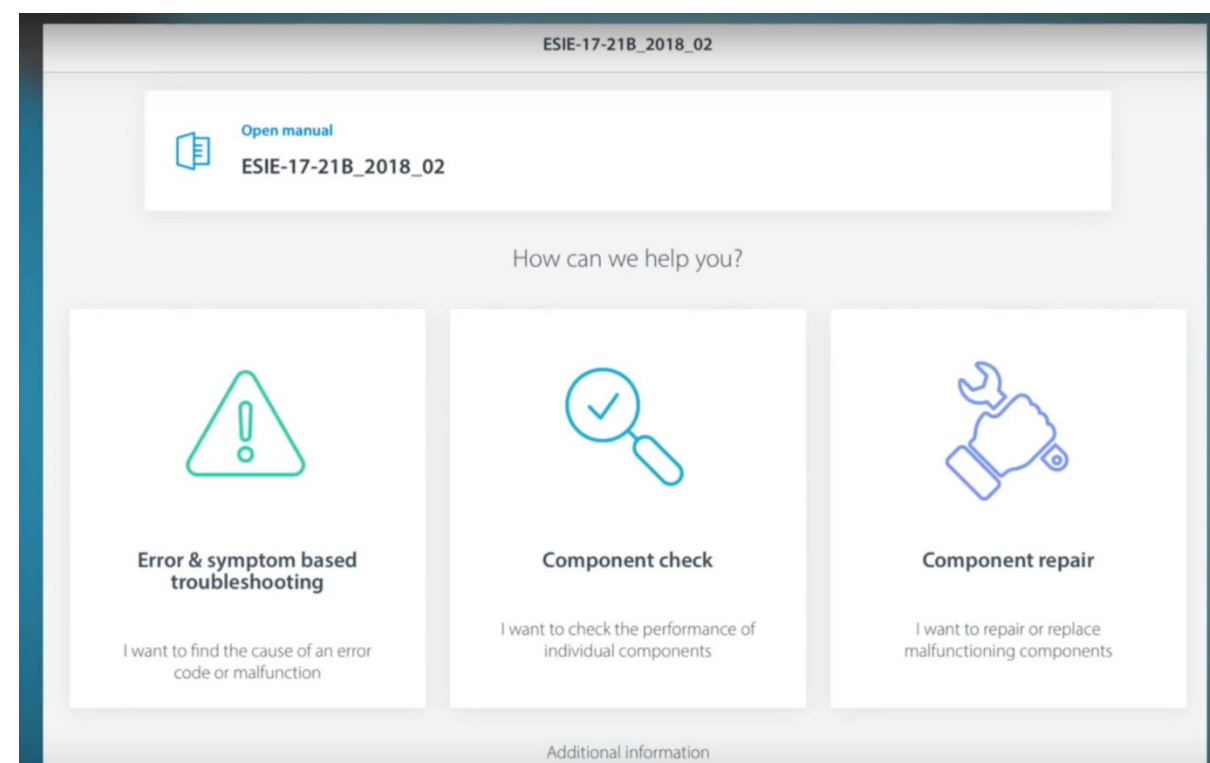


DIS

Reseller support
(Heating, AC)

→ [Youtube Daikin e-doctor](#)

Installation, Configuration, Troubleshooting



DIS

Service (von Ardenne)

Remote Assist (including video + AR)



Thank you for your attention!

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