

Many source systems one target system - an update -

Siemens Energy & ICMS



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**the global leader in the energy
business**

~ 1/6

of the world's electricity generation
is based on our technology.

We are present in

> 90 countries.

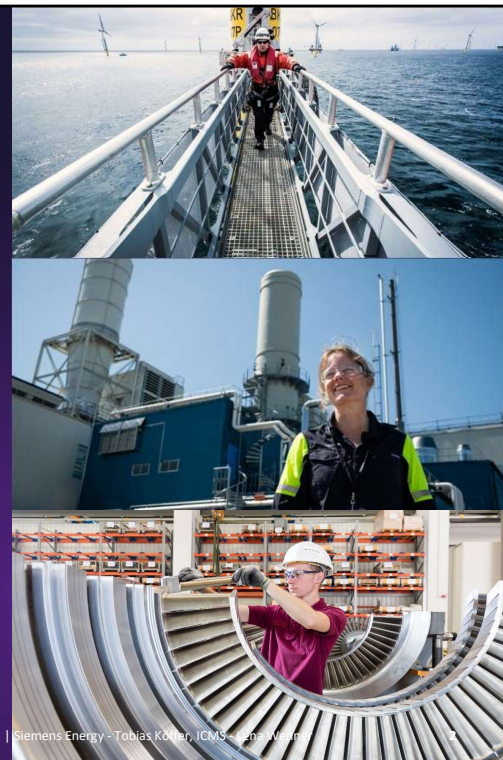
92.000

employees work together as a
global team.¹

We invest around

1 Mrd. € annually
in research and development.

1 Number of employees as at September 30, 2022
2023-11-14



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1

As an integrated energy technology company,

we support our customers along the energy value chain



Low- or zero-emission power generation

- Gas Services
- Siemens Gamesa Renewable Energy

Transport and storage of electricity

- Grid Technologies

Reducing our GHG footprint and energy consumption in industrial processes

- Transformation of Industry

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Power plant components

Steam turbine

Generator

Gas turbine





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ENERGY**

Tobias Köffer

Content Manager

tobias.koeffer@siemens-energy.com

Tobias Köffer

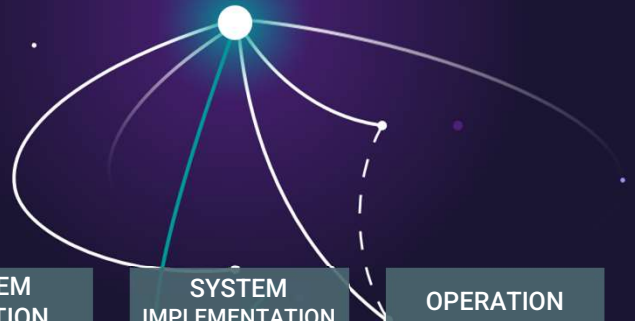
- With Siemens Energy (formerly Siemens AG) since 2009
- Since 2014 in technical writing in various areas of documentation
- Studying "Technical Communication and Media Management" alongside work since 2022
- (Further) development of our information products
- Generator documentation for existing plants
- Digitization projects in the editorial environment



Lena Wenner
Consulting
[lena.wenner@icms.de](mailto:lana.wenner@icms.de)

Lena Wenner

- Consultant at ICMS GmbH
- Conception and introduction of content delivery
- Cross-divisional classification concepts and semantic models
- Development and support of digital information services (DIS)



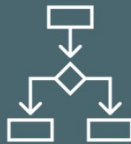
CONSULTING



OPTIMIZATION
ANALYSIS



SYSTEM
SELECTION



SYSTEM
IMPLEMENTATION



OPERATION



Basics



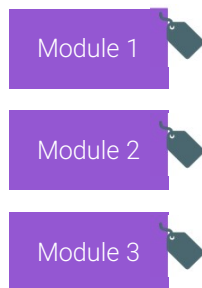
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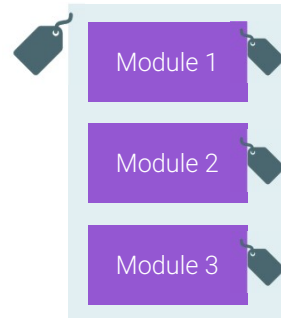
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Creating information in the content management system (CMS)

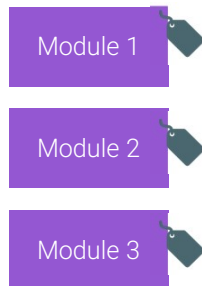


Content is recorded modularly
and tagged with metadata

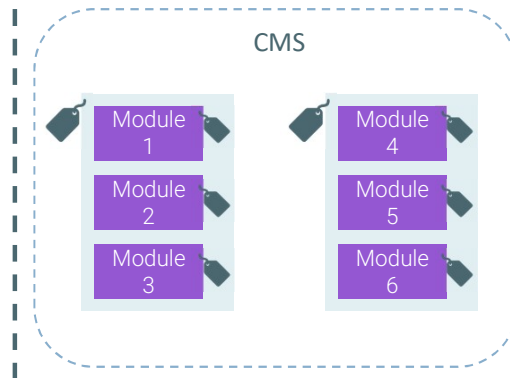


Content is aggregated into publications
and tagged with metadata

Creating information in the content management system (CMS)

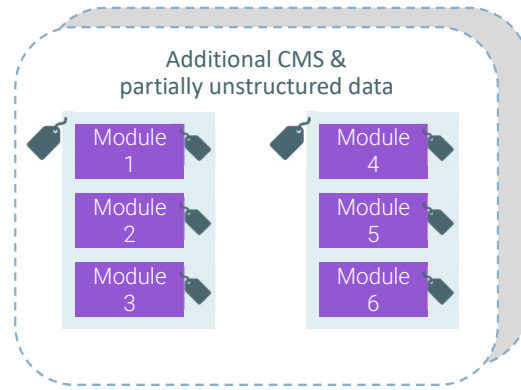
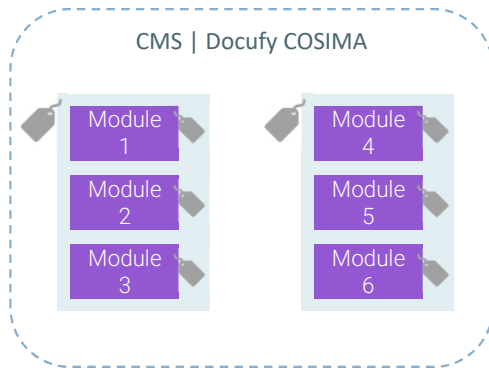


Content is recorded modularly and tagged with metadata



Content is aggregated into publications and tagged with metadata

Creating information at Siemens Energy



Content



1

Initial situation
"Fishing grounds and fishing gear"

2

Solution approach
"The right fishing net"

3

System landscape
"From knotting to hauling"

4

Outlook
"View to the horizon"

Initial situation

"Fishing grounds and fishing gear"

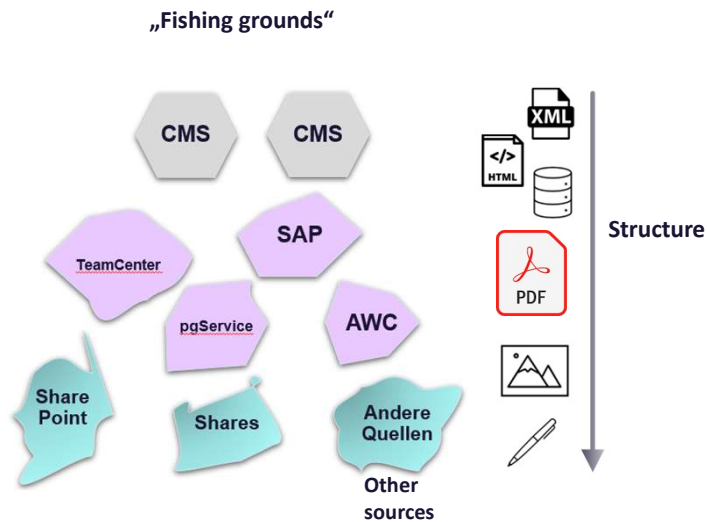


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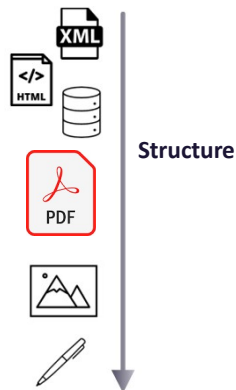
Initial situation



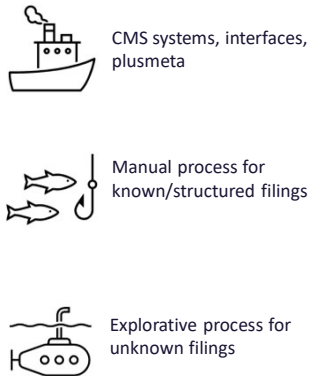
Summary

- Information is created and managed decentrally
 - Quality of information varies greatly
 - Structures differ considerably
 - Strong focus on documents
- A diverse ecosystem with many individual information biotopes.

Initial situation



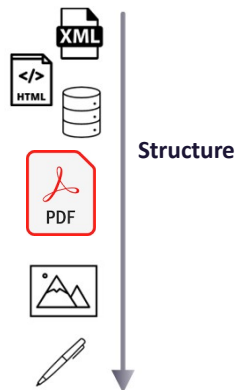
„Fishing gear“



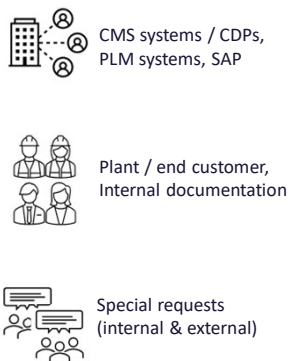
Summary

- Few (semi-)automatic interfaces
 - a lot of information has to be prepared and transferred manually
 - No standardized catch method
 - "By-catch" is dragged through (IDs, structure numbers, etc.)
- Capturing the right information is complex and time-consuming.

Initial situation



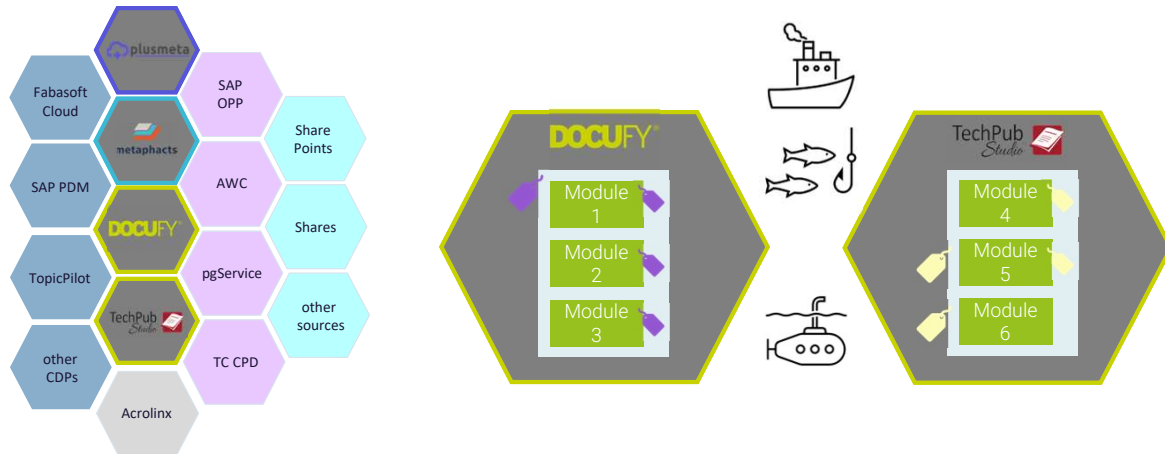
Delivery targets



Summary

- diverse delivery targets with existing structures
 - Very different requirements for preparation and structure
 - Deliveries are not coordinated with each other
- No standardized exchange / delivery format, therefore formats are not compatible with each other.

The ecosystem in field service



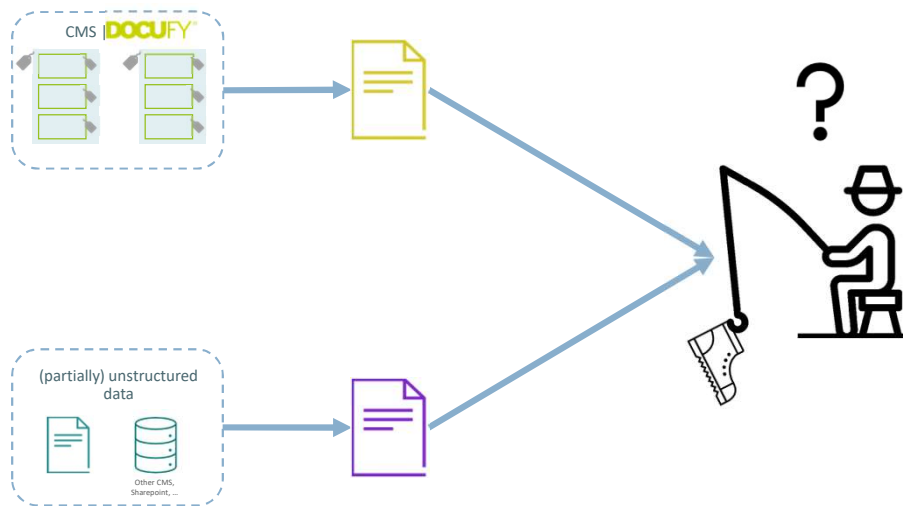
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- 2 CMS in use
- Each CMS has a different purpose
- Working methods within the CMS work perfectly → satisfied with the use
- 2 CMSs and other data sources should continue to be used

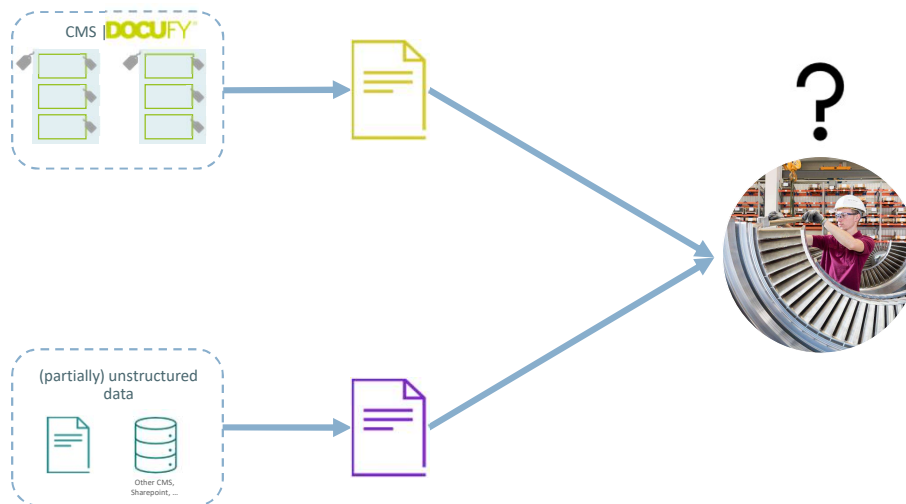
Publishing information



Current status: Users receive unstructured documents and information from different channels

Goal: Harmonized delivery format (for data from both CMS and data from third parties)

Publishing information

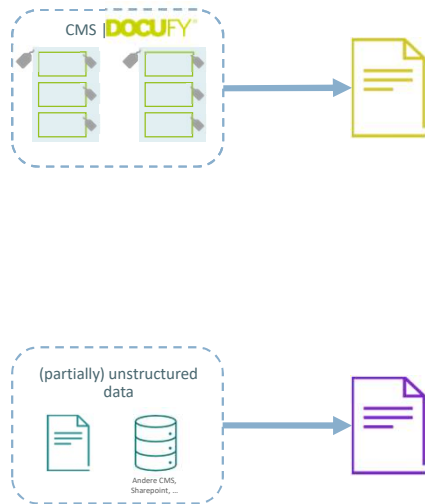


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Publishing information

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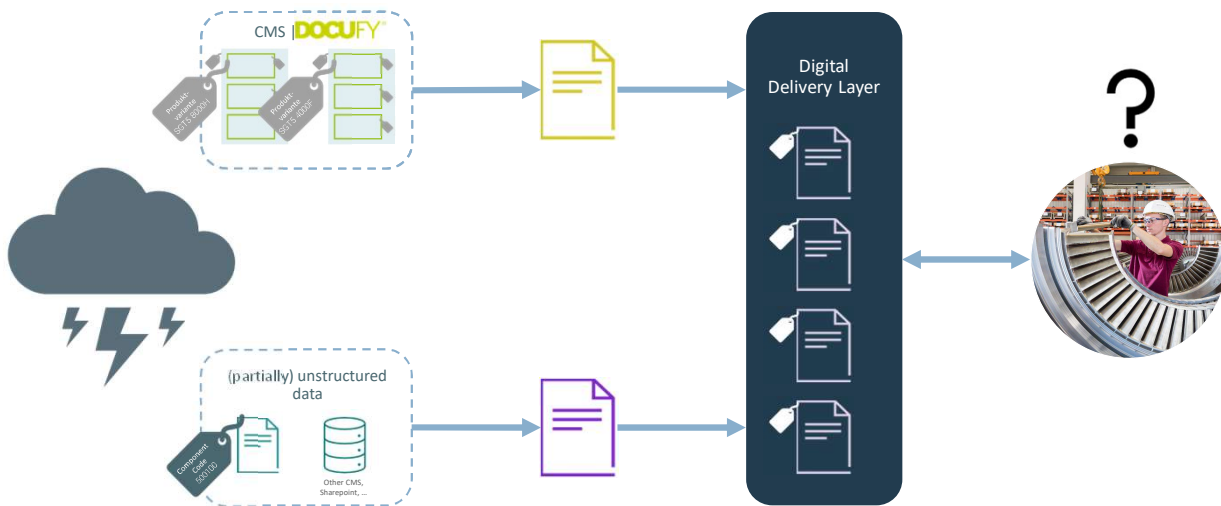
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Current status: Users receive unstructured documents and information from different channels

Goal: Harmonized delivery format (for data from both CMS and data from third parties)

Publizieren von Informationen



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Current status: Users receive unstructured documents and information from different channels

Goal: Harmonized delivery format (for data from both CMS and data from third parties)

Solution approach

"The right fishing net"



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Solution approach

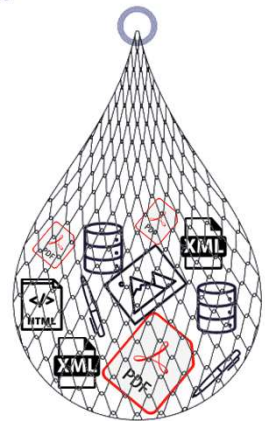
"A standardized exchange and delivery format"

Objective:

- Provide information as a package digitally and situationally.
- Linking information instead of dragging it along.

Framework conditions:

- Individual sources remain as they are for the time being (specialized in their content).
- No direct transfer from one structure to another.
- Migration or continuous exchange between CMS too time-consuming.



Why do we need a standardized exchange/delivery format?

- Although there is (partially) structured information from different areas, these documents cannot be harvested by the same harvesting machine because the harvesting machine cannot recognize what it is.
- Separately created information has different structures (classifications, systematics, logics, ontologies)
- We want/must provide this information in a linked digital and situational manner (for publication or exchange)

What problem do we currently have in not being able to link the information with each other?

- A direct transfer from one structure to another is not possible
- Individual sources remain as they are for the time being (specialized in their content)
- Migration does not make sense, time-consuming, maintenance-intensive, etc. → not a viable option
- Migration only makes sense if data structures exist

Example

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Check installation completion
CMS | COSIMA

Installation instructions
CMS | TechPub Studio

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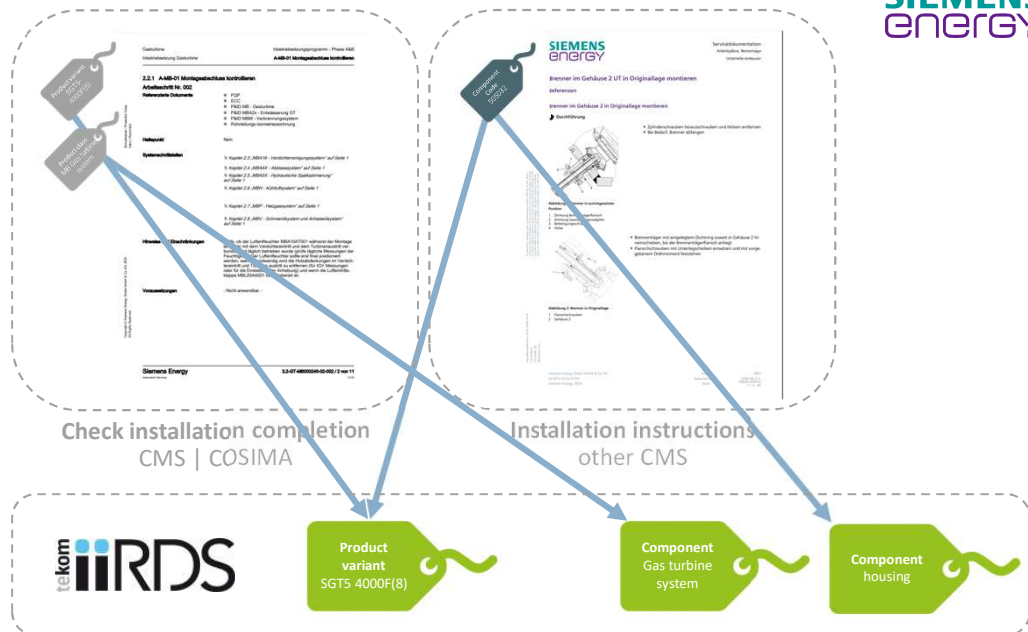
Historically conditioned, current systems map requirements from outside

TPS > ComponentCode as a requirement from "the Americans" (Teamcenter)

Cosima > Requirement comes from target system

Goal: make all target systems iIRDS-capable > remain flexible

Example



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This is where we came on board as ICMS. How can the CMSs and their working methods be retained and how can we achieve the goal of a digital delivery layer?

As the two CMSs should remain in place and their working methods should not be affected, we decided on metadata mapping.

Metadata from the systems is mapped to a common information model. The metadata remains in its source systems, but a common information model is developed to which the metadata is mapped.

Here: Product variant SGT4000F(8) corresponds to this variant in Cosima, in TPS it is only available in encrypted ComponentCode.

Metadata mapping

Advantages



- Common, system-independent information model
- Uniform corporate image
- No "bending" of the systems
- Connection of further systems
- Update capability through changes to the "master" information model
- Future-proof: Adaptation to company-wide specifications possible

Disadvantages



- Agreement on a common information model
- Additional tool / system required
- Necessary process adjustments

System landscape

"From knotting to hauling"

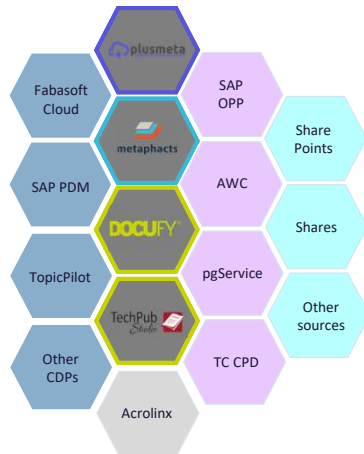


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The ecosystem in field service



How does it work exactly?

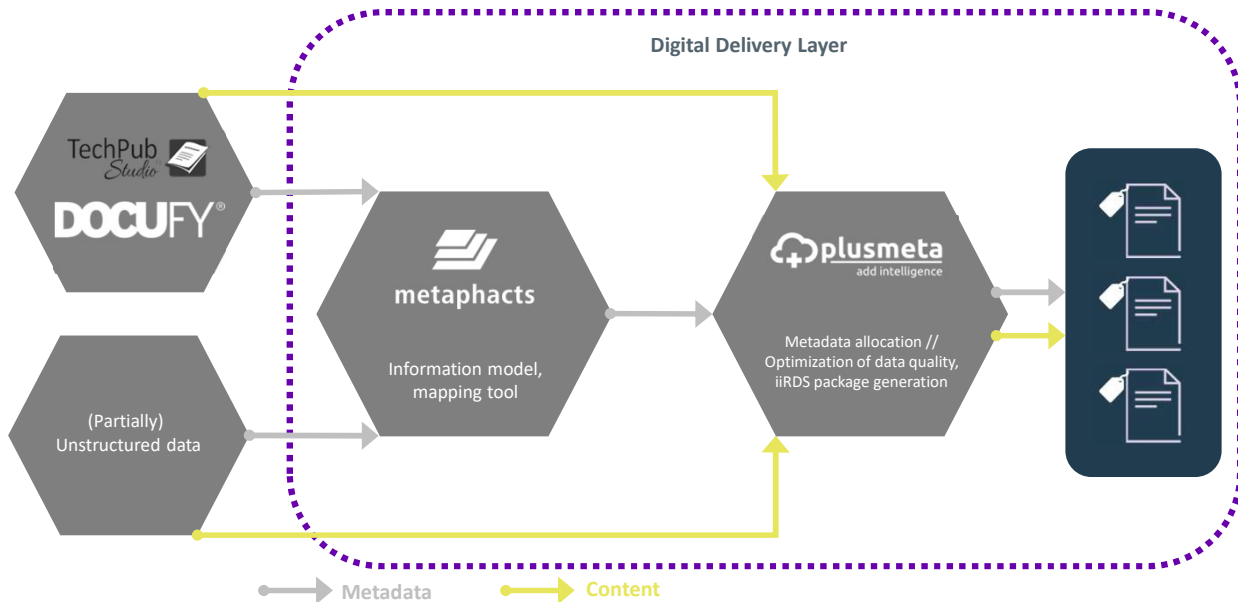
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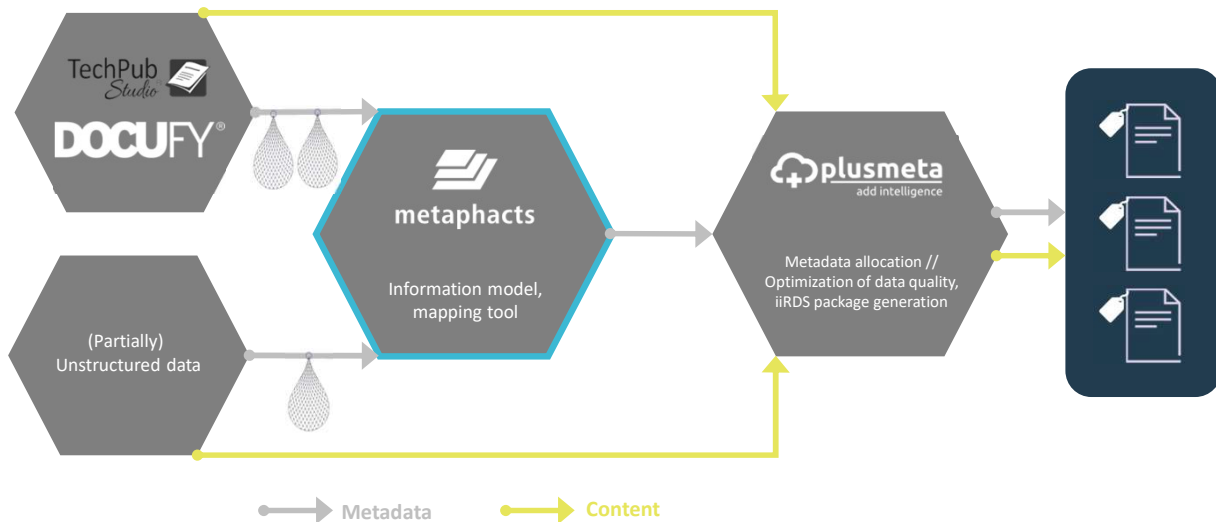
- 2 CMS in use
- Each CMS has a different purpose
- Working methods within the CMS work perfectly → satisfied with the use
- 2 CMSs and other data sources should continue to be used

System landscape



- The 4 systems are involved in the project of a "digital deliver layer"
- Creation: 2 CMS with metadata, partly unstructured data e.g. Sharepoint
- Metadata harmonization: metaphacts
- Optimization of data quality: plusmeta
- metaphacts collects information models from the source systems and harmonizes / standardizes them → delivers this information to plusmeta
- Content is added at plusmeta, where the content then merges with the metadata

System landscape

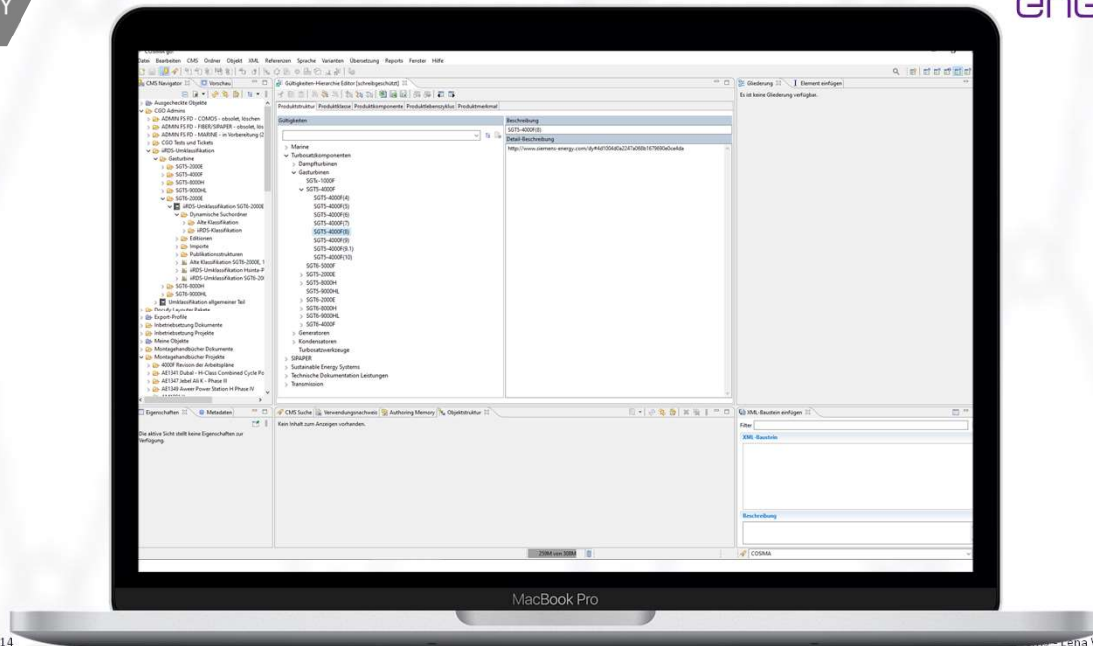


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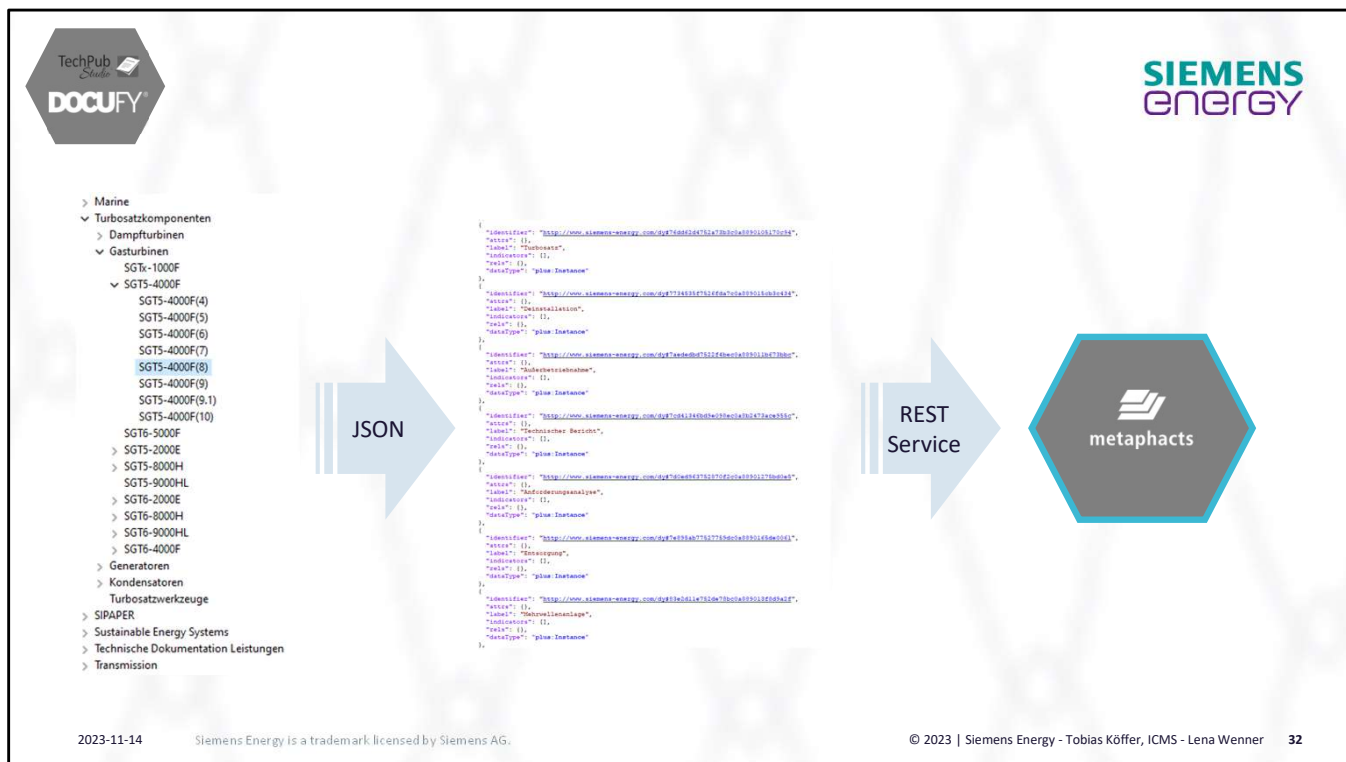
Fisher Metaphor: the nets collect the metadata of the source systems and transmit them to metaphacts



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- Let's take a closer look at Cosima's network
- Interface of the CMS

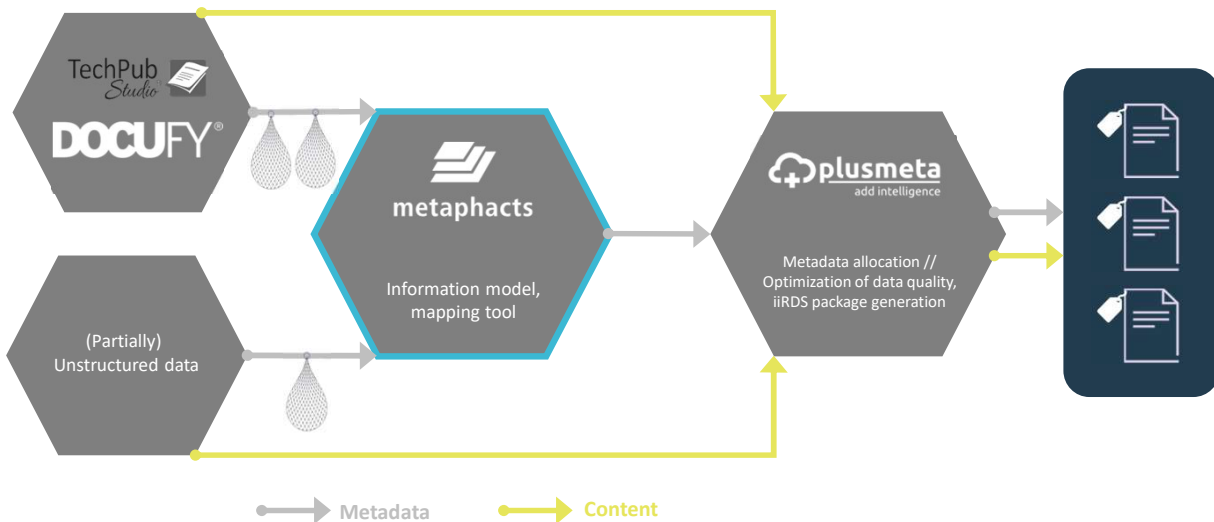


Metaphacts

- The content is not important in the first step, we look at the quality hierarchies
- Goal: mapping the Cosima taxonomy
- Taxonomies are written in any format (here: JSON) via the scripting engine contained in Cosima
- This format can then be transferred to metaphacts via REST services

The scripting engine included in Cosima provides extensive methods for interacting with the editorial system. JavaScript is available as the programming language for creating scripts. With the help of these scripts, we can evaluate the metadata stored in validity hierarchies and transfer it into a JSON format. This exchange format can be automatically transferred via HTTP interfaces to a REST interface provided by PlusMeta. The data prepared by PlusMeta is then also transferred to a (customized/developed for this purpose & data is also transferred in JSON format) REST interface in the target system/metaphacts and thus stored in the graph.

System landscape



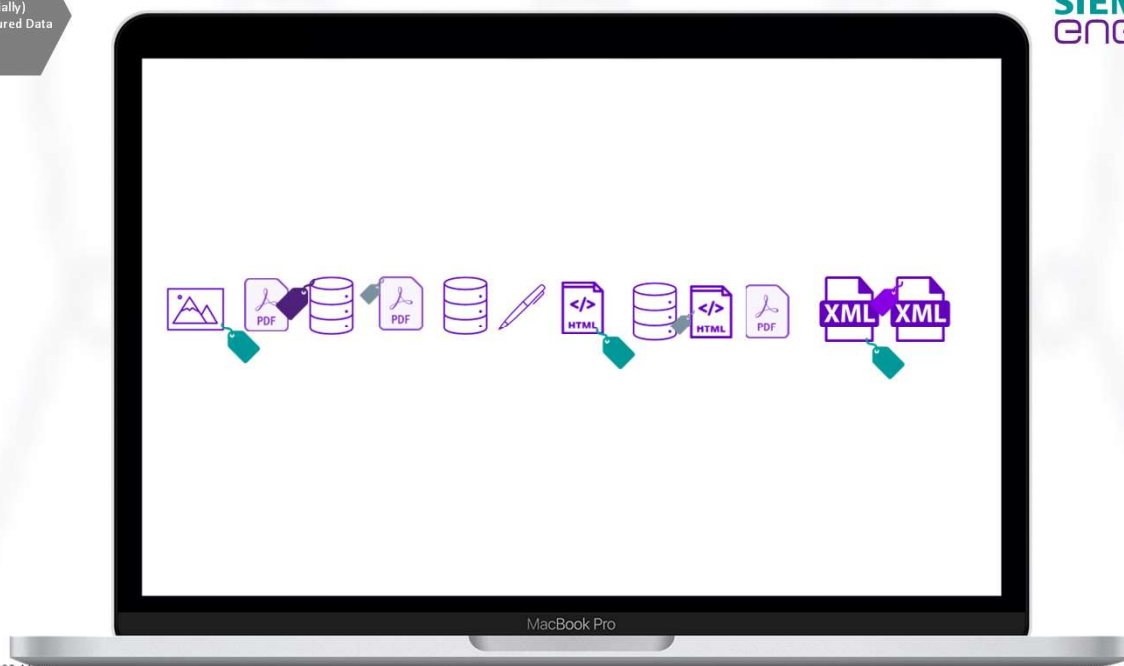
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Classification models of the other systems should also be mapped in metaphacts

(Partially)
Unstructured Data



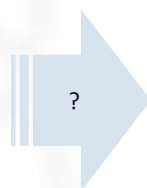
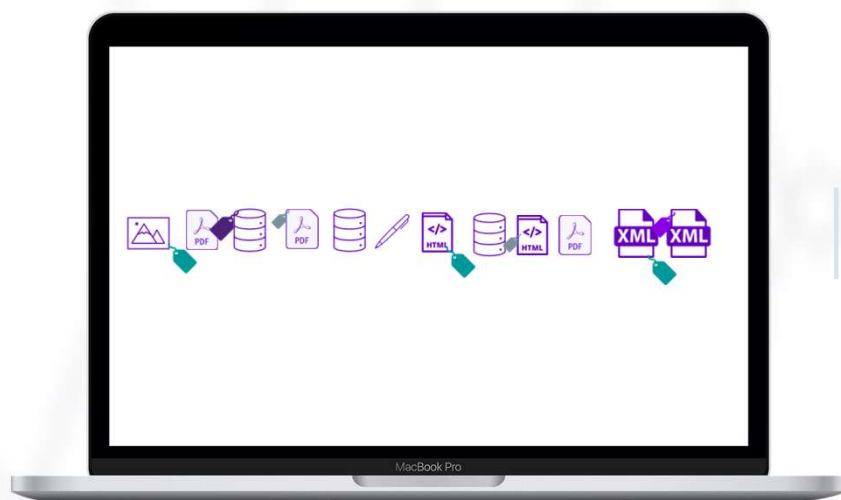
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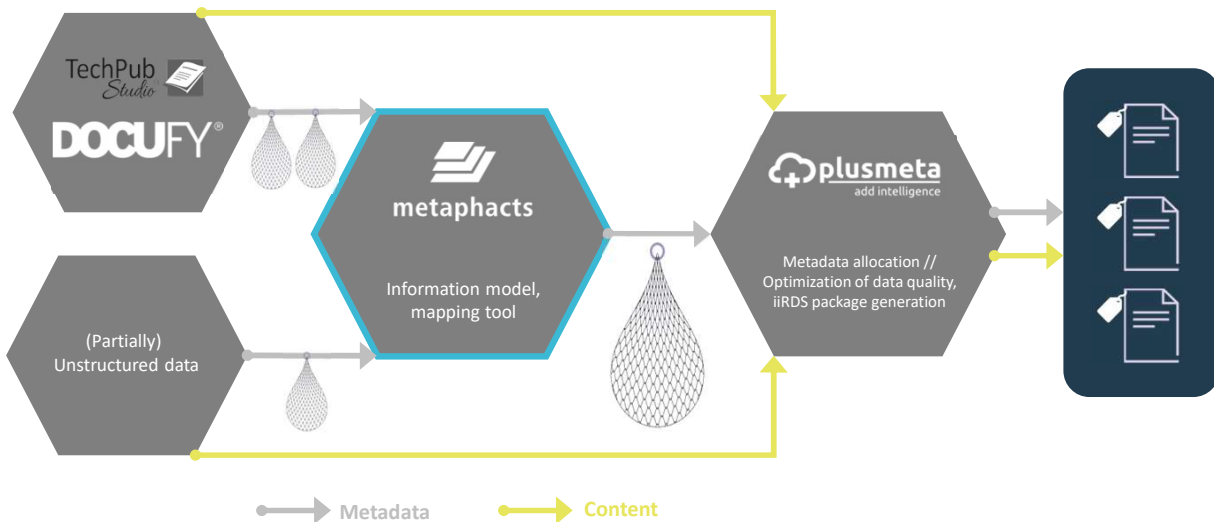
Unstructured data is available

(Partially)
Unstructured Data



This data can be mapped in metaphacts via individual interfaces: Import from Excel, manual creation, ...

System landscape



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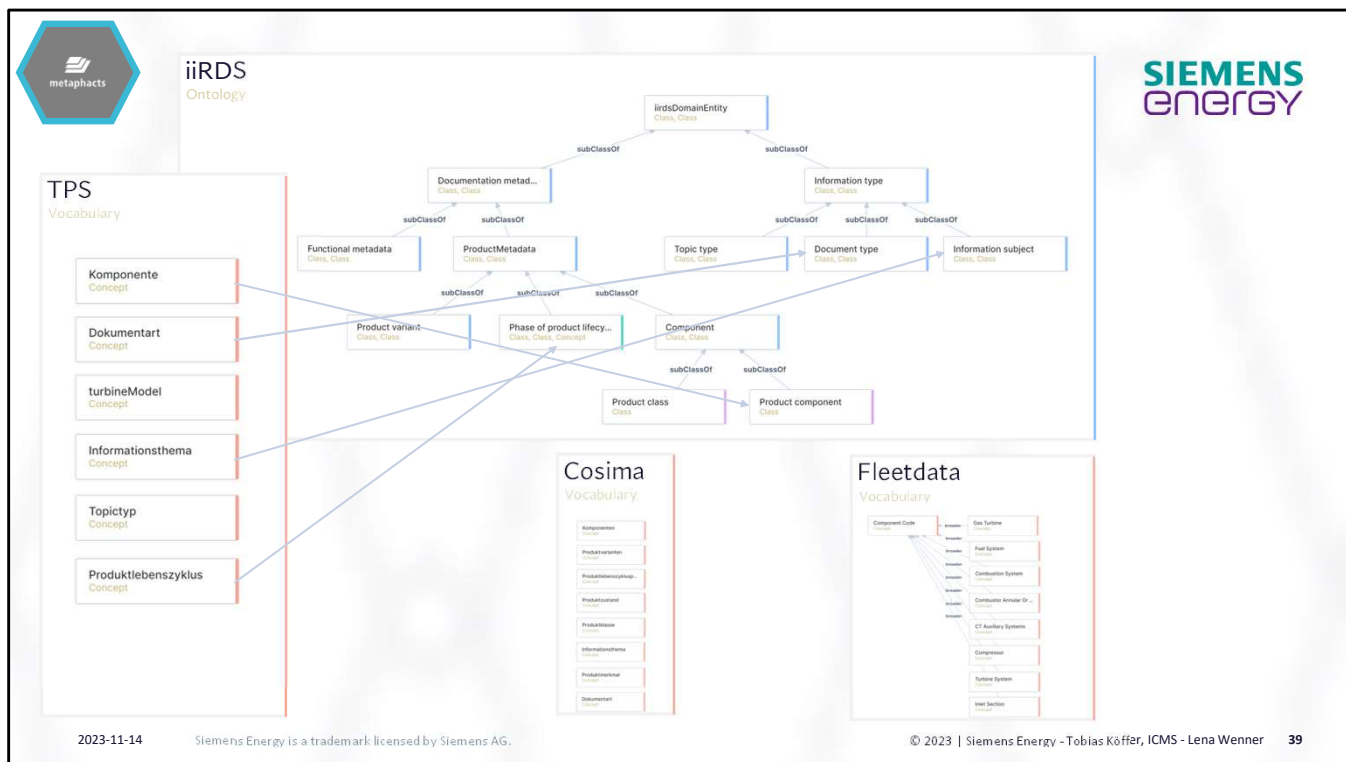
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In metaphacts the different classification models are unified and collected in a network and brought to plusmeta

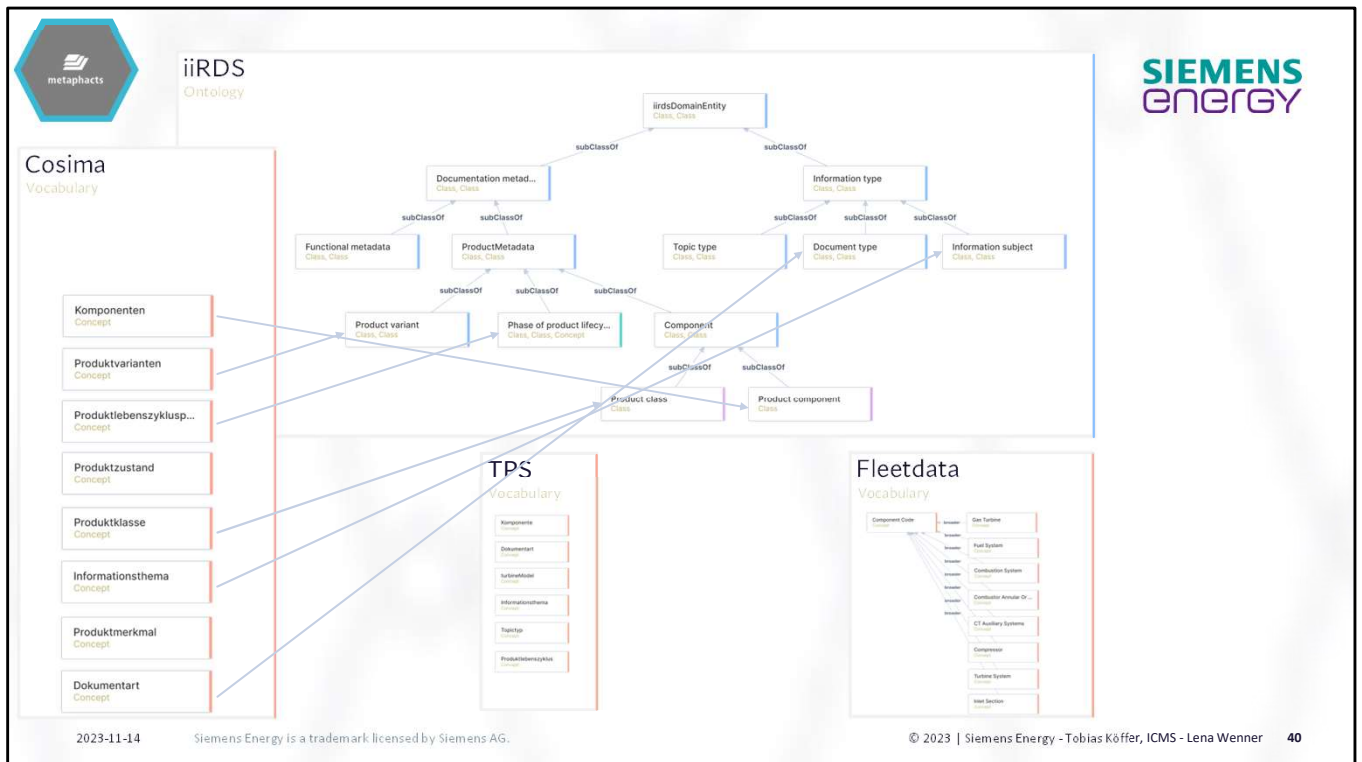


After importing metadata from the source systems, these are stored in parallel to each other

- iiRDS standardizes the individual concepts



A mapping of the individual instances is created: e.g. each component of the TPS classification has an equivalent in iIRDS

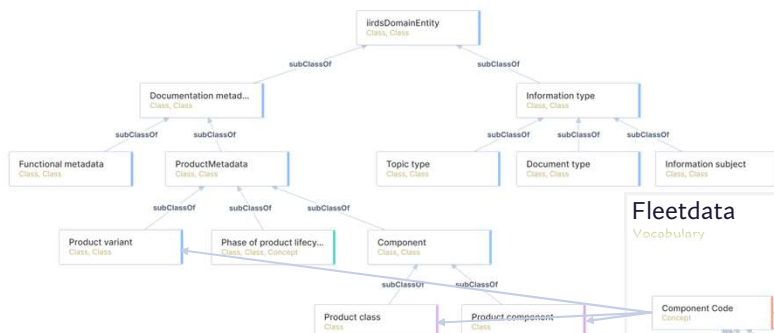


The same applies to Cosima and Fleetdata

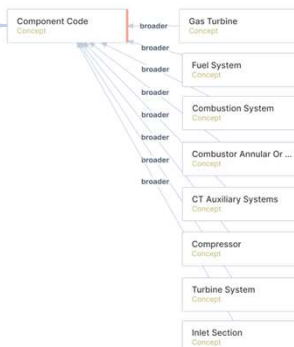


iIRDS
Ontology

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Fleetdata
Vocabulary



Cosima
Vocabulary



TPS
Vocabulary



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metaphacts

iiRDS
Ontology

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Zurück zur iiRDS-Übersicht

Brenner

Description ⓘ
Enter description here...
Add description

label *
Brenner
Add label

hat Entsprechung (Docufy Cosima)
bren
Brenner
Brennereinbaute
Brennkammer
Add hat entsprechung (docufy cosima)

Save Reset Delete

Informationstheorie
Produktentwurf
Produktentwicklung
Produktmanagement

Produktentwurf

Turbine System
Inlet Section

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Let's take a closer look at the mapping tool:

- The user has the option of creating or linking equivalents for the values in the iiRDS network
- Network visualization, forms, ...
- Any display can be configured by the user

iIRDS

Ontology

iIRDS

Class, Class

subClassOf

subClassOf

Documentation meta...

Information type

Dokument aus TP

Component Code aus Fleet Data

Titel	Component Code(s)	Component Code	Major System	Major Component	Sub Component	Produktklasse	Produktkomponente	Produktstruktur
Inspect control operator for stator blade adjustment device	500100	500100	Inlet Section	Inlet Guide Vane Assembly		MBA11 Verdichter/Leitschaukel/Verstellsystem		SGTS-3000E#SGTS-8000H#SGTS-4000F#SGT6-8000H#SGT6-4000F
Remove Turbine Vanes Stages 1-4 US	508316#508314#508318#508314	508314	Turbine System	Vanes	Tie-1 Stationary Blade 1 DG 12601	M8B Turbinensystem	Vane Stage 1	SGTS-3000E#SGTS-8000H#SGTS-4000F#SGT6-8000H#SGT6-4000F
Remove Turbine Vanes Stages 1-4 US	508316#508314#508318#508316	508316	Turbine System	Vanes	Tie-2 Stationary Blade 2 DG 12642	M8B Turbinensystem	Vane Stage 2	SGTS-3000E#SGTS-8000H#SGTS-4000F#SGT6-8000H#SGT6-4000F
Remove Turbine Vanes Stages 1-4 US	508316#508314#508318#508318	508318	Turbine System	Vanes	Tie-3 Stationary Blade 3 DG 12643	M8B Turbinensystem	Vane Stage 3	SGTS-3000E#SGTS-8000H#SGTS-4000F#SGT6-8000H#SGT6-4000F
Remove Turbine Vanes Stages 1-4 US	508316#508314#508318#508320	508320	Turbine System	Vanes	Tie-4 Stationary Blade 4 DG 12644	M8B Turbinensystem	Vane Stage 4	SGTS-3000E#SGTS-8000H#SGTS-4000F#SGT6-8000H#SGT6-4000F
Install packing rings and burner support inserts in annular combustor LS	507031	507031	Combustor Annular	Combustor Inserts		MBM Verbrennungssystem	Burner insert	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Assemble burners in casing 2, lower section, in their original positions	505032	505032	Combustion System	Casing DG 10605		MBM Verbrennungssystem	Burner casing	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Close turbine stator	508317	508317	Turbine	Carrier Section (US)		MBM Verbrennungssystem	Burner casing	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Install packing rings and burner support inserts in annular combustor US	507031	507031	Combustor Annular	Combustor Inserts		MBM Verbrennungssystem	Burner insert	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Install burners in casing 1, upper part, in their original positions	505031	505031	Combustion System	Casing DG 10606		MBM Verbrennungssystem	Burner casing	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Install upper blowoff and extraction lines	506532	506532	Combustor	Carrier Section (US)		MBM Verbrennungssystem	Burner insert	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Remove the temporary supports from underneath the casings	506532	506532	Combustor	Carrier Section (US)		MBM Verbrennungssystem	Burner insert	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Install support frame at the gas turbine	506532	506532	Combustor	Carrier Section (US)		MBM Verbrennungssystem	Burner insert	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Connect wiring to combustion chamber	506532	506532	Combustor	Carrier Section (US)		MBM Verbrennungssystem	Burner insert	SGTS-3000E#SGTS-2000E#SGTS-2000E#SGTS-4000F#SGT6-4000F
Install the fuel oil supply and purge water lines	504907	504907	Fuel System	Fuel Oil System		MBM Heizölsystem		SGTS-3000E#SGTS-4000F#SGT6-4000F
Dimensions and Weights	529900	529900	Gas Turbine	Gas Turbine		MB Rumpfturbine		SGTS-3000E#SGTS-4000F#SGT6-4000F

Informationssystem

Produktstruktur

Dokument

Produktstruktur

Turbine System

Inlet Section

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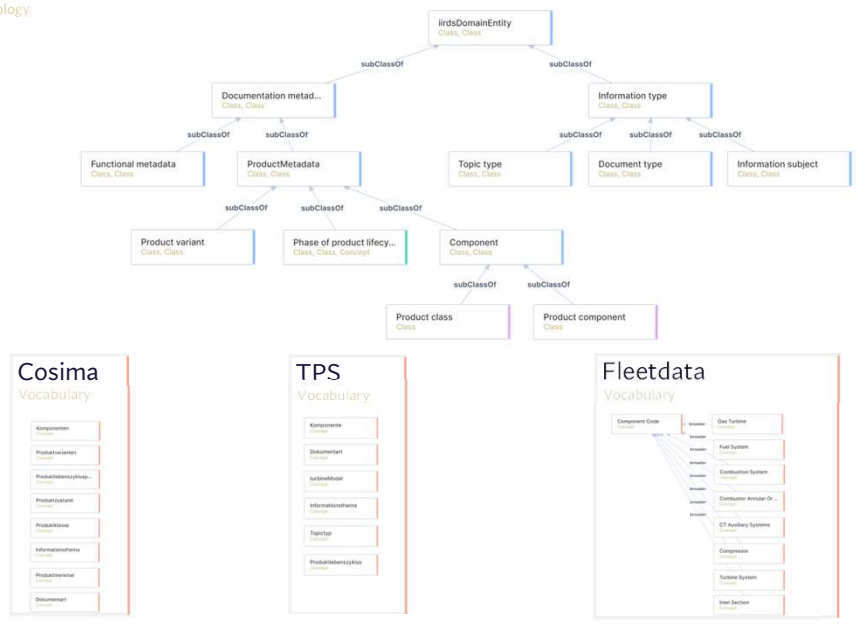
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Looking back: not manageable in a world with Excel → a tool was needed



iiRDS
Ontology

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Result: a standardized information model that covers all existing metadata systems without the individual systems having to change



iiRDS Ontology



Cosima Vocabulary



TPS Vocabulary



Fleetdata Vocabulary



REST
Service

PLUSMETA

GET /rest/extensions/plusmeta/GetPlusmetaData-GetPlusmetaData

Returns all plusmetadata resources from the database in json format

Code Details

200

Response body

```
{
  "id": "http://www.siemens-energy.com/iiRDS/00000000-0000-0000-0000-000000000000",
  "name": "iiRDS",
  "description": "iiRDS",
  "url": "http://www.siemens-energy.com/iiRDS/00000000-0000-0000-0000-000000000000",
  "type": "iiRDS",
  "status": "Active",
  "created": "2023-11-14T10:00:00.000Z",
  "modified": "2023-11-14T10:00:00.000Z",
  "deleted": "2023-11-14T10:00:00.000Z",
  "version": "1.0.0"
}
```

Response headers

Content-Type: application/json

Content-Length: 1024

Server: Apache/2.4.18 (Ubuntu)

Response

Code Description Links

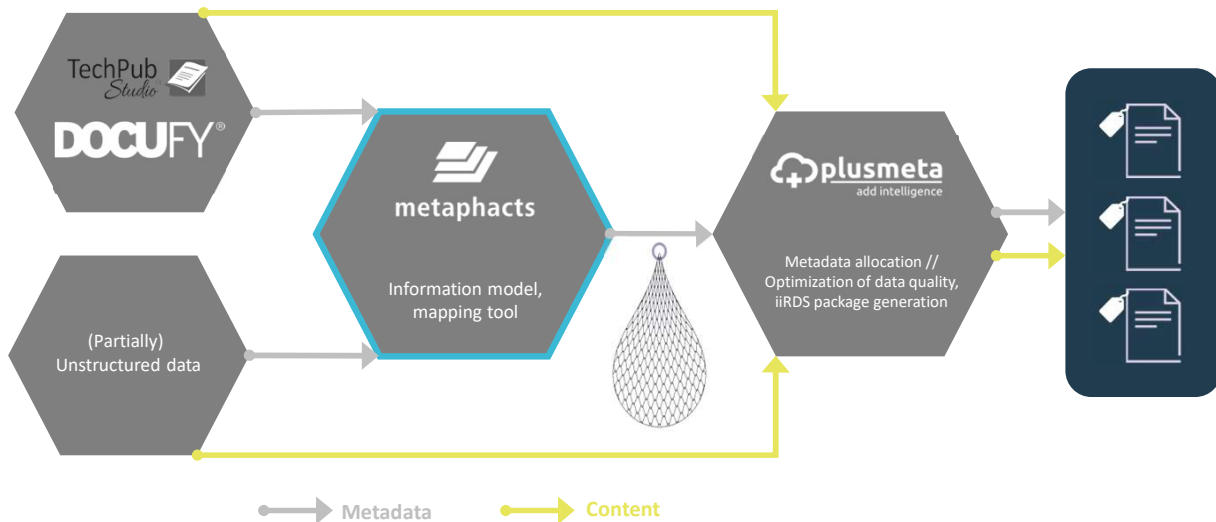
200 Successfully request

400 Bad request. See log.

500 Internal server error - Something went wrong. See log.

- All the information is now transferred to metaphacts via a REST service
- JSON format created for plusmeta in metaphacts

System landscape



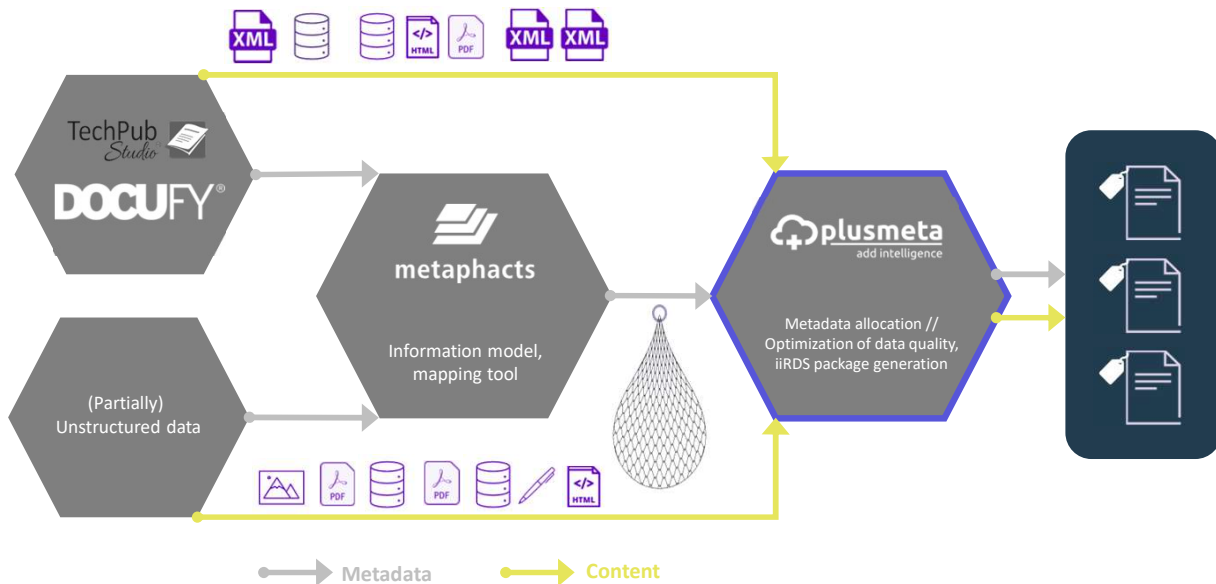
2023-11-14

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We now have the complete information model in the network and can deliver it to plusmeta.

System landscape



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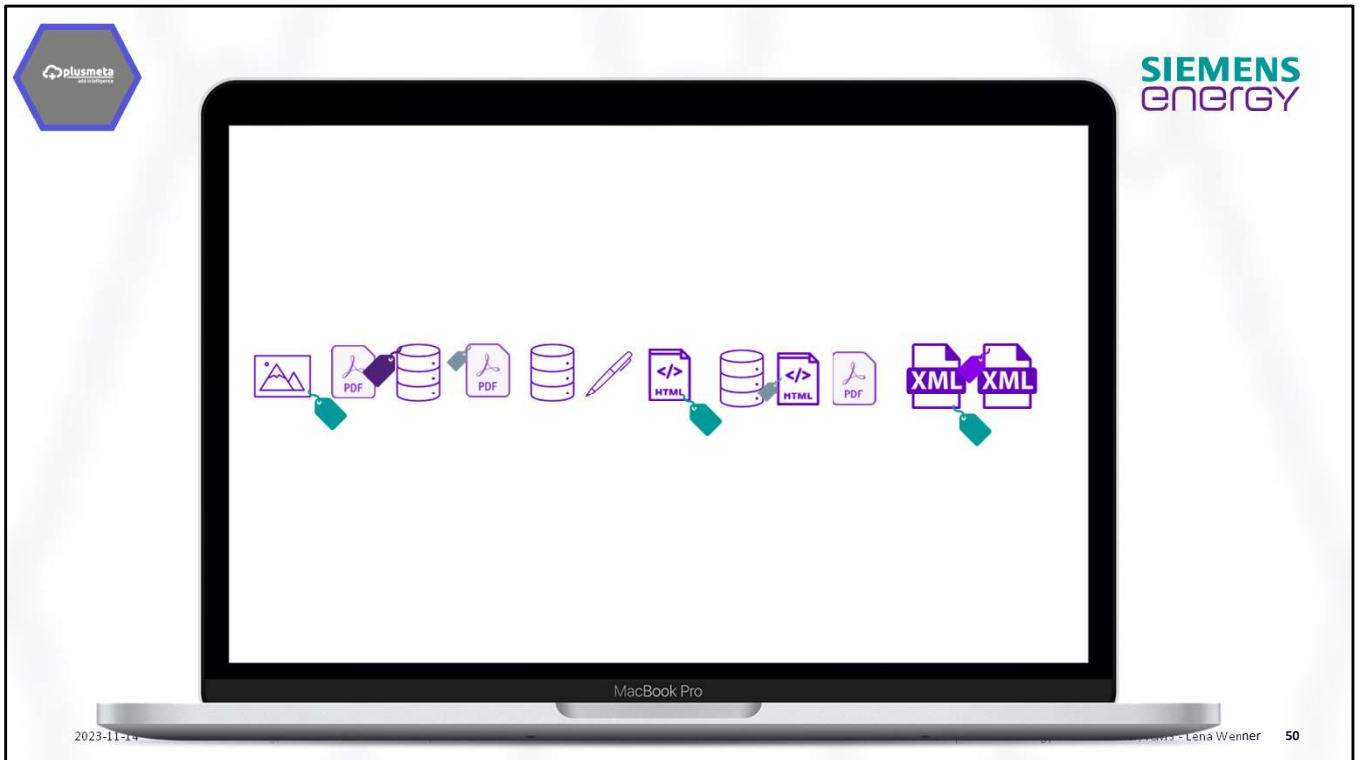
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- In addition to the metadata, the content is added in plusmeta
- Content and metadata are now combined here

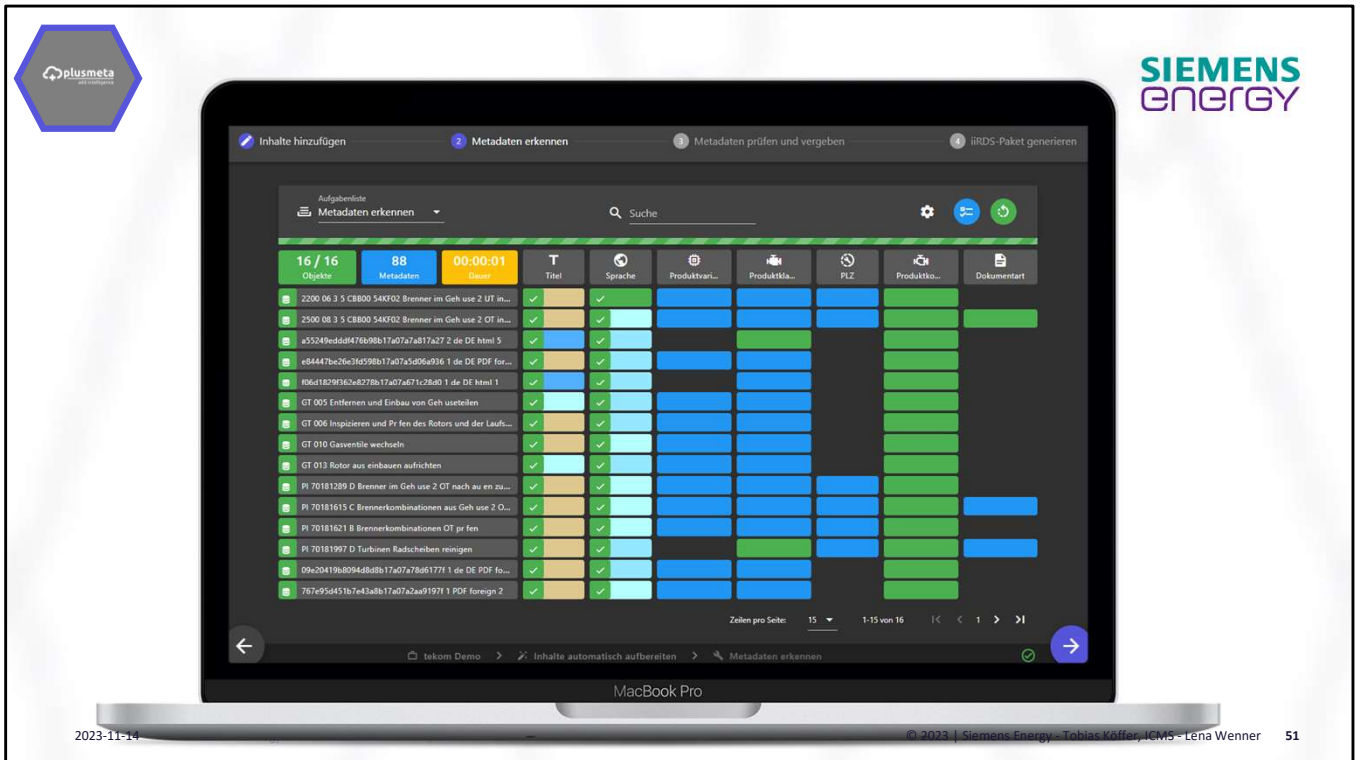


REST Service

Input from metaphacts → the entire information model



- Import of files
- For data from the CMS incl. metadata from the respective source system

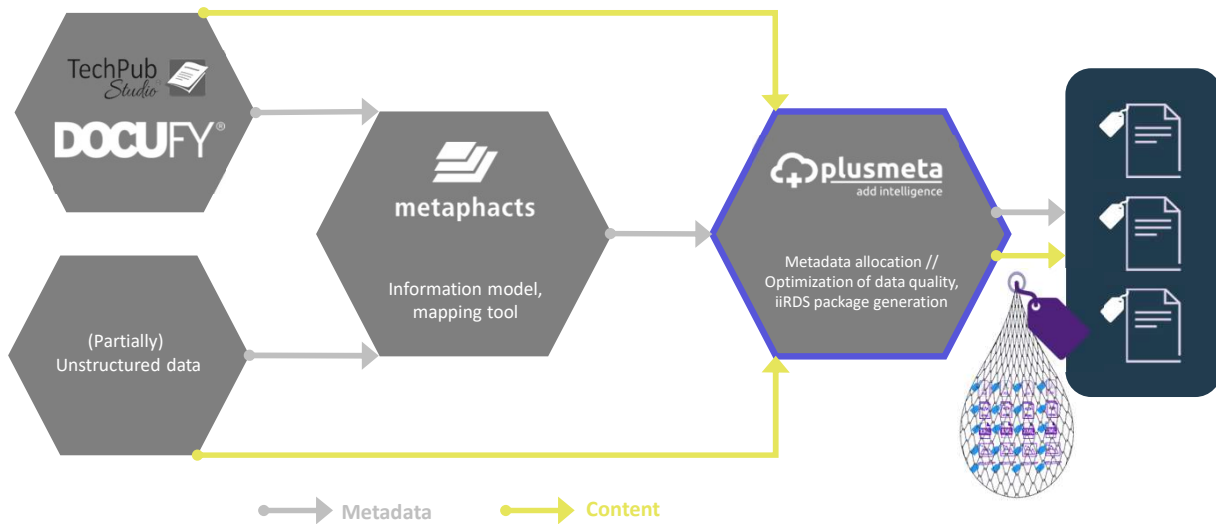


- Files are stored in the project
- Provided with metadata → corresponding metadata is read out via mapping OR assigned accordingly via AI (can be configured per metadata)
- Then release follows



Download the iIRDS packages incl. standardized metadata

System landscape



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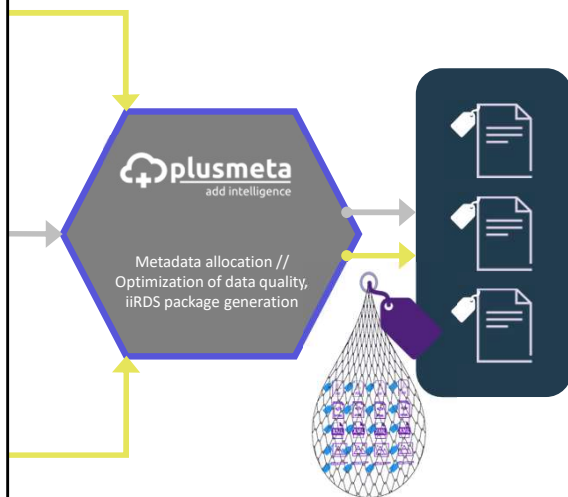
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Net with "best fish" and without "bycatch"

System landscape

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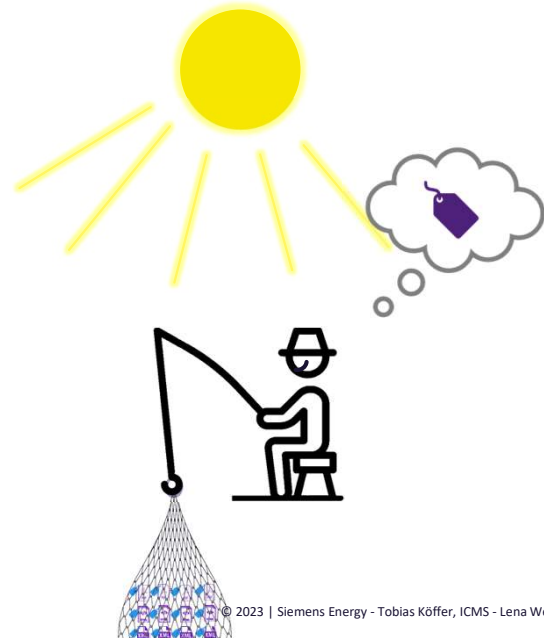
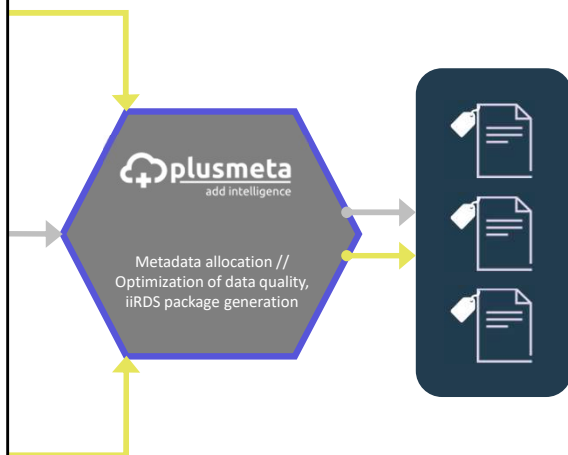


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- Fisherman no longer have to fish in the dark
- with the right bait he catches the desired fish

System landscape

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The fisherman is provided with the information according to the required metadata so that he only catches the fish he wants

Outlook

"View to the horizon"



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A look into the future



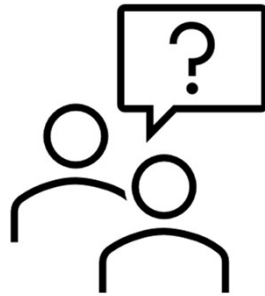
Right under your nose:

- Fast, uncomplicated distribution of content to other systems
- Machine learning training (in plusmeta) enables expansion to other use cases and departments

On the horizon:

- Application of the concept company-wide
- Growing knowledge network with further sources and additional other networks
- Flexibility and adaptability to higher-level and global decisions

Questions & Suggestions



Thank you!



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Content Management

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