

FIWARE
**Global
Summit**

Smart Data model generation for big data models in a solar thermal power plant

Vienna, Austria
12-13 June, 2023
#FIWARESummit

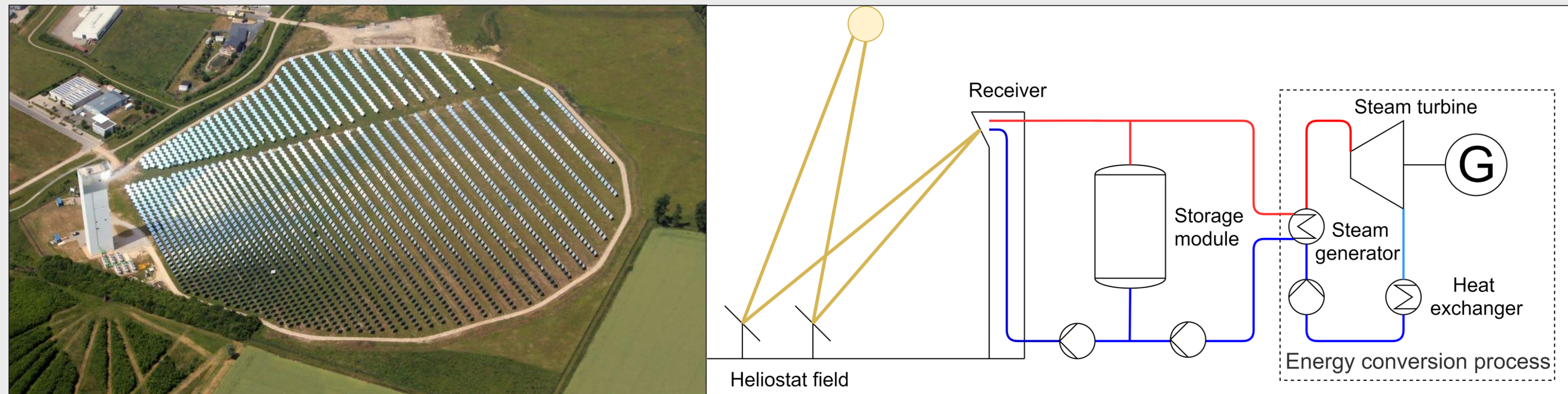
**From Data
to Value**

OPEN SOURCE
OPEN STANDARDS
OPEN COMMUNITY

 **FIWARE**
Open APIs for Open Minds

Use Case

- Transform solar power plant into cyber-physical system
- Support and improve plant operation with data-based applications
- Challenge: Integration of Process Control System (PCS)



- Process Control System has ~2,700 relevant variables from ~ 90,000 variables overall
- A lot of effort to manually structure list of entities & create smart data model / IoT-Agent configuration

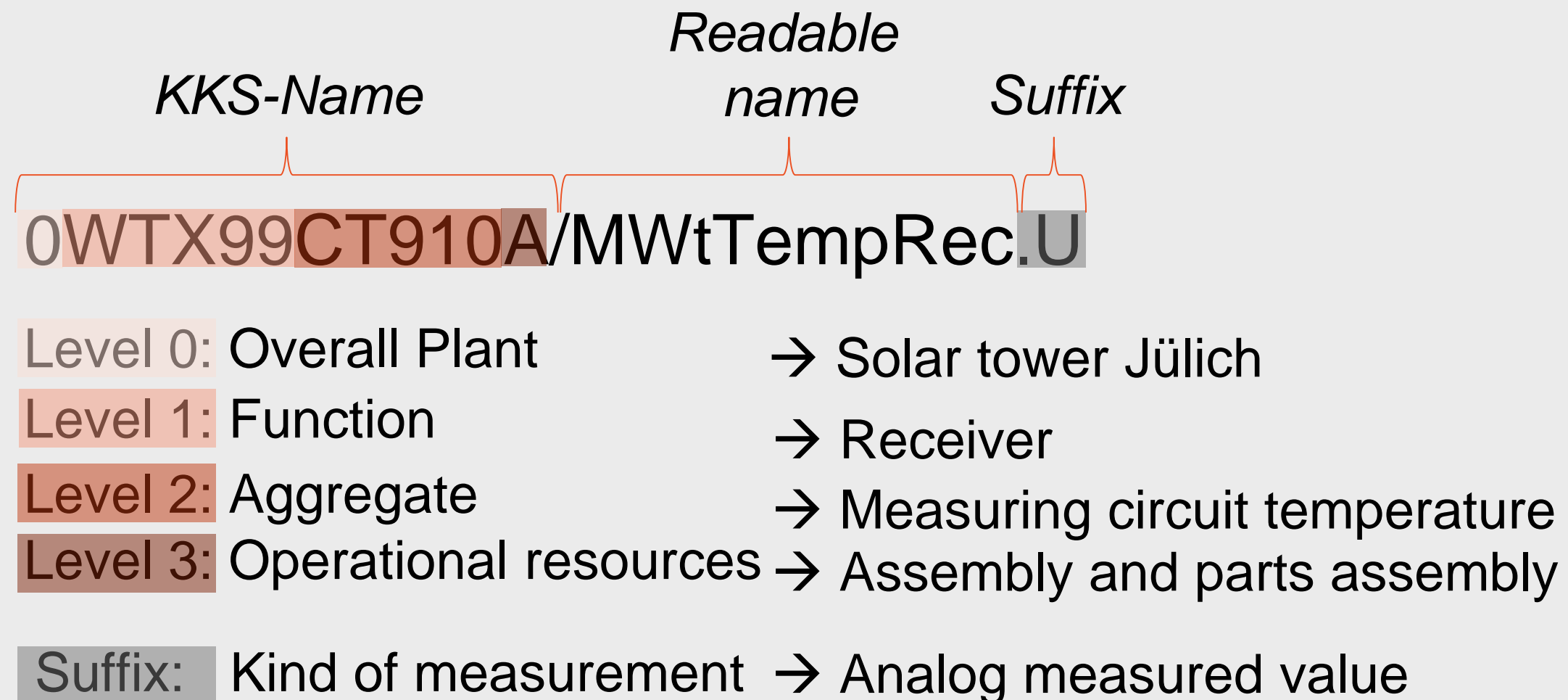
1
Structure PCS
Variables into
meaningful entities &
attributes

2
Create FIWARE
Smart Data Model

3
Create FIWARE IoT-
Agent configuration

Main outcomes

- Idea: Automated FIWARE artefact creation for big data models
 - PCS uses name pattern ‘Identification System for Power Stations’ / ‘Kraftwerk-Kennzeichensystem’ (KKS)



Main outcomes

- Developed Tool to generate FIWARE resources based on standardized name pattern
- Generates Smart Data Model & Agent Configuration

```
DeionizedWater >
DuctSystem >
Receiver v {
  description: Process management system function 'Receiver' with KKS function code: 'WTX' (de:
  'Receiver')
  id* > {...}
  type* > [...]
  dateObserved* > [...]
  isSubsystemOf* > [...]
  kksFunction > [...]
  0WTX99CT910:MWtTempObFlaRec:U_WL > [...]
  0WTX99CT910A:MAXWtTempRec:U number
  x-ngsi: OrderedMap { "model": "https://schema.org/Number", "type": "Property" }
  Receiver Nr. 99 Measuring circuit Temperature Nr. 910 A (Analog value measurement)
  0WTX99CT910:MWtTempObFlaRec:U_WL
```

Entity

Mandatory attributes

Relation to PCS entity

Additional information

Cleaned KKS-name as property name

Generated entity description

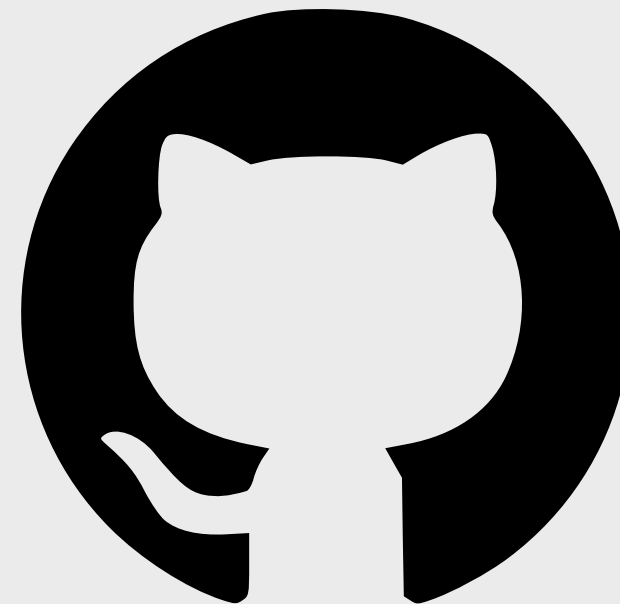
Mapped Data Type

Generated attribute description

Data Standardization and Smart Data models

■ Summary

- Big Smart Data Models create a lot of manual effort for creation of SDM & IoT-Agent configuration
- Standards and name patterns can be used to automatically generate FIWARE artefacts
- Example tool for big data model generation in a solar thermal power plant based on KKS name system



<https://github.com/DLR-SF/FiwareResourcesKKS>

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Thanks!

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