

Open APIs
for Open
Minds

Smart Data Models for cross-domain data sharing

Juanjo Hierro

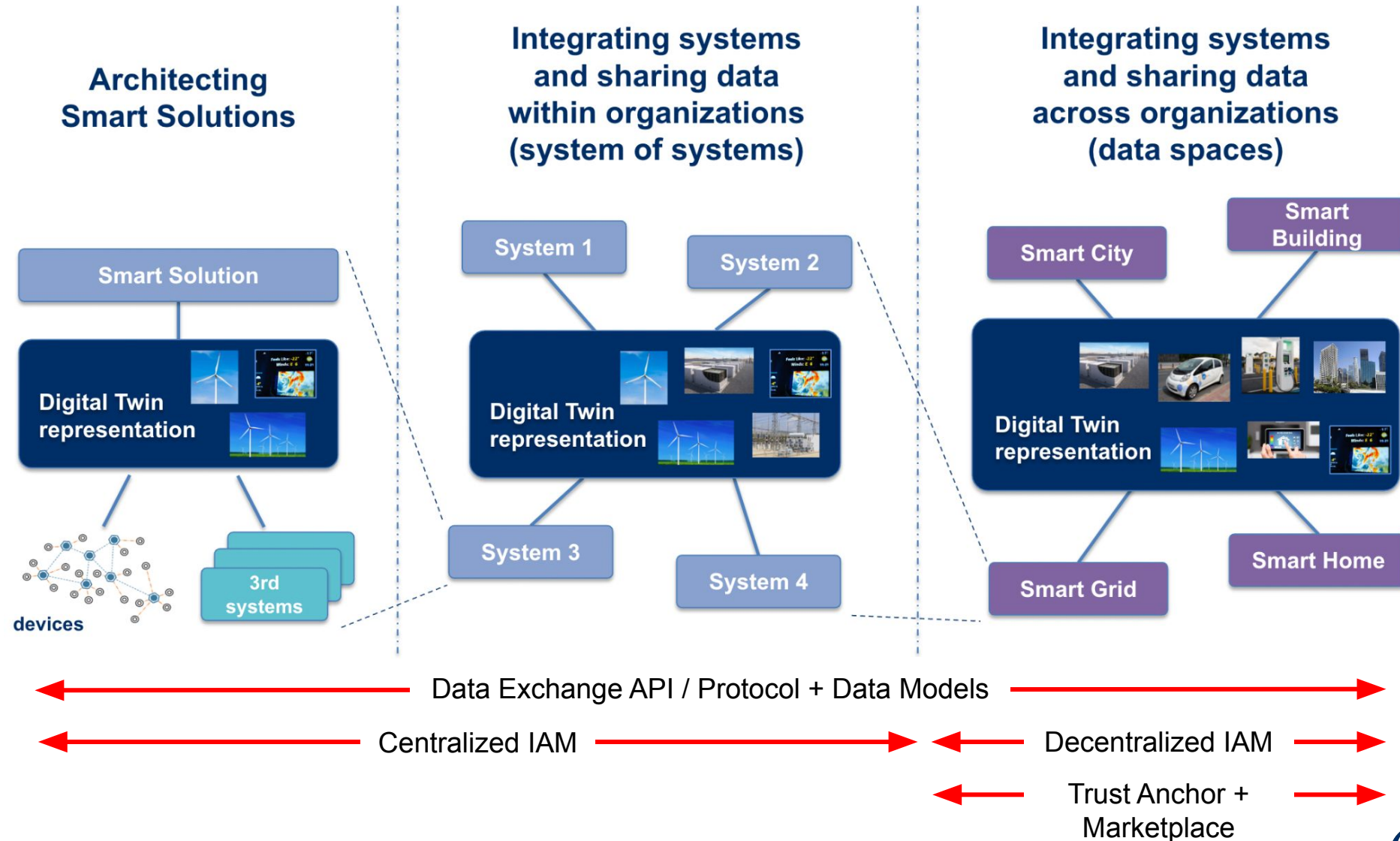
CTO

FIWARE Foundation

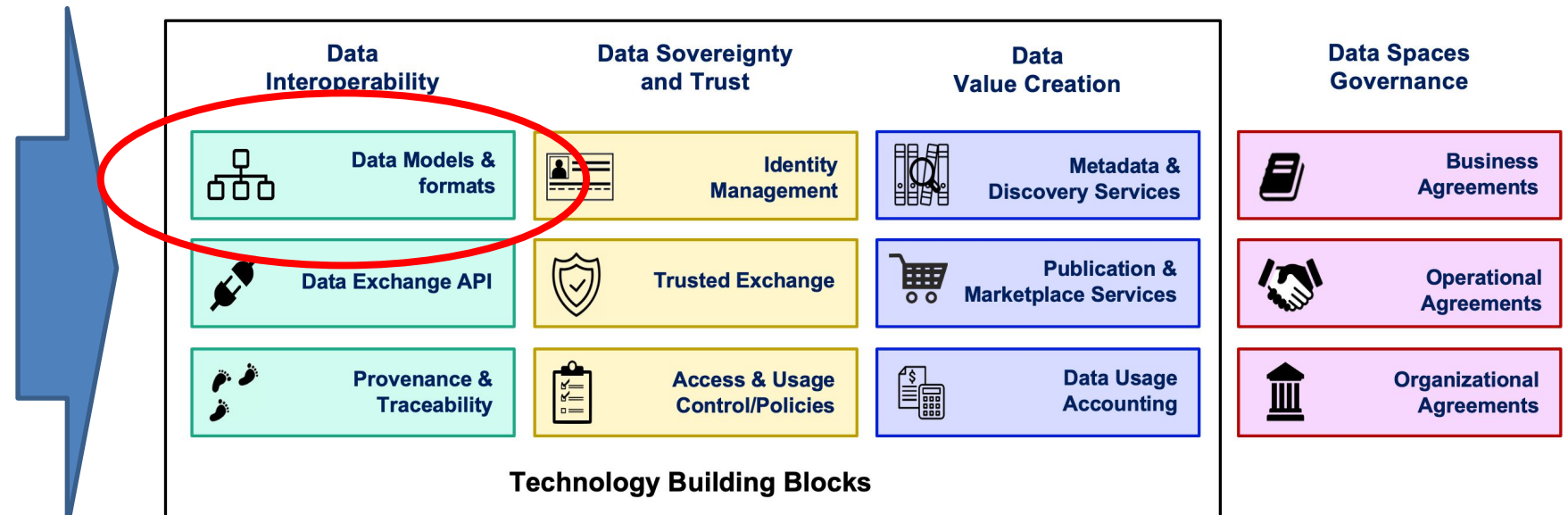
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Digital Twins: the right approach for digitisation at multiple levels

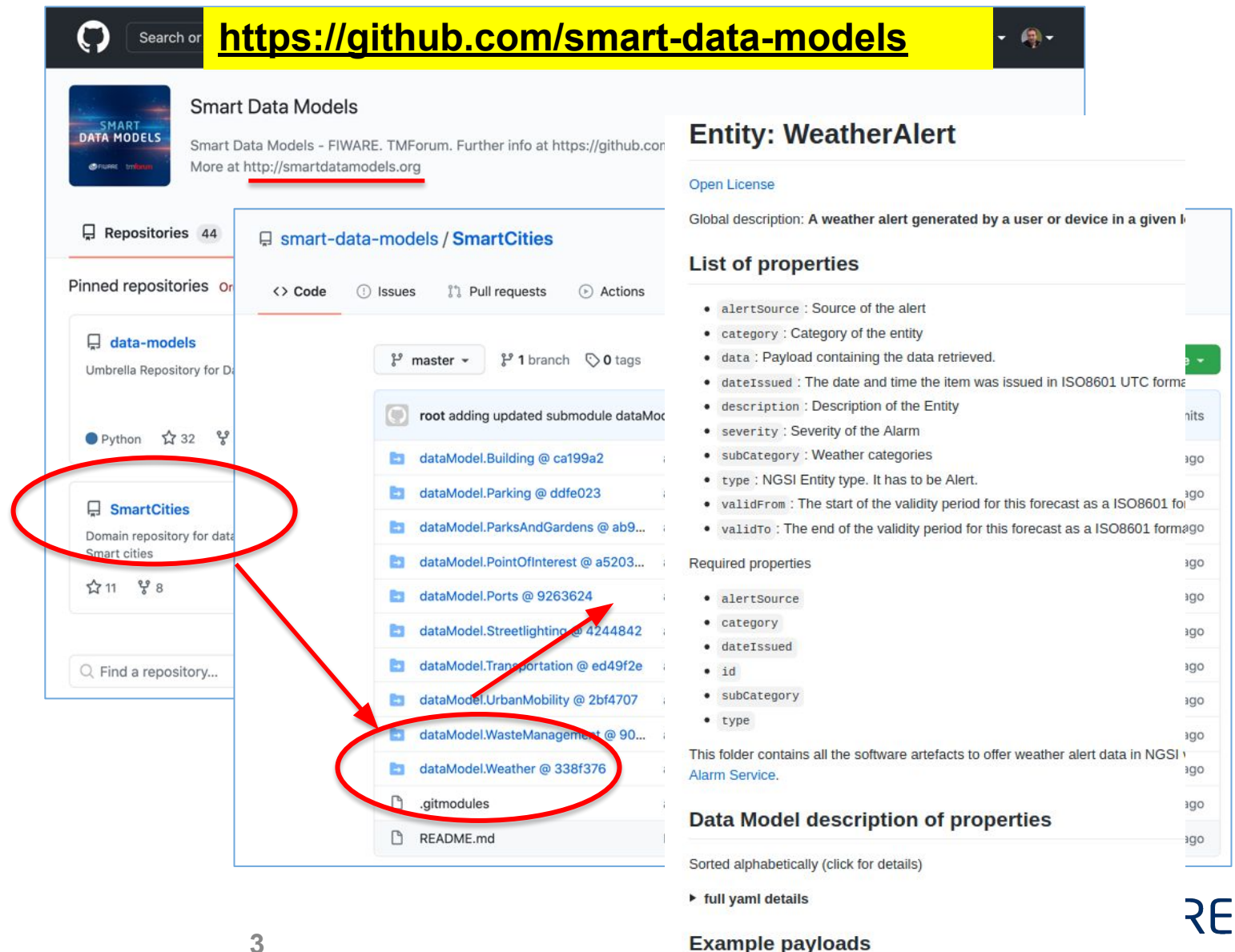


Common data models and formats: key for interoperability in Data Spaces



The Smart Data Models initiative

- Goal: provide a useful global “resource library” for developers
- For each model:
 - documentation in 6 languages
 - mapping (with validation schemas and examples) to DTDL and 4 serialization formats: JSON, JSON-LD, CSV, GeoJSON feat.
- Principles:
 - Agile process (6 weeks)
 - Implementation-driven
 - Cross-sector
- Defined data models rely on relevantly adopted standards (e.g., schema.org, SAREF, IEC CIM in Energy or UNE 178503 for Tourism) and contributions from real projects by the Community



<https://github.com/smart-data-models>

Smart Data Models

Smart Data Models - FIWARE, TMForum. Further info at <https://github.com/smart-data-models>
More at <http://smartdatamodels.org>

Repositories 44

Pinned repositories

data-models
Umbrella Repository for Data Models

Python 32 8

SmartCities
Domain repository for data models in Smart cities

11 8

Find a repository...

smart-data-models / SmartCities

Code Issues Pull requests Actions

master 1 branch 0 tags

root adding updated submodule dataModel

- dataModel.Building @ ca199a2
- dataModel.Parking @ ddf023
- dataModel.ParksAndGardens @ ab9...
- dataModel.PointOfInterest @ a5203...
- dataModel.Ports @ 9263624
- dataModel.Streetlighting @ 4244842
- dataModel.Transportation @ ed49f2e
- dataModel.UrbanMobility @ 2bf4707
- dataModel.WasteManagement @ 90...
- dataModel.Weather @ 338f376**
- .gitmodules
- README.md

Entity: WeatherAlert

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Global description: A weather alert generated by a user or device in a given location

List of properties

- alertSource : Source of the alert
- category : Category of the entity
- data : Payload containing the data retrieved.
- dateIssued : The date and time the item was issued in ISO8601 UTC format
- description : Description of the Entity
- severity : Severity of the Alarm
- subCategory : Weather categories
- type : NGSI Entity type. It has to be Alert.
- validFrom : The start of the validity period for this forecast as a ISO8601 format
- validTo : The end of the validity period for this forecast as a ISO8601 format

Required properties

- alertSource
- category
- dateIssued
- id
- subCategory
- type

This folder contains all the software artefacts to offer weather alert data in NGSI Alarm Service.

Data Model description of properties

Sorted alphabetically (click for details)

► full yaml details

Example payloads

Smart Data Models: domains and subjects

DATA-MODELS

- Guides for coding new data models
- Template for new data models and examples
- Directory for scripting tools to check data models
- Inventory of domains and data models
- Inventory of attributes and terms
- @Context for json-ld



data-models
Umbrella repo

DOMAINS REPOSITORIES

Readme pointing to the list of subjects
General info or shared resources



Smart Water

Smart Cities

Smart Environment

Cross Sector

Smart Destinations

Smart Agrifood

Smart Energy

Smart Manufacturing

Smart Aeronautics

Smart Robotics



Subject 1
(sewage)

Subject 2
(parking)

Subject 3
(weather)

Subject 4
(Power Transformer)

SUBJECTS' REPOSITORIES

Readme pointing to the list of data models for the objects
Contributors.md
subject-schema.json

DATA MODELS

README.md
/doc/spec.md
/examples
schema.json
Adopters
LICENSE



LIFECYCLE MANAGEMENT REPOSITORIES

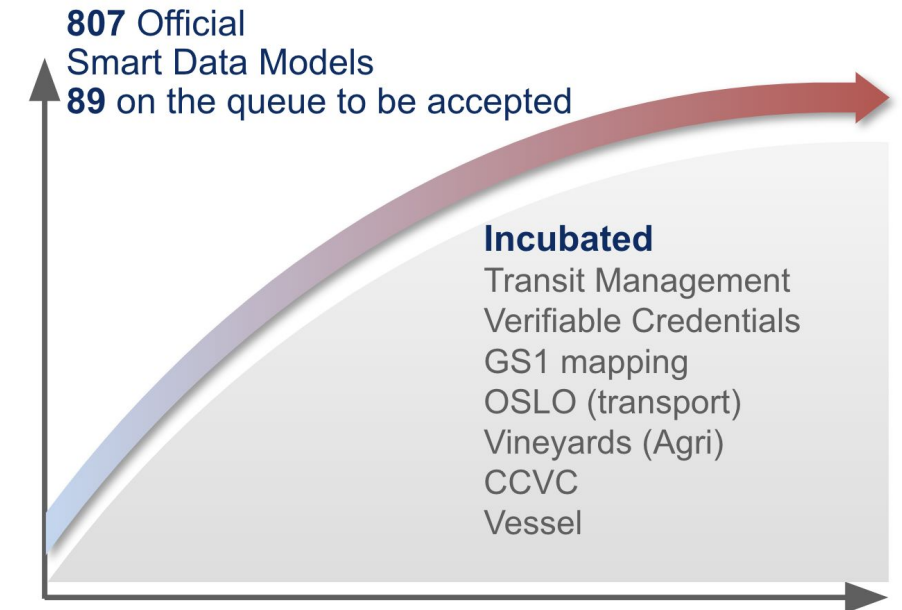
Incubated

Harmonization

Smart Data Models: Current status

1	Smart Energy	424
2	Smart Sensoring*	138
3	Smart Cities	85
4	Cross Sector	77
5	Smart Water	35
6	Smart Agrifood	30

7	Smart Environment	23
8	Smart Aeronautics	13
9	Smart Robotics	12
10	Smart Destination	11
11	Smart Manufacturing	3
12	Smart Health	2



Updated 20-6-22

* Many sensors are specific from other domains but not counted there
Water 4, Environment 12, health 19, energy 5, cities 27, agrifood 1, robotics 1

Contributors and dissemination



- 116 active contributors
- 226 contribution in data models
- 22 services to contributors in data models



- Contributors belong to 75 different organizations
- Terms available for search 18.271
- Documented adopters 130



- Every term in data models has an associated page <https://smartdatamodels.org/term>
- Google finds 1570 pages in smartdatamodels.org

Updated 20-6-22

Conclusions

- Adoption of a minimum but common set of data interoperability mechanisms is key in development of a strategy for digitisation:
 - system of systems approach within orgs
 - materialization of cross-sector data spaces
 - develop once, integrate plug&play
- Defining common data models is crucial but it's not only about defining ontologies but also bring the answer to how data should be serialized when used together with APIs
- The Smart Data Models program meets the requirements to become the reference for developers:
 - open, community-driven
 - agile, implementation-driven
 - great momentum, growing fast



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