

Open APIs  
for Open  
Minds

## Smart Data Models:

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Data modelling expert

FIWARE Foundation

# Index

## The Smart data Models Initiative

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- Approach to data models. 'De facto' standardization.

### **PART 2. The initiative**

- Principles. What is the Smart Data models Initiative
- Structure
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- Data models sources and why using
- Data models lifecycle
- Services to users and contributors
- Roadmap and last news

# PART 1

Approach to data models. 'De facto' standardization.

# Approach to data models. 'De facto' standardization.

## QUESTIONS

- How frequently changes the conditions on your business?
- Would the standards help you on the change?
- The standards meet your needs?
- Digital transformation at standardization speed?
- I.e. ISO 50001
  - First version 2011
  - Next version 2018
- 4 years is the right period?
- Could we think on something which complements current methods of standardization?



# Approach to data models. 'De facto' standardization.

Concept	Classic	De-facto
Standardization body	Stable and fully-dedicated entity → DIN	Unstable or not fully dedicated → Smart Data Models Initiative
Standardization groups	Extended and Balanced members from relevant and interested actors	Interested users and developers with expertise on the field
Consensus mechanisms	Global Reviews by participants	By contribution and Benevolent dictator
Prestige of standards	By source entity	By use of the results
Advantages	Low-biased standards. Coherence with former standardizations Predictable reviews Funding based on standard costs and members fees	Standard created together with implementation <b>Evolution by use</b> <b>Quick reviews</b> Low cost
Disadvantages	Creation of <i>theoretical</i> standards (never implemented) <b>Slow reviews</b>	Standardization hardly support costs Potential biased standards Low barriers to Potential competitors

# Data models needs

As **user** what will happen to the data models you use when ....

- ... your project ends.
- ... you have to update them. Could you afford it?
- ... you were asked to make them interoperable with other/new initiatives?
- ... you need to update it to new regulations / standards?

As **contributor** what is the cost of using/integrating new standards .....

- ... in terms of time-to-market?
- ... in terms of costs?
- ... being out of the definition of standards / adaptation?

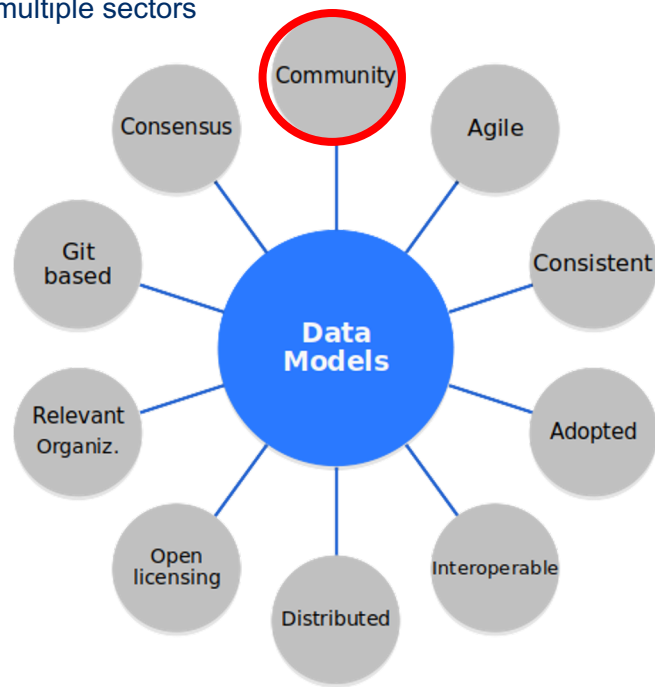
Wouldn't be more efficient and useful to do it together?

## PART 2

### Principles of Smart data models initiative

# Principles of Smart data models initiative

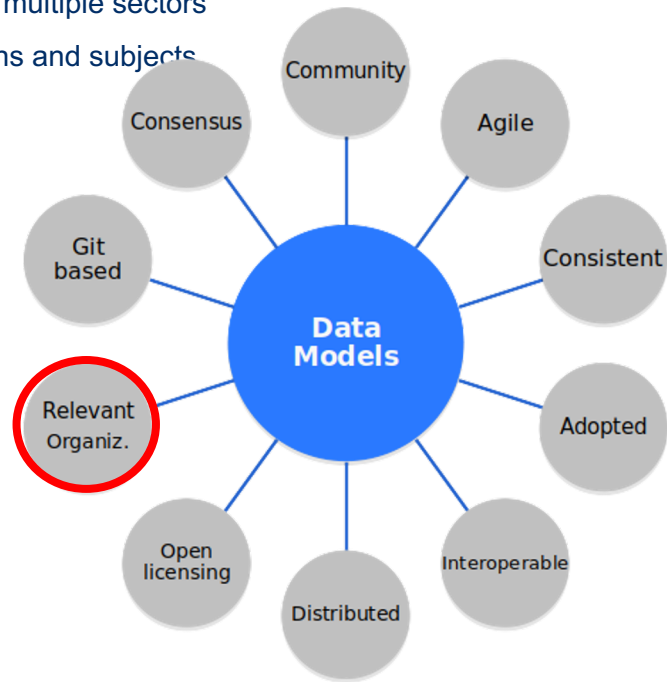
- A **community** site with **detailed data models** available for open and free use for multiple sectors





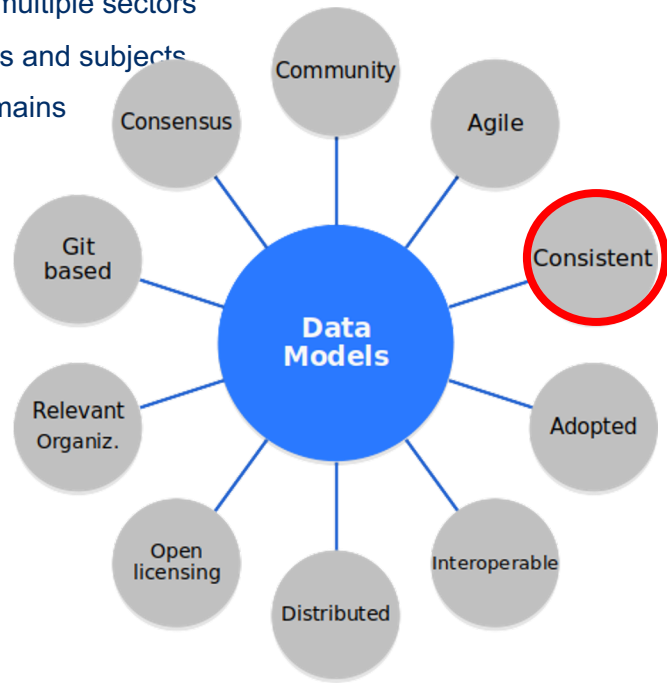
# Principles of Smart data models initiative

- A **community** site with **detailed data models** available for open and free use for multiple sectors
- Together with other **relevant organizations** in the curation of the different domains and subjects



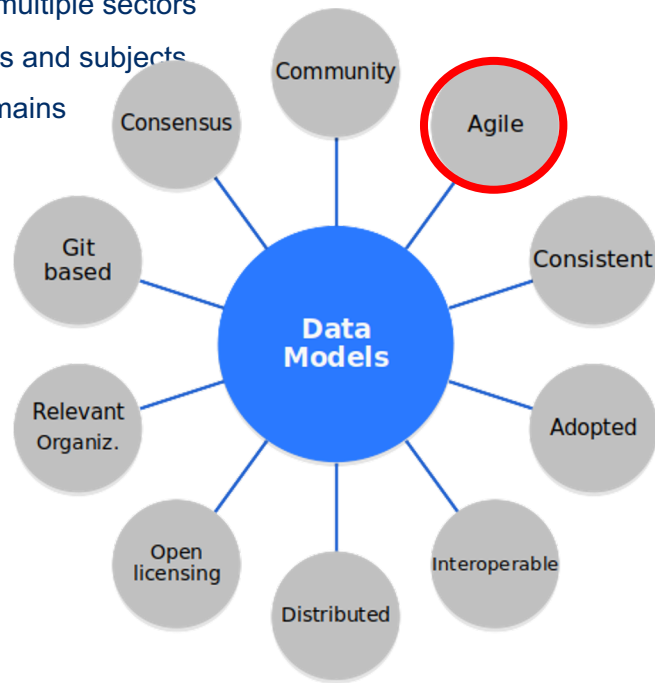
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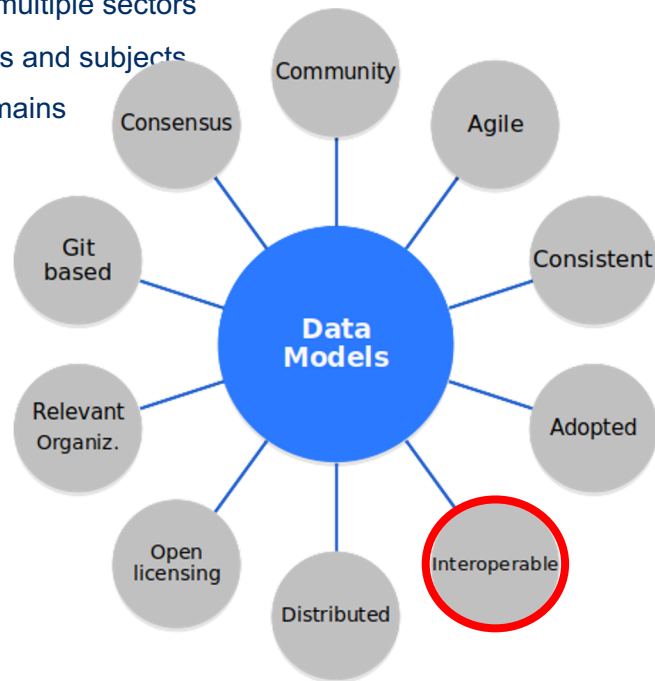
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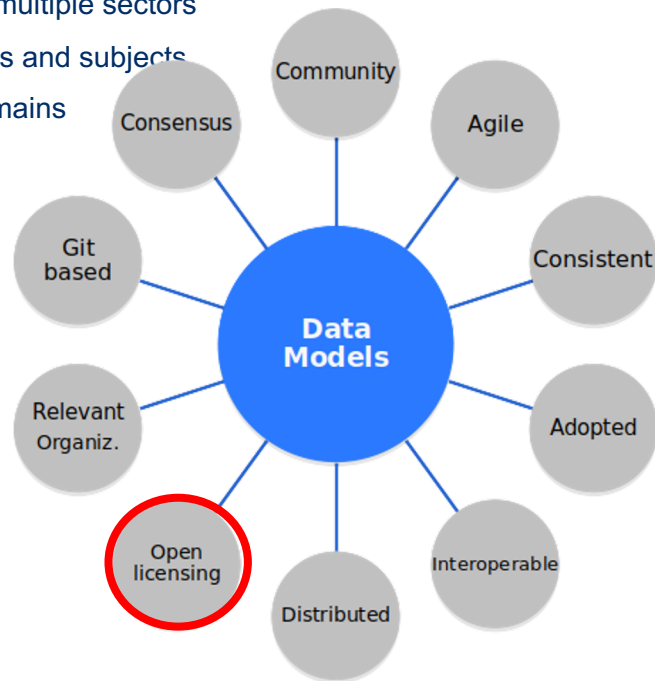
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- To provide extended usefulness to FIWARE platform users in terms of:
  - Extended **interoperability**
  - Reduced time dedicated to data model coding
  - Accumulated experience tested in real case scenarios
  - Mapped to be integrated with other platforms



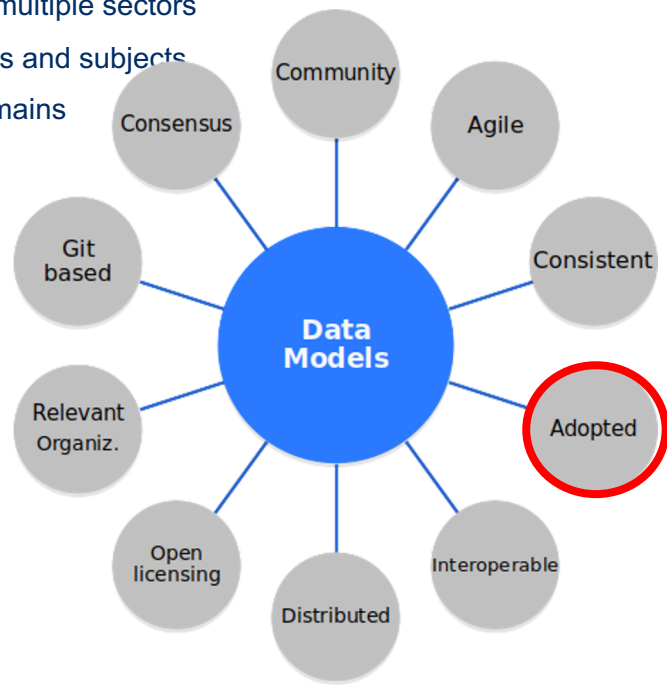
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- Using **open licensing** to allow extensive use and adoption



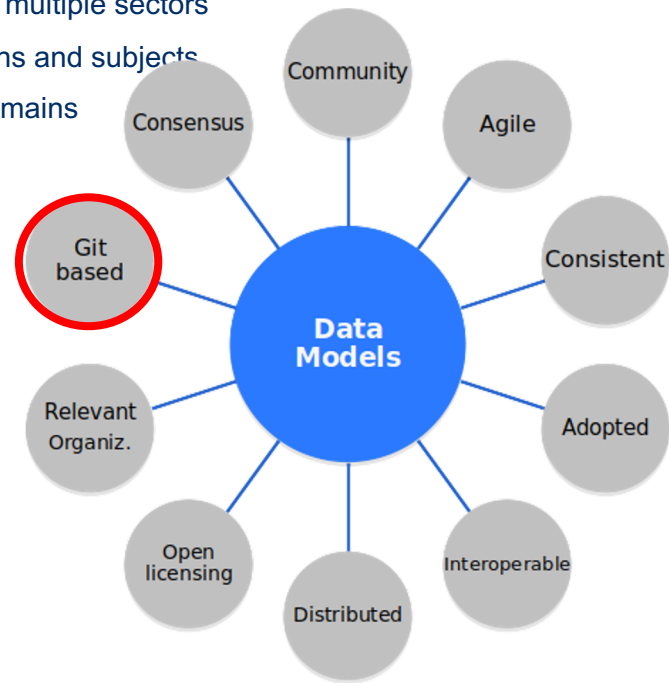
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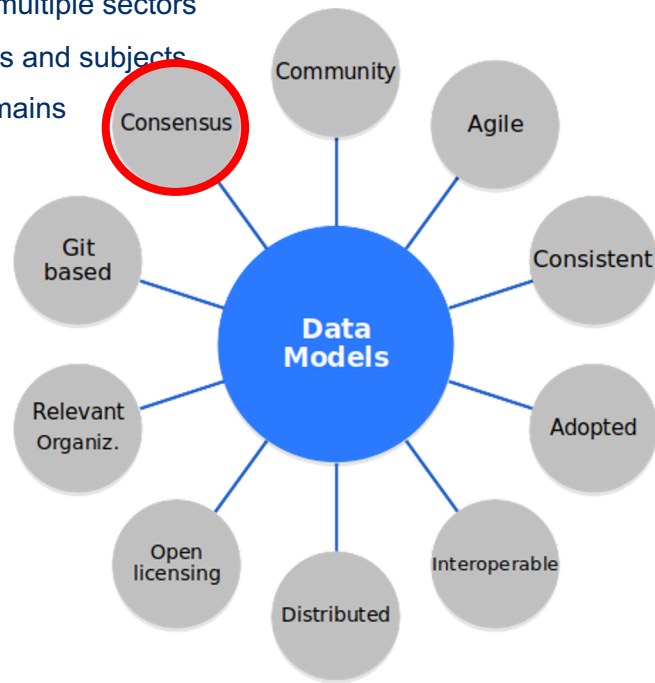
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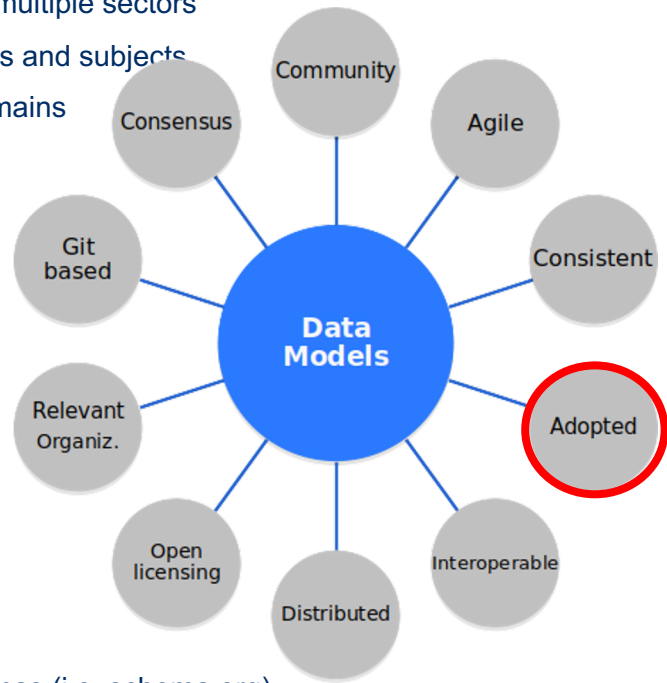
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- Consensus as main decision method





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- Using **open licensing** to allow extensive use and adoption
- Used in **real** case scenarios (and based on real use cases)
- Based on git platform and github as development frontend
- Consensus as main decision method
- Based on **widely adopted** standards (including ontologies and international schemas (i.e. schema.org))



# PART 2

## Structure

# Structure: domains and subjects compile data models

## DATA-MODELS

- Guidelines 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 and terms for json-ld

**data-models**  
Umbrella repo

## DOMAINS REPOSITORIES

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

Cross Sector

Smart Water

Smart Robotics

Smart Energy

Smart Cities

Smart Environment

Smart Destinations

Smart Sensoring

Smart Manufacturing

Subject 1

Subject 2

Subject 3

Subject 4

## SUBJECTS' REPOSITORIES

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

Subject N

## DATA MODELS

/doc/spec.md  
/examples  
schema.json  
Current Adopters



# Structure: Webs

## GITHUB

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

The screenshot shows the GitHub repository for Smart Data Models. The repository is named "Smart Data Models" and is described as "Smart Data Models - FIWARE, TMForum". It has 34 repositories, 0 packages, 8 people, 2 teams, 0 projects, and 0 settings. The pinned repositories section shows six repositories: "data-models" (Umbrella Repository for Data Models, 16 stars, 7 forks), "SmartAgriFood" (Domain repository for smart data models related with AgriFood sector, 2 stars), "SmartCities" (Domain repository for data models related with Smart cities, 2 stars, 3 forks), "SmartEnvironment" (Domain repository for smart data models related with Environment, 3 stars, 1 fork), "SmartEnergy" (Domain repository for smart data models related with Energy, 1 star), and "SmartWater" (Domain repository for smart data models related with water management, 0 stars, 0 forks). At the bottom, there is a search bar for repositories, filters for Type (All) and Language (All), and a "New" button.

- Oriented to **developers**
- Contribution by PR
- Issues on data models

## SITE (wp)

<http://smartdatamodels.org>

The screenshot shows the Smart Data Models website. The header includes links for Contributor agreement, Contact, Submit an issue, Learning zone, Attributions, How to use data models, and Contribution Manual. The main navigation bar includes links for Governance, Submit data model, Data models, Subscribe, About, and News. The main content area has a heading "Smart Data Models" and a subheading "An open initiative for agile data model standardization". Below this, there is a text block that says "Check here any term you want to check if it is already standardized. If not maybe it could suggest it here choose the option new data model." followed by a heading "List of terms in data models". There are icons for Print, Excel, CSV, and Copy. Below this, there is a search bar and a table with columns "name", "schema", "dataType", and "type". The table contains data for various activities, including "id", "dateCreated", "dateModified", "source", "name", and "alternativaName".

name	schema	dataType	type
id	<a href="https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json">https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json</a>	object	Attribute
dateCreated	<a href="https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json">https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json</a>	string	Attribute
dateModified	<a href="https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json">https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json</a>	string	Attribute
source	<a href="https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json">https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json</a>	string	Attribute
name	<a href="https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json">https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json</a>	string	Attribute
alternativaName	<a href="https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json">https://github.com/smart-data-models/dataModel.User/blob/master/Activity/schema.json</a>	string	Attribute

- Oriented to **end users**
- News on updates (subscription)
- Check attributes, enumerations and descriptions
- Learning zone



# Structure: Github. Domains

Domain repositories and others. <https://github.com/smart-data-models/dataModel.Energy>

root adding updated submodule dataModel.Weather at 2020-09-02T18:00:20 3b7b521 21 hours ago 1,940 commits		
dataModel.Building @ a33b683	adding updated submodule dataModel.Building at 2020-09-02T18:00:20	21 hours ago
dataModel.Parking @ 4a03582	adding updated submodule dataModel.Parking at 2020-09-02T18:00:20	21 hours ago
dataModel.ParksAndGardens @ e48...	adding updated submodule dataModel.ParksAndGardens at 2020-09-02...	21 hours ago
dataModel.PointOfInterest @ 5b58a46	adding updated submodule dataModel.PointOfInterest at 2020-09-02T1...	21 hours ago
dataModel.Streetlighting @ 1647811	adding updated submodule dataModel.Streetlighting at 2020-09-02T18:...	21 hours ago
dataModel.Transportation @ 7143454	adding updated submodule dataModel.Transportation at 2020-09-02T18:...	21 hours ago
dataModel.UrbanMobility @ 8c09b0b	adding updated submodule dataModel.UrbanMobility at 2020-09-02T18:...	21 hours ago
dataModel.WasteManagement @ ce...	adding updated submodule dataModel.WasteManagement at 2020-09-0...	21 hours ago
dataModel.Weather @ 2c74c16	adding updated submodule dataModel.Weather at 2020-09-02T18:00:20	21 hours ago

- Subjects as submodules of the Domain
- Updated daily to last commit

albertoabellagarcia updated on the 2020-09-01 20:57:23.112777	
BikeHireDockingStation	updated on the 2020-08-08 02:29:18.516646
CrowdFlowObserved	updated on the 2020-08-08 02:29:24.216342
EVChargingStation	updated on the 2020-08-08 02:29:29.959585
Road	updated on the 2020-08-08 02:29:35.687520
RoadSegment	updated on the 2020-08-08 02:29:41.601035
TrafficFlowObserved	updated on the 2020-08-08 02:29:47.978448
Vehicle	updated on the 2020-08-08 02:29:53.697267
VehicleModel	updated on the 2020-08-08 02:29:59.429981
.gitignore	First version from FIWARE Data Models
.travis.yml	Update .travis.yml
CONTRIBUTORS.md	update from fiware data models
CONTRIBUTORS.yaml	Update CONTRIBUTORS.yaml
README.md	Update README.md
substitute.sh	data-models

- Shared elements for all the Data models in the subject

- Data models in the subject

## PART 2

### Governance and participation

# Governance and participation

**Technical steering board**

Governing body  
Consistency and participation  
Consensus procedure  
Resources committed

**Domains**

Relevant Organizations  
Industrial sector. i.e. Smart city

**Subjects**

Relevant organization or individuals  
Groups of data models related .i.,e. BIM

# Governance and participation

## Steering board members

### who can be member

- FIWARE foundation
- TMForum
- Others to come

### Management

- Consensus decisions
- Support resources
- Strategy

### How to belong

- Under strategic agreement

## Incumbent Stakeholders

### who can be member

- Relevant organizations (industrial sectors)

### Management

- Manage domains' and subjects' repositories

### How to belong

- Under strategic agreement

## Contributors

### who can be member

- Open contribution
- Manage evolution

### Management

- Their contributions
- Contribution Guidelines

### How to belong

- Contribution agreement (online form)
- Contributions' quality reviewed
- Real case scenario

## Users

### who can be member

- Open license
- Mapping of community

### Management

- Data models use
- Feedback on use

### How to belong

- Voluntary community
- Organizations Cross sector, Integrators, End users



# Governance and participation

## Requirements for participation

1. To become a **contributor** you need:
  1. A github account
  2. Sign the [contribution agreement](#)
  3. Use the [guidelines](#) and the [contribution manual](#)
  4. A contribution approved (a [Pull Request](#) or a [submitted form](#))
  5. Listed in the [contributors file](#), other [example](#)
1. To become a **administrator** of Subject (person or organization) or Domain (organization)
  1. Explicit agreement with management
  2. Agreement on the guidelines
  3. Resources (mostly time dedication for managing the repo)
1. To get into the **steering board** (organization)
  1. Specific agreement

# PART 2

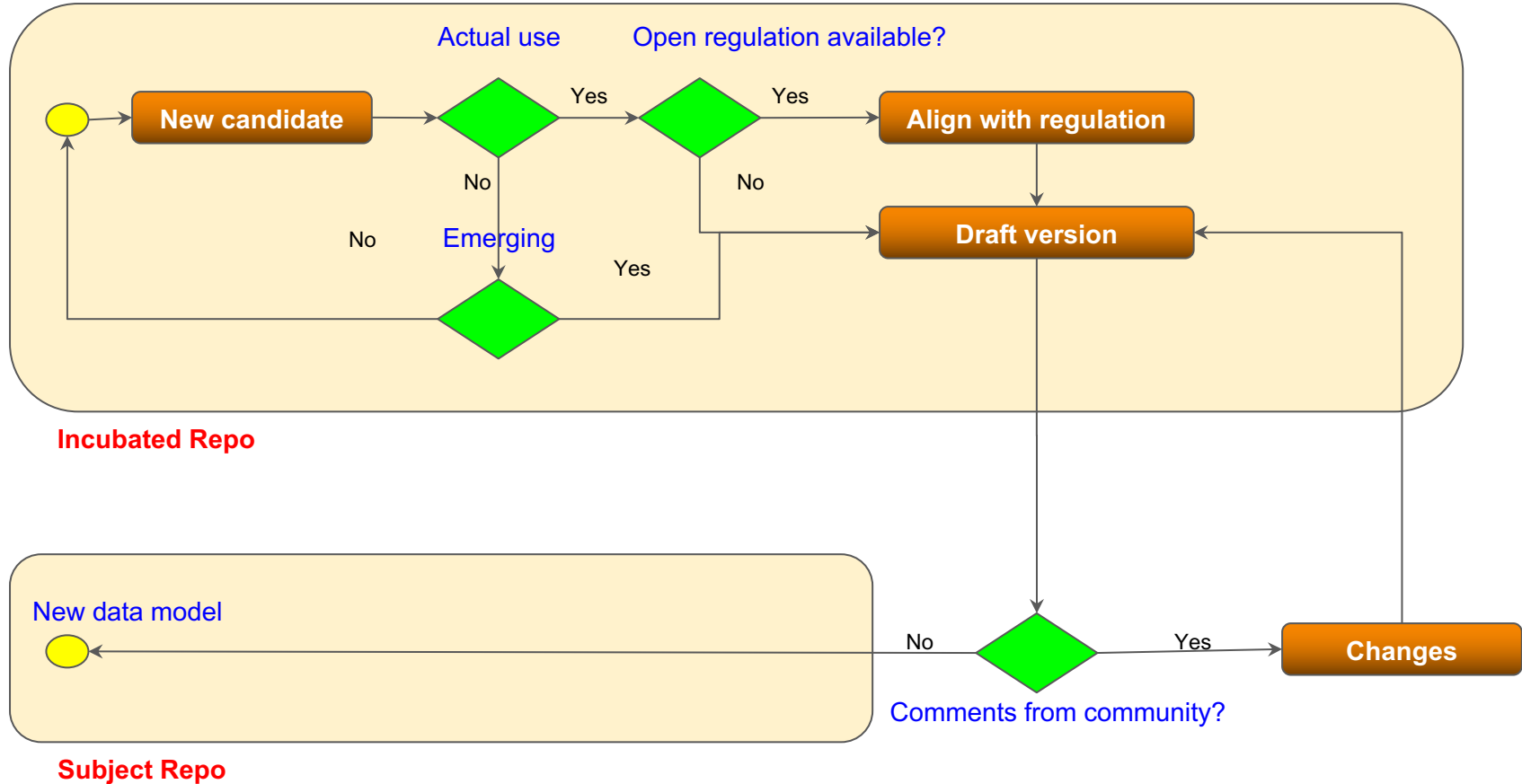
## Data models

# Data models sources

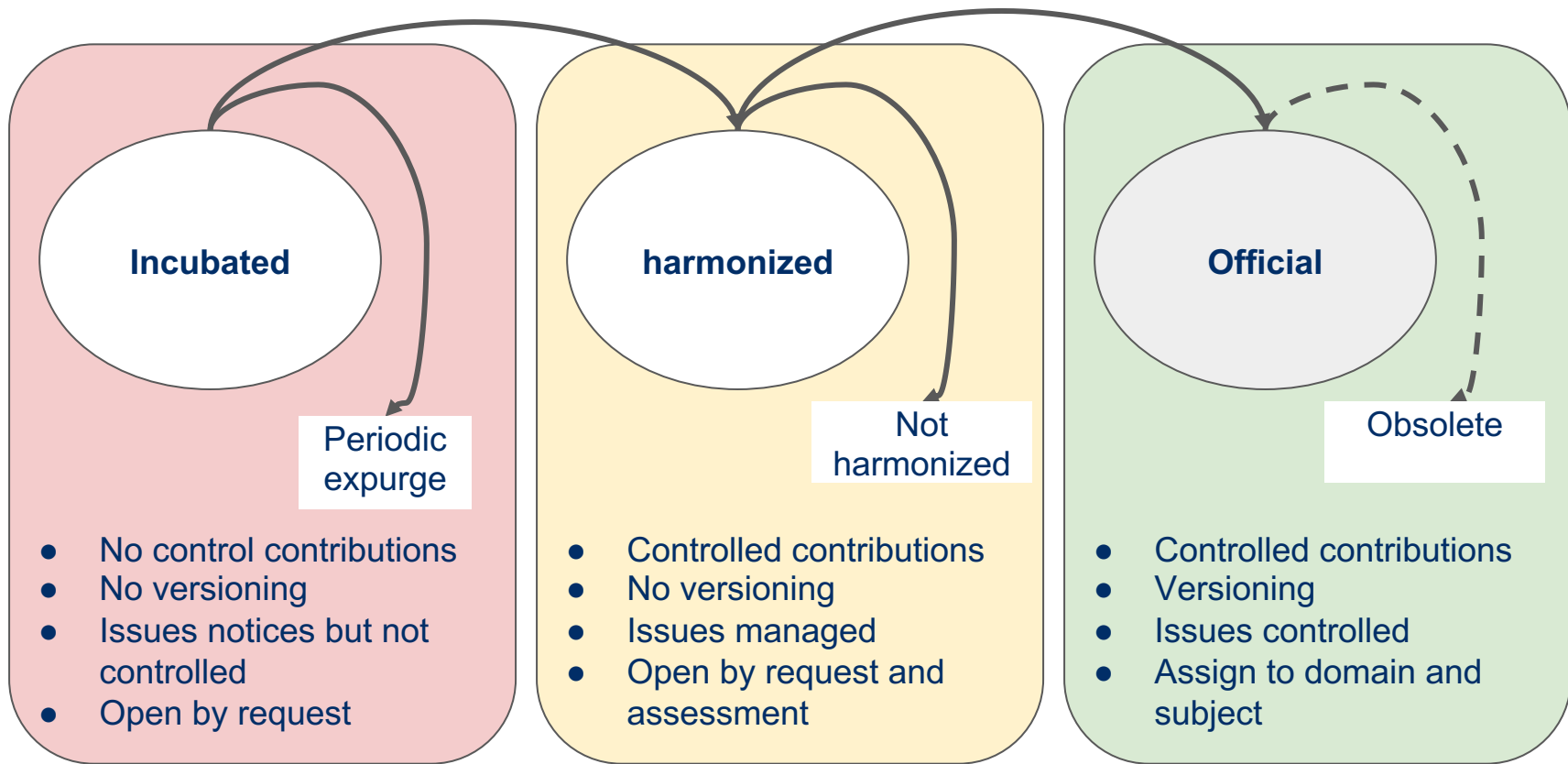
## Data models' sources

- Translation of existing adopted regulations (**IEC 61970/61850**, UNE178503, Building hierarchies, etc)
- Voluntary contributions from real use cases
- Projects' results with real case scenarios
- Other sources (i.e. agreements with other organizations GS1's dictionaries)

# New data model Lifecycle



# Data model Lifecycle



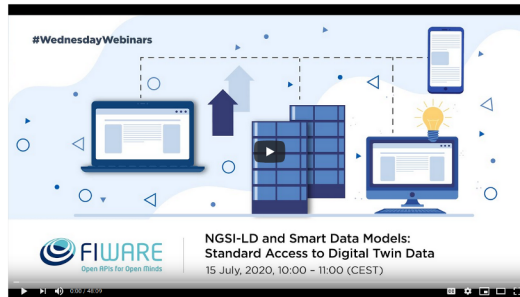
## PART 2

Data Services for the users

# Services to users and contributors

Frontpage. <https://smartdatamodels.org/index.php/news/>

1. [DDBB of attributes and enumerations](#)
2. [DDBB of attributes' descriptions](#)
3. [Subscription to news \(per domain i.e. water\)](#)
4. [Support to issues](#)
5. [Submit data models](#)
6. Training
7. [Contribution manual](#)
8. [Contribution agreement](#)
9. Services on line for [checking](#) data models



[Example 1.](#) Looking for attributes for a new data model

[Example 2.](#) Integration of data model with other system.

[Licensing](#) of data models.

How to [contribute](#).

[Governance](#).

[Roadmap](#).

## PART 2

Roadmap and last news



# Roadmap and last news

## **Last news (september - october)**

1. Automation of context and terms
2. Integration with EPANET in water domain
3. Updates on data models
  1. Smart cities: OnStreetParking
  2. Environment: AirqualityObserved
  3. Water: Valve, Pump, Pipe
4. Incubated data models (41)
5. Harmonization data models (16)
6. Updating of documentation
7. PoC for random payloads
8. Drafting data models for energy (483 elements)
9. Draft Service for checking properties a of new data model

# Roadmap and last news

## Roadmap data models

1. Extension of the data models coming from global data sources:
  1. Energy IEC 61970 and 61850
  2. Smart city models coming from other standardization initiatives
  3. Smart destinations semantics translation into data models
  4. New subject Ports
  5. Robotics data models (microROS)
  6. Agrifood data models
  7. Water Quality and water distribution data models
  8. Aeronautics domain
  9. Schema.org massive translation into data models (partially used)
  10. Smart buildings adaptation

## 2. Automation

1. Payload generator beyond PoC
2. Automatic check of complete documentation and examples
3. Multilanguage documentation (specifications)

# Q & A

Alberto Abella  
Data modelling expert