Energy Architectures in Data Exchange Frameworks
Agile standardization with the Smart Data Models Program

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Alberto Abella
Data Modelling expert
FIWARE Foundation

@smartdatamodels
@fiware
@aabella
alberto.abella@fiware.org

The challenge for data sharing: Market speed

Comparison	2G	3G	4G	5G
Year (market)	1993	2001	2009	2018
		← 8 years →	← 8 years →	← 8 years →
Bandwidth	25	25	100	30.000 to 300.000
Main applications	Voice calls, short messages	Voice conferencing, mobile TV, GPS	High speed applications, mobile TV, wearable devices	High resolution video streaming, remote control vehicles, robos and medical procedures

- ▪ How many standards should we have to meet the needs of this 8-year lapse?
- ▪ What is the lapse for the green deal?

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Shared data based on Standardization: Scenarios at digital markets

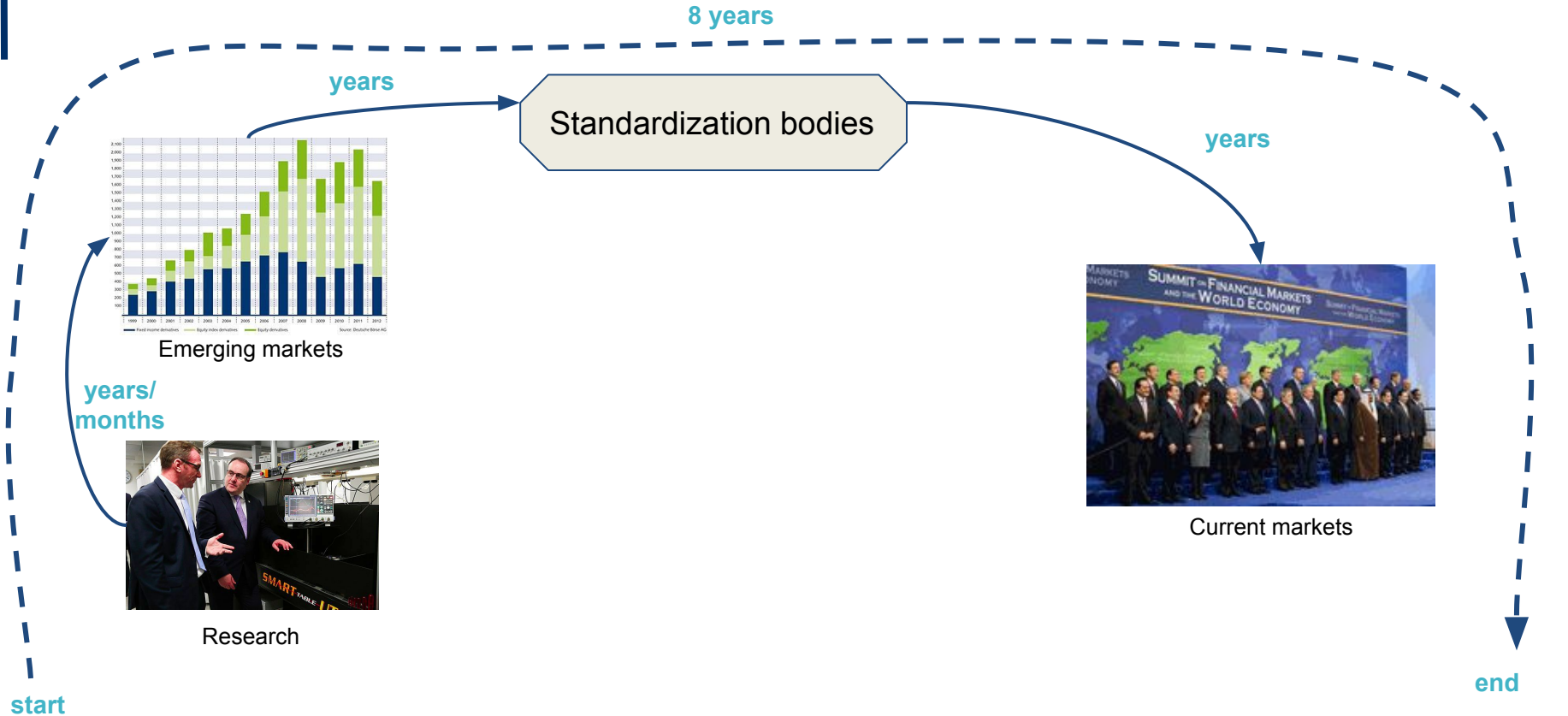| Jungle |
| :---: |
| No actual standards |
| Each user/maker create their own |
| Full incompatible formats |
| Need 'translators' |

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Shared data based on Standardization: Scenarios at digital markets

Jungle	Competing
No actual standards	Several standards in the market
Each user/maker create their own	Not open licensed
Full incompatible formats	Generated by incumbents in the market
Need 'translators'	Could be not complete technical details

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Shared data based on Standardization: Scenarios at digital markets

Jungle	Competing	Adopted Standard
No actual standards	Several standards in the market	One winning standard
Each user/maker create their own	Not open licensed	It could be the result of a winning one in the competing scenario
Full incompatible formats	Generated by incumbents in the market	Occasionally released as open from incumbent to cope market
Need 'translators'	Could be not complete technical details	

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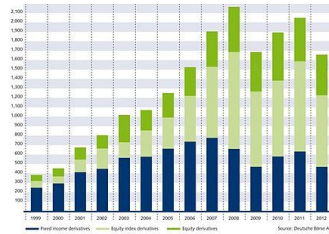# Shared data based on Standardization: Scenarios at digital markets

Jungle	Competing	Adopted Standard	Public regulation
No actual standards	Several standards in the market	One winning standard	Mandatory
Each user/maker create their own	Not open licensed	It could be the result of a winning one in the competing scenario	Do not provide details
Full incompatible formats	Generated by incumbents in the market	Occasionally released as open from incumbent to cope market	Different administrations different regulations
Need 'translators'	Could be not complete technical details		

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Classical standardization in a digital market

8 years

years

Standardization bodies

years

years/ months

Emerging markets

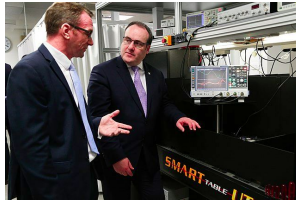Research

Current markets

start

end

Agile standardization in a digital market

1 Month

weeks

weeks

days

Emerging markets

Research

Agile standardization

Current markets

start

end

Smart Data Models

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Standardization in a digital market

8 years

years

Standardization bodies

years

Emerging markets

weeks

asap

months

Research

weeks

Agile
standardization

days

Current markets

start

end
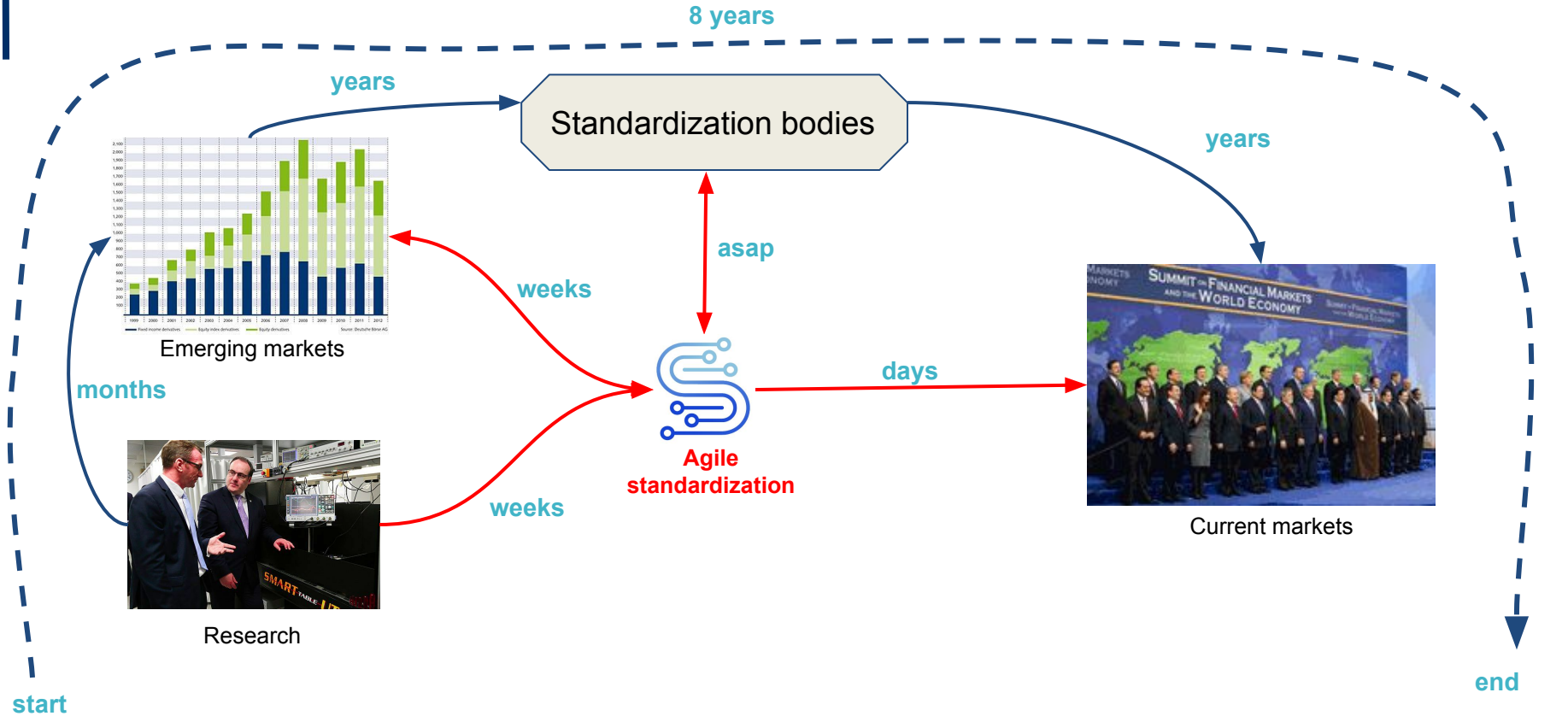
Generic architecture of a data exchange facility

Smart Data Models

Technology Building Blocks

Data Interoperability	Data Sovereignty and Trust	Data Value Creation	Data Spaces Governance
Data Models & formats	Identity Management	Metadata & Discovery Services	Business Agreements
Data Exchange API	Trusted Exchange	Publication & Marketplace Services	Operational Agreements
Provenance & Traceability	Access & Usage Control/Policies	Data Usage Accounting	Organizational Agreements

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What is the Smart Data Models Program

- All non-profit organizations
- Smart Data Models is a collaborative program to **provide data models**
  a. Free and open-licensed data models (0€ cost)
  b. Multisector
  c. Based on <u>actual use cases</u> and adopted open standards
  d. At market speed
  e. Customizable to local needs
  f. Compatible with linked data

What does Smart Data Models Program provide?

- Written specifications in 6 languages (EN, FR, DE, ES, JA, IT)
- Exports in json, jsonld, csv, DTDL, yaml, geojsonfeatures
- Technical validation schema (json format) Single-source-of-truth allow full update in minutes

- Main site: https://smartdatamodels.org
- Repository: https://github.com/smart-data-models
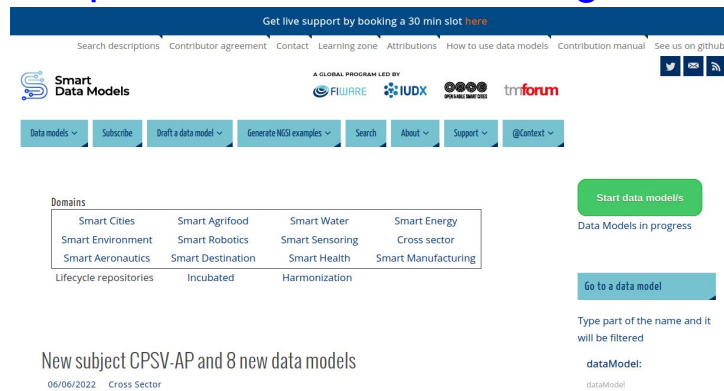
- 807 data models
- 75 organizations contributing
- More than 18.000 attributes documented
- MoU to join the Board

Services and support to users

- Find a data model by name
- Find a data model by the subject
- Search an attribute name
- Search an attribute data type
- Search an attribute anything of its definition
- Generate an example in json key values format
- Generate an example in jsonld normalized values format
- Generate a specific context merging several data model
- Generate a specific context mapping external vocabularies
- Subscribe to update
- Raise an issue

- **Book a support session**
- **Draft a data model from csv payload**
- **Draft a data model from json/ld payload**

https://smartdatamodels.org

Thanks

Slides available at: https://bit.ly/IotWeek2022

@smartdatamodels
@fiware
@aabella
alberto.abella@fiware.org

Annex

Current status

Current status (domains, subjects & data models)

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

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Current status: New subjects new data models

56 subjects (Groups of data models)

1	CPSV-AP
2	AutonomousMobileRobot
3	IT
4	STAT-DCAT-AP
5	OCF
6	Digital Innovation Hub

807 Official Smart Data Models
89 on the queue to be accepted

Incubated
Transit Management
Verifiable Credentials
GS1 mapping
OSLO (transport)
Vineyards (Agri)
CCVC
Vessel

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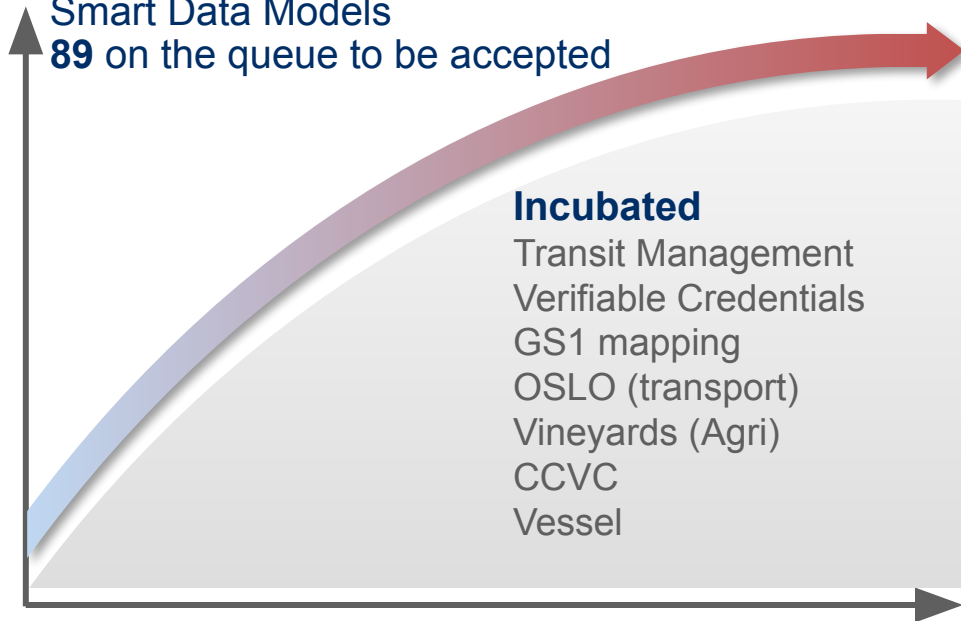
Contributors and dissemination

- 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 1670 pages in smartdatamodels.org

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