Open APIs for Open Minds

FIWARE: Making MIMs happen!

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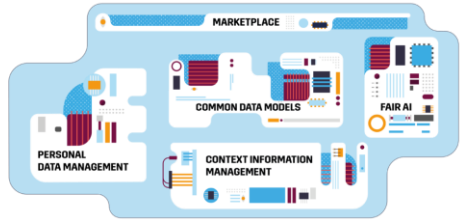
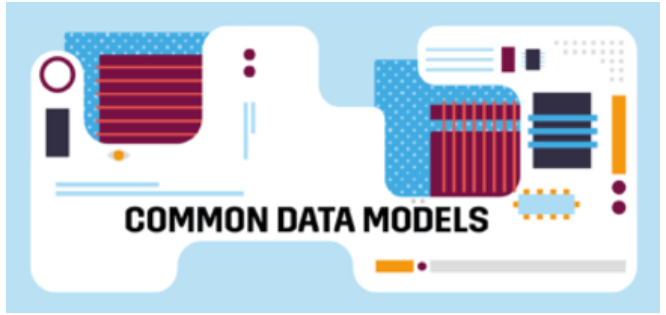
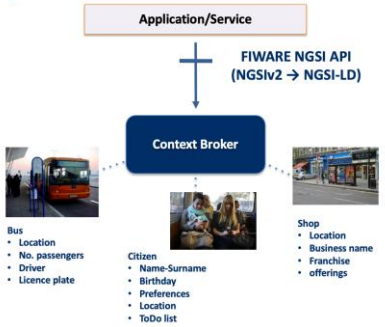
FIWARE: Materializing MIMs





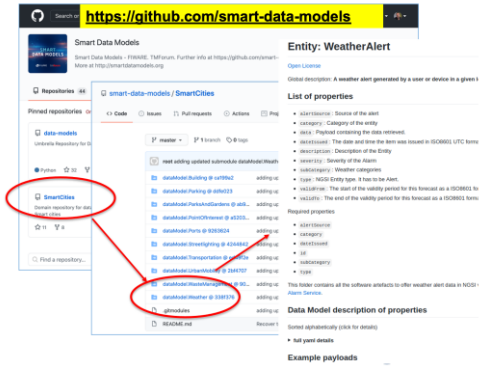
Digital Twin Data API: ETSI NGSI-LD



- NGSI-LD is a simple yet powerful REST API
- Simple: simple operations are rather simple, what you would expect in a RESTful API
  - Entity types, entities, attributes have a path
  - You perform standard GET, POST, PUT, PATCH, DELETE operations
- Yet powerful: powerful operations supported
  - Geo-queries
  - Subscription / Notification
  - Pull/Push styles for gathering data
  - Multiple data "renderings" (key value, normalized, GeoJSON)
  - Temporal operations
  - Federation mechanisms

Digital Twin Data Models: Smart Data Models initiative

- FIWARE Foundation is collaborating with relevant organizations towards definition of common data models for multiple application domains
  - Smart Cities
  - Smart Health
  - Smart Energy
  - Smart Environment
  - Smart Manufacturing
  - …
- Defined data models rely on well-established "de-facto" standards (e.g., schema.org, SAREF, IEC CIM in Energy or UNE 178503 for Tourism)



Data Marketplace and Publication/Brokering Services

- Data Marketplace Services:
  - Supports the definition of offerings around digital assets:
    - Data Files
    - Right-time Data Access Services
    - Right-time Data Processing Services (AI, BigData, …)
  - Integral part of a data service offering description:
    - Context / Digital Twin models supported
    - NGSI-LD endpoints used for data exchange
    - Terms and conditions: access/usage policies, pricing models, …
  - Advanced pricing and revenue sharing support: free, one-time payment, subscriptions, pay-per-use, discounts
  - Data providers can instantiate their own marketplace or rely on global independent Marketplace services
  - Relying on TM Forum Business Ecosystem Open APIs
- Data Publication/Brokering Services:
  - Data portal supporting DCAT-AP and publication of data resources linked to offerings in the Marketplace – able to harvest open data
  - NGSI-LD as basis for discovery of data resources (modeled as entities with DCAT-AP properties)

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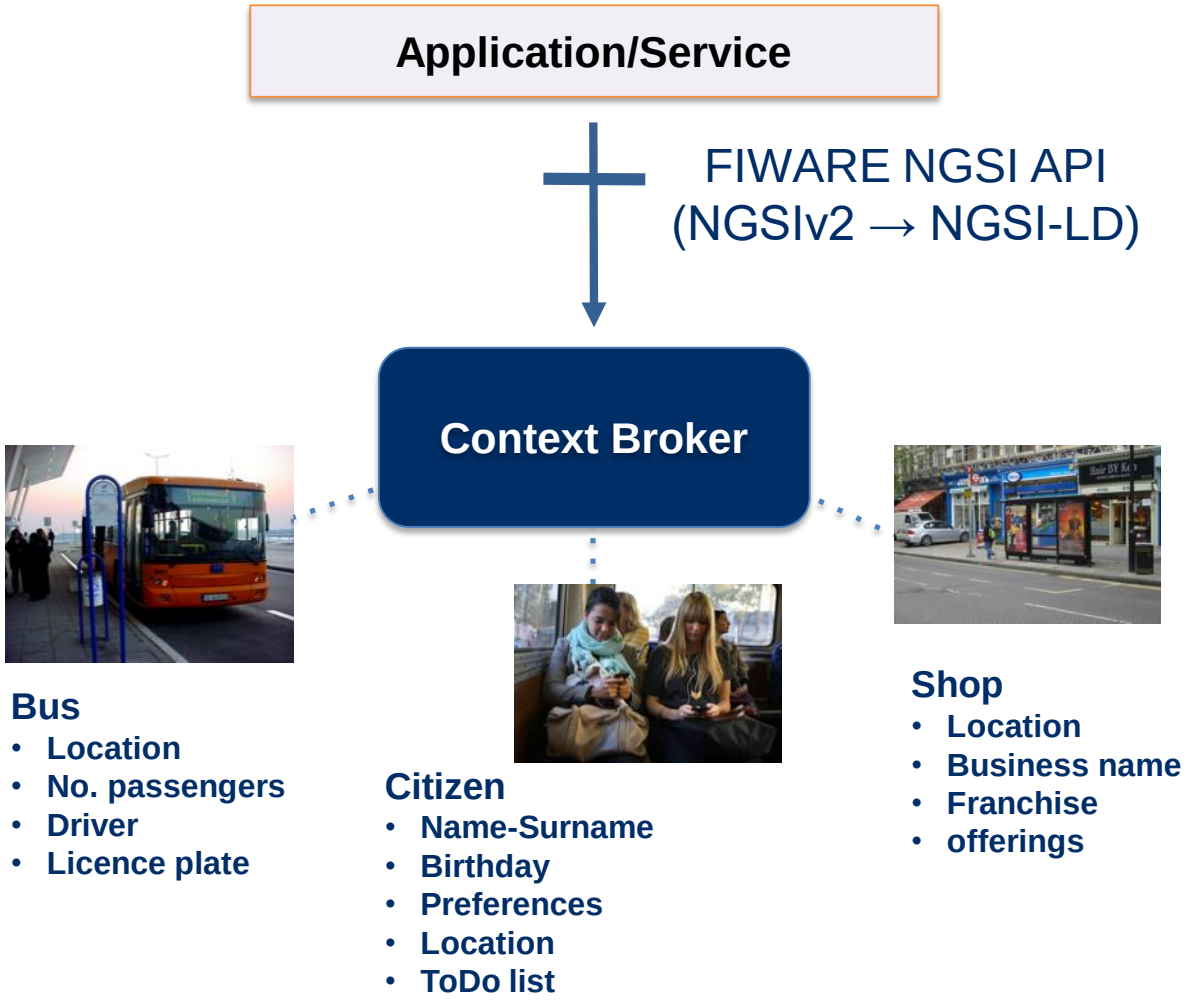
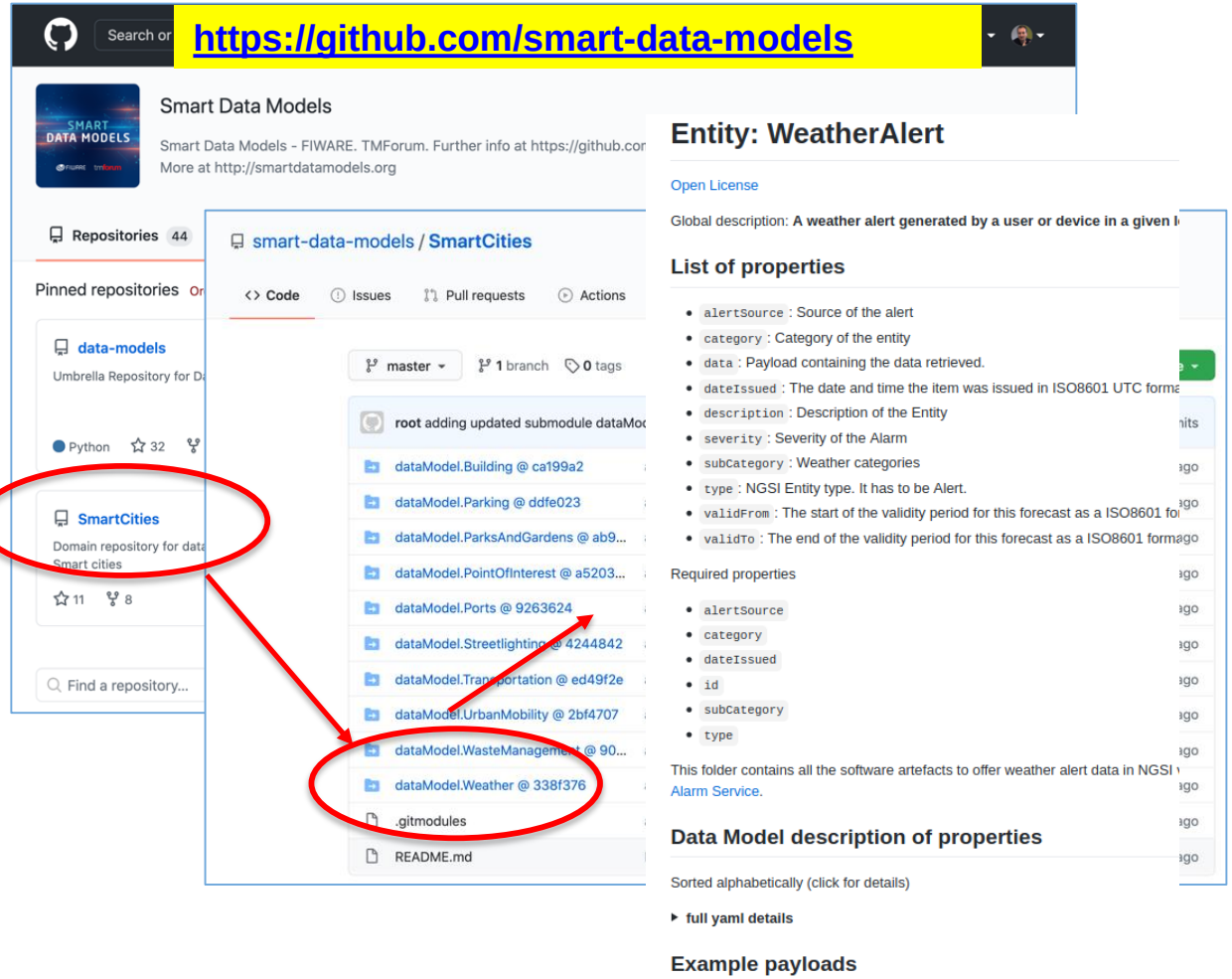
MIM-1: ETSI NGSI-LD

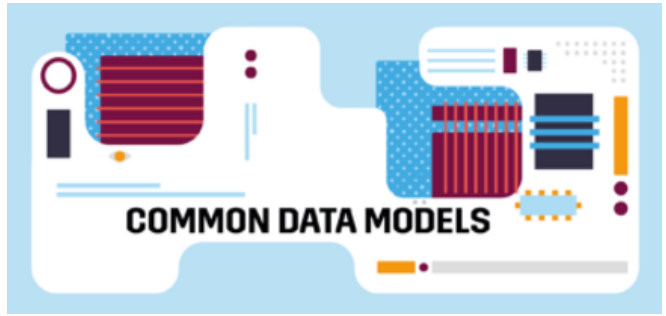


- Relevance presence in EU's rolling plan on ICT standardization (2016-2021)
- Adoption by Bureau of Indian Standards (BIS)
- Driven-by-implementation approach in evolution of the standard
- Multiple implementations available under the FIWARE Catalogue
- Gaining position as standard API for access to Digital Twin data

Promote NGSI-LD (MIM-1) as standard Digital Twin API

MIM-2: Data Models

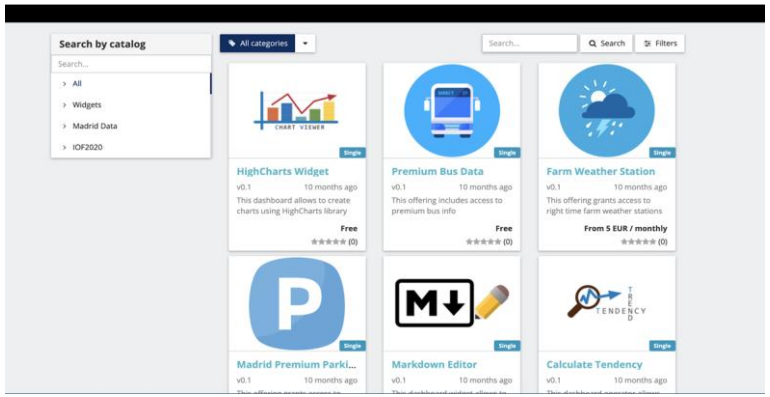


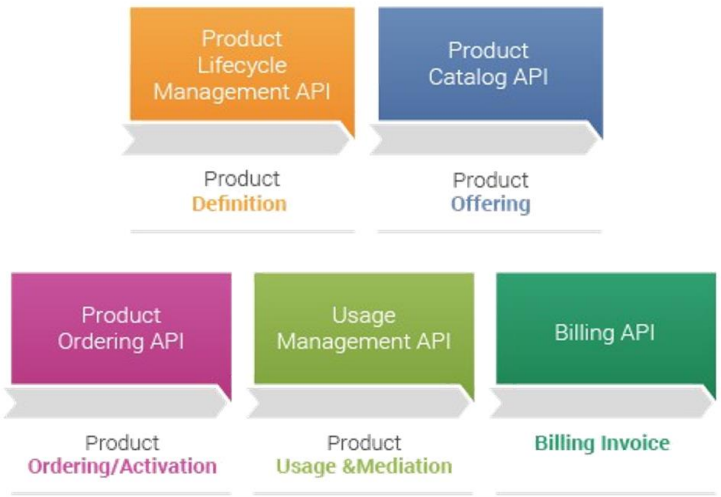


- The Smart Data Models initiative (github, web) provides a library of curated standard-based model descriptions in JSON/JSON-LD compatible with NGSI-LD
- Fast-growing community since its creation:
  - 650+ data models
  - 70+/100+ orgs/individuals contributing
- Endorsement by relevant organizations: FIWARE, IUDX, TM Forum, OASC

Contribute to Smart Data Models initiative to ensure a healthy development of MIM-2

MIM-3: Marketplace functions



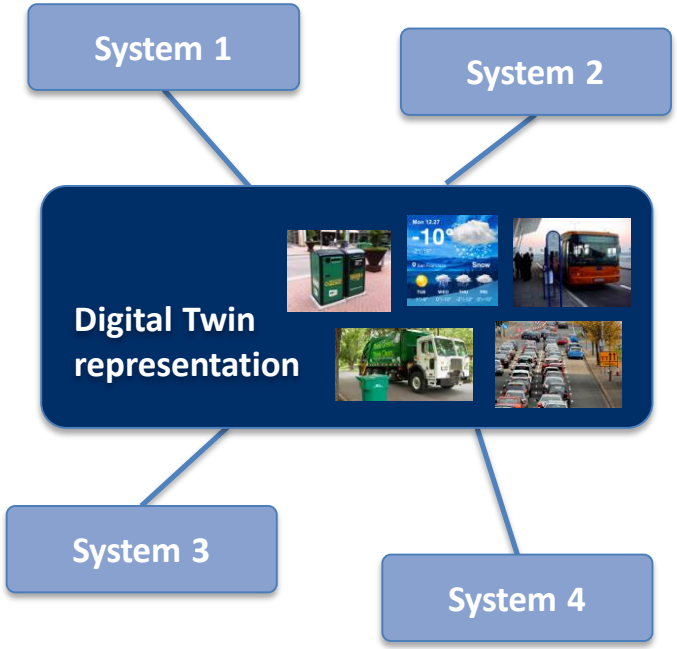


- Working implementation of Marketplace services based on TM Forum APIs ready and mature (TRL 6+)
- Pilots in the past (e.g., SynchroniCity)
- Components have evolved to facilitate integration with distributed IAM frameworks (necessary for data spaces)
- Projects using it today:
  - KI Marktplatz (AI Marketplace)
  - i4Trust (FIWARE lighthouse for data spaces)

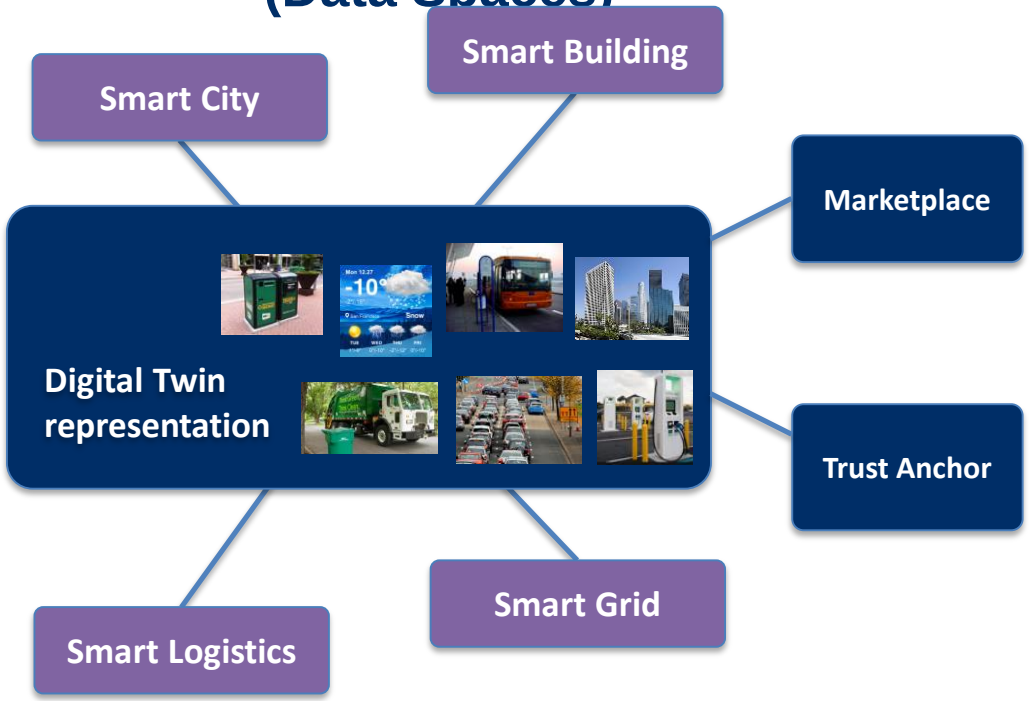
Incorporate MIM-3 as basis for your Data Space Marketplace Services

MIMs 1-3: Essential elements for data spaces

Integrating systems and data within organizations (system of systems)



Sharing Data across organizations (Data Spaces)



Summary

- Promote NGSI-LD (MIM-1) as standard Digital Twin API
- Contribute to Smart Data Models initiative to ensure a healthy development of MIM-2
- Incorporate MIM-3 as basis for your Data Space Marketplace Services
- Shouldn’t we address definition of a MIM coping with Identity and Authorization Management?

Thank you!

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