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

22-6-21

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The challenge for data sharing: Market speed

<table>
<thead>
<tr>
<th>Comparison</th>
<th>2G</th>
<th>3G</th>
<th>4G</th>
<th>5G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year (market)</td>
<td>1993</td>
<td>2001</td>
<td>2009</td>
<td>2018</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>25</td>
<td>25</td>
<td>100</td>
<td>30.000 to 300.000</td>
</tr>
<tr>
<td>Main applications</td>
<td>Voice calls, short messages</td>
<td>Voice conferencing, mobile TV, GPS</td>
<td>High speed applications, mobile TV, wearable devices</td>
<td>High resolution video streaming, remote control vehicles, robos and medical procedures</td>
</tr>
</tbody>
</table>

- How many standards should we have to meet the needs of this 8-year lapse?
- What is the lapse for the green deal?
Shared data based on Standardization: Scenarios at digital markets

Jungle

- No actual standards
- Each user/maker create their own
- Full incompatible formats
- Need ‘translators’
### Shared data based on Standardization: Scenarios at digital markets

<table>
<thead>
<tr>
<th>Jungles</th>
<th>Competing</th>
</tr>
</thead>
<tbody>
<tr>
<td>No actual standards</td>
<td>Several standards in the market</td>
</tr>
<tr>
<td>Each user/maker create their own</td>
<td>Not open licensed</td>
</tr>
<tr>
<td>Full incompatible formats</td>
<td>Generated by incumbents in the market</td>
</tr>
<tr>
<td>Need ‘translators’</td>
<td>Could be not complete technical details</td>
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### Adopted Standard
- One winning standard
- It could be the result of a winning one in the competing scenario
- Occasionally released as open from incumbent to cope market

---

**Shared data based on Standardization: Scenarios at digital markets**
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### Public regulation
- Mandatory
- Do not provide details
- Different administrations different regulations

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**Shared data based on Standardization: Scenarios at digital markets**
Classical standardization in a digital market

Standardization bodies

Emerging markets

Current markets

Research

8 years

years

years/months

start

end
Agile standardization in a digital market

Emerging markets

Research

Agile standardization

Current markets

1 Month

weeks

days

start

end
Standardization in a digital market

Standardization bodies

Emerging markets

Asap

Agile standardization

Current markets

Research

start

end

weeks

months

years

8 years

Research
Generic architecture of a data exchange facility

Technology Building Blocks

Data Interoperability
- Data Models & formats
- Data Exchange API
- Provenance & Traceability

Data Sovereignty and Trust
- Identity Management
- Trusted Exchange
- Access & Usage Control/Policies

Data Value Creation
- Metadata & Discovery Services
- Publication & Marketplace Services
- Data Usage Accounting

Data Spaces Governance
- Business Agreements
- Operational Agreements
- Organizational Agreements
What is the Smart Data Models Program

- All non-profit organizations
- Smart Data Models is a collaborative program to **provide data models**
  - Free and open-licensed data models (0€ cost)
  - Multisector
  - Based on [actual use cases](#) and adopted open standards
  - At market speed
  - Customizable to local needs
  - 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](https://smartdatamodels.org)
Repository: [https://github.com/smart-data-models](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
Thanks


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Annex
Current status
### Current status (domains, subjects & data models)

<table>
<thead>
<tr>
<th></th>
<th>Domain</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Smart Energy</td>
<td>424</td>
</tr>
<tr>
<td>2</td>
<td>Smart Sensoring</td>
<td>138</td>
</tr>
<tr>
<td>3</td>
<td>Smart Cities</td>
<td>85</td>
</tr>
<tr>
<td>4</td>
<td>Cross Sector</td>
<td>77</td>
</tr>
<tr>
<td>5</td>
<td>Smart Water</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>Smart Agrifood</td>
<td>30</td>
</tr>
<tr>
<td>7</td>
<td>Smart Environment</td>
<td>23</td>
</tr>
<tr>
<td>8</td>
<td>Smart Aeronautics</td>
<td>13</td>
</tr>
<tr>
<td>9</td>
<td>Smart Robotics</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>Smart Destination</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>Smart Manufacturing</td>
<td>3</td>
</tr>
<tr>
<td>12</td>
<td>Smart Health</td>
<td>2</td>
</tr>
</tbody>
</table>

Updated 9-6-22
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

Updated 9-6-22
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

Updated 9-6-22