

Bringing Data to Market: Data Property as Economic Goods

Yuri Demchenko, Wouter Los, Cees de Laat (University of Amsterdam), Leon Gommans (KLM)

From FAIR Principles to STREAM Properties

(Leveraging FAIR data principles for Data commoditisation)

FAIR Principles in Research Data Management

Findable – Accessible – Interoperable – Reusable

STREAM Data Properties as Economic goods

Sovereign – Trusted – Reusable – Exchangeable – Actionable - Measurable



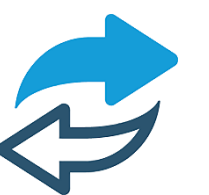
Sovereignty: Data sovereignty allows companies, data owners to remain control over their data. It is important for business to enter the data market with their proprietary business data



Trusted: Using data in decision making or in the processes control requires that data is trusted and verifiable. Trust in data is achieved by the whole process of data collection and by using verified models of the processes.



Reusability: Data reusability allow multiple uses of data, even if not for original purposes data created. Data re-usability can create multiple opportunities for data economy actors



Exchangeability: Data exchangeability ensures that data can be exchanged between data producer and data consumer in general and be used for target applications or intended purposes.



Actionability: Data must serve the business purposes and contain necessary information to derive actionable decisions about operations or processes optimisations



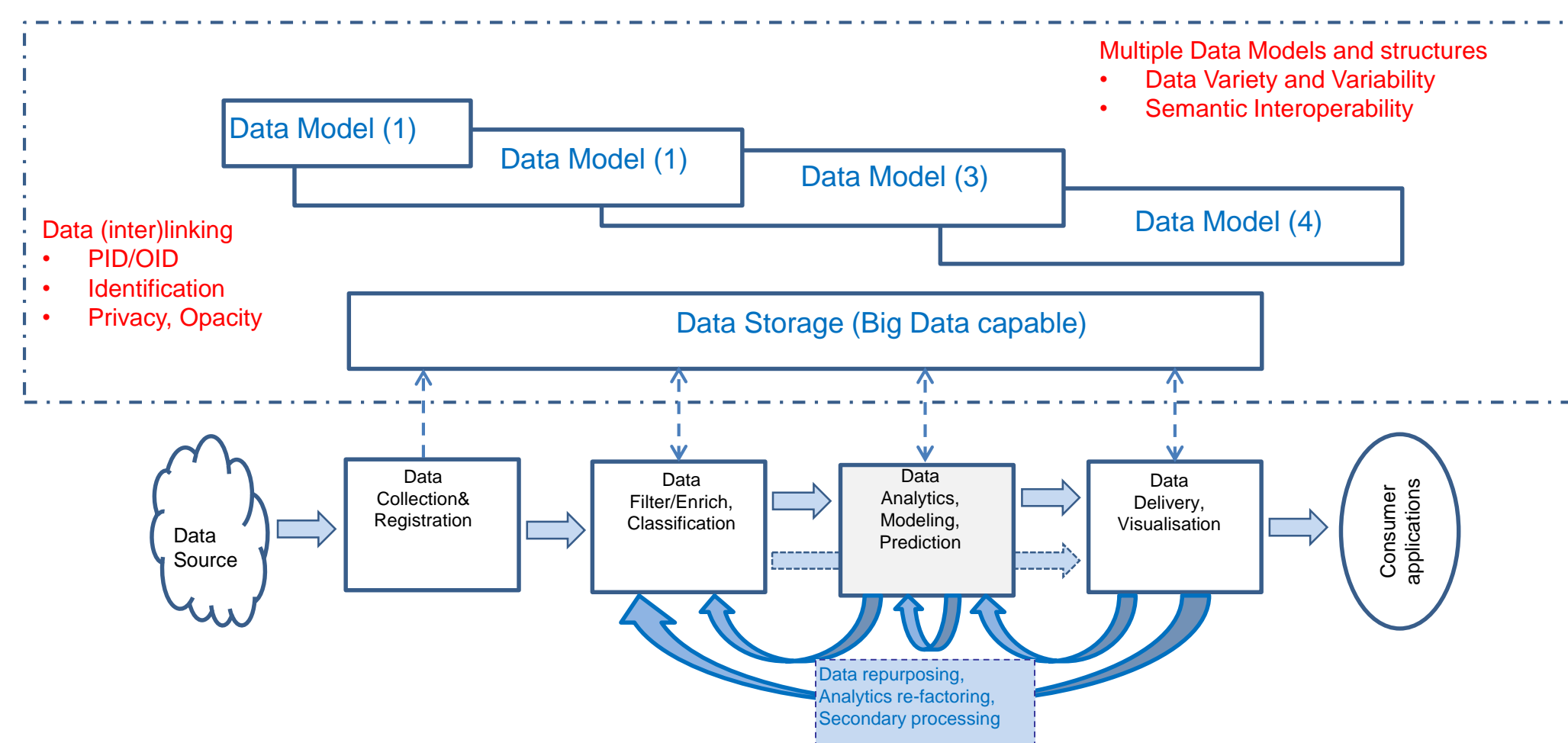
Measurability: Data measurability is used for data valuation and exchange as economic goods, and a part of data handling on the data infrastructure platforms.

Other Data properties for commoditisation and data trading and exchange for goods:

- Quality, Value, Auditability/Trackability, Branding, Authenticity, as well as original FAI(R)properties Findability, Accessibility, Interoperability.
- Special features that must be managed in all data transfer and transformation are data ownership and IPR.
- The data property originated from its digital form of existence defined as not-Rivalry, on one hand, makes data exchange (copying, distribution) easy, while protecting proprietary, private or sensitive data or IPR

Data Lifecycle Workflow and Data Model Variability

Data Reusability, Data Models Variability, Data staging and continuous storage (Data Lakes), Distributed infrastructure



Data exchange protocols

Provided as a part of the Data Exchange and use layered model

- Based on reliable and secure modern Internet protocols
- Upper layer data exchange protocols
- Network and cloud virtualisation technologies allow building programmable virtualised networks as part of Virtual Private Clouds (VPC) and support data applications that produce and consume data and involve data exchange internally inside secure VPC and with external parties.
- Mechanisms for effective and consistent data exchange and applications: Persistent data Identifiers (PID), Data Factories, Metadata and data types registry, data annotation and data discovery mechanisms

Data Driven Economy and Data Markets

The establishment of the Open Data Markets is a necessary stage in making Digital Single Market (DSM) in Europe reality

- Facilitate the digital transformation of European economy
- New trend related to Industry 4.0
- Data driven technologies.

Factors to facilitate Data Markets

- IoT sensor network and farms that continuously produce data that potentially may be used by different organisations and produce secondary data that may have added value;
- Use of personal data for advanced market research and services development;
- Earth exploration data collected over years (such as from mining or oil/gas companies) that can be also offered on the market;
- Existing data archives which value may increase if data traded in more flexible and measurable way;
- Secondary data created from Open Data.

Data Markets Components

Modern data architecture vs Data Market

Characteristics of modern data architecture

1. Customer-centric
2. Automated
3. Smart
4. Adaptable, Agile
5. Cloud based
6. Elastic
7. Collaborative
8. Governed
9. Secure, Trusted

Characteristics of emerging data markets

1. Customer-centric
2. Automated
3. Smart
4. Regional/sectoral specialised
5. Cloud powered/integrated
6. Collaborative
7. Governed
8. Secure, Trusted
9. Auditable
10. Transparent
11. Commoditised/Monetised
12. Combining data and algorithms (as part of containers)

Data Markets Infrastructure components

Infrastructure – Catalog - Trust - Brokerage

Infrastructure is a necessary component of any service architecture. The following are essential components of the Data Market infrastructure:

- Architecture and conceptual model of the Data Market space, including technological, organisational, legal and commercial aspects;
- Shared/Federated infrastructure to access and operate the Data Market;
- Federated hybrid cloud based Big Data infrastructure to support data storage, processing and exchange in a secure and trusted way;
- DataHubs support for generic services for data suppliers such as caching, streaming, containerised delivery;
- Support for on-demand connectivity and bandwidth provisioning between data handling services/hosts in the data lifecycle;
- Gateway based and computational enforcement of market policies and rules.

References

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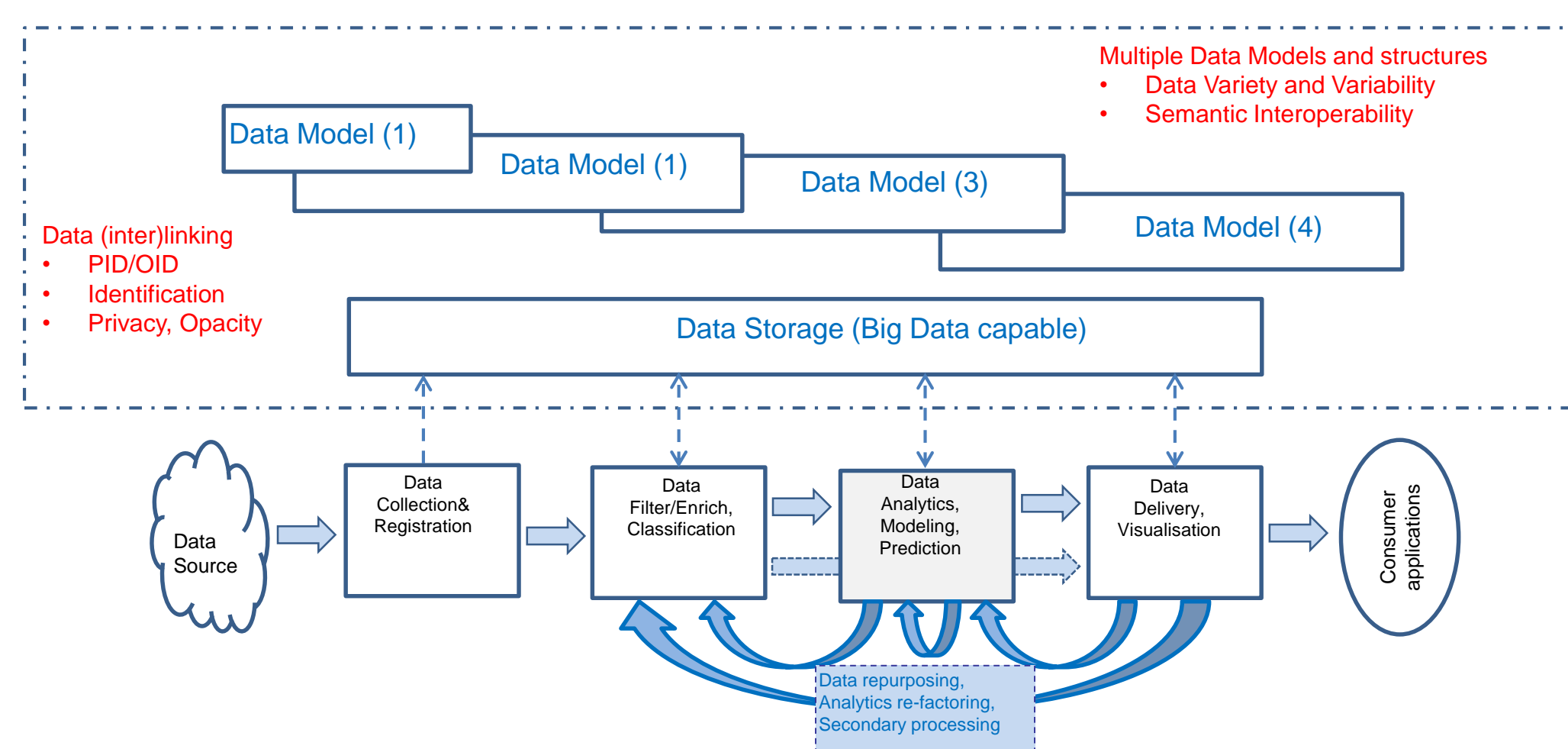
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