MATRYCS

Data at work

The MATRYCS technological perspective

Modular Big Data Applications for Holistic Energy Services in Buildings

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MATRYCS

- Buildings are responsible for 40% of EU energy consumption
- Integration of different BVC actors within a global energy transition framework is needed
- Buildings' transformation into digital-enhanced edge hubs is needed
- Ensure sustainability & resilience along the building's life cycle

MATRYCS Big Data Value Chain

MATRYCS

MATRYCS Governance

MATRYCS Processing

MATRYCS Analytics

- Structured data
- Unstructured data
- Real-time data
- Data streams
- IoT devices
- Sensors networks
- Building Management Systems
- Protocols
- Interoperability

Data Acquisition

Data Curation

- Data pre-processing
- Noise reduction
- Data Anonymazition
- Data modelling
- Semantic annotation

- No-SQL DB
- Distributed File System
- Graph-DB
- High Performance Query Engine
- APIs
- Security
- Scalability and performance
- Consinstency, Availability, Partition-tolerance

Data Storage

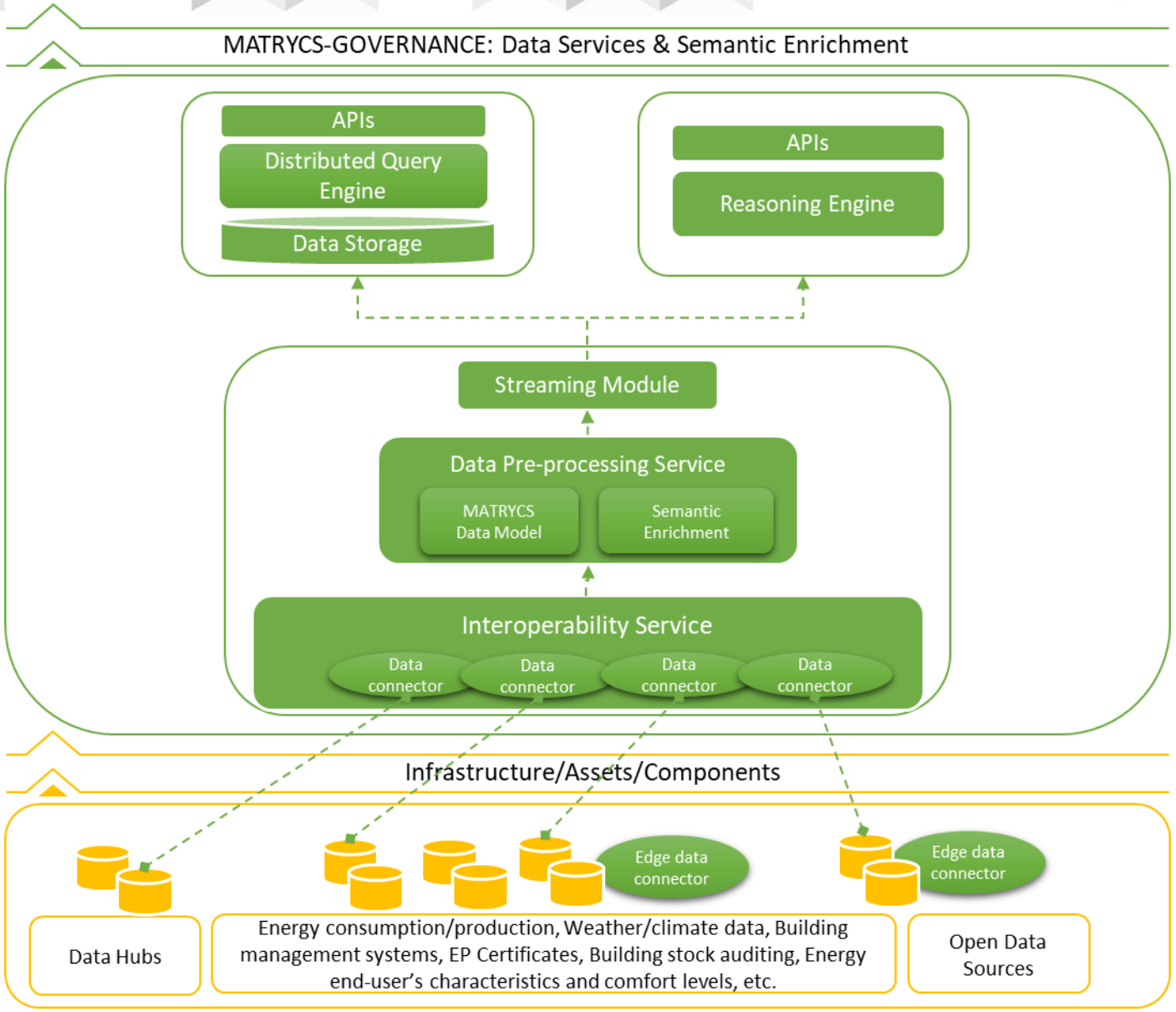
Data Analysis

- Semantic analysis
- Machine Learning
- Stream mining
- Data feed
- AI/ML serving layer

- SaaS
  - Visualization Engine
  - Digital Building Twin
- PaaS
  - Virtual Workbenck
- IaaS

Data Usage

MATRYCS-GOVERNANCE



Technical Objective

Delivering a **data governance** technology enabler to facilitate **cross-stakeholder data sharing, exchange and handling**

MATRYCS-GOVERNANCE

MATRYCS-GOVERNANCE layer allows the **integration**, **pre-processing**, **semantic annotation** and **querying** of heterogeneous data, **guarantying traceability, provenance tracking and accountability** of the MATRYCS data.

Interoperability Service Module is in charge integration of heterogeneous data from different sources and/or platforms belonging to different MATRYCS Data Providers .

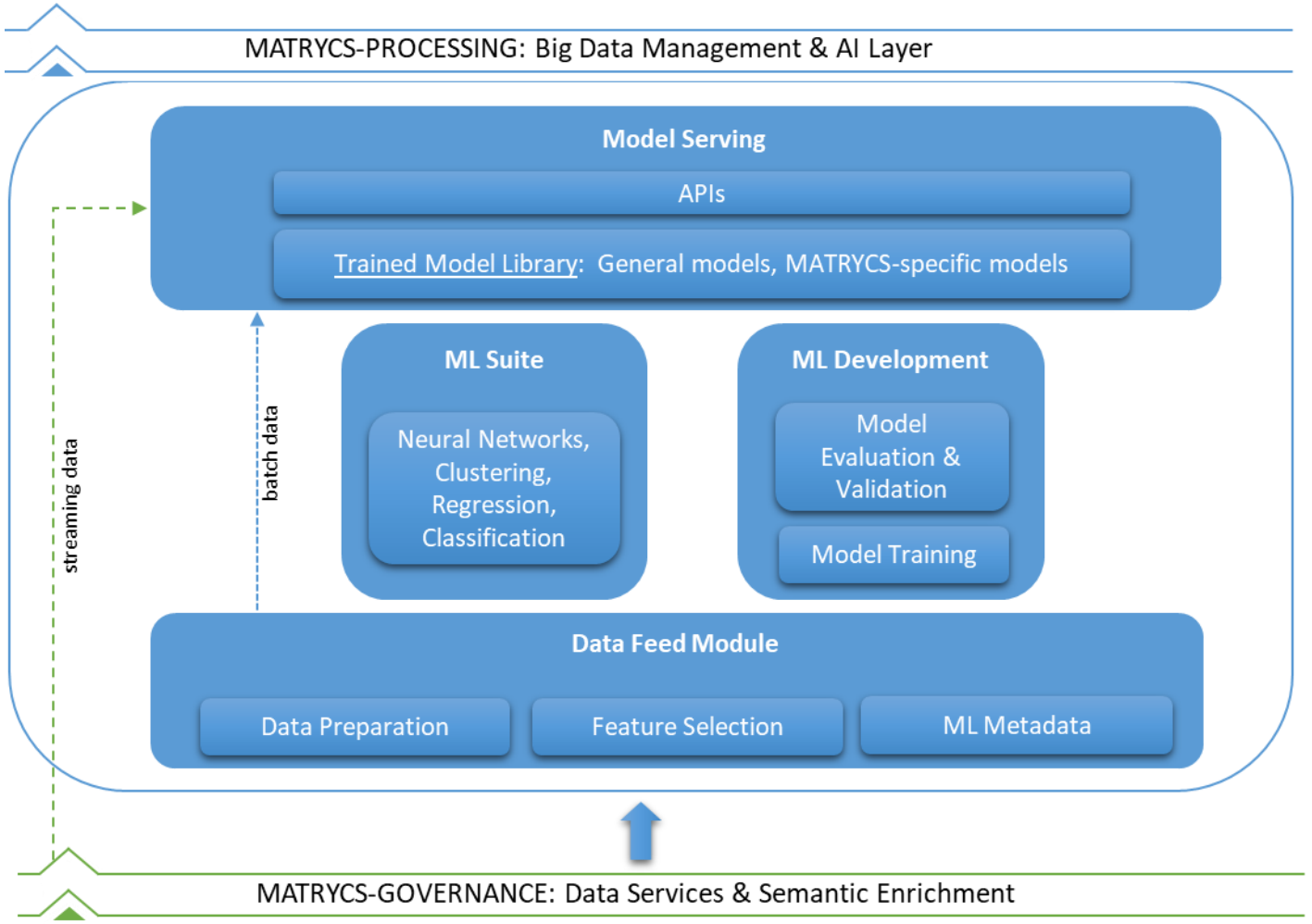
Pre-processing & Semantic Enrichment Module is in charge data pre-processing activities for data cleansing, data curation, data anonymisation , semantic annotation and data modelling.

Streaming module manages the frequency rates of the data streaming

Reasoning Engine based on Graph Database technology is used as a Triplestore DB in order to persist semantic datasets and any RDF information

High Performance Query Engine is built on top of a No-Sql DB (Columnar DB) to perform complex queries in very efficient and high-scalable way

MATRYCS-PROCESSING



Technical Objective

Evolution and deployment of a technology enabler for **a set of trained, high-quality Machine Learning and Deep Learning models**

MATRYCS-PROCESSING

The MATRYCS-PROCESSING integrates the i**ntelligence components of the MATRYCS solution** providing a library of **reusable AI-based ML / DL models** that will be made available with a view to promote quick adaptation and reuse of machine learning models along different contexts.

Data Feed Module

- Data Validation
- Data cleansing
- Data Transformation
- Feature Selection

ML Suite

- A library of state-of-the-art AI data-driven tools and methods that will be used to develop the MATRYCS AI models

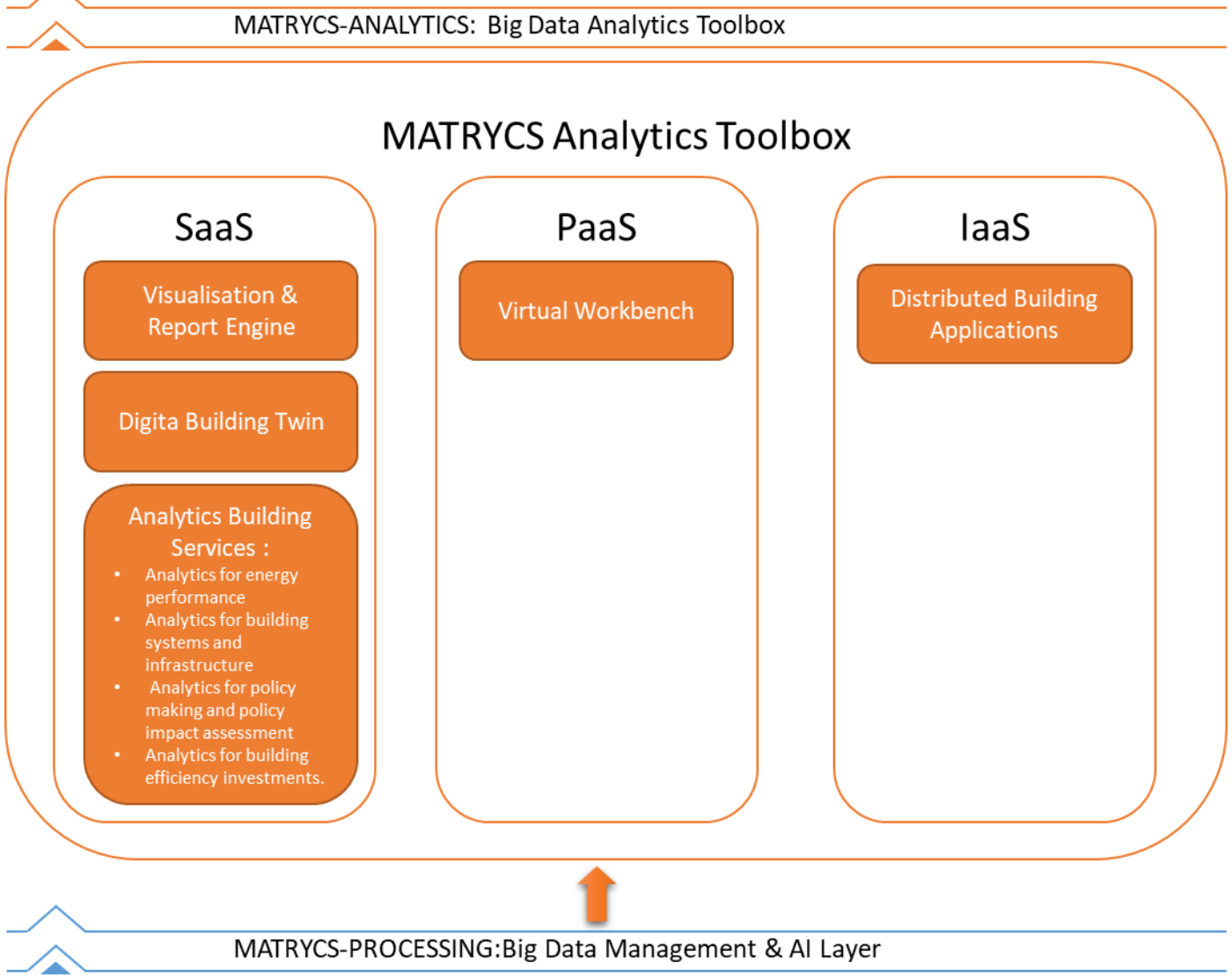
ML Development

- AI/ML framework that exploit the ML Suite and use the available tools to create, train, evaluate and validate models based on the MATRYCS data flow

Model Serving

- High-performance framework for serving, managing, and deploying the MATRYCS trained models

MATRYCS-ANALYTICS



Technical Objective

Deployment of the MATRYCS **open, cloud-based data analytics toolbox** along different deployment modes

MATRYCS-ANALYTICS

A **cloud-based data analytics toolbox** along different deployment modes (IaaS/SaaS/PaaS)

SaaS

- Visualisations and Reports Engine for the visual representation of the stored data and the results produced from the analytical components.
- A range of innovative Analytics Building Services exploited through LSPs
- Digital Building Twins that creates digital representations of physical systems in order to perform analytics, simulations, examine multiple scenarios, make predictions and estimations to the digital space and generate actionable insights and optimisation recommendations

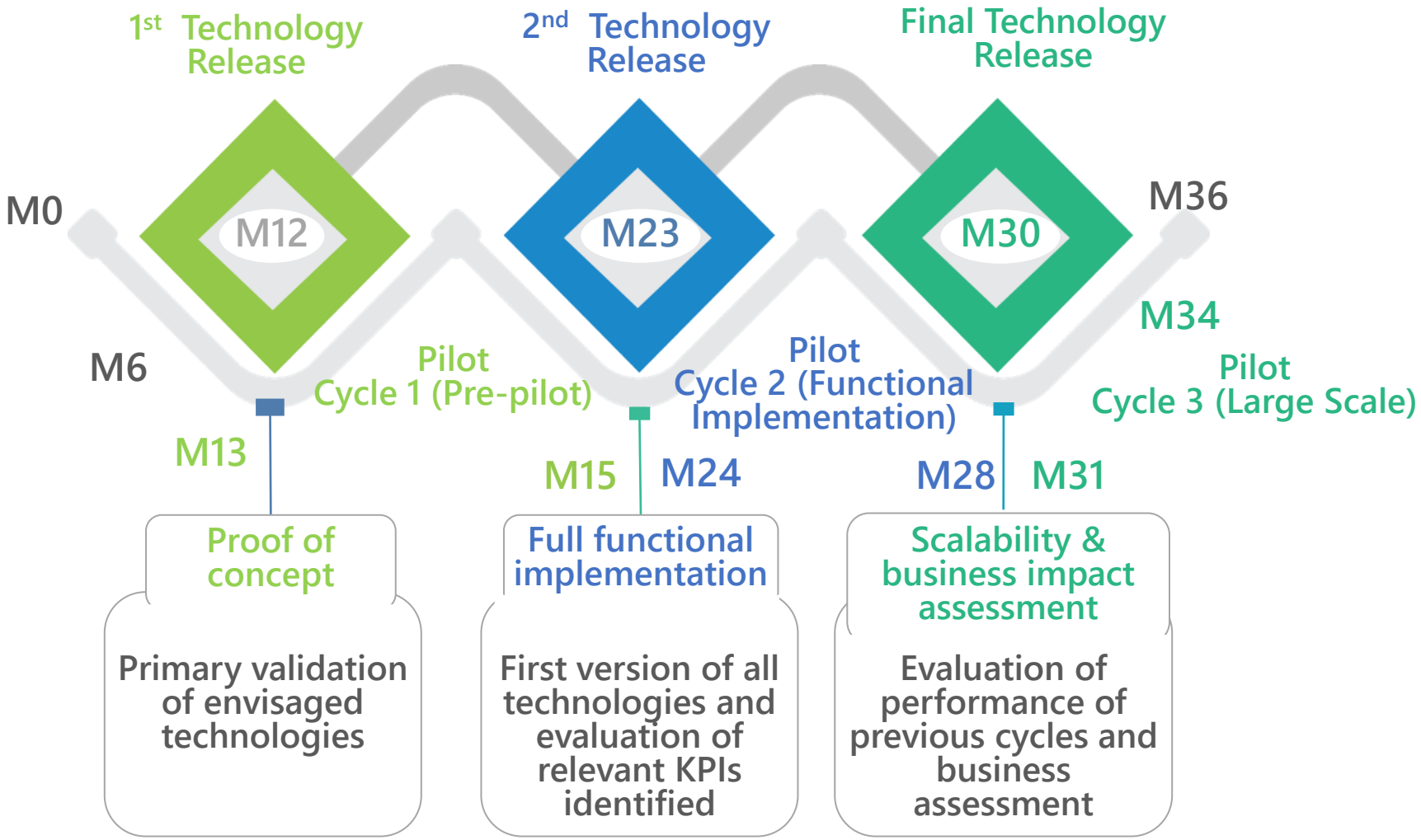
PaaS

- Virtual Workbench to incorporate a set of tools targeting SMEs, developers and potential innovators, who design and develop new services for the buildings sector

IaaS

- As an open source sandbox, in container-based workflows that could be flexibly deployed over cloud infrastructures

Methodology



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Thank you!

Visit our Website

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