Perceptive Sentinel – Big Data Knowledge Extraction and Re-creation Platform

Grega Milčinski(1), Klemen Kenda(2), Janez Hafner(1)
(1) Sinergise, Ljubljana, Slovenia
(2) Jožef Stefan Institute, Ljubljana Slovenia

INTRODUCTION

- Usage in agriculture
- Paradigm shift – EO data as a stream – free access to high temporal and high spatial resolution EO data
- Platform:
  - hyper scalable
  - general purpose
  - data ingesting
  - machine learning

PLATFORM

Perceptive Sentinel platform vs EO-Toolbox

DATA FLOW

Processing chain
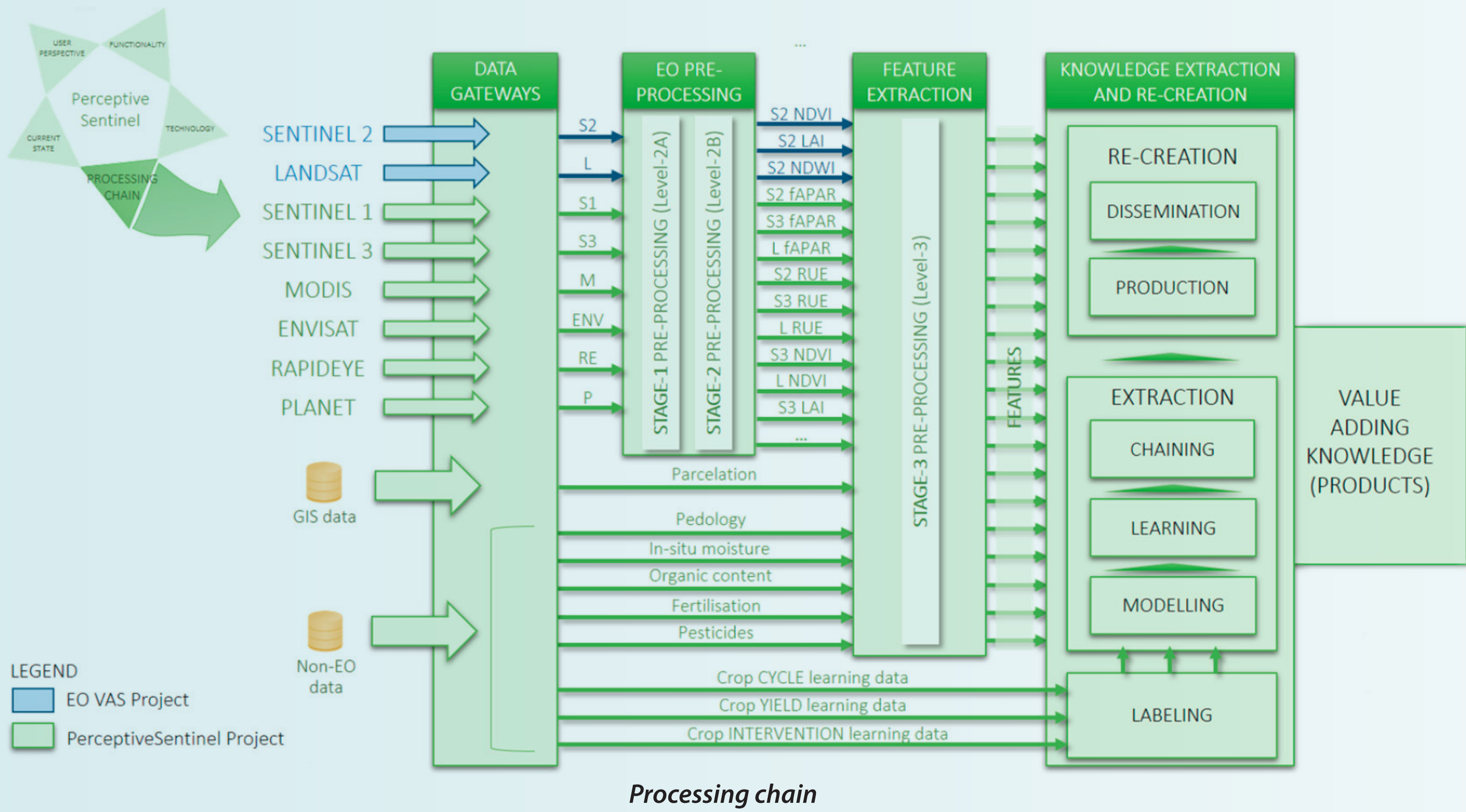
MACHINE LEARNING

- Stream Mining approach to Big Data problem
  - Exposing one piece of data to the algorithms only once
  - Computationally and resource-wise cheap
- Time-series Classification (crop)
- Time-series Regression (yield, vegetation indices)
- Clustering (to assist crop classification)

Signature matching problem
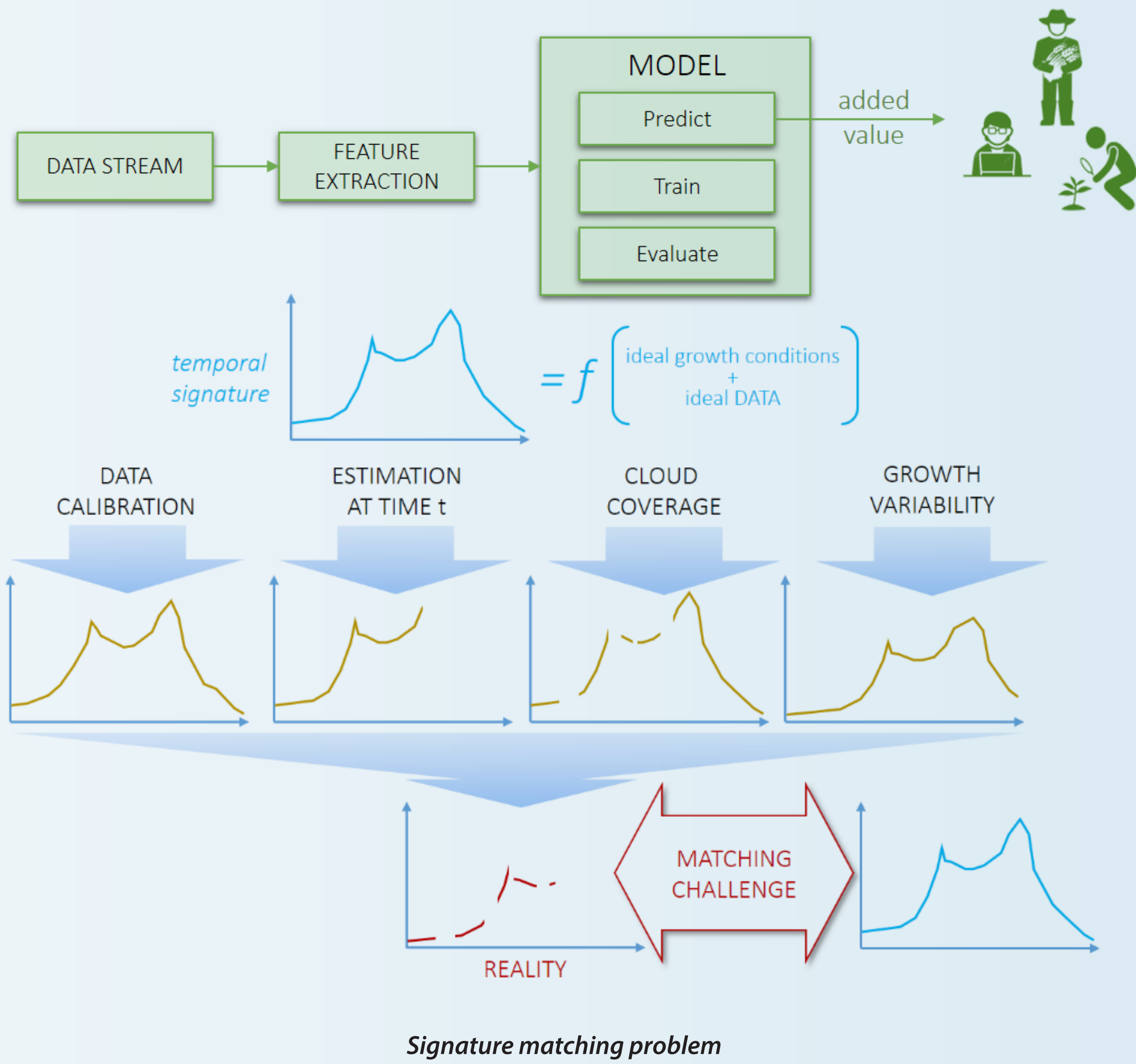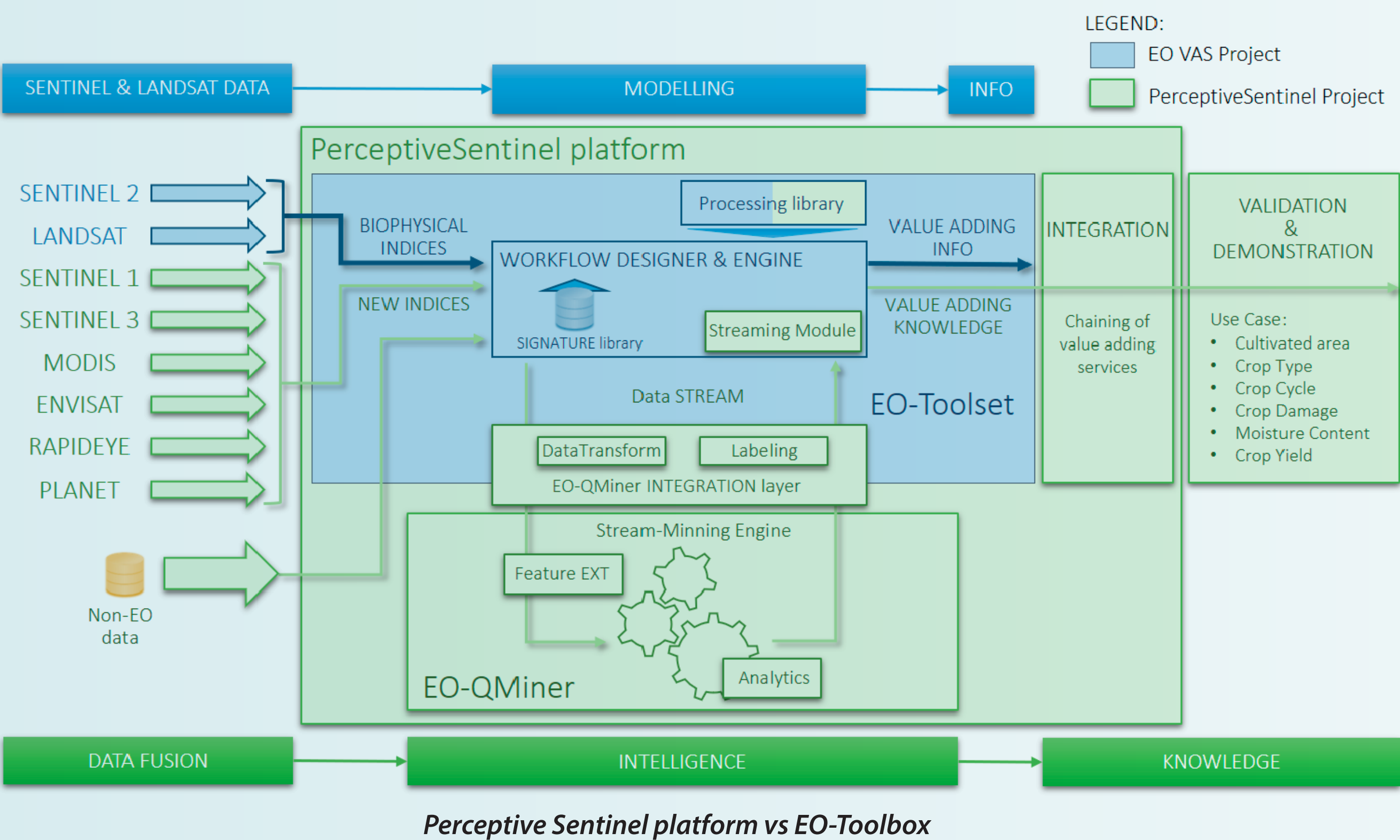
SENTINEL HUB

- Access the entire global archive of multi-spectral data, from the very first imagery to the latest available
- Compliance with OGC standards such as WMS, WMTS, WCS and WFS
- Time-lapse functionality and time-series statistical analysis tools
- APIs for advanced feature integration and on-the-fly output definitions
- Results in real-time

EO-QMINER

- Based on QMiner - Open-source stream processing engine
- Autonomous Big Data stream processing engine
- Automation of most time-consuming task in data analysis – data pre-processing
- Feature Engineering – Data Enrichment
- Data Fusion of Heterogeneous Data Sources
  - weather data
  - EO data
  - pre-calculated features
- Feature Vector Generation

USE CASES

- Cultivated Area
- Crop Type
- Chained use cases
  - Crop Status
  - Crop Damage
  - Crop Yield
  - Moisture Index

CONSORTIUM

- Sinergise (Slovenia)
- Jozef Stefan Institute's Artificial Intelligence Laboratory (Slovenia)
- GeoVille (Austria)
- Magellium (France)
- Landbrug & Fodevarer (Denmark)
- Agricultural Institute of Slovenia (Slovenia)

SINERGISE

GeoVille

Kmetijski inštitut Slovenije
Agricultural Institute of Slovenia

magellium

Institut
"Jožef Stefan"
Ljubljana, Slovenia

LANDBRUG FØDEVARER