HCLTech | Supercharging Progress™

AION:
"switch on ai"

Overview

Organizations today are targeting to promote democratization of Machine learning & AI, this will unlock immense potential that is still untapped as most of the domain experts are not capable of building ML models. AION will enable domain experts (Also known as Citizen Data Scientists) build ML models to derive useful insight from raw data & help resolve business problems.

AION is an AI lifecycle management platform for applying machine learning to real-world problems. AION encompasses the complete pipeline from raw dataset ingestion to deployable machine learning model with low-code/no-code approach. AION Includes the following sub-processes:

- Data exploration, insights generation and transformation (Data Engineering)
- Machine learning, deep learning and artificial intelligence training (Algorithms & Models)
- Prediction interpretation/explanation, model testing and uncertainty quantification (XAI / ML Test / UQ)
- Model deployment, model observation and model operations (MLOps)

Industry challenges & solution using AION

Challenges	HCLTech AION Advantage

Development of ML Models takes long time & need specialized skill set

Empower people in organization whether Technical (Working in code) or Business (Low code/No code) to create ML Models

Data needed for building ML Models is not centralized and is available in varied data formats & platforms

Hooks to integrate with varied enterprise data sources Handle data cleansing, data quality issues, data outlier issues Handle multiple data types and unstructured data

Data scientists do not have deep domain understanding & Domain experts do not understand Machine Learning

AION helps citizen data scientists develop ML Models. Reduces Repetitive work needed by data scientists in developing models saves precious data scientist effort by automating low end work

ML Model & Data might drift with time, resulting in incorrect insights & predictions

Model monitoring support and drift analysis for input/output data & Model predictions

ML Models are black box & give no explanation on predictions

AION provides detailed explanations on reasons for prediction

Code Generated by AI Lifecycle Mgmt. Platform is not reusable across Platforms

MLaC feature generates Platform independent Python code & containers that can be consumed outside AION as well

AION Differentiators

Integrate with any digital platform and provide analytics as a service

Single platform providing services to convert raw data into insights & value
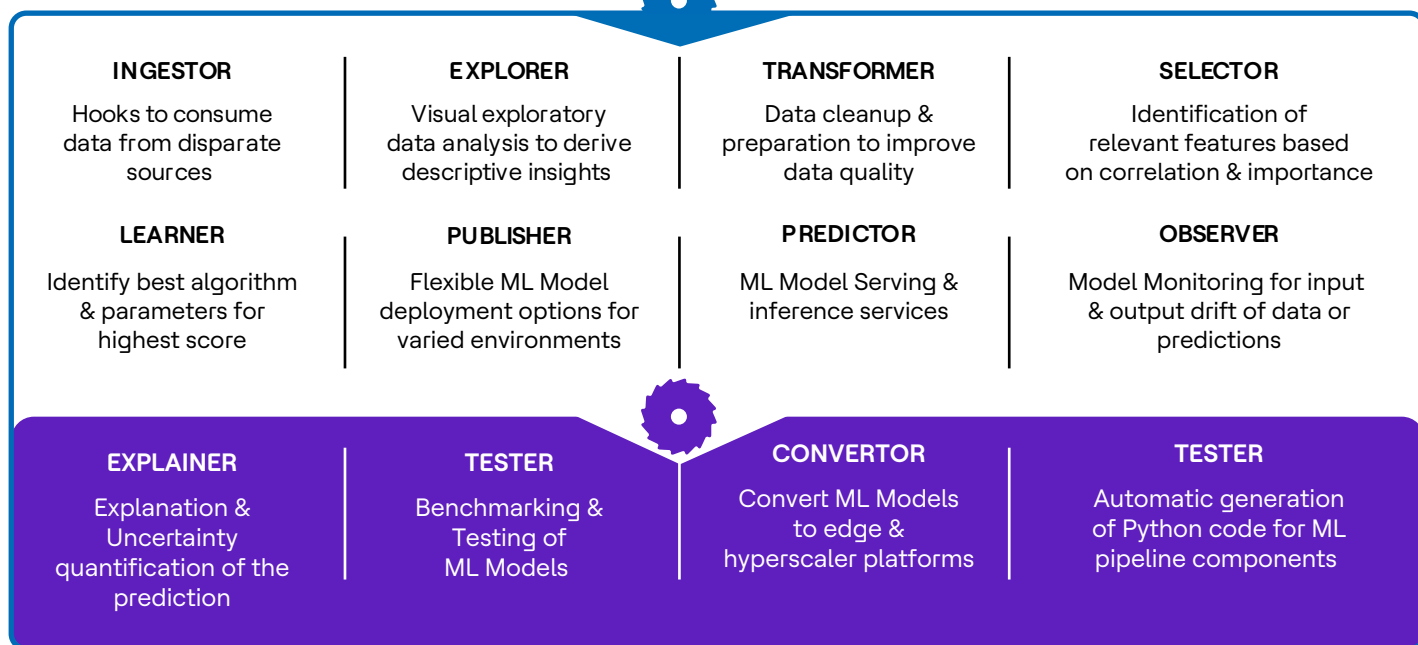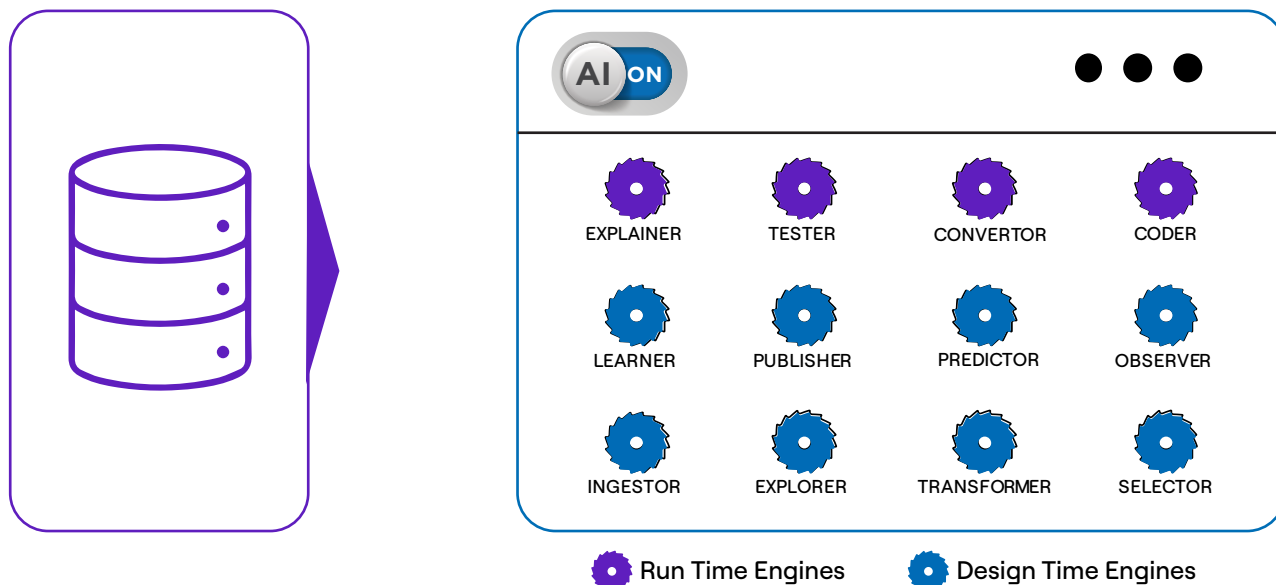
Model & Prediction Explainability

Easy integration with different data sources and hyperscalers

ML as a code (MLaC) available for expert data scientists & easier maintenance

AION Engines

Run Time Engines / Design Time Engines

INGESTOR	**EXPLORER**	**TRANSFORMER**	**SELECTOR**
Hooks to consume data from disparate sources	Visual exploratory data analysis to derive descriptive insights	Data cleanup & preparation to improve data quality	Identification of relevant features based on correlation & importance
LEARNER	**PUBLISHER**	**PREDICTOR**	**OBSERVER**
Identify best algorithm & parameters for highest score	Flexible ML Model deployment options for varied environments	ML Model Serving & inference services	Model Monitoring for input & output drift of data or predictions
EXPLAINER	**TESTER**	**CONVERTOR**	**TESTER**
Explanation & Uncertainty quantification of the prediction	Benchmarking & Testing of ML Models	Convert ML Models to edge & hyperscaler platforms	Automatic generation of Python code for ML pipeline components

AION Business Benefits

Productivity Improvement of Data Scientists in ML Model development time

ML models helping in Operational effciency

Wider analytics adaptability across organization helping in providing more insights

Proof Points

Complaint Identification for Medical Devices

The problem was to identify cases of medical device complaints given a set of device services report records using unsupervised and supervised techniques. The complaint data was passed through AION pipeline where data profiling and feature selection were performed. Constant features were removed, and low variance features were handled. Features with empty rows were imputed appropriately. Supervised classification and unsupervised clustering was performed as two diferent approaches to categorize complaints.

Network Quality of Service QoS) Classification

A leading telecom service provider wanted to introduce QoS analytics capabilities in a device management platform that they were using from HCL using HCL AION, a solution to provide Descriptive and Predictive Analytics insights for the CPE devices was developed. The Descriptive Analytics included dashboards for QoS Analysis, Degraded QoS and Statistical insights. Predictive Analytics included quality-based traffc patterns, forecasts of error rates, noise and signal strengths.

Customer Order Forecasting

A leading telecom service provider wanted to automate order volume and trend monitoring (which was being monitored manually). No telemetry was defined for order volume variation. AION was introduced for AI/ML based forecasting to help in defining telemetry for order volume variation. A time series forecasting model was developed that was trained automatically every 24 hours (or as per configured interval) to forecast volumes for the next period (1 hour or configured interval).

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