



TRIDIAGONAL. α
Domain-driven AI

Accelerating your DT → AI journey

Process R&D Roots (19+ Years)



Global Experience



350+ Professionals

with top talent > 70 % masters / Post Docs

2500+ Projects (Multi-domain), Global Delivery Model



Advanced Modeling



Testing & Validation



Scale-up & Technology Transfer



Dx. Consulting



Advanced Analytics



Process Optim.



Agentic AI



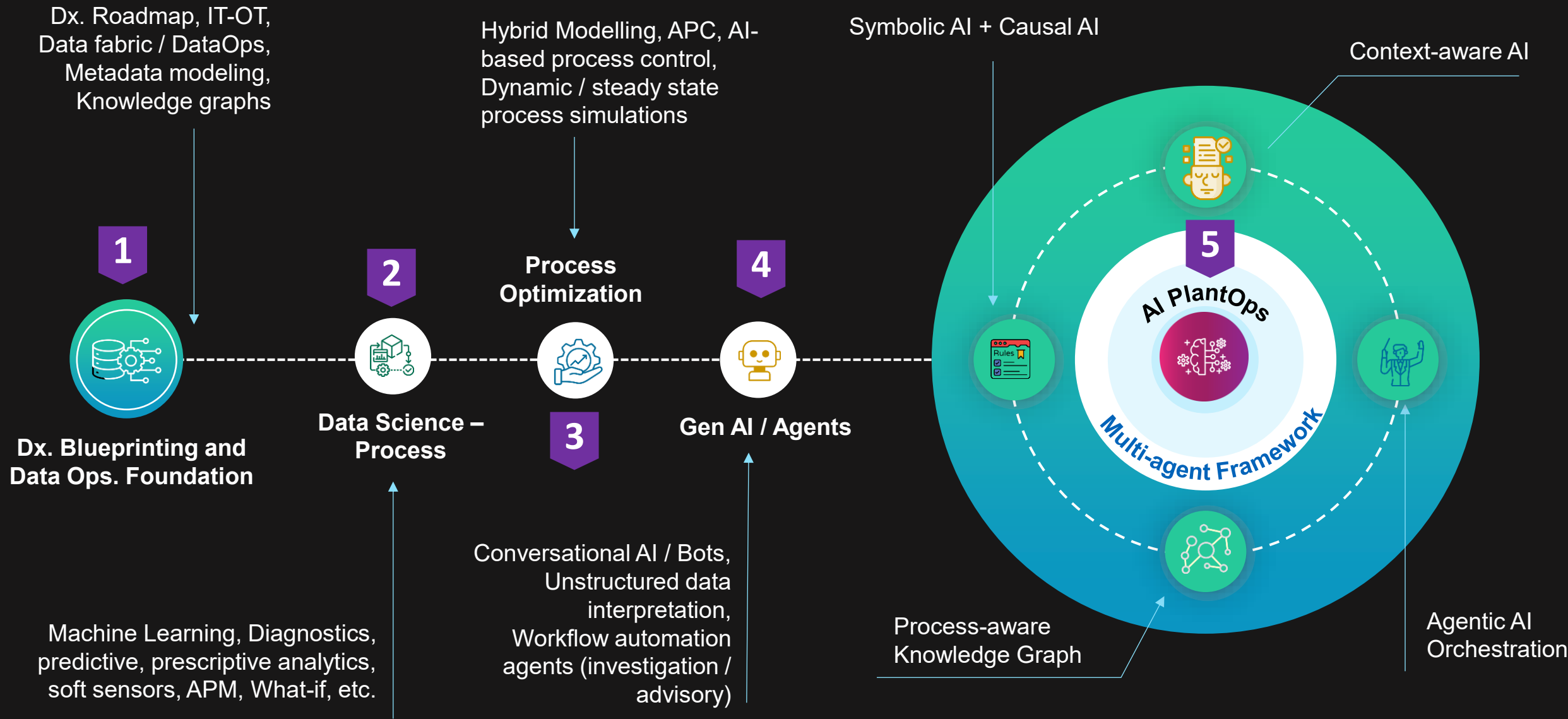
Delivery Center – India (Pune)
Program Management / Account Management -
Dubai, Houston, Germany*



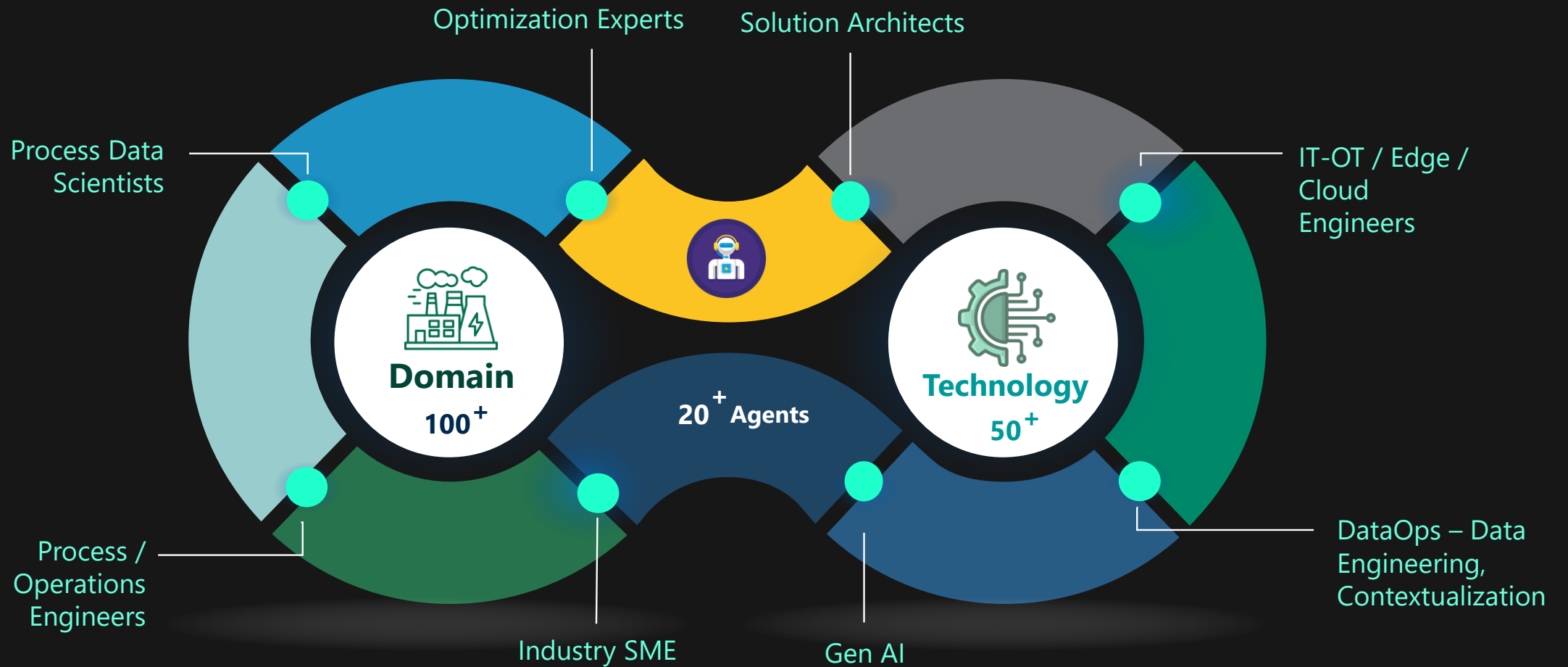
Global Customer base



Empowering Industry's AI Evolution – From DataOps Foundations to Agentic Intelligence



Combination of Expertise for the Process Industry



(With top talent > 50 % masters , PhD in Chemical / Mechanical / Metallurgical /Computer Science Engg.)

T.AI Oil & Gas Solution(s) Capabilities – Breadth and Depth



AI-based Process Optimization

Non-linear optimization, Model-predictive control, APC, Hybrid RTO, etc.

Advanced Analytics

Soft sensors, yield prediction, moisture prediction, Prescriptive analytics, energy management



Predictive and Prescriptive Maintenance

End of cycle prediction, RUL, component level failure prediction, Early Event Detection

Gen AI

RAG-based agents – Co-pilot, investigation, advisory, etc



Modeling & Simulation

Steady state / dynamic simulation (OTS), Blending, moment automation, Heat-integration studies, process debottlenecking / improvement, etc.

AI PlantOps

Multi-agent frameworks, for network intelligence such as hydrogen/ steam network optimization, VCO



AI-based Process Optimization



Custom Solutions

Process stabilization, Quality optimization, Recycle opt., Energy opt.

CDU Opt.



- Maximize diesel production
- Maximize Naphtha rate

DHT Unit



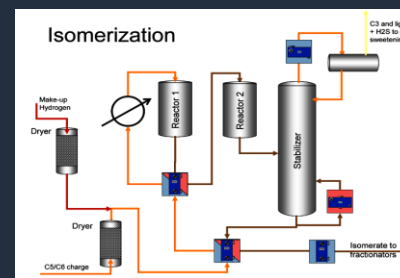
- Maximize diesel production

FCC Unit



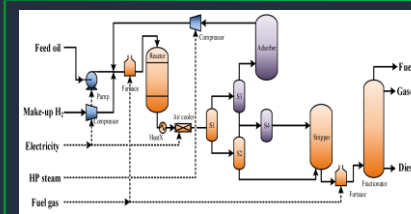
- Optimize the Reactor and Regenerator section, Minimize C3 slippage

Isomerization Unit



- Maximize octane barrel by optimizing ROT

HGU, DHT Opt.



- Improved throughput, reduced energy intensity, and stabilized operation

PX Plant Purity Opt.

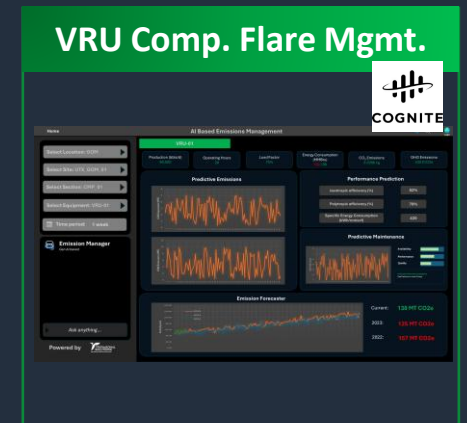
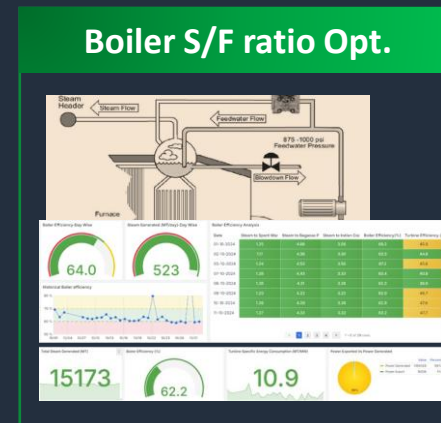
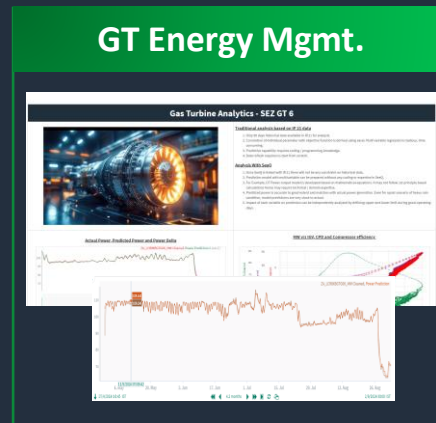
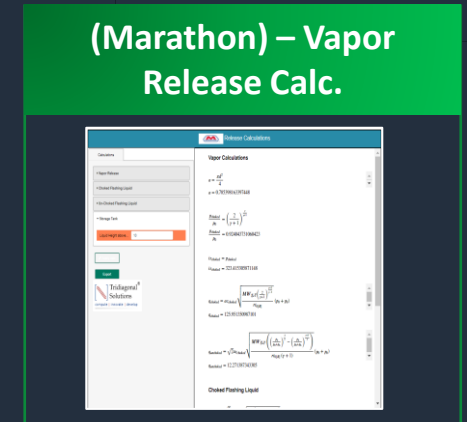
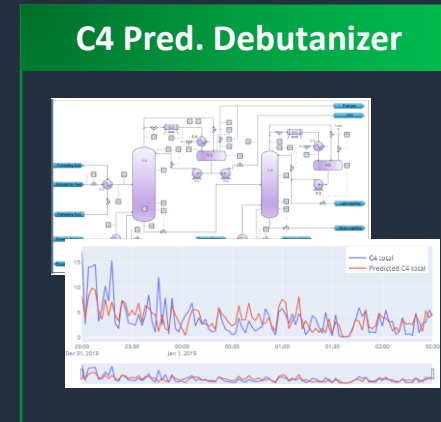
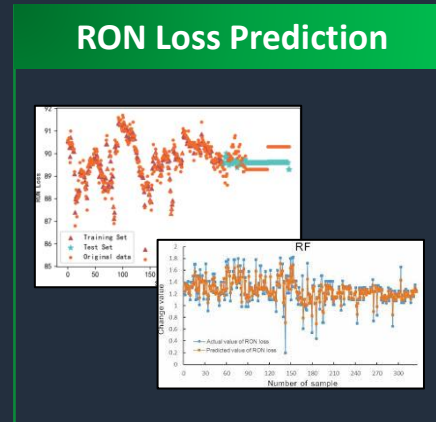


- Improved purity, optimized recycle, energy

Other Cases -

- Refinery units – Cracker furnaces, compressors, separation columns, ethylene plant, CCR, Ortho-xylene recycle, MSCC, PX Purity opt., HDN, HDS

Advanced Analytics & Energy / Emissions Management



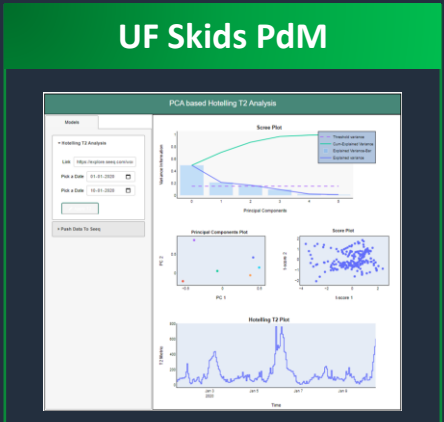
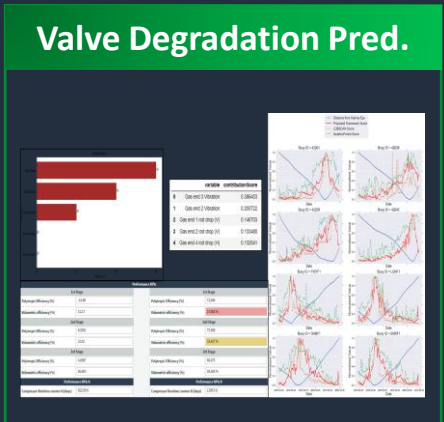
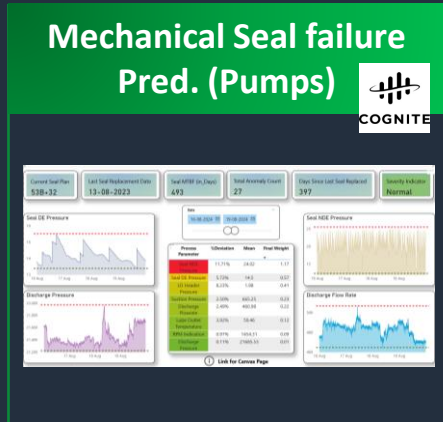
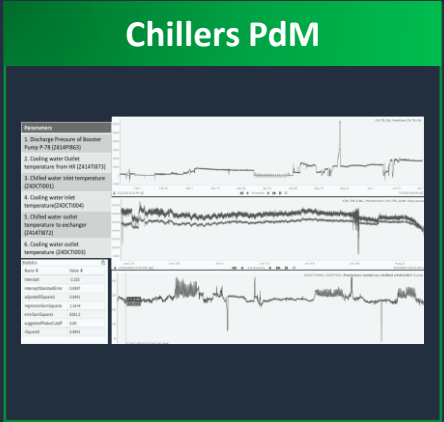
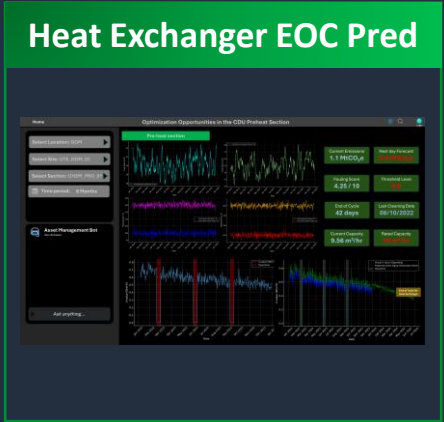
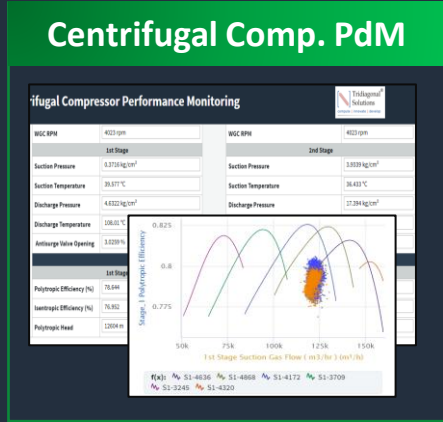
Soft sensors, yield prediction, moisture prediction, Prescriptive analytics, plant-level mass balance, Automated shift report generation, energy management

- ### Other Cases -
- CDU preheat section, Emissions management for critical assets, reciprocating compressors
 - **Refinery units** – CDU, FCC, DHDT, HDS, DCU, Reactors, Sour water strippers, others

Predictive Maintenance



End of cycle prediction, remaining useful life, component level failure prediction, Early Event Detection, Condition based monitoring



Other Cases -

- SWRO / BWRO / UF Skids, Cooling towers, Boilers, Turbines, Motors, Bearings, fans, blowers, etc.



Maintenance Planning

Functional Location	Fluc Name	Equipment Name
SAV-BLCH-ADVV-CBTC-SC3P2-PUMP9		Pump
SAV-BLCH-ADVV-CBTC-SC3P2-PUMP1		Pump
SAV-BLCH-ADVV-CBTC-SC3P2-PUMP2		Pump
SAV-BLCH-ADVV-CBTC-SC3P2-PUMP3		Pump
SAV-BLCH-ADVV-CBTC-SC3P2-MTR01		Motor
SAV-BLCH-ADVV-CBTC-SC3P2-MTR02		Motor

Hydrogen Network Opt.

P&ID based Contextualization

Chatbot - E&I Diagrams

Work Order Cost Estimation

SAP Master Data Cleanup

Other Cases -

- Alarm prioritization, Time series agent, SAP agents, work order planning agent, RCA agent, Work order deduplication agent, Knowledge mgmt.

Process Simulation – OTS, BMA



CDU/VDU



Ethylene Cracker



Offshore Gas Processing Facility



LNG Terminal

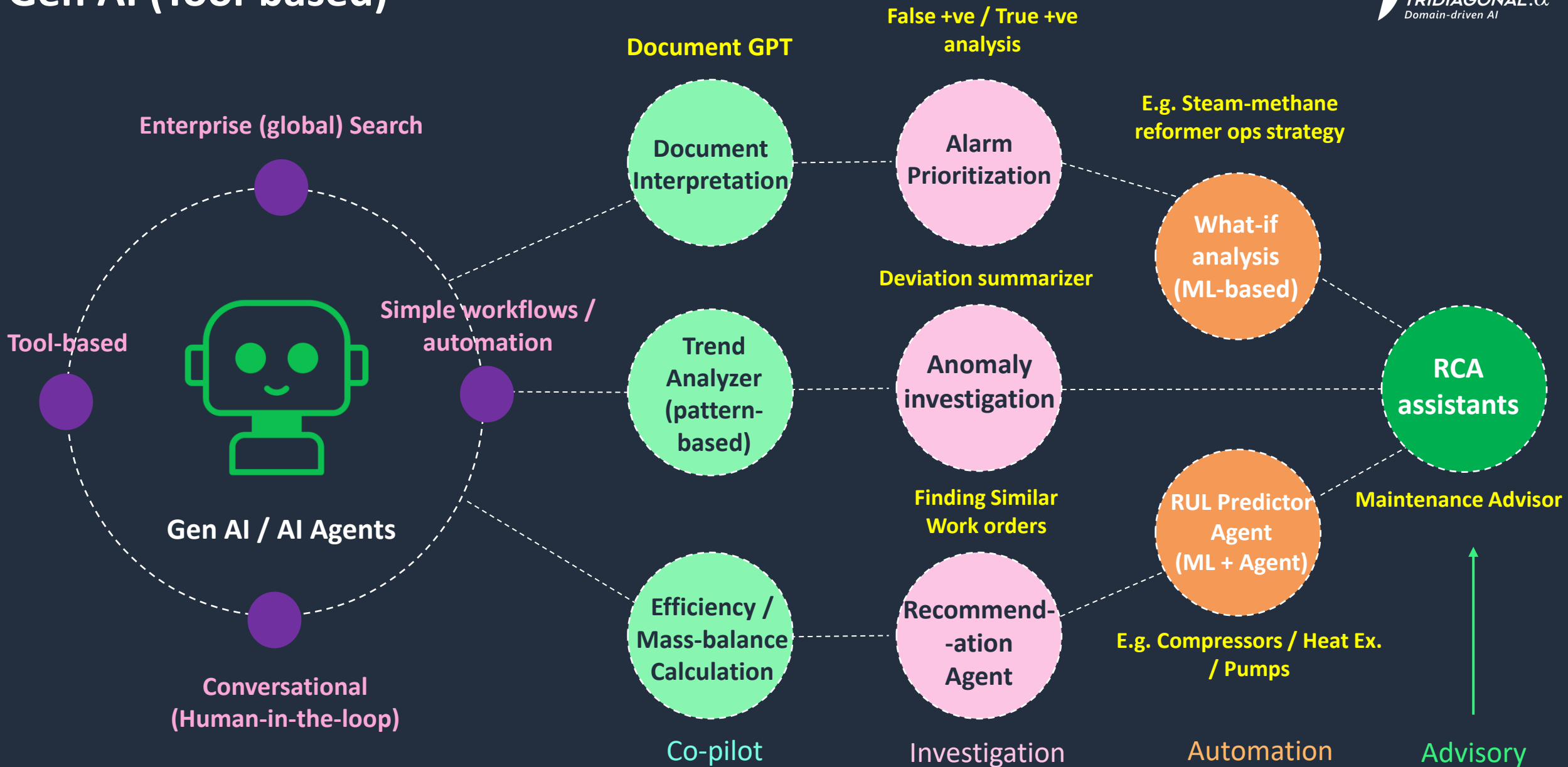


Ammonia Production

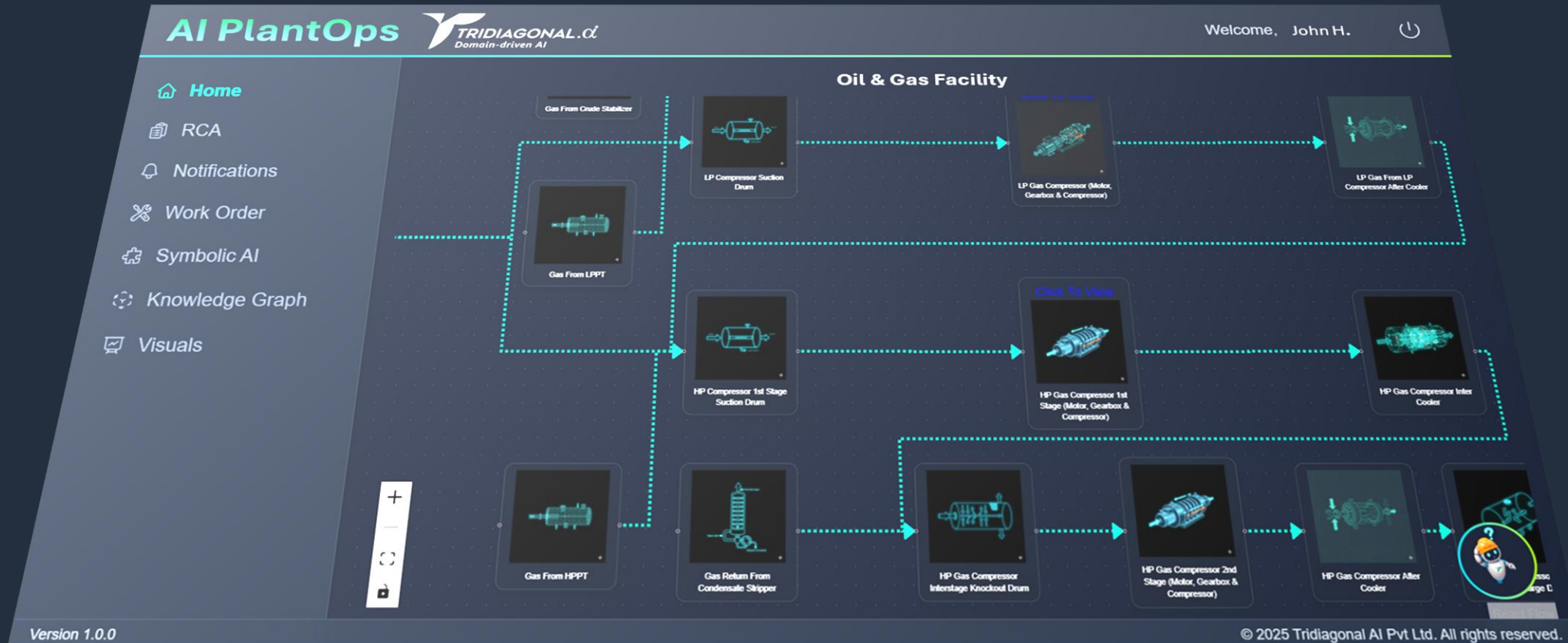


Tank farms (Blending automation)

Gen AI (Tool-based)



AI Operating System for Operations (AI PlantOps)



What is AI Plant Ops?

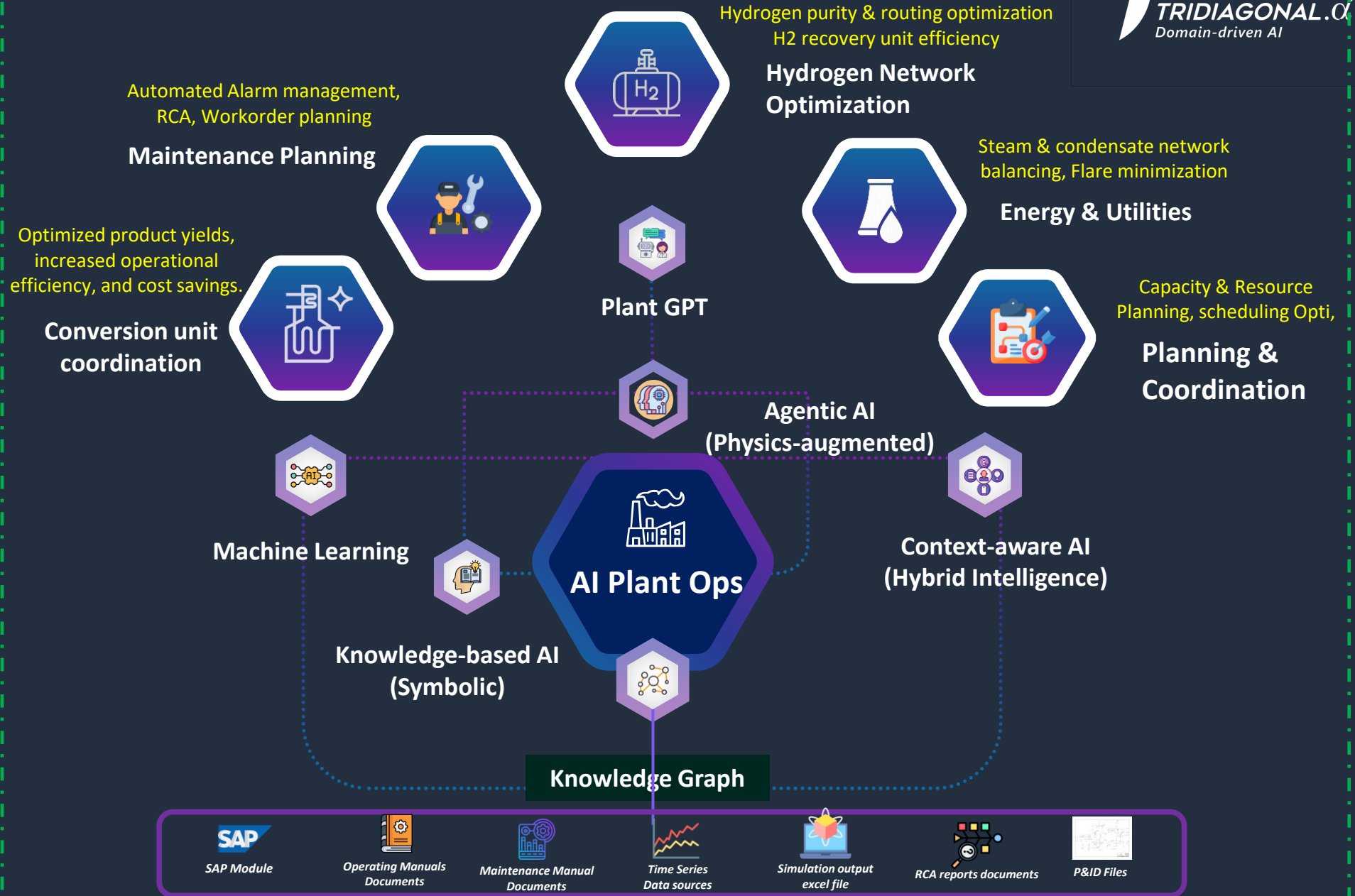
Agentic AI - Simulates, validates, and executes actions using physics-economic coupling

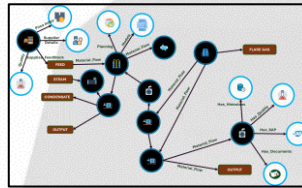
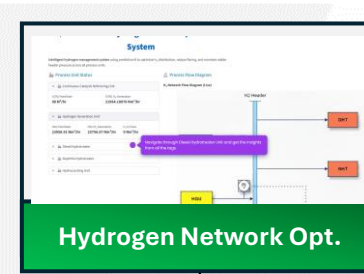
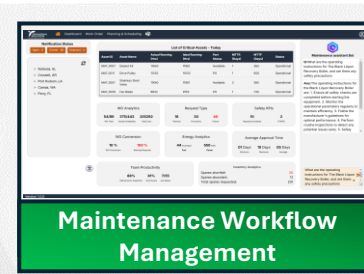
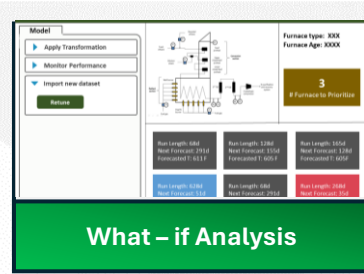
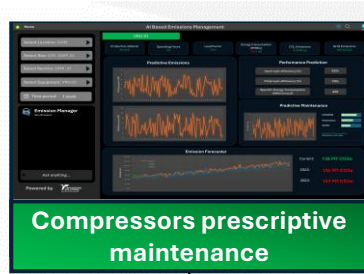
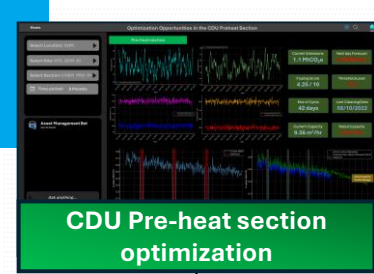
Context-aware AI - Connects plant insights with cost, demand, logistics, and price drivers.

Machine Learning Learns yield, energy, and fouling behaviors across feedstocks and operating conditions.

Symbolic AI - Encodes process rules, heuristics, and operational logic (e.g., COT, TMT limits, furnace coking dynamics, yield relationships).

Value Chain Knowledge Graph Creates a unified digital backbone Links feedstock, furnaces, downstream units, logistics, and markets into one digital ecosystem.





- P&ID based Knowledge Graph
- Value Chain based Knowledge Graph

- Real time process parameters
- Critical Assets Vibration readings

- Raw Material, Production Information
- Asset Hierarchy
- Maintenance, Spare parts, Quality compliances

- Material / process flow information
- Instrumentation, line daigram, tag information

- Equipment maintenance manuals
- Operating procedues
- SOPs
- Compliances and standards

- Analytics
- Simulation
- APM
- Others

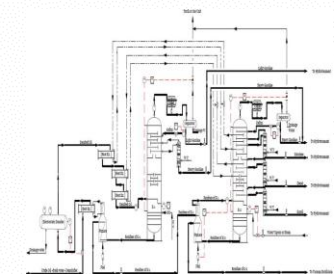
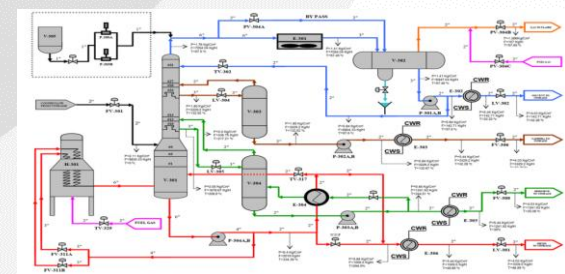
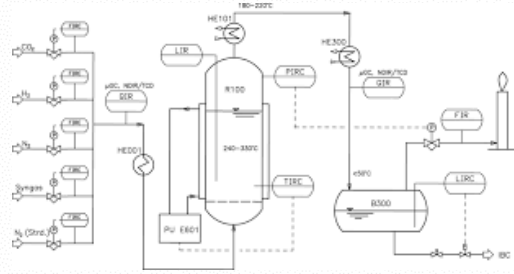
Time series data

SAP

P&IDs

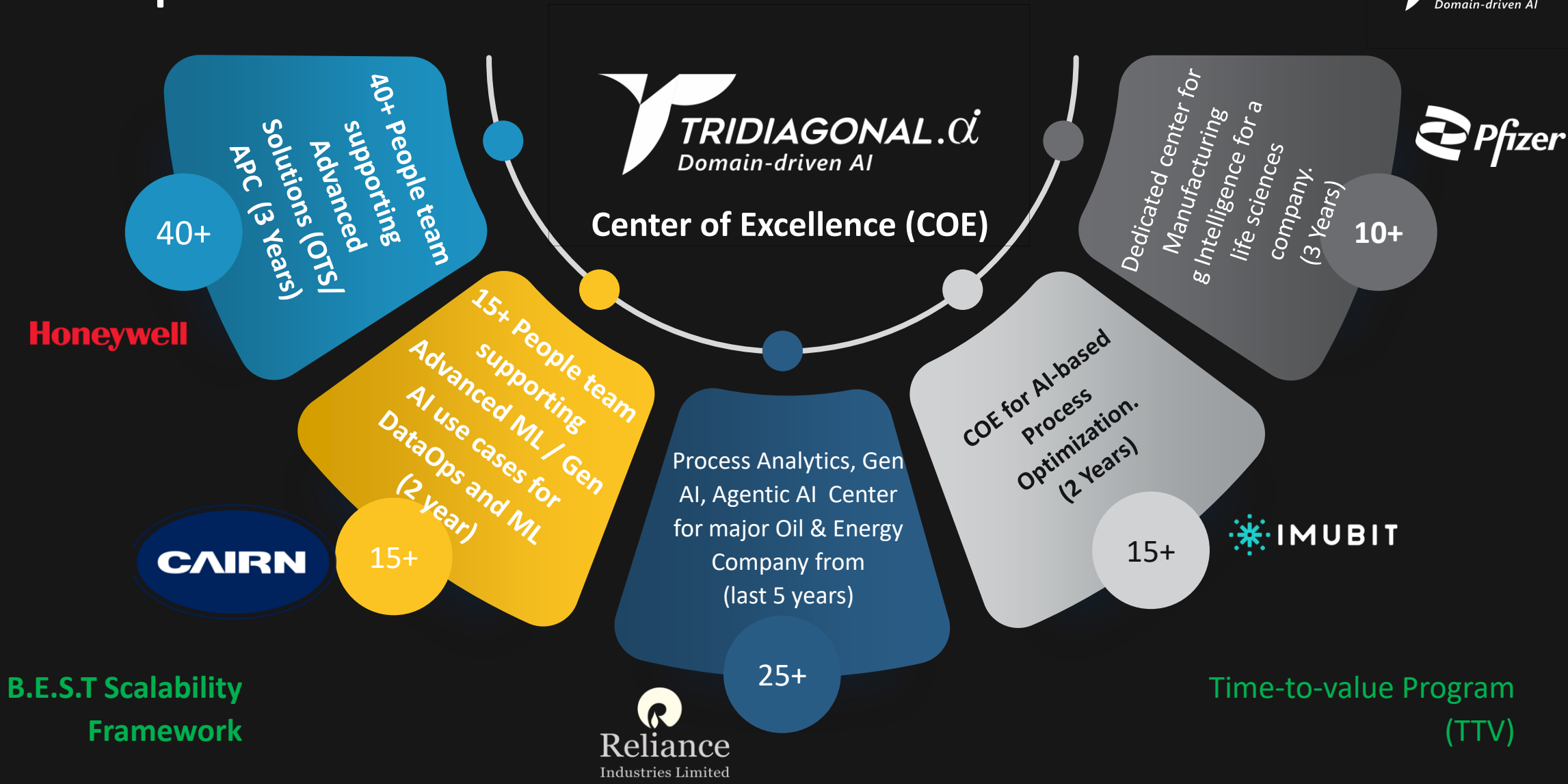
Manuals

3rd party Application



Oil & Energy, Pet. Chem, Chemicals

T.AI COE Experience



Why T.AI?

06 Local (US) + India COE (12x12 Delivery Model)

- US-based solution architects and Cognite specialists are the front-facing layer for customers



Domain Expertise 01

- Deep process industry knowledge
- Innovation and Value Focused
- Next Gen AI - frameworks, optimizers Physics-augmented Agentic AI
- Advisory Boards with global experts



05 Templates & Accelerators for Speed

- Soft sensors, inferentials, hybrid ML models
 - Agentic AI workflows & autonomous decision logic



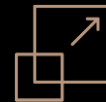
Long-Term Dx. Transformation Partner 02

- T.AI provides value enablement and not platform enablement.
- Key focus: Business KPIs and outcomes



04 Rapid Scalability - (60–90 Days Ramp-Up)

- Proven GCC-enabled scaling model
- Combination of teams - Cognite-certified data engineers, DataOps, ML engineers, Atlas AI specialists, and process SMEs.



Unified AI Plant Ops (Vertical AI) 03

- **AI OS for Industry** – T.AI purpose-built operating system for refinery extends Cognite beyond data foundation to network intelligence
- **Composable Orchestration** – Complements & connects with Cognite, Atlas AI and other existing systems to uncover larger value



THANK YOU



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Domain-driven AI