



On-Premise Enterprise AI Agent Platform | Co-Researcher AI Agent

From Experience to Scientific Decision-Making

Building an enterprise-grade AI research collaboration system to create reproducible, reusable decision models for truly data-driven outcomes

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WHO WE ARE

BoldTek is committed to being a trusted partner for enterprise digital transformation and AI adoption, providing one-stop support from engineering services to AI solutions.

With years of deep experience in electronics manufacturing, we are well versed in OEM/ODM product development and validation, helping clients through product development, testing, validation, and mass production. We also combine AI Agents, enterprise knowledge bases, and process automation to help organizations improve knowledge management, optimize operations, and accelerate AI adoption, turning innovation into real business value.



Global Presence

United States (Denver HQ),
Taiwan, India, Singapore,
Vietnam



ISO 27001

Information Security
Management Standard



ISO 9001

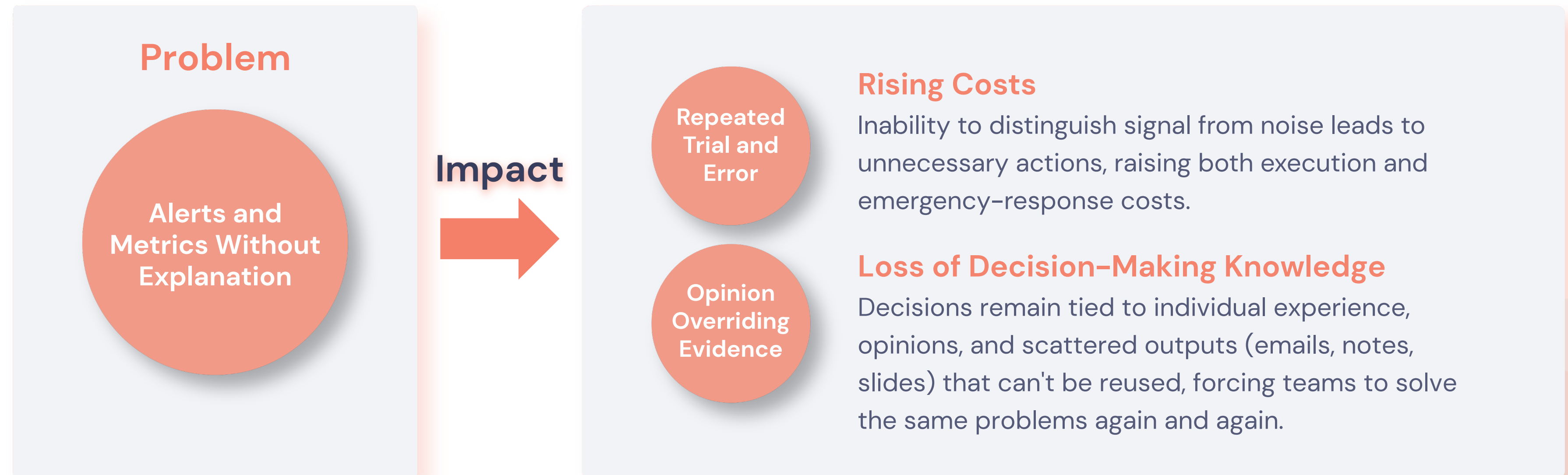
Quality Management
Standard

THE PROBLEM

Digitalization solved data visibility, but **did not** improve **decision quality**

Background

- Data usage remains largely descriptive (reports, summaries, monitoring)
- Problem-solving depends heavily on individual experience



THE PROBLEM

The real bottleneck is a “scalable methodology”

caused by these limitations:

Passive Analysis

BI can only describe what happened, not support decisions:

Dashboards can only show “what happened,” not answer “why it happened,” “what should change,” or how confident we should be in our judgment.

Statistical tools depend heavily on experts:

SPSS, Minitab, and Excel can run analyses, but rigor depends on the experience.

Human Constraints

Methods rely heavily on individual experience:

Most frontline operations staff have never been systematically trained in hypothesis thinking, yet must make judgment calls at high decision frequency.

Bias emerges under time pressure:

Schedule pressure pushes teams toward intuition and heuristics, raising the risk of misjudgment and wrong action.

Engineers' time goes into “organizing data” instead of doing real research!

THE SOLUTION

From data visualization to evidence-based decisions and systematic iteration

1

See → Monitor

What happened?

Tools

Dashboards, KPIs, alert systems

Limitation

Shows only surface patterns and trends — can't explain why, or whether immediate action is warranted

2

Understand → Explain

Why did it happen? Is this signal or noise?

Tools

Hypothesis testing, causal analysis, bias and confounder checks

AI Co-Researcher's Role

Helps ensure correct analysis and interpretation, reducing conclusions driven by mere experience or noise

3

Decide → Iterate

What's next? What did we learn this time?

Tools

Experimental design (DOE), optimization scenario analysis, and counterfactual analysis

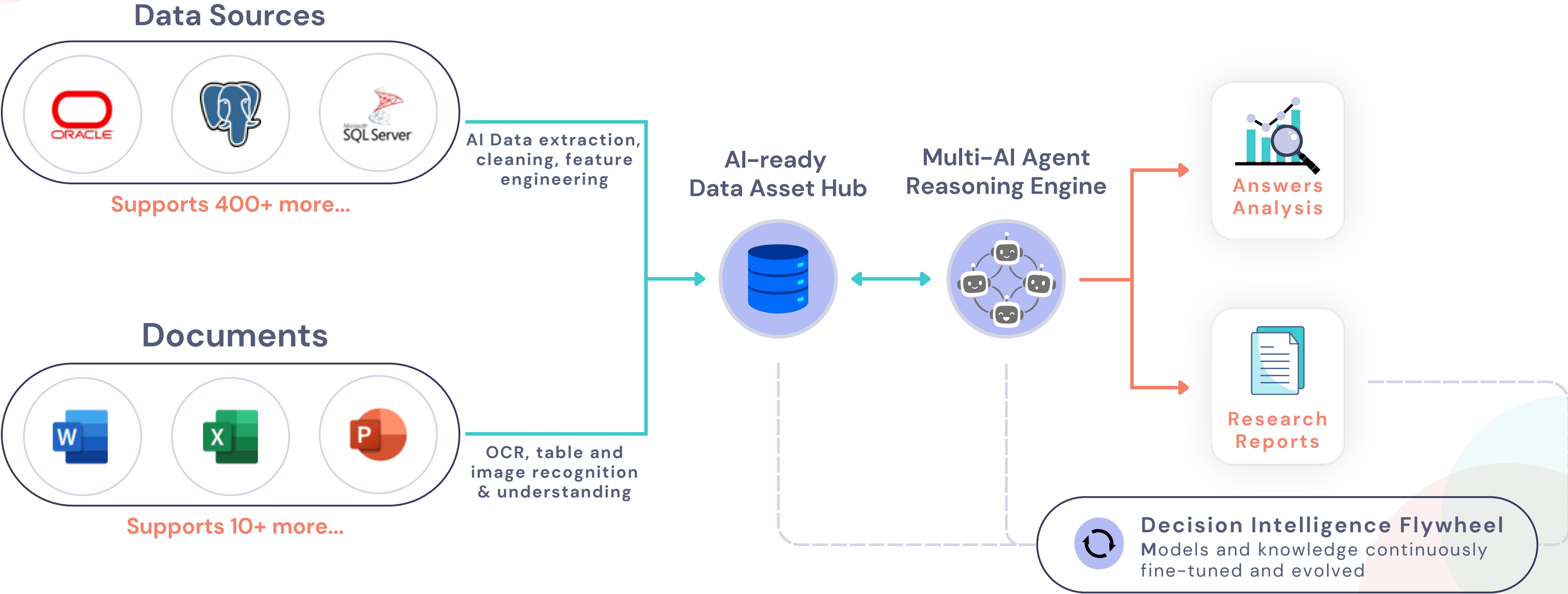
AI Co-Researcher's Output

Delivers clear, evidence-backed action recommendations; decision logic is structured and retained as a reusable enterprise asset

THE SOLUTION

Co-Researcher Multi-AI Agents System

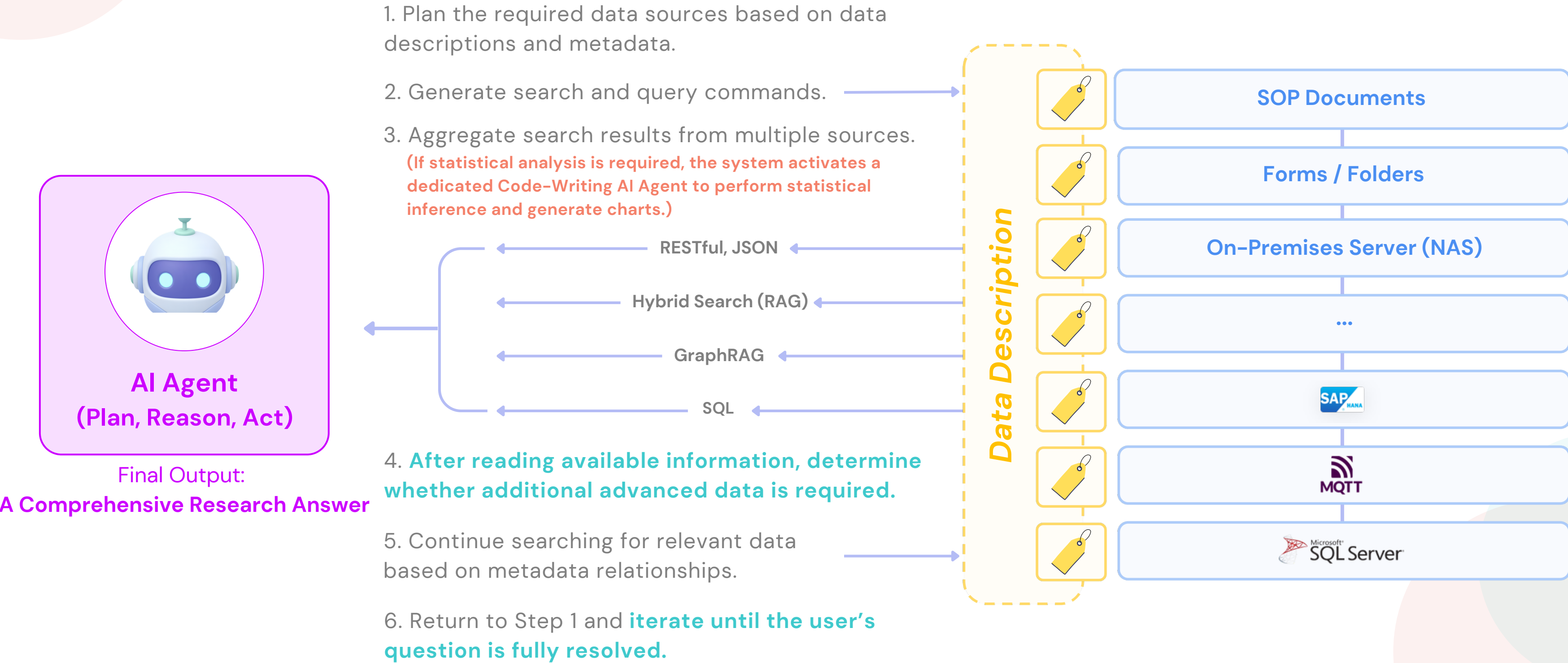
An AI Agent platform integrating: (1) industry-specific algorithms and statistical methods
(2) a complete enterprise-grade Data Lakehouse architecture



THE SOLUTION

Architecture | Iterative Deep Analysis of Heterogeneous Data

Not a one-time Q&A tool, a **Multi-AI-Agent system** that iteratively reasons through data to deliver actionable insights & real-world solutions.



Use Cases

Covering core scenarios in R&D, manufacturing, and supply chain

R&D& Manufacturing Scenarios

- ✦ **Process Parameter Optimization**
AI automatically runs DoE to find the optimal process recipe, with expected yield of **98.3%**
- ✦ **Root Cause Analysis**
From tens of millions of records, pinpoint the root cause of product defects
- ✦ **New Product / NewProcess Introduction (NPI)**
Accelerates experiment iteration, shortening R&D cycles from weeks to days
- ✦ **Simulation & Digital Twin**
AI **runs 24/7** simulation, automatically finding better designs and parameters
- ✦ **Process Parameter Optimization**
Combines literature and experimental data to optimize material composition ratios

Supply Chain& Other Scenarios

- ✦ **Demand Forecasting**
AI forecasting model — prediction accuracy **double that of competitors (40% vs. 99% error rate)**
- ✦ **Supply Chain Risk Alerts**
Flags weak risk signals **3–5 days in advance**, shifting from reactive firefighting to proactive prevention
- ✦ **Safety Stock Optimization**
Dynamically adjusts safety stock, easing inventory pressure
- ✦ **Smart Email & Communication**
Based on ERP, CRM, and logistics data, AI auto-drafts professional replies
- ✦ **Scenario Simulation**
Monte Carlo simulation calculates stock-out / line-stop probability to support fast decisions

Leading ODM Manufacturer

AI-Driven Burn-in Optimization & DOE Analysis Platform



Background & Challenge

During electronic product burn-in and DOE analysis, the client needed extensive engineering effort for data organization, physical modeling, parameter comparison, and report writing. Beyond long analysis cycles, it was also hard to quickly identify the optimal burn-in recipe, limiting validation efficiency and engineering resources.

Solution

Helped the client deploy an AI Burn-in Analysis Agent that combines physical modeling, DOE analysis, and burn-in recipe optimization to **build an AI-assisted analysis workflow**.

The platform supports direct import of engineering data formats such as STP, and through its Agentic File Research mechanism, **lets AI automatically understand product specs, test documents, and experiment context to quickly build project knowledge without retraining the model**.

Results & Value

1

AI analysis time reduced from 2.2 hours to about 0.26 hours (**about an 88% reduction in analysis time**)

2

Automatically completes DOE, physical modeling, and reliability analysis, **reducing engineers' workload**

3

Rapidly builds product knowledge (Agentic File Research), accelerating onboarding of new projects

4

AI automatically generates analysis reports, shortening the validation cycle and improving decision-making efficiency

2



Mid AI Analysis AI Agent

What are you working on today?

Stages 1,2,3) and generate the full analysis report and

AI can make mistakes, so double-check it

Stop your experiment result and report



emo

Home

Dashboard

Data Assets

Model Training

My AI Agents

Integrations

AI Writer

AI Chats

NPI Burn-In 批次分...

More

AI Docs

Burn-In AI Co-Resear...

More

Contact Us

Document Writing AI Agent / NPI Burn-In 批次分析研究報告

Burn-In AI Co-Research Report

Figure 7: 失效機率對環境溫度與負載的三維曲面。曲面顏色表示失效機率梯度，紅色區域為高風險操作區間。

AI 觀察：
曲面呈現明顯的非線性交互作用——溫度與負載的聯合效應大於個別效應之和。這表示在高溫高負載的組合條件下，失效機率的增速顯著加快。建議避免同時推高兩個參數。|

4. 統計分析

4.1 Monte Carlo 模擬結果

Cap Dry-Out — Monte Carlo (n=300)

MOSFET Thermal Runaway — Monte Carlo (n=300)

Figure 8: 綜合失效機率的 Monte Carlo 模擬分佈 (n=300)。紅色虛線為觀測值，藍色區間為

02_param

03_3d_fa

04_mont

05_weib

06_mosf

07_solde

08_sce

09_bayer

10_bath

11_reali

12_sum

Burn-In AI Co-Research Re

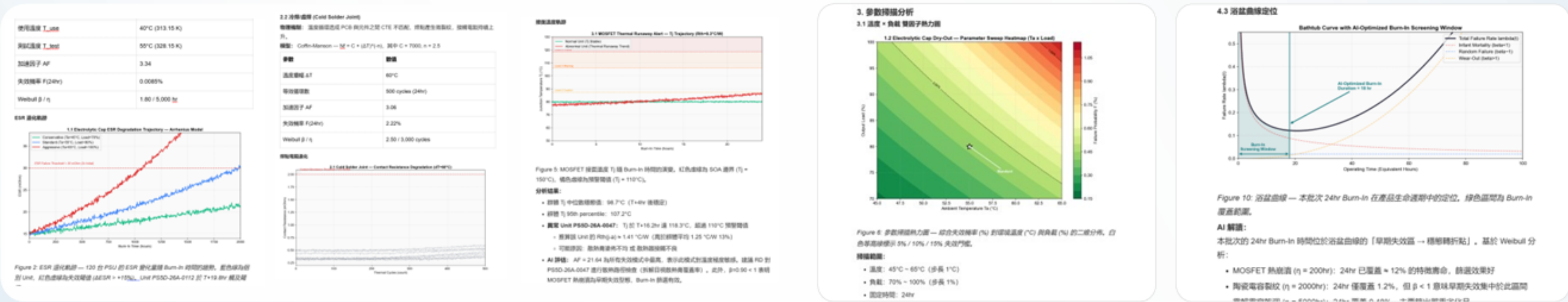
您的內容已完整依照指示建立

Ask AI about anything...

AI can make mist

Wait... and then Get your complete, insightful analysis report

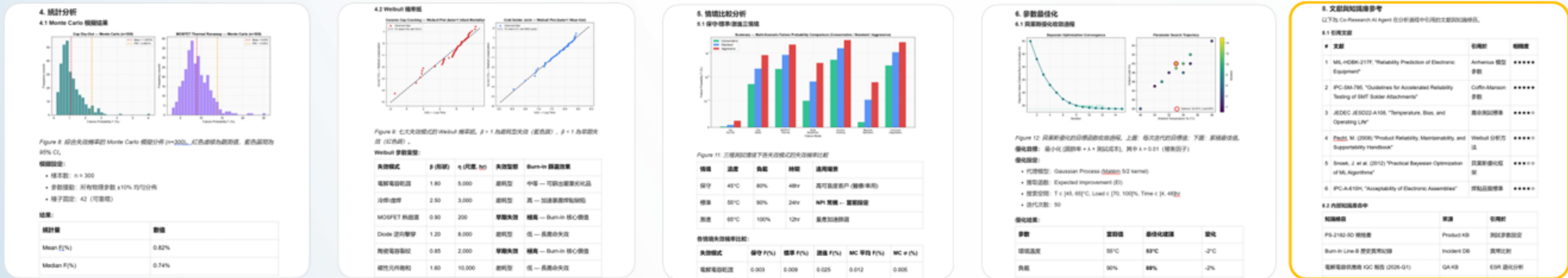
Case: Electronic Unit Burn-in Testing and Recipe Optimization



Physical Modeling and Analysis of 7 Failure Modes

Parameter Sweep Analysis

Bathtub Curve Positioning



Random Parameter Simulation (Monte Carlo)

Failure Analysis (Weibull)

Scenario Comparison Analysis

Parameter Optimization (GP)

Literature Review and Integrated Insights

Leading Thermal Solutions Manufacturer

Agentic AI Accelerates Vapor Chamber Design Optimization



Background & Challenge

In vapor chamber design, the client relied on engineers' expertise (e.g. cylinder radius, cavity size, structural configuration); design changes required remodeling and re-simulation, which lengthened the cycle, with optimization speed limited by available manpower and experience.

Solution

An AI design optimization agent that combines product design knowledge with simulation results to **establish an AI-assisted thermal design workflow**. It automatically analyzes correlations between design parameters and provides vapor chamber geometry optimization suggestions. Tasks completed by AI:

- Vapor chamber geometric design analysis
- Thermal structure parameter optimization
- Design option comparison
- Automatically generated design recommendation reports
- Provides simulation direction and optimization suggestions

Results & Value

1

14 working days shortened to about 15 minutes to complete AI initial design recommendations

2

Significantly shortens design cycles, accelerating new product development and design iteration

3

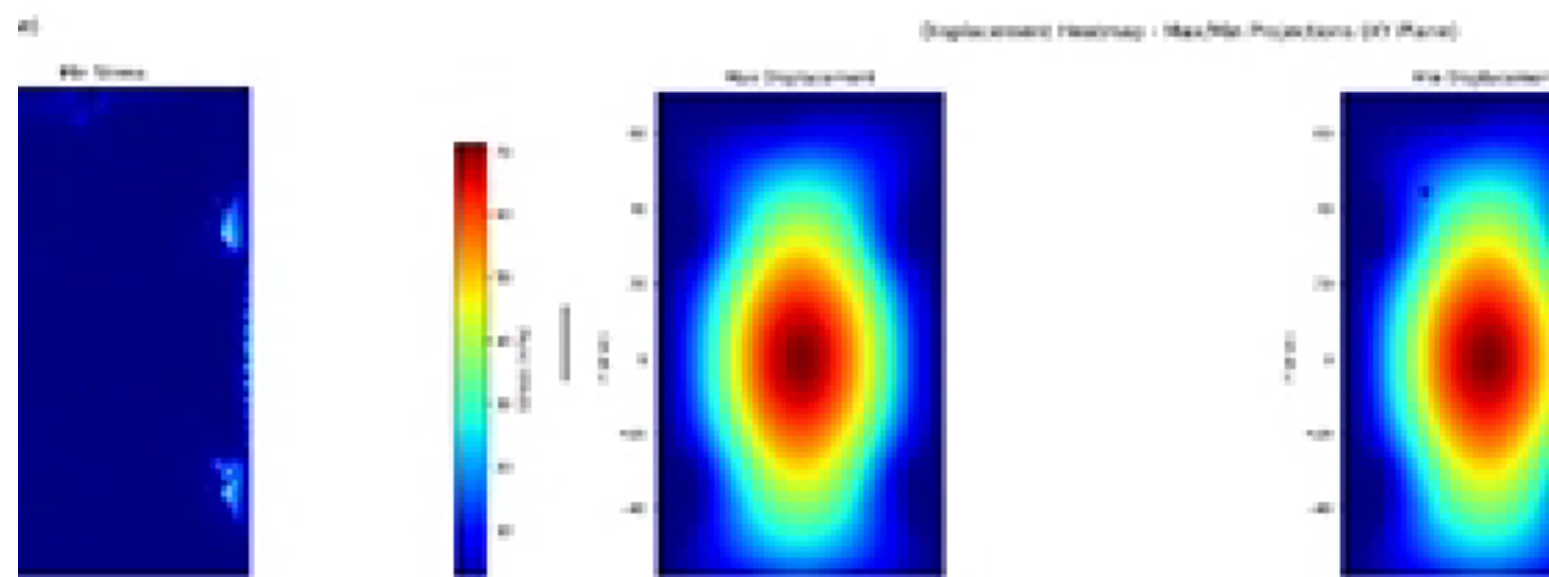
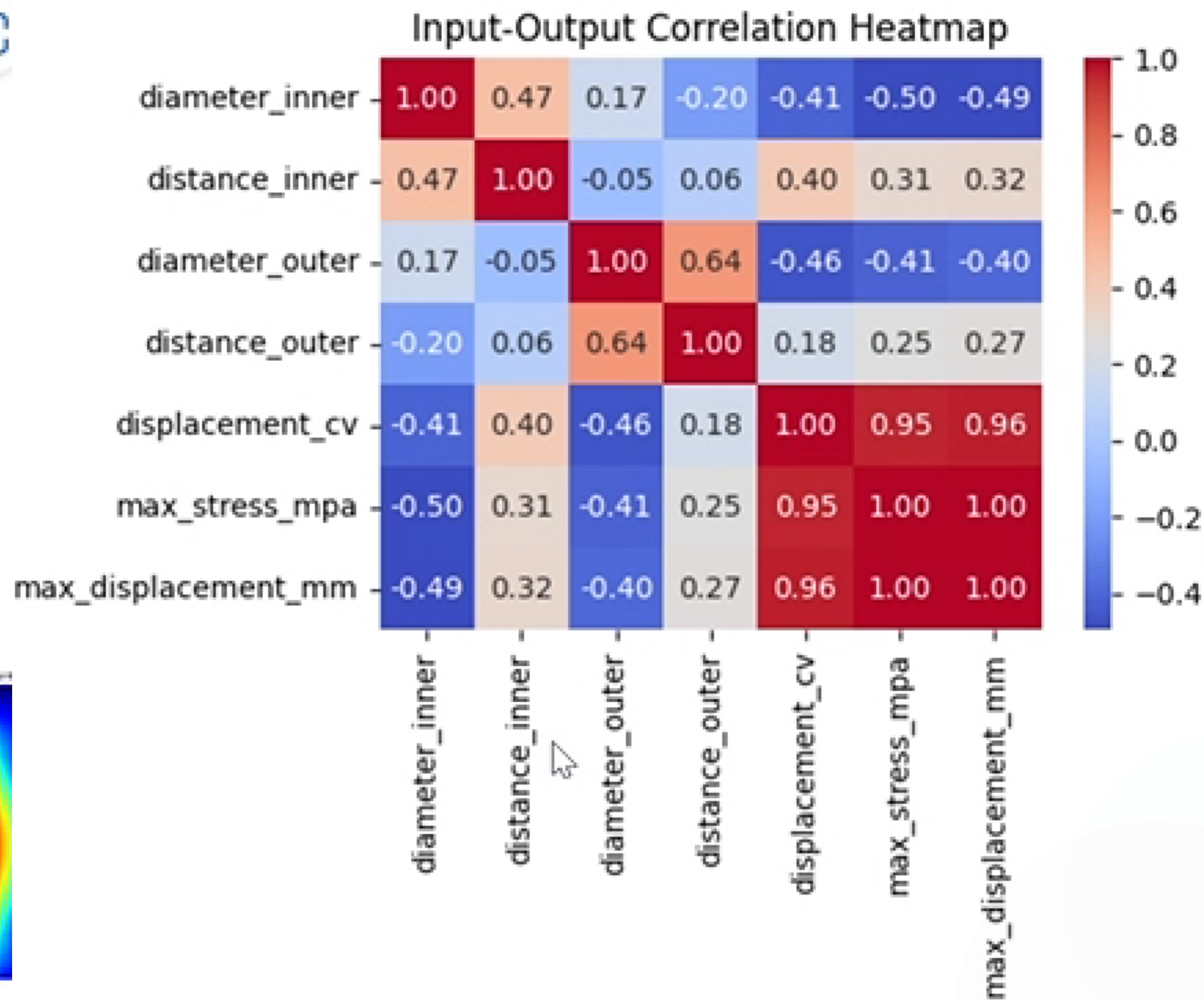
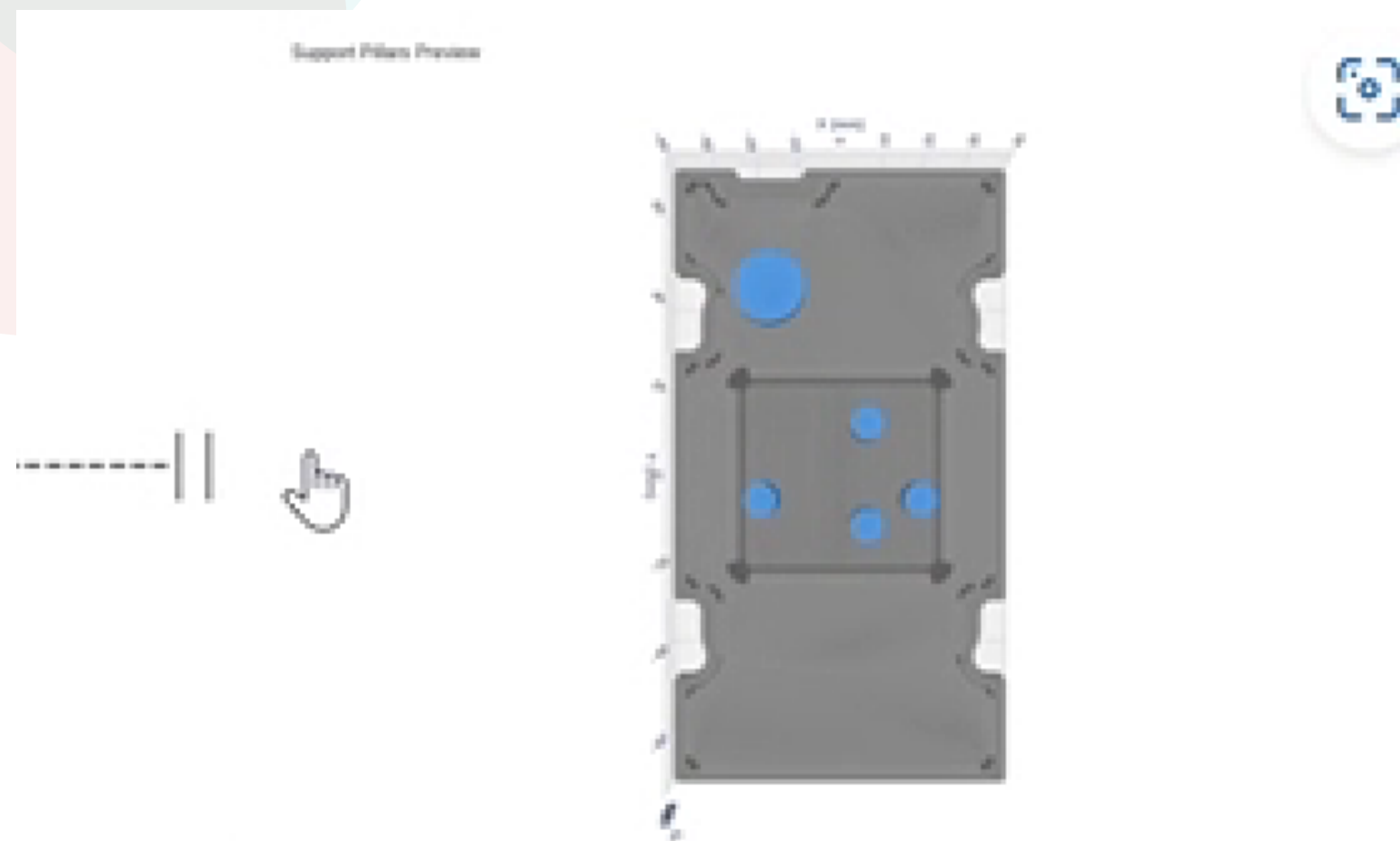
AI-assisted decision-making boosted overall R&D efficiency and product development speed

4

Standardizes and digitizes design knowledge, **reducing dependence on senior engineers**

4

Offers multiple design options to help engineers focus on high-potential designs, **improving simulation efficiency**



Leading Thermal Technology Company

AI-Driven Heat Sink Simulation & Optimization



Background & Challenge

In heat sink design, the client had to repeatedly adjust fin height, thickness, spacing, and other design parameters, then validate thermal performance via CFD simulation. The traditional process required repeated modeling, simulation, and analysis, greatly extending the product development cycle and engineering cost.

Solution

Helped the client deploy an AI Thermal Design Optimization Agent, **integrating CFD simulation results, DOE analysis, and parameter optimization to build an AI-assisted thermal design workflow.**

The platform automatically analyzes key heat sink design parameters, runs DOE and sensitivity analysis, compares design options, provides optimization suggestions, and supports interactive 3D Simulation visualization. This helps engineers quickly identify the best thermal design direction, reducing the number of trial-and-error iterations.

Results & Value

1

AI automatically analyzes heat sink simulation results, **significantly cutting engineering analysis time**

2

Quickly identifies the key design parameters affecting thermal performance, **improving design efficiency**

3

Reduces repeated CFD simulation runs, **shortening the product development cycle**

4

Provides interactive 3D simulation and DOE analysis, **accelerating engineering decisions**

Case: Heat Sink Simulation & Optimization

PhysicsNeMo DoE Analysis Agent / 3D Simulation with fin_height_center Parameter

Run a simulation with fin_height_center=0.5 and show me the 3D view

Thoughts

The simulation has been successfully run with fin_height_center set to 0.5. The interactive 3D view panel is now open, allowing you to explore the heatsink geometry and the simulation results (temperature, pressure, and velocity fields) in real time.

If you would like to focus on a specific visualization mode (such as temperature, pressure, or velocity) or adjust

Heatsink Thermal Analysis

3D View

Heatsink Parameters

Fin Length (Center) 1.000

Fin Length (Sides) 1.000

Fin Thickness (Center) 0.100

Fin Thickness (Sides) 0.100

Visualization

Temperature Velocity Pressure

Results

Peak Temperature: 11353.8 K (11080.6 °C)

Pressure Drop: 9.18 Pa

Inference Time: 117.6 ms

Workflow: sequential

PhysicsNeMo DoE Analysis Agent / Optimal Fin Configuration Analysis

Sensitivity analysis ranks fin_height_center as the most influential parameter, followed by fin_thickness_center.

Visualization:

The temperature contour for the optimal configuration (shown above) confirms effective heat spreading and the lowest peak temperature achieved in the sweep.

Recommendation:

Use the maximum tested values for both fin_height_center (0.5) and fin_thickness_center (0.15) to achieve the lowest possible peak temperature without exceeding the pressure drop constraint. If further improvement is needed, consider optimizing additional parameters or increasing airflow.

If you need further analysis or wish to explore a broader parameter range, please let me know!

DoE Statistical Analysis

Pareto Front

Main Effects on Peak Temperature

Response Surface: Peak Temperature (K)

Parameter Sensitivity

Ask AI about anything...

AI can make mistakes, so double-check it

Heatsink Thermal Analysis

Window Rendering

Viewport Render Settings

Heatsink Parameters

3D View

peak_temperature: 11353.8 K (11080.6 °C) mean_temperature: 305.4 K pressure_drop: 9.18 Pa

Case: Heat Sink Simulation & Analysis Report

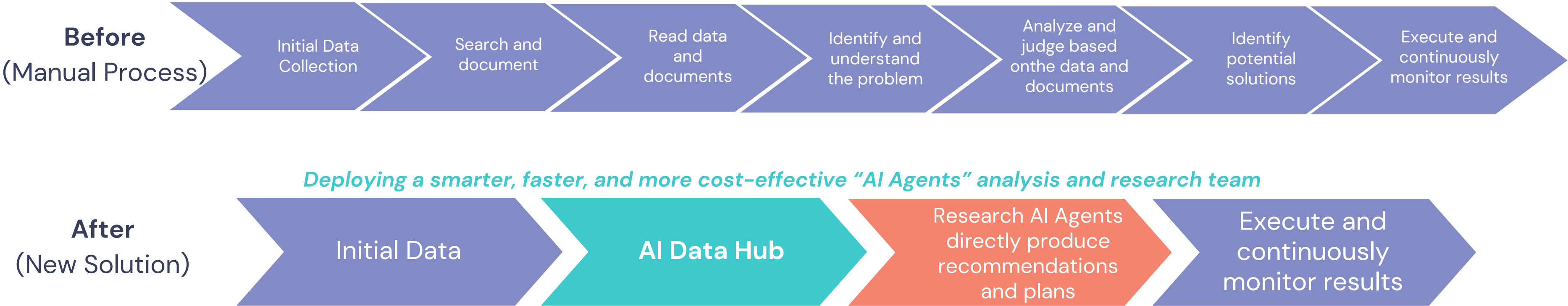


BEFORE & AFTER

Decision Time

5–10 days → 2–3 days

- Research and planning efficiency improved up to 100x
- AI- and data-driven, rapidly empowering every process across the organization



Decision Time	Document Processing Time	Cost Savings
30–100x	Research 1 week → 0.5 hours Routine 1.5 hours → 1 minute	US\$200K/month
Can reference 20–30x more data simultaneously		Based on a single 10–person lab

Enterprise AI: Supporting Research, Planning, and Decision-Making

Practical

Concrete

Systematic

Scientific

Depth

Upgrades from Excel-level analysis to industrial-grade statistical methods that uncover root causes

Speed

Cuts insight generation from “days” to “seconds” (10 million records, initial analysis report in 12 seconds)

Accessibility

Extends expert- and PhD-level analytical capability from the few to everyone (not just digitalization, but data-driven decision-making for all)

Proprietary Fine-Tuned Models
100% on-premise deployment,
secure and controllable

Training data sources: cleaned internal enterprise data, industrial-grade statistical methods, optimization and simulation workflows, and complete ML/DL training scripts.

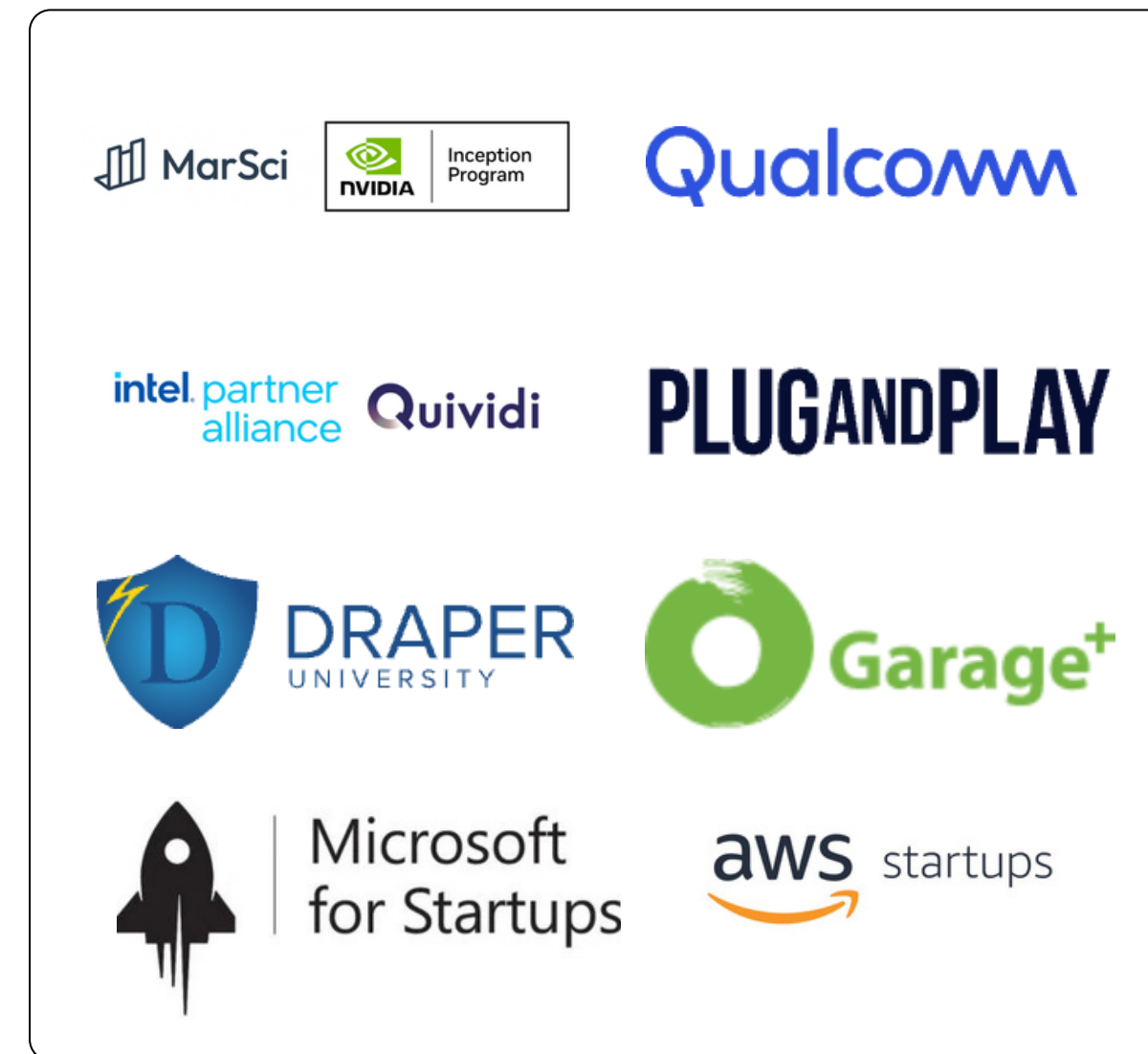
Clients & Partners



Enterprise Clients



Strategic Partners

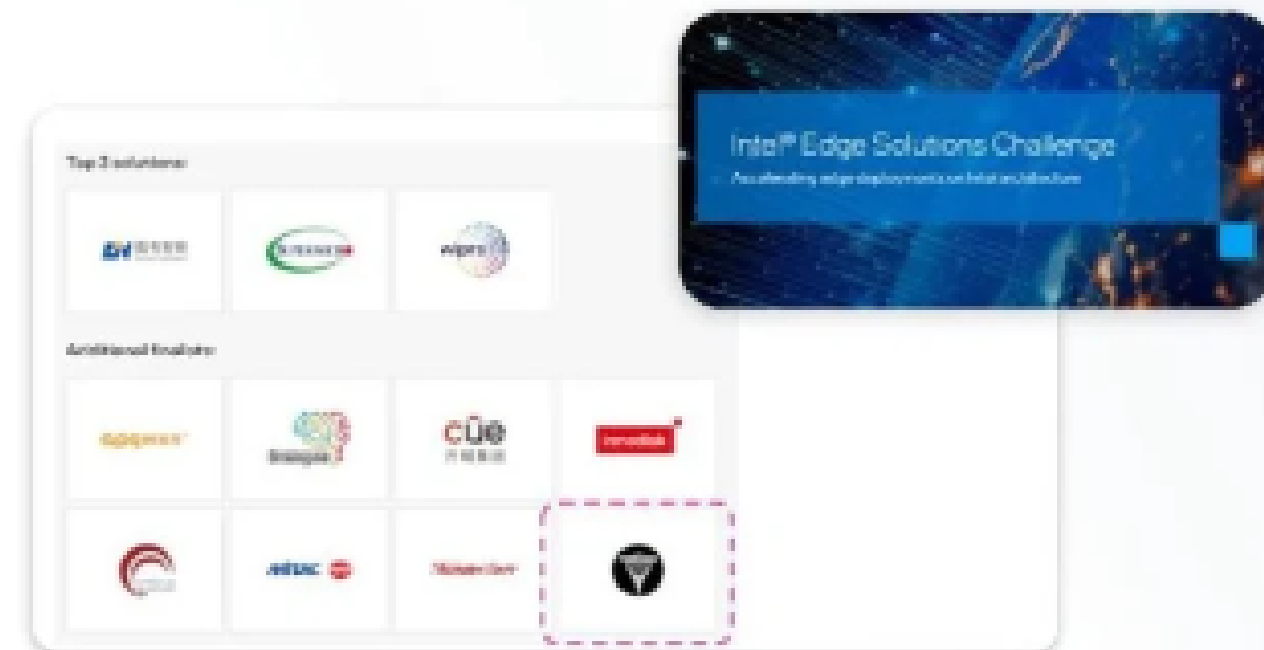


Accelerators & Ecosystem Partners

Technology Integration & Joint Solutions with Enterprise Partners



Qualcomm



intel partner

Discuss with AI

*Empowering exceptional thinking with AI
to help enterprises solve critical problems, driving
a more reliable, more sustainable future.*

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