MAXIMIZING DATA'S POTENTIAL

Data Analytics in Data Storage Device Development and Test

Debin Wang
Sr. Engineer | Drive Design & Test Analytics Platform Lead
Drive Reliability Group
Seagate Technology (US)

Open for Innovation ®
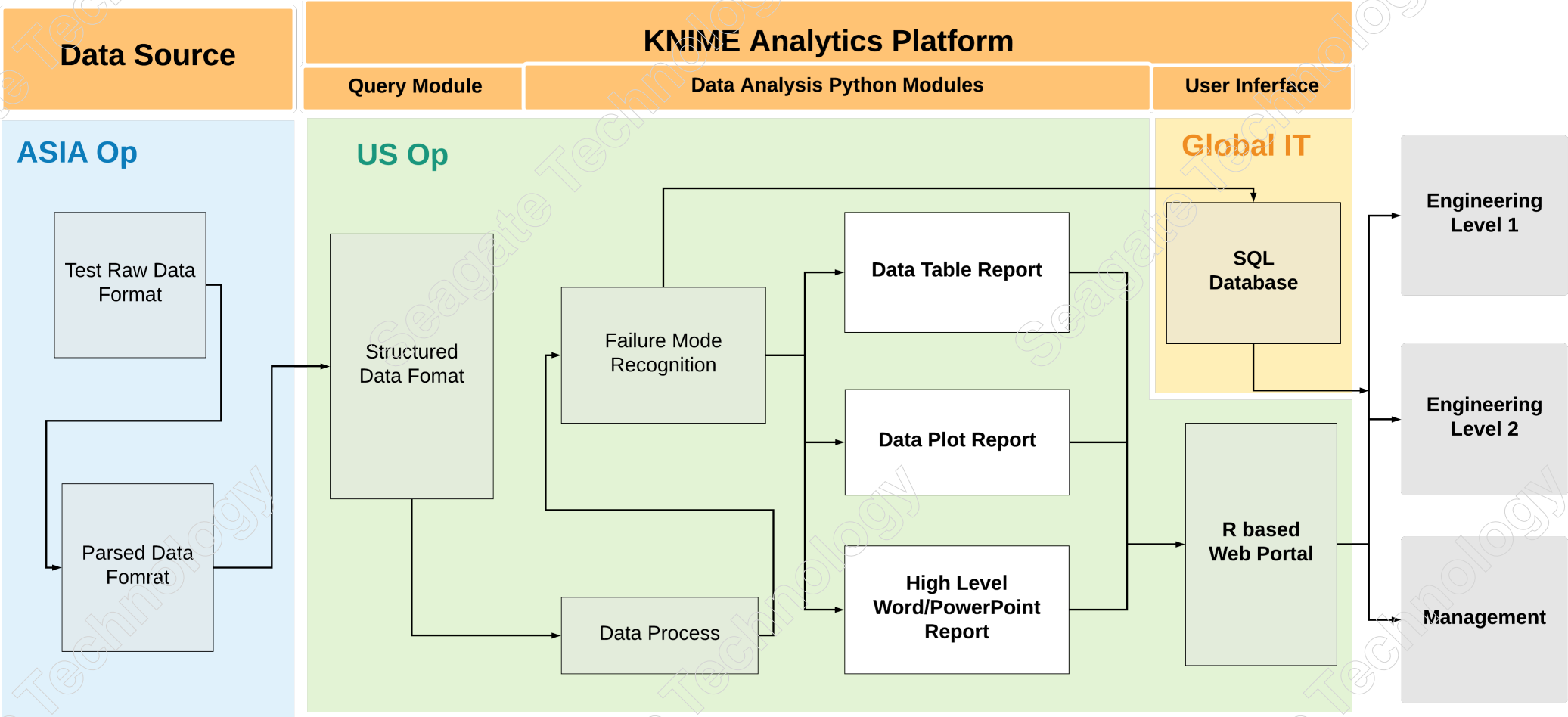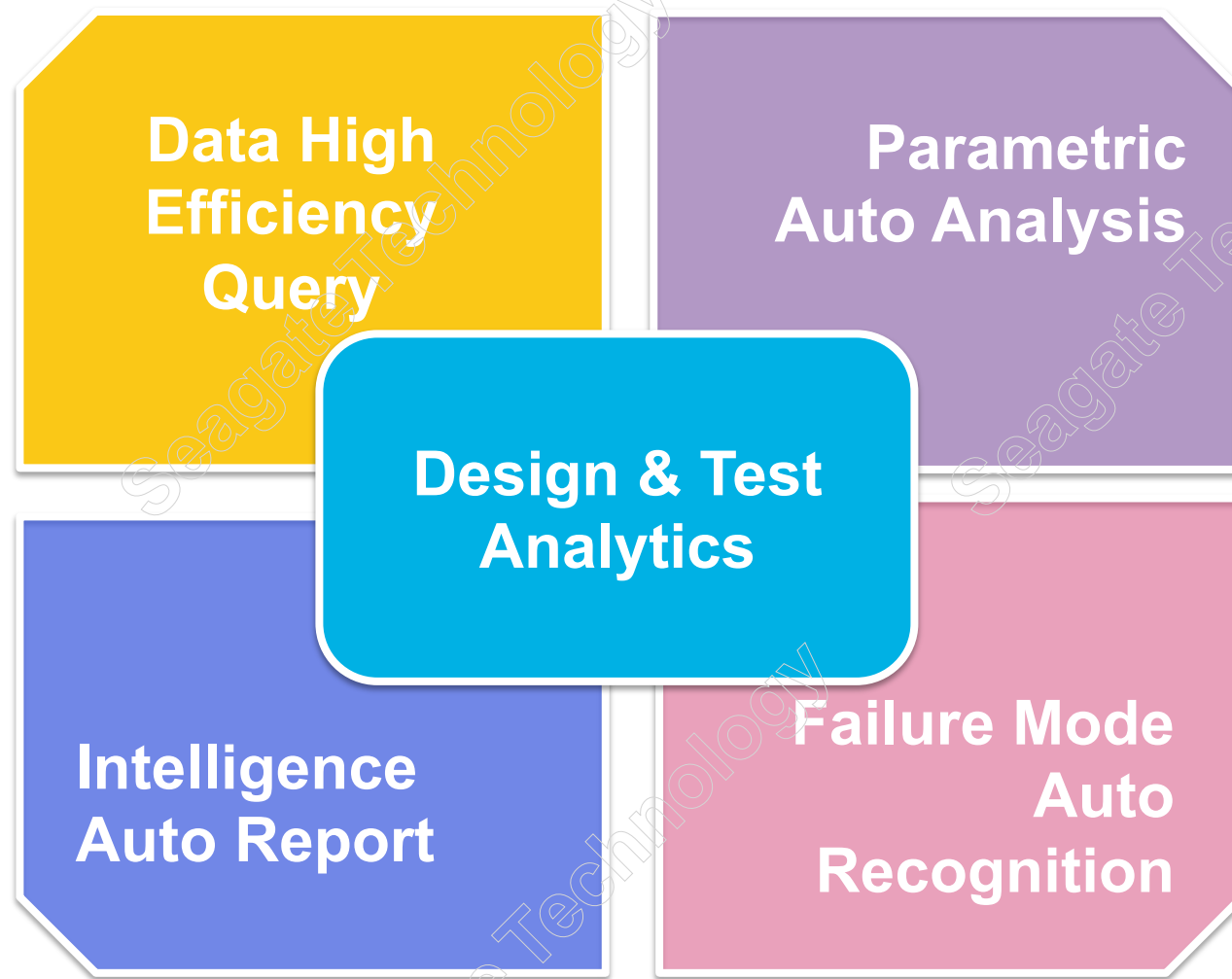KNIME

SEAGATE

Agenda

- ***About the Speaker***

- ***Drive Design & Development Analytics Platform***

- ***KNIME Applications & Working Cases***

  - *Integrated analytics platform*

  - *Parallel data query*

  - *Device failure mode recognition & prediction*

KNIME Deployment with Device Test Analytics Platform

Intelligence Platform for Device Design and Test

Data High Efficiency Query

Parametric Auto Analysis

Design & Test Analytics

Intelligence Auto Report

Failure Mode Auto Recognition

- **KNIME as a key enabler to drive the entire analytical streamline process.**

Integrated Drive Design and Test Analystics Platform

|		Data Query	Data Reports
Data Source		Device test log files and tables, images, etc	Summary tables, plots, pareto analysis, and reports.
Platform	Before	Web Browser, SQL Developer.	Excel, SAS JMP, Rstudio, Python IDE, Word, PowerPoint
	Now	**KNIME**	
		SQL Nodes	Python, R, Java Nodes

- **KNIME:** an integrated analystics platform that streamlines query, analytics, and reporting.
- **Cross platforms**: Windows, Mac, Linux (cluster server capable).
- **Open source** (cost reduction).
- **GUI:** visually create data flows,pipelines.
- **Integration:** Java, SQL, Python, Perl coding fragments, as well as R and ImageJ open source projects.
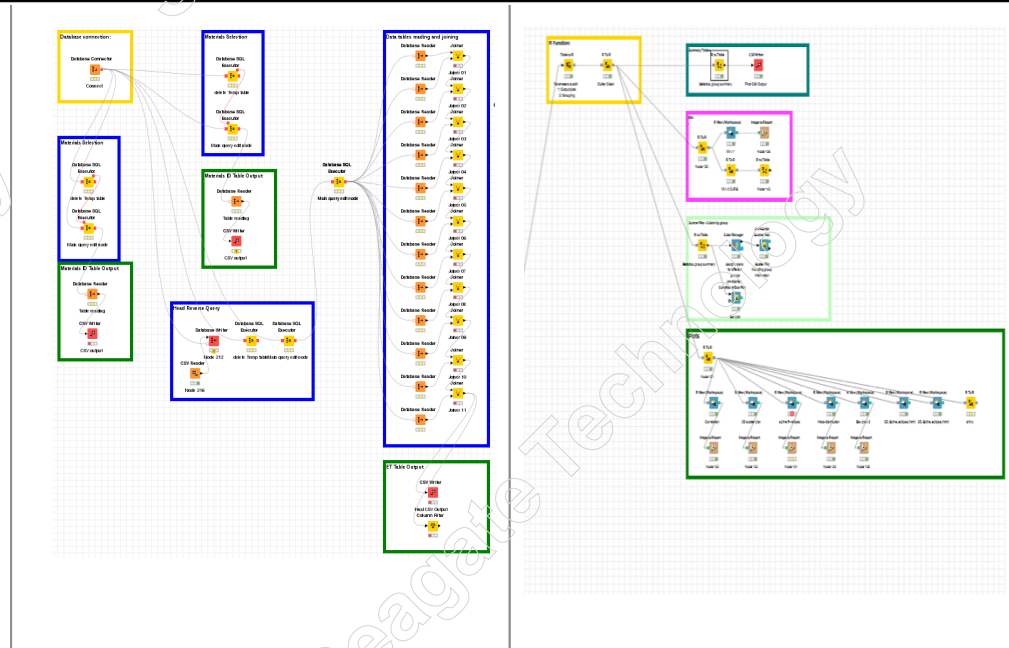
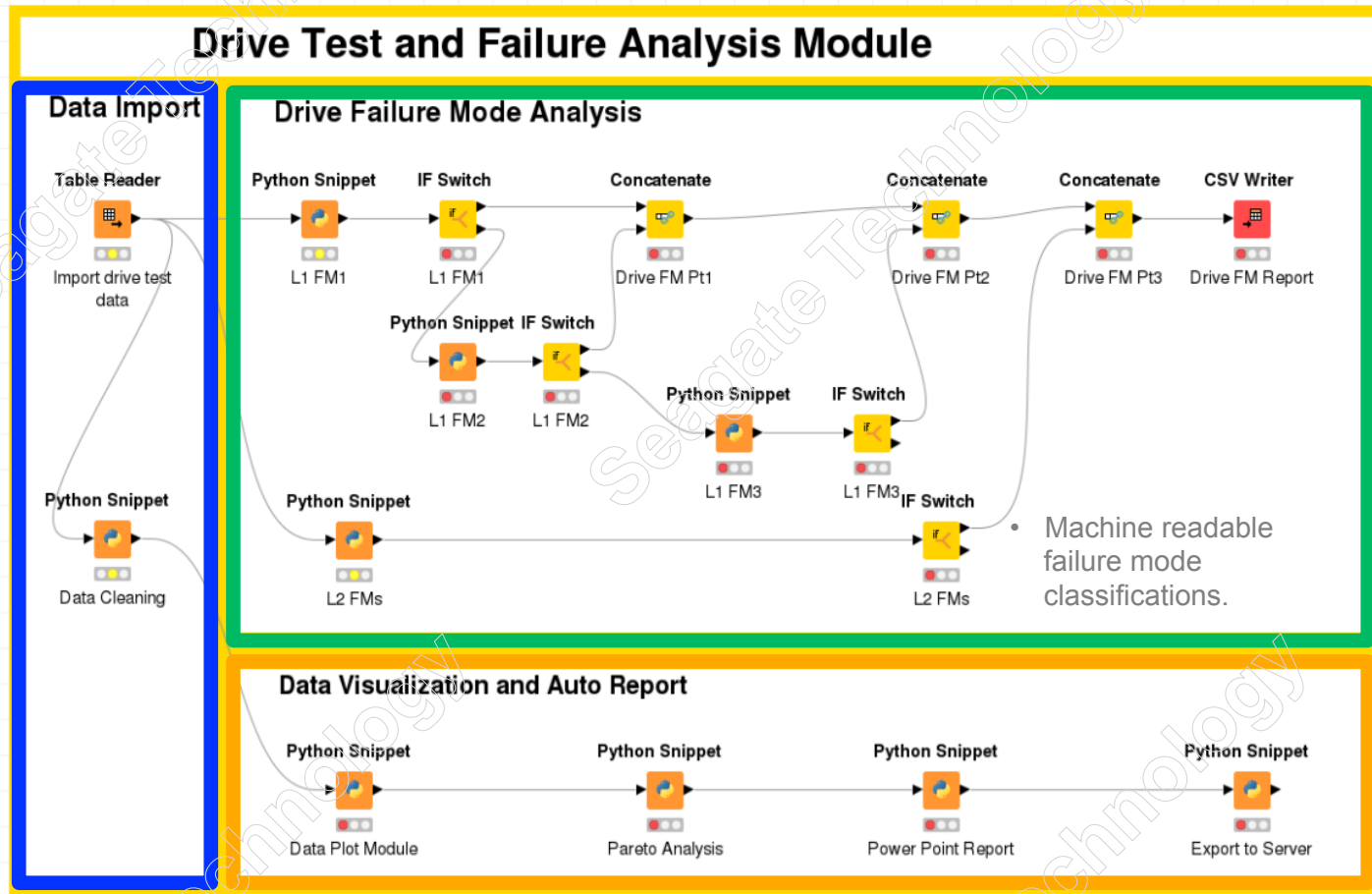# Work Case Scenario: Device Test Data Analysis
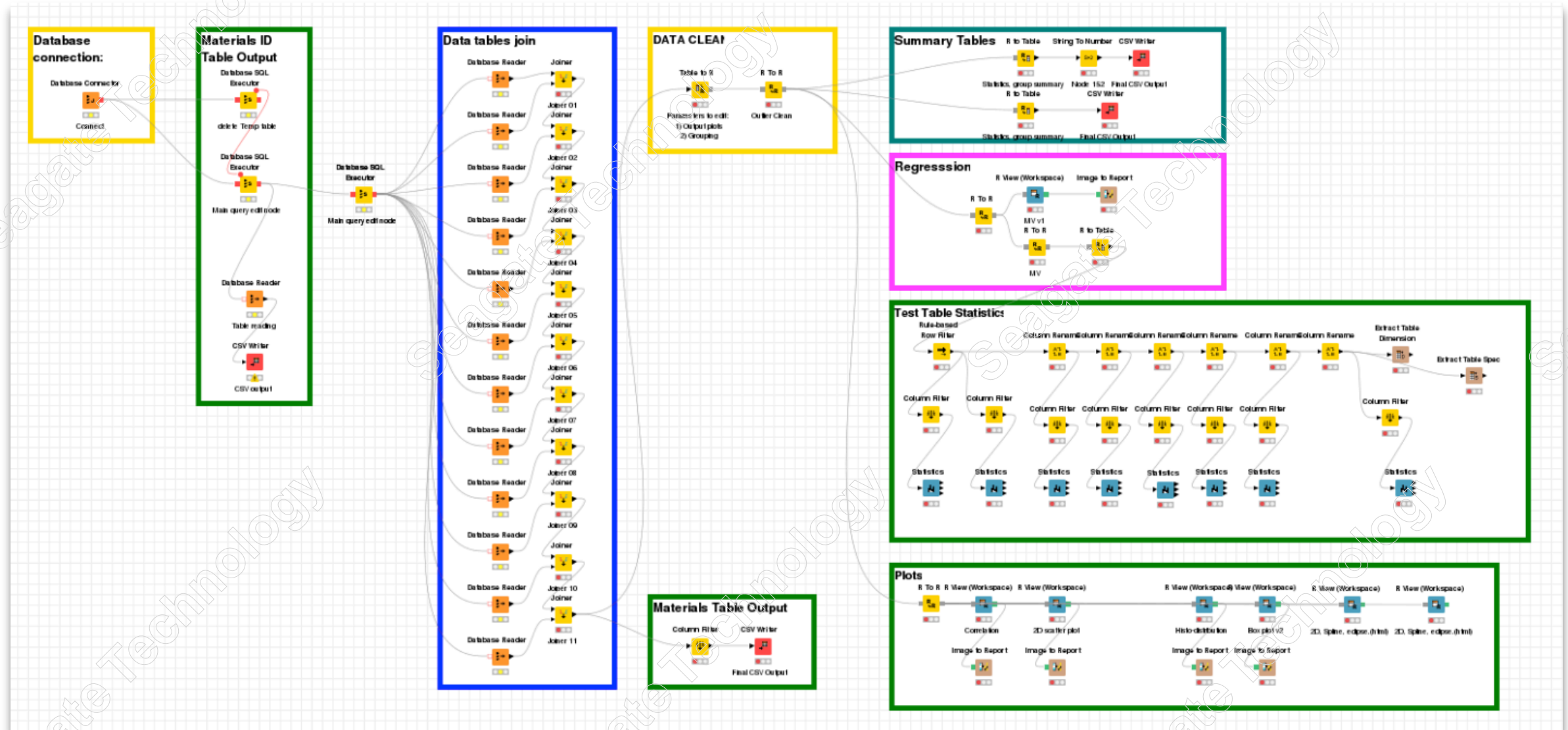
Work Case Scenario: Parallel Data Query
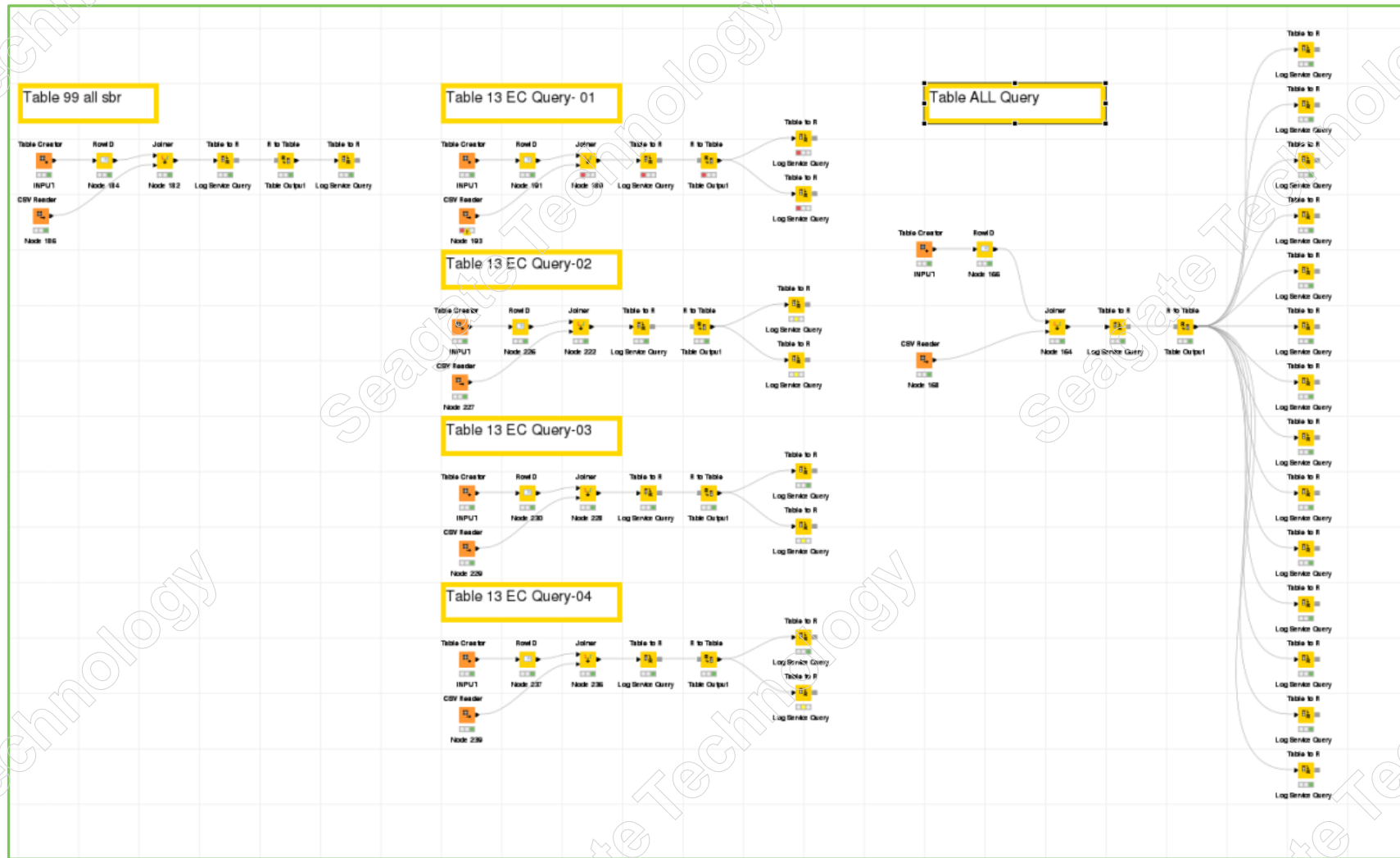
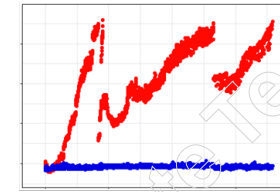- **KNIME enables powerful parallel query mechanisms to maximize data query efficiency.**

Work Case Scenario: Device Failure Prediction

Drive Test and Failure Analysis Module

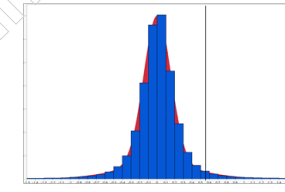- Machine readable failure mode classifications.
- Human readable plots and summary tables to digest and understand failure symptoms.

FM Regression & Prediction

Input (x1, x2) Parameter (a1, a2, a3)

$$f = f(x1, x2, a1, a2, a3)$$

Benchmark — Machine Recognition

Matching Score xx.x%