What Problems are we trying to solve?
Traditional Diagnostics Landscape

- Diagnostics Data Authoring Tooling
- Manufacturing Tester
- ECU Validation
- Diagnostics Design Tooling
- Embedded Diagnostics / OTA
- ECU Software Change Management
- After Sales Tester
- Diagnostics Sequence Authoring Tooling
Traditional Diagnostics Landscape

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Development

Manufacturing

After Sales
High-level Pain Points

• Efficiency / Cost
  • **Siloed Departments** – Engineering, Manufacturing, After Sales (inconsistent processes ?)
  • **Lack or re-use / Duplication** – Re-inventing the wheel
  • **Data Transport Inefficiency** – Multiple repositories, inconsistent version control, etc.

• Quality
  • **Waterfall / downhill mentality** – Less and less involvement as we move right
  • **Localised corrections** and work-arounds – Lack of field feedback

• Time
  • **Slower time to market** – Longer development cycles
Drivers/benefits of integration and automation?
Drivers for integration

- Increasingly complex vehicle platforms and ECU counts = Diagnostic Complexity
  - Customer demands for higher feature count
  - Electrification and Autonomy
- Customer Satisfaction
- Lower Warranty costs
- Reduced Time to Market
Why integrate?

- Efficiency
  - **Joined-up processes** – Plan and manage your development as an enterprise
  - **Left-shift tasks** – Reduce bottle necks and mature data earlier
  - **Centralise Storage** – Single repository for all diagnostic artefacts

- Quality
  - **Joined-up development** – All stakeholders have involvement in the development process
  - **Feedback loop** – “field” data is fed back into the development cycle, Continuous Improvement
Why automate?

- Efficiency
  - **Workflow Integration** – Automate task and resource management, lower PM costs
  - **Authoring Efficiency** – An author once, re-use many mentality
  - **Centralised Storage** – Single source of the truth, tooling integrations, event-based updates

- Quality
  - **Automated Checks & Validation** – Reject bad data, fewer field defects, fewer ECU sw revisions
  - **Consistent Change Management** – Minimise duplication, maximise re-use, delivery efficiencies
Why automate?

• Time
  • **Reduced task overhead** – Leverage workflow and validation to simplify resource-specific tasks
  • **Reduced validation** – Use tooling like the ECU Validator to reduce sw acceptance testing cycles

• Cost
  • **Workflow Integration** – Automate task and resource management, lower PM costs
  • **Reduced year-on-year cost** – Automation reduces the carry-over effort
Integration Pay-back

Automation in the V-cycle

Automate data **import**

Automate **development** tasks

Automate transitions with **workflow**

Automate ECU / feature **testing**

**Vehicle Requirements Definition**

**Feature Requirements Definition**

**ECU Development**

**ECU Validation**

**Feature Integration & Rig Validation**

**Vehicle Validation**
KPIT’s IDD Solution
Solution Overview

IDD – Platform Tooling for Diagnostic Design, Data Authoring & Compliance Testing

**Diagnostic Design**
- Diagnostic design at Logical, System & Component Levels
- Diagnostic design using Failure Modes & Effects Analysis, Vehicle Wiring Harness, Systems & Network Architecture Data

**Diagnostic Authoring**
- Standardised Diagnostic Data & Test Sequence Authoring
- Documentation of Trouble Codes & Parameters for Manufacturing & Service Technicians
- Exchange of standardised machine readable data formats – ODX & OTX

**Compliance Testing**
- Testing & Validation of Diagnostic requirements implemented in the ECU SW
- Automated configuration and execution of test cases
- Integrated debugging, test logs and results

**User Group:**
- Diagnostic Architects, Feature Owners
- Component Owners, ECU Vendors
- Component Owners, ECU vendors
Solution Overview

Enterprise Apps

Analytics
Publication / Release Management

IDD Repository

IDD Tool Interface

OTX/ODX Checkers
ECU Editor
ECU Validator
OTX Authoring
Custom tools

Workflow
Dashboard

Engineering
Manufacturing
Aftersales / Embedded
Differentiators

• Holistic Approach
  • **Process Unification** – Consistent processes cross the enterprise (engineering -> after sales)
  • **Tool Integration** – Uniquely positioned as a ‘whole solution’ package with full integration
  • **Enterprise Integration** – Capable of up/downstream integration to carry feeds and outputs

• Quality
  • **Automated Validation** – Data management and quality checkpoints
  • **Consistent Data Management** – Consolidated storage, author once, re-use mentality

• Uniquely positioned in the market – platform, tools, and process development
Customer Successes
UK based OEM

- Process and Solution Development internally released
- Final rollout Q1 2019
- Expected diagnostic development time savings of 30 - 50% over current state
- Dramatically reduced ECU sw validation cycles through automated testing
Final Thoughts
What is your preference?

Approach A - Disparate

- Process intensive, disparate tooling

Approach B - Integrated

- Streamlined process, integrated tooling and automated management
Thank you for listening!

Q&A