



KPIT

K-DCP Business Integration Booklet

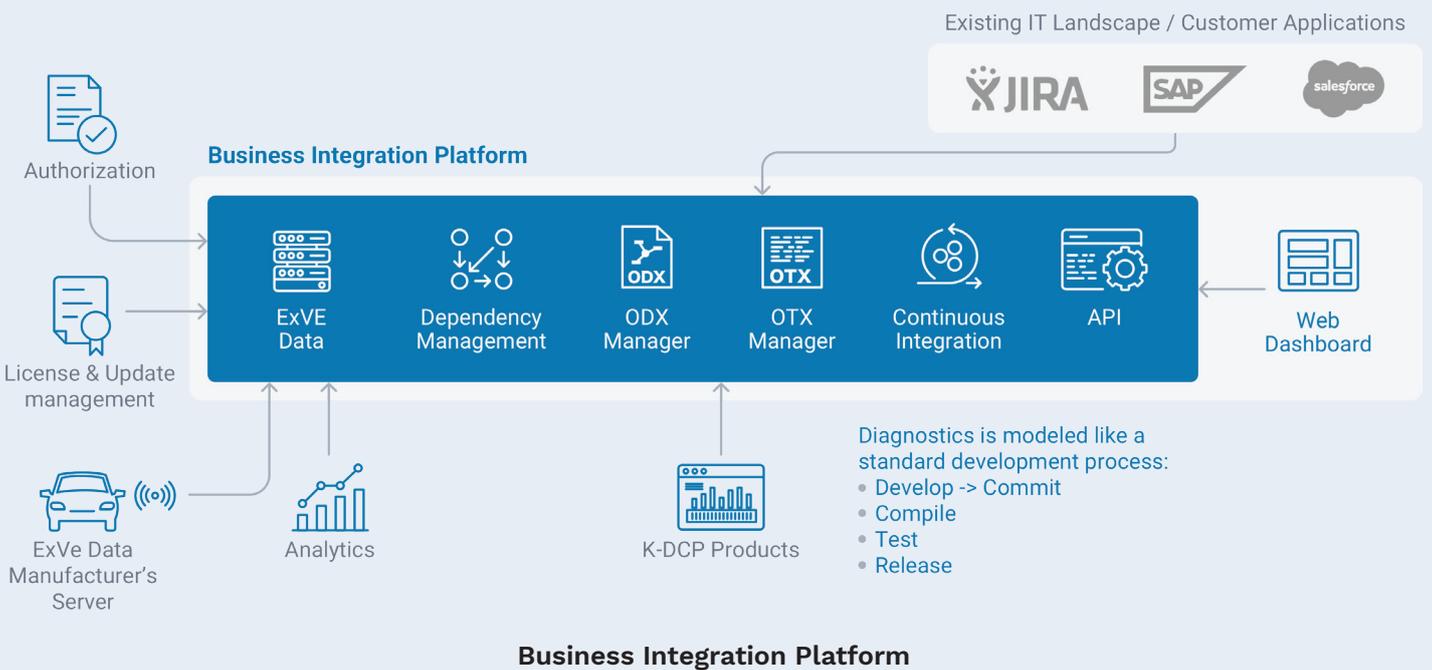
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K-DCP: KPIT's Diagnostic & Connectivity Platform

K-DCP Business Integration

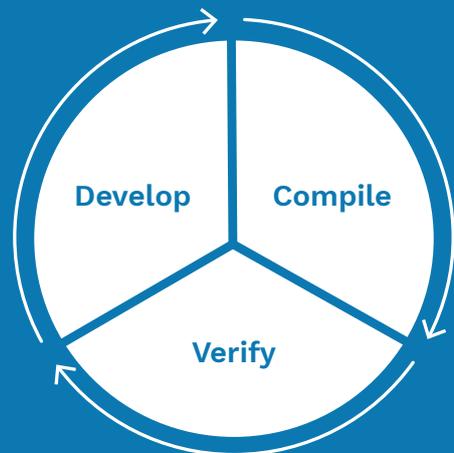
In an era of digital transformation, it has become imperative for organizations to think about how to integrate systems, applications and data. Successful technological innovations today need to leverage assets at an enterprise level, in order to leverage existing data assets and cross functional synergies for business utility.

KPIT provides a Business Integration Platform and consultancy to enable integration of K-DCP offerings with the OEM's enterprise environment. This system level integration supports customers digitization needs and ensures proper utilization of existing data assets & cross functional synergies.



The Business Integration Platform follows enterprise integration methodologies, with industry specifications like REST HAL, OPEN API, OAuth2, etc. to expose diagnostic data services within and outside the diagnostic data development process.

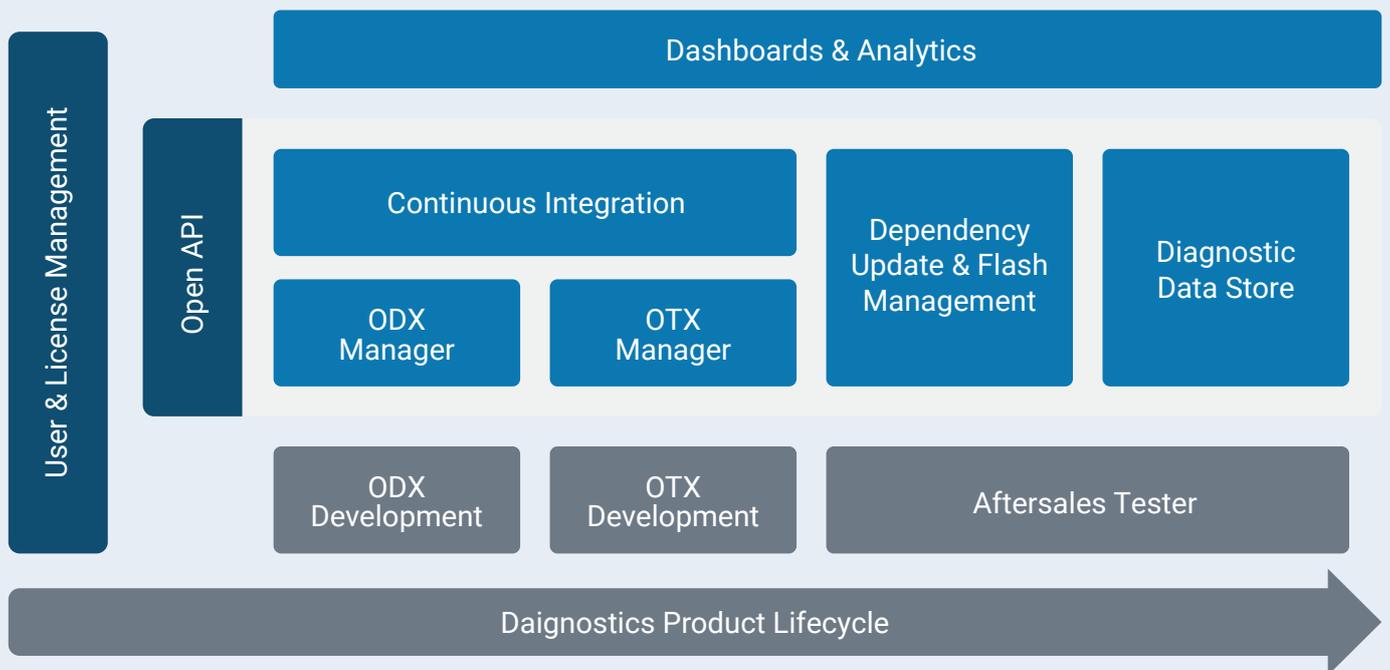
The platform mimics a standard software development process for Diagnostics development. This ensures that 'stored data' is reliable and 'deployable'.



Value Proposition

The K-DCP Business Integration platform enables better reliability, higher reusability and lower development cost of diagnostics data, whilst maintaining high data quality

The cloud-based or on-premise Business Integration Platform provides services and data storage to support the whole diagnostics product lifecycle, combined with an API layer to integrate existing IT landscape solutions, manage authentication/ authorization and ensure security.



KPIT's Business Integration Platform joins the dots between processes and tools, and:

- Provides a backbone for truly centralized diagnostic data authoring and content delivery system
- Enables rapid platform adoption with out-of-the-box tooling integration
- Uses enterprise integration patterns to lower cost and accelerate IT-backend cohesion
- Provides data maturity dashboards with up-to-the-minute insights
- Is deployable on-cloud and on customers infrastructure

Integration API | Product Overview



Purpose

The Integration API is a gateway to the data stored in the Integration platform and provides the infrastructure for integrating with existing IT landscape



Users

Application developers, external applications as consumers



Input

Standard REST API call



Output

JSON



Key Benefits

- REST-based following the OPEN API standard
- OAuth out of the box
- All diagnostics data, engineering and aftersales, is available across the enterprise landscape

Integrating existing toolchain and diagnostic tools to accelerate adoption, KPIT's K-DCP tools are integrated out-of-the-box, and authorized external applications can easily be added through simple integration interfaces. This flexible approach allows for the creation of custom adapters to integrate with systems which would send data to the Business Integration Platform. This data can be stored and made available to downstream applications.

Integrates easily
with the existing
IT landscape

Secure Access – In a world with an ever-increasing burden of information-privacy and security-related threats, a “secure-by-design” ethos is a critical factor in any system that manages sensitive information. KPIT provides out-of-the-box authentication using OAuth and fine-grained access control of data artifacts across its entire toolchain. Integrated licensing management through KPIT's LIMAS ensures that the correct data is only visible to the appropriately authorized personnel.

Salient Features

Standards compliant API for
frictionless integration

Integrates with Salesforce,
identity management, Open ID

Access is controlled with
licenses

Unified tool chain achieved with
central data source

Data is **available centrally** for all
enterprise systems

KPIT tools are **integrated
out of the box**

License Management (LIMAS) | Product Overview



Purpose

LIMAS is an off-the-shelf solution for License management of K-DCP and related tools. It provides dynamic licensing solutions with models to suit multiple use-cases (floating, token-based, etc.).



Users

Tool users, administrators



Input

User information



Output

Encrypted License File, Software Update Package



Key Benefits

- Flexible Software Licensing Models
- Efficient In-Product license Activation Support
- Protect Software and Prevent Unauthorized Copying
- Web-based Administrator Console
- Update data and software delivery
- API for 3rd party integration for user data
- Supports 3rd party application licensing with simple API and library

In today's world of rapidly evolving solutions, it is vital that our customers can provide fit-for-purpose provisioning solution to match dynamic business needs. KPIT's LIMAS makes it easy for application producers to monetize, secure, enhance and grow market share through the flexible pricing, packaging, and licensing of applications, intelligent devices or equipment using embedded software.

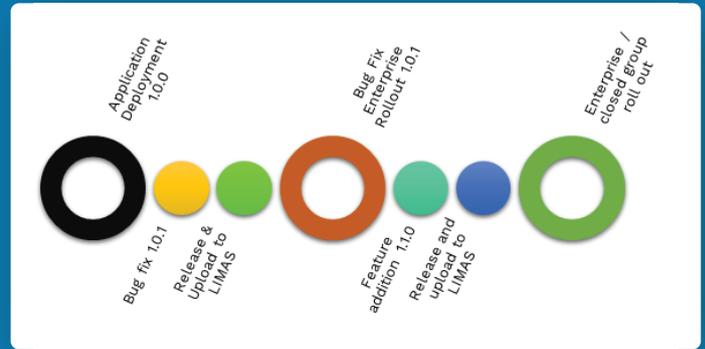
LIMAS licensing also gives organizations the power to protect IP and rein in unauthorized software use to prevent piracy

LIMAS manages applications by controlling different license models, user roles, features and updates.

Flexible Software Licensing Models - Support for the most popular software licensing models to protect customer's software tools (e.g. engineering, manufacturing or service testers) and enforce business rules. Software licensing models supported include subscription, time-limited, capacity-based, feature-based, hardware-locked, node-locked, concurrent/floating, pay-per-use, and trial/evaluation licensing.

Application Updates

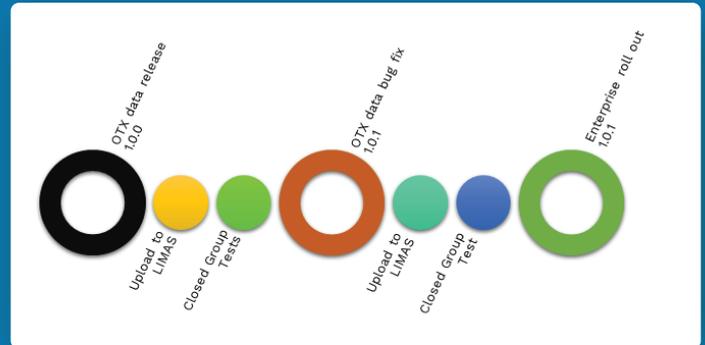
LIMAS provides in built functionality for application data and entire application updates. These updates can be rolled out to an entire organization or just target groups. All updates are tied to a valid license



Data Updates

Like application updates, LIMAS supports update of diagnostic data. This allows easy distribution of diagnostic data to consuming applications. This distribution of data can be controlled at user level as the update is tied to a user's licenses

The update mechanism can be integrated directly into the engineering ecosystem, reducing friction in the entire data creation and distribution process



Efficient In-Product License Activation Support - Enable users to activate license servers in a single step; provide secure license return and transfer; reduce instances of 'casual copying' or 'soft lifting'; support for secure online and offline in-product license activation.

Protect Software and Prevent Unauthorized Copying - Minimize piracy risk, maximize revenue and strengthen IP (intellectual property) protection with additional security layers utilizing KPIT's tamper resistant application functionality that provides protection against hacking and software piracy through sophisticated detection and identification of unauthorized use.

Offline Support

Offline support allows the license provider to license applications permanently or temporarily with one-time activation process.

All long-term licenses are available offline. They can be configured to periodically connect to the server to keep their operational validity. This forces the user to be online at least once as defined in the license.

Floating licenses can be 'checked out' for a few hours or days when the user knows that they need to use the application offline, e.g. working in basement or remote locations.

Unlimited configurations

LIMAS does not restrict the license providers licensable features. Any number of features can be licensed without development efforts on LIMAS.

Salient Features

Licensing with unlimited licensable features	REST based backend for easy integration with CRM systems e.g. salesforce	Licenses are available offline
Floating, long term and node locked licenses	User management with identity management integration	Data and software updates controlled via licenses

ODX | OTX Data Management | Continuous Integration | Product Overview



Purpose

A central system of record for diagnostic data (OTX and ODX data) that offers API integrations and built-in workflows.



Users

All OTX and ODX tool users



Input

OTX and ODX data



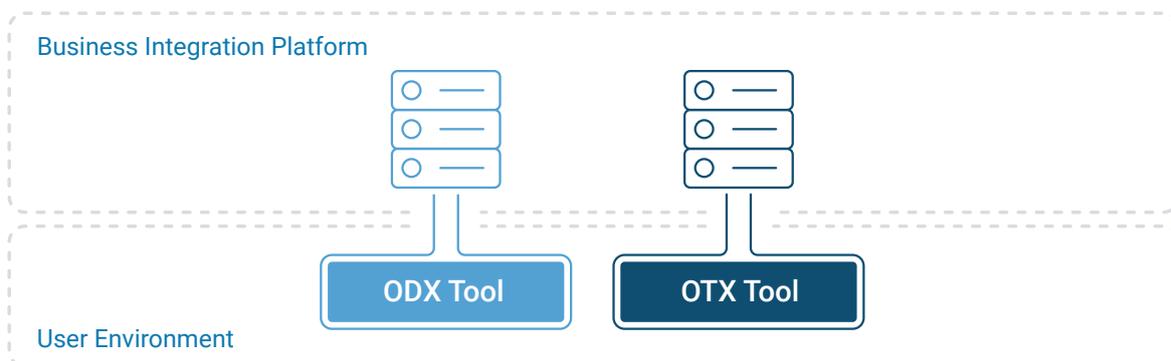
Output

Data is stored centrally and is available over API



Key Benefits

- OTX and ODX data is centrally available
- With continuous integration only valid and tested data is released to downstream systems
- Possibility of locking files to prevent concurrent modifications



OTX and ODX data management - Reliable, controlled storage is a vital part of any diagnostic data delivery system. KPIT's Business Integration Platform comes equipped with off-the-shelf diagnostic data storage and delivery functionality.

It manages data generated by the diagnostic development process and provides delivery for data utilized by the diagnostic execution process. This is integrated with all the K-DCP tools and includes storage of ODX data and OTX sequences as well as any ancillary data. These data stores are segregated and are available via API.

All data stored in the OTX and ODX data management application is versioned and provides checkout, revision history and merging functionality in consuming tools.



Continuous Integration – Quality is the key to reliability in the field. KPIT understand this and provide processes to automatically perform quality and validation checks. The integration solution allows diagnostic data to mimic the software development process with steps such as: quality gates with continuous build, checkers, test automation, release management and publishing. These can be easily configured to implement customer-specific data quality and verification processes.

Enables automated testing & validating

Infrastructure and Database Agnostic

Both OTX and ODX managers provide an abstraction to the underlying deployment and data storage mechanism. This gives an organization the freedom to choose its infrastructure provider and storage method. The backend generates a REST contract for the application. Also, the backend supports plugin architecture which allows quick development of unsupported storage types.

Salient Features

Can use multiple backend storage types as the integration is API driven	REST based communication allowing easy integration	Data is version controlled
File locking functionality to avoid parallel changes	User level access control on data	Can be deployed on cloud or customer environment

Dependency Management (DDM) | Product Overview



Purpose

Engineering data, artifacts, manuals and documentation are made available for download based on its dependencies



Users

Development team, Diagnostic engineers, After sales tool users



Input

Material Information, Assets, Dependency relationships



Output

Material Information, Assets, Dependency relationships



Key Benefits

- Visual representation of dependency Graph
- Graph API for querying the dependency Graph
- Update package generation based on relationships

Dependency management, as the name suggests, manages dependencies within and between software (flash files or calibration files) and hardware parts, in different parts of a subsystem or a system. These dependences can be easily modelled via a user interface.

Every part can define its own asset which can be images, hex files or anything that needs to be managed. Also, each part can have its own attributes.

All this information is arranged by the system as a directed dependency graph as illustrated below.

Material: E1358-2225

Type	: ECU
Name	: Bodyroll
Number	: E1358-2225
Description	: Control unit for roll

#	Type	Name	Unit	Value	Action
1	Currency	Price	EUR	800	[edit] [delete] [refresh]
2	Scientific	Speed	m/s	10	[edit] [delete] [refresh]

Material Versions

Name	Material Version	Phasing Out Date	Validity Date	Breaking Charges	Deprecated	Action
Deployment Release	1.0.0	Sep 5, 2019	Aug 8, 2019	NO	NO	[G]
Pre-Production Release	2.0.0	Sep 25, 2019	Sep 5, 2019	NO	NO	[G]
Production Release	3.0.0	Sep 30, 2019	Sep 25, 2019	NO	NO	[G]
0.0.2-ewrwer-7686rtw3reerz56769776-zuydfasdawdasc56456575676		Sep 28, 2019	Sep 14, 2019	NO	NO	[G]

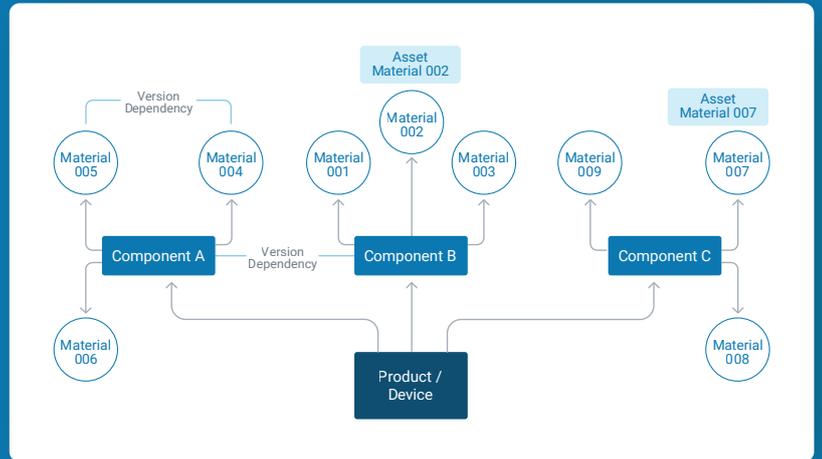
Material Assets

#	Name	MBME Type	URL	Description	Action
1	Product Image	Image/png	https://cdn.example.local/images/E1358	..	[edit] [delete] [refresh]

Each node represents a part (hardware, software, etc.), and each relationship represents how two part are associated. This general-purpose structure allows you to model all kinds of scenarios – from a material, to a network of devices, to a vehicle or anything else defined by relationships.

This gives the system a unique ability to manage assets attached to a part as dependencies. The system can generate an **update package** based on the dependencies which are available for download via an API.

With the above information in the aftersales, Dependency Management optimizes delivery efficiency and enables update recommendations and efficient data packages for usage in service-tester. It creates a dependency graph for each device in the system.



The system is fully Open API compliant. This allows your organization to easily integrate up-stream systems to feed [or manually define] hardware and software version combinations to build software update lineage. The system can determine orchestration plans that can be leveraged at update time to ensure feature-based or multi-ECU based updates are correctly applied. This enables also to target specific vehicle-sets with combinations of hardware and software versions and suggest the optimal approach to update or calibrate the connected vehicle.

Dependency management, as a result, provides a **central system** to **track software** and **hardware** update information along with **historical service information** in case of **warranty claims**.
It **acts** as a **system of records** to **audit** how a device was upgraded and by whom.

Salient Features

All data stored as dependencies	Graphical visualization of dependencies	Simple form-based dependency modelling
REST based Graph Query API	Full audit trail will rollback information	Asset Management for content delivery

Diagnostic Data Store (DDS) | Offering Overview



Purpose

Store vehicle or machine state data and make it available via an API



Users

After sales tool users, engineering teams, business management



Input

Session data from testers. Production data with machine flash information



Output

Machine data stored in data base which is readily available via an API



Key Benefits

- All machine data is available in one location – No heterogeneous data lakes
- Data is available via Open API compliant API
- Data show is a raw data twin of a machine or a vehicle in the field

In an increasingly automated world where data-driven intelligence drives business decisions, information is key. KPIT meets this need with a fit-for-future **'data-twin'** solution: vehicle data from manufacturing to end-of-life as well as feedback and semantic knowledge from the field is captured in a **Diagnostics Data Store** and a **data-twin** is generated for each vehicle. It provides automated data-feed capabilities and an intuitive interface for data visualization.

One important feature of DDS is the flexible data model which allows easy 3rd party integration to store data in DDS. This flexibility is achieved by auto generating the REST API and the repositories based on the target data model provided.

The advantages of a valid-in-time vehicle model for entire vehicle fleets are unbounded. They range from acting as a stable base data source for an **Extended Vehicle (ExVe Standard)** through to advanced machine-learning based algorithms for predictive analysis.

Salient Features

Flexible data model
for diagnostics

Auto generated API reducing
deployment time

Available offline with KPIT
tester framework outside
the box

Diagnostics data for devices is
available online

Secure access via licenses or
enterprise Identity management

Multi-tenant
support

Dashboards & Analytics | Offering Overview



Purpose

Analysis of data available in the Business Integration Platform for

- Dashboarding
- Predictive maintenance



Users

Business decision makers



Input

All the data in Business Integration Platform



Output

- Dashboard
- Alerts
- Recommendations



Key Benefits

- Data is readily available from Engineering till aftersales
- Engineering maturity is visible in real-time
- Alerts and anomaly detection can be automated for quick reaction

In-built dashboards provide management an overview that ensures your organization is firmly in control and able to rapidly zero-in on in-field or development issues. Data analytics provide detailed usage statistics and identify attention hotspots (for example emerging or recurrent diagnostic failures or program development that is not currently behind, but where the velocity and remaining work effort mean it will become late).



Dashboards can provide early field warning and help establish the maturity scoring a vehicle model in development.

When combined with aftersales data, analytics can quickly identify recurring problems in the field with vehicles. This is further extended to predict potential problems in the field based on historical evidence.

Salient Features

Overview of diagnostic development state	Early field warnings for delays	Maturity scoring for vehicle models in development
Dashboarding for management with actual live data	Analyze after sales data for warranty claims	Detect potential delays in diagnostic data development cycle