P&PM´s Device Status Code Manager
Management of Diagnostic Trouble Code Data via Cloud Solutions

Powered by Mendix

Complexity and Relevancy of
Diagnostic Trouble Codes significantly increases

The more functions are implemented via embedded software, the more codes are needed to steer the interaction of products with end users, service technicians etc. - also in case of faults. Therefore, the relevancy of Diagnostic Trouble Codes increases.
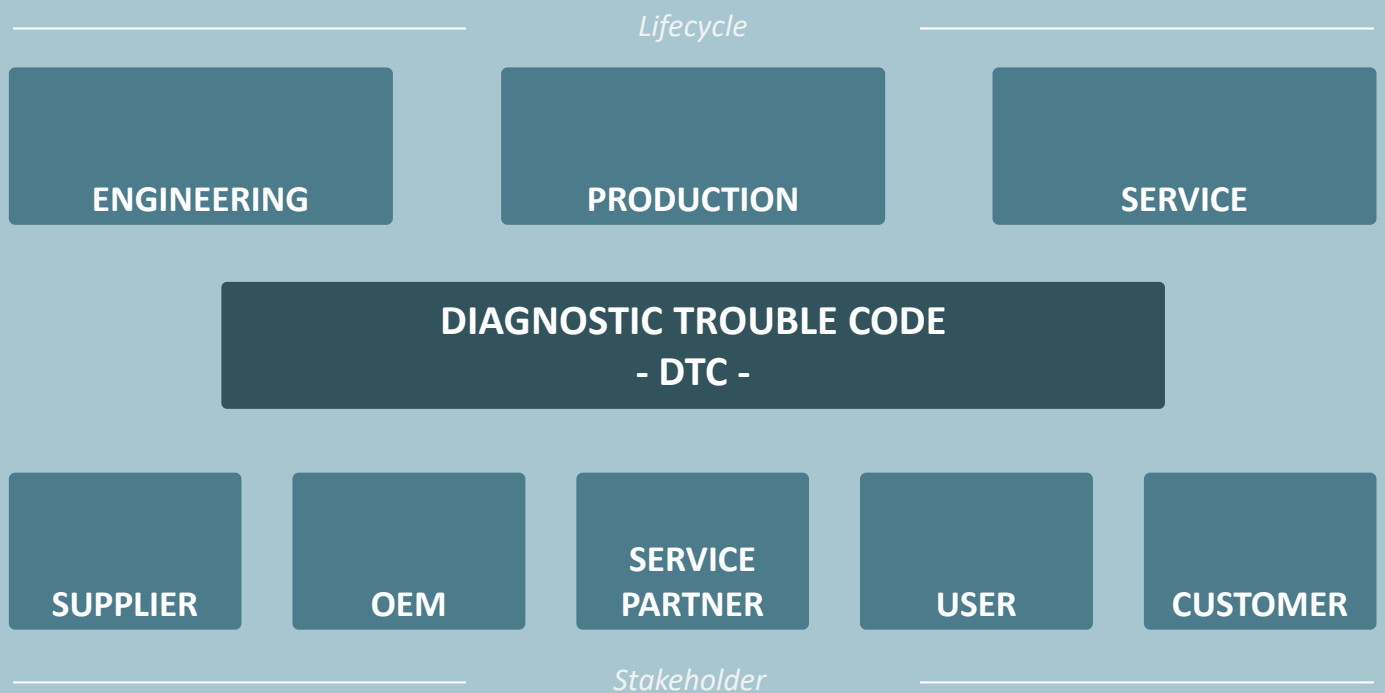
Additional complexity results from the increasing amount of function variants of embedded software: Fault descriptions as well as corrective measures more and more become specific per function variant. Fault and measure descriptions need to be configured per function variant.

Precise Diagnostic Trouble Codes and the instant availability of related information on corrective measures are a rather hidden product quality aspect. With an increased amount of software functions as well as an enhanced connectivity, the management and distribution of fault codes and related information becomes a key success factor for state of the art service performance.

Providing detailed fault descriptions in case of incidents together with the right measure and action plan significantly influences First-Time-Fix-Rates and therefore operating costs. Also, accurate fault probabilities and impacts are the basis for predictive maintenance.

Correct and fast Interpretation of Device Codes directly influences the Operation Performance of Products

Single Source of Truth for Diagnostic Trouble Code Data – linking Engineering and Service Operations

Lifecycle

ENGINEERING	PRODUCTION	SERVICE

DIAGNOSTIC TROUBLE CODE - DTC -

SUPPLIER	OEM	SERVICE PARTNER	USER	CUSTOMER

Stakeholder

Diagnostic Trouble Code Data is used by diverse process partners along the product lifecycle. Diverse applications utilize the data. A central data management based on open integration capabilities offers diverse opportunities to enhance operation performance.

**STANDARDIZE FAULT CODES AND INCREASE
QUALITY AND COMPLETENESS OF INFORMATION
ENHANCE THE SUPPLY OF INFORMATION
DURING FAULT EVENTS**

**INCREASED PRODUCT QUALITY
REDUCED OPERATING COSTS**

Centralized Management of Diagnostic Trouble Code Data - Enable Collaboration across the Lifecycle

BASELINE TROUBLE CODE DEFINITIONS AND LINK WITH REQUIREMENTS MANAGEMENT

DEFINE TARGET SOFTWARE VERSION OF DTC SCOPE, IMPORT & CHECK CODES OF SOFTWARE FILES

LINK AFFECTED SYSTEMS & COMPONENTS

REQUIREMENTS

SYSTEM / COMPONENTS

DEVICE SOFTWARE

DEFINE STANDARDIZED CODES

DIAGNOSTIC TROUBLE CODE - DTC -

VERSION AND VARIANT MANAGEMENT ON DTC DATA

Version & Variant Handling

CAUSE

IMPACT

REMEDY

DETECTION

EVENTS

RISK PROFILE

DEFINE CAUSES PER FAULT, DESCRIBE DETECTION MODES

DESCRIBE FAULT & ACTION TEXTS PER LANGUAGE & STAKEHOLDER GROUP

ASSIGN BUSINESS EVENTS AND TRIGGER

INTEGRATE ACROSS THE LIFECYCLE

Manage device codes on a central platform and exchange data with all process partners: From Requirements Engineering to Software Engineering down to Technical Publications and Service Events.

STANDARDIZE FAULT CODES

Standardize device codes including related information like visibility, severity, stakeholder etc. Use variant handling capabilities to manage specific information in relation to technical options.

COLLABORATE WITH PARTNERS

Make the information retrievable in an easy way. Publish relevant data to process partners for reviews or translation purposes.

Import codes from suppliers and enrich with work instructions.

LEVERAGE DATA AT OPERATIONS

Leverage capabilities of a cloud infrastructure to integrate with subsequent processes.

Publish data to Digital Solutions like Fleet Management or any other service application.

REQUIREMENTS MANAGEMENT

SOFTWARE ENGINEERING

DIAGNOSIS TOOL AUTHORING

TECHNICAL PUBLICATION MGMT

OPERATIONS

Cloud Services

DIAGNOSTIC TROUBLE CODE DATA

ROOT

ACTION

FAULT

DETECTION

EVENTS

Assets & Products
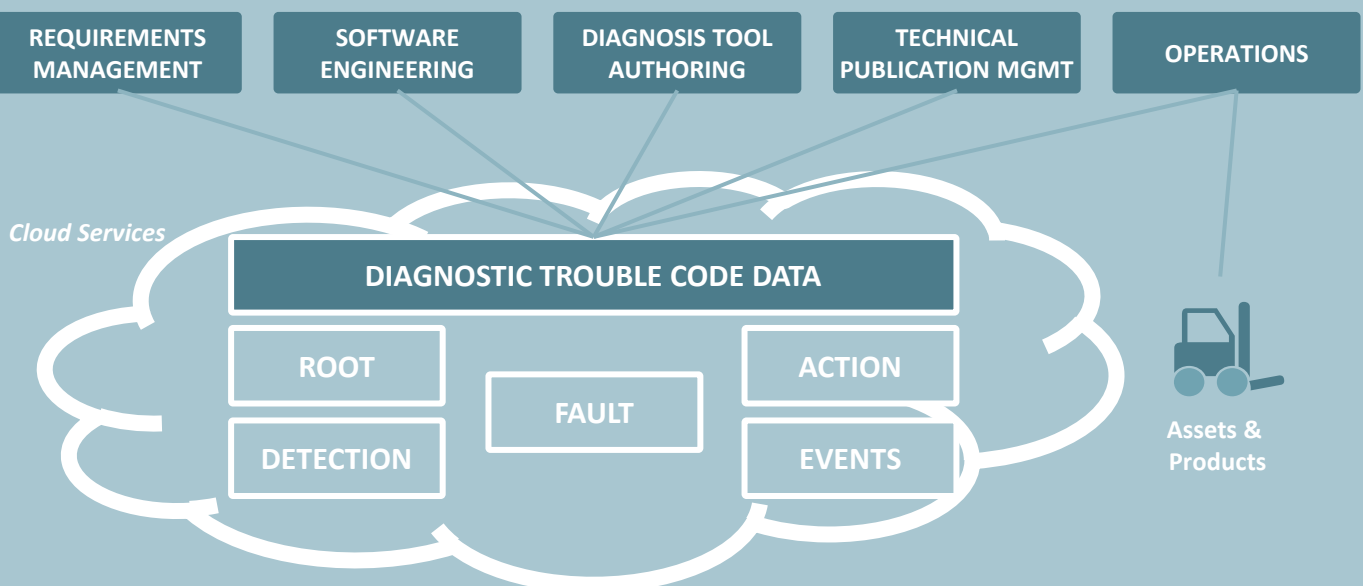
REQUIREMENT MANAGEMENT

EXCHANGE
RegIF

Reference

DEVICE SOFTWARE

EXCHANGE
IODD
ODX-D

Reference

SYSTEMS ENGINEERING

Reference

FMEA FAILURE MODE EFFECT ANALYSIS

— Integration —

DIAGNOSTIC TROUBLE CODE MANAGEMENT

CODE LIBRARY

VARIANT & VERSION MANAGEMENT

TECHNICAL & DIAGNOSIS DATA

Signals & Detections

PUBLICATION DATA & PACKAGES

Translations
Stakeholder View

RISK PROFILING

ANALYTICS

— Integration —

FURTHER PROCESS PARTNERS

DIAGNOSIS AUTHORING

TECHNICAL PUBLICATION

TRANSLATION OFFICES

...

DIGITAL SOLUTIONS

SERVICE APPS

FLEET MANAGEMENT

IIOT

...

Analyse and control the usage of DTCs in your portfolio.

DTC Packages
- Overview
- DTC Version (of Variant)
- DTC Variant
- DTC Publication Views
- DTC Publication Views - Status Board

Diagnostic Trouble Code Packages

Manage Diagnostic Trouble Codes across the Lifecycle.

Diagnostic Trouble Code: Variants/Versions

111 Released	17 In Review	2 In Work

Diagnostic Trouble Code: Publication Views

178 Released	42 In Review	8 In Work

Use standardized libraries for causes, detections, impacts and remedies. Assign to Requirements, Software Releases and Systems.

**Bundle relevant translations & descriptions per target group and publish them.**

Fault Causes | Fault Detection | Fault Impact | Remedy | Requirements | Events | Publication Packages | Comments

New

Fault detection	KDC
Controlled by device	KDC
Caused by device	KBC
SPN	0003
FMI	80
Message	Seat_Switch_Signal_Error
Message ID	
Signal start bit	
Signal length	
Conditions of entry	
Cnt up time	
Cnt down time	
Description	

Fault Causes | Fault Detection | Fault impact | Remedy | Requirements | Events | Publication Packages | Comments

New

Fault impact	Pause operation
Effect on product	Pause operation
Reset condition	Confirm that driver is present.
Display level	User
Activation mode	Direct
Description	The vehicle operation needs to be paused by setting it into a safe position.
Additional data	

Save   Cancel

Assign DTC to relevant Device Software and monitor the usage.

Device Packages
- Overview
- Device Package
- Software Package
- Software Item
- Hardware Package
- Hardware / Device

Device Packages

Manage your Device Packages (Hardware/Software Packages).

Device Packages

22 Released	2 In Review	1 In Work

Software Package

22 Released	3 In Review	0 In Work

Software Items

245 Released	42 In Review	0 In Work

Hardware Packages

17 Released	1 In Review	0 In Work

Hardware

84 Released	5 In Review	0 In Work

Cross lifecycle Management of Diagnostic Trouble Code Data centrally via Cloud Services - integrated to your Operations

P&PM´s Device Status Code Manager enables customers to manage Diagnostic Trouble Code data across its lifecycle and share it with all relevant stakeholders.

Our application is available as SaaS – Software as a Service – powered by Mendix.

P&PM´s Device Status Code Manager is based on a micro-service architecture with web-based user interfaces using REST and OData APIs. Running on cloud native components, customers can leveraging full potentials for diverse integration scenarios.
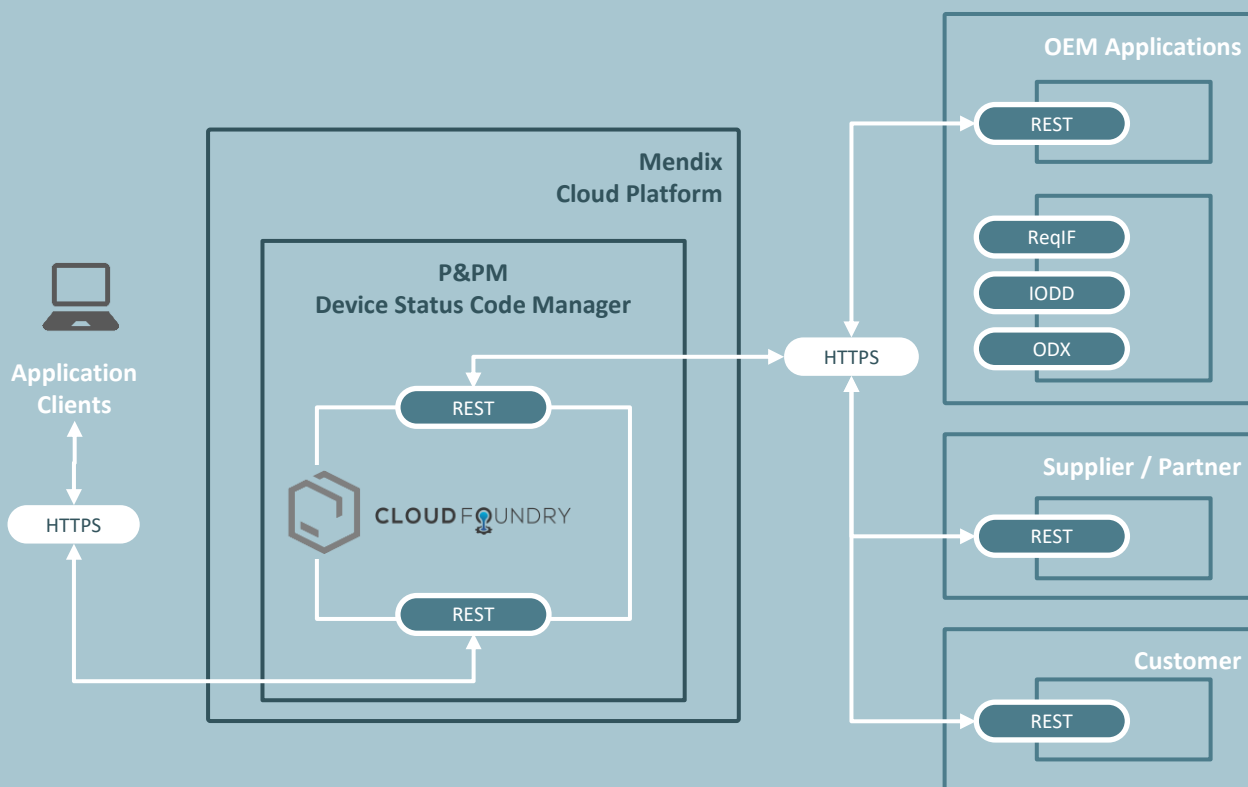
Mission

Centralized management of DIAGNOSTIC TROUBLE CODE DATA across the lifecycle. Easy exchange of data – within the company but also with suppliers, partners and customers breaking today´s information silos.
Enhanced product quality and complexity control by standardized codes & accurate fault information

Cap-abilities

Code library for DTC – Diagnostic Trouble Codes
Management of technical and related data (root/detection/actions) with version and variant control
Requirements Management: Define relevant codes and descriptions, apply baselines and publish to Requirements Management tools
Supply DTC data to Software Engineering and Diagnosis Authoring
Manage risk profiles and link to systems / components or FMEAs
Import / Export of DTCs based on ReqIF, IODD, ODX
Supply DTC data to Technical Publication Management
Cooperate with supplier / manage translations with external partner
Publish DTC data to operations: Service staff as well as customers

Use Cases

Requirements Engineering: Definition of DTC related requirements
Software Engineering: Retrieval of DTC definitions
Diagnosis Authoring: Editing of diagnosis pages with fault data
Technical Publication Management: Managing fault related information
Translations: Management of translations on fault data
Operations: Retrieval of fault related data at event
Analytics: Analyze dependencies and risk profiles

Stake-holder

System Engineer / Architect and Requirements Engineer
Software Engineer as well as Diagnosis Author
Quality & Service Manager
Retrieval of DTC data during operations: Service staff as well as Customer / User

Tech-nology

Micro-service based architecture with web-based user interface
Open Integration via REST APIs
Runs on Cloud Platform with Cloud Foundry Runtime
Our application is powered by Mendix
Available as SaaS – Software as a Service

About P&PM

P&PM designs and implements solutions to manage Software within your Products & Assets along their lifecycle.

P&PM was founded by experienced consultants in 2012 leveraging knowledge both from diverse operations transformation and application implementation projects especially within the Engineering and Service domain.

P&PM is a silver partner in the SAP PartnerEdge program.
P&PM is a partner in the Mendix ISV program.

P&PM´s office in Rösrath, near Cologne, Germany

P&PM
Solutions & Consulting

P&PM is a special expertise consultancy in the area of PLM – Product Lifecycle Management.

P&PM supports you in transitioning your operations to manage the growing complexity of software in your products along the value chain and product lifecycle.

P&PM - Product Lifecycle & Program Manufactory

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