Software is guiding function development, data flows and process, materials etc. Best practices are shared how IT support ties in and ensures an efficient daily operation.
Target of the Workshop - Goal

How to create and manage best the IT landscape and its support to enable and monitor the powertrain development process including test and simulation
The Powertrain Development is organized in consecutive generations with increased maturity of the powertrain in each generation enabled and monitored by a variety of SW tools.
IT trends – CAPGEMINI Study

- Extension of digitalization
- Development of new, innovative IT products and services
- Increase of end user satisfaction
- Increase of agility and flexibility
- Increase of efficiency
- Increase of data security
- Reduction of costs
- Shorten time-to-market (e.g. shortened release cycles, faster provisioning of IT, ...)
- Improvement of information analysis and usage
- Close technological gap compared to competition

SW-Enabled Frontloading

Collaboration + virtual/real \(\rightarrow\) managed by SW: simulation/data/process

Source: VOLVO/MS
Examples for IT tools in PT Engineering

AVL SW LANDSCAPE

AVL CONCERTO™
Data Analysis & Reporting

AVL CAMEO™
Automatic Calibration

AVL DRIVE™
Objective Assessment of Vehicle Attributes

AVL CRUISE™
Powertrain Simulation

AVL SANTORIN MX™
Test Data Mgt

AVL EXCITE™
Multi-body Engine Dynamics and Acoustics

Engineering

Model.CONNECT™
Model Integration

AVL FIRE™
Physics Simulation

AVL VSM™
Maneuver Simulation

Testbed.CONNECT™
SW/HW Integration

AVL CRETA 4™
Calibration Data Mgt

Vehicle Integration Test and Optimization

AVL-M.O.V.E./DRIVE

Test Systems

MIL/SIL/HIL

Component Simulation, Design and Test

Virtual TB

Battery TB

Inverter TB

Starter TB

E-Drive TB

Fuel Cell TB

Hybrid ICE TB

E-Integration TB

Powertrain TB

Vehicle TB

Dr. Bernhard Behr, Patrick Peindl, Stefan Forstner | 29 November 2018
Support & Maintenance Models to Reduce Operational Risk

OVERALL CUSTOMER DEVELOPMENT PROCESS

ENGINEERS, TESTBED OPERATORS & 1ST LEVEL SUPPORT

Customer Team for HW & SW

2ND & 3RD LEVEL SUPPORT

Supported by CUSTOMER IT SOLUTION CHAIN from CONCEPT to TESTBED
Work on Business Needs & Deliverables

Approach

Business Scenario

Architectural Hypothesis

Architectural Design und Rules

Checked Business Scenario

Business Restrictions

Scenario Analysis

Business- / IT Alignment, Interviews/SME Discussions

Architecture Hypotheses Testing

GAP + Impact Analyse

Sprint review

Next Sprint

~ 2 Weeks (per Sprint)
Sample Project Outline
Details for Start-up & Phase 1

Project kick-off

Set-up & Design

Phase 1/pilot 1 (MVP)

Pilot 1 finished

Roll-out readiness

Start maintenance

Further phases

Phase ...

Phase ...

Phase 2

Phase 3

Phase 4

Phase ...

Phase ...

Phase ...

Phase ...

Approach per phase

Start Design: Fit / GAP Analysis

Start Pilot MVP

Base configuration (Integration into infrastructure, IT-Security, interfaces, ...)

Application module

Application module 2&3

Further modules

Acceptance solution design part A

Acceptance solution design part B

Acceptance solution design part C

Pilot 1 roll-out ready

Customer

Possible AVL support areas during roll-out:

- Train-the-Trainer
- Administrator training
- Roll-out coordination / ...

- Maintenance / support
- Issue analysis, on-site support, bug fixing,

Big Picture / Solution Design

2 Wo. 2 Wo.

Sub-process A

Demo/report regularly

2 weeks 2 weeks

Implement & Test

Business analysis & solution design

Backlog

- High level
- Sub-process A more detailed

DoR

Remark: Illustrative, actual duration for business analysis, sprints / iterations will be aligned individually

Stabilization

Pilot 1 completed

Changes over time / continuous improvement
Example 1 / Global acting OEM

**Contract scope (global)**
333 engine / powertrain / component TB automation systems
Office software products
8 locations / 5 countries
Over 2000 users
5 year frame agreement

**Contract targets**
Manage all AVL software globally
Sustain high software quality
Comply with future technology requirements

**Activities**
Software support with a dedicated global team
Software validation incl. customer applications
Implementation of customer-influenced product evolutions
Performance reporting
Productivity and utilization monitoring

**Impact**
10% point utilization increase
Globally standardized software platform
Example 2 / Global acting TIER 1

**Contract scope**
- 54 engine TB automation systems
- 26 emission applications
- Office software products
- 9 locations / 8 countries
- 4 year duration

**Contract targets**
- Reach optimal software stability
- Ensure global data compatibility
- Leverage of global synergies
- Achieve smooth migration to new software generation

**Activities**
- Software maintenance
- Case management (incl. global consolidation) & processing via priority lane
- Remote support
- Global release upgrades
- Realization of enhancement requests
- Global performance reporting

**Impact**
- Downtime Reduction
- Utilization Increase
Example 3 / Local acting OEM

**Contract scope**
115 engine & powertrain TB automation systems
3 sites / 1 country
10 year duration

**Contract targets**
Controlled software harmonization and evolution over time
Defined issue resolution cycles (KPI-based)
Access to AVL HQ developer competences

**Activities**
Software maintenance
Case management & processing via priority lane
Remote support
Regular expert workshops
Provision of new software releases
Performance reporting

**Impact**
>90% KPI achievement
High customer satisfaction
Example 4 / Racing

**Contract scope**
- 2 engine TB automation systems (Software & Hardware)
- 1 site
- Contract since 2011

**Contract targets**
- Risk reduction with application-specific equipment support
- Quick recovery in case of TB standstill

**Activities**
- Software maintenance
- Case management & processing via priority lane
- Remote support
- Expert workshops
- Performance reporting

**Impact**
- No major downtime of AVL equipment over the last 24 months
- Next-day-implementation of workarounds in 9 out of 10 cases
Conclusions (source: McKinsey)

- Agile approaches can enable IT infrastructure groups to **boost their productivity by 25 to 30 percent** in six to 18 months, depending on the size of the organization.
- Improved infrastructure service delivery and **shortened time to market for digital products and features**.

Transforming IT infrastructure organizations using agile