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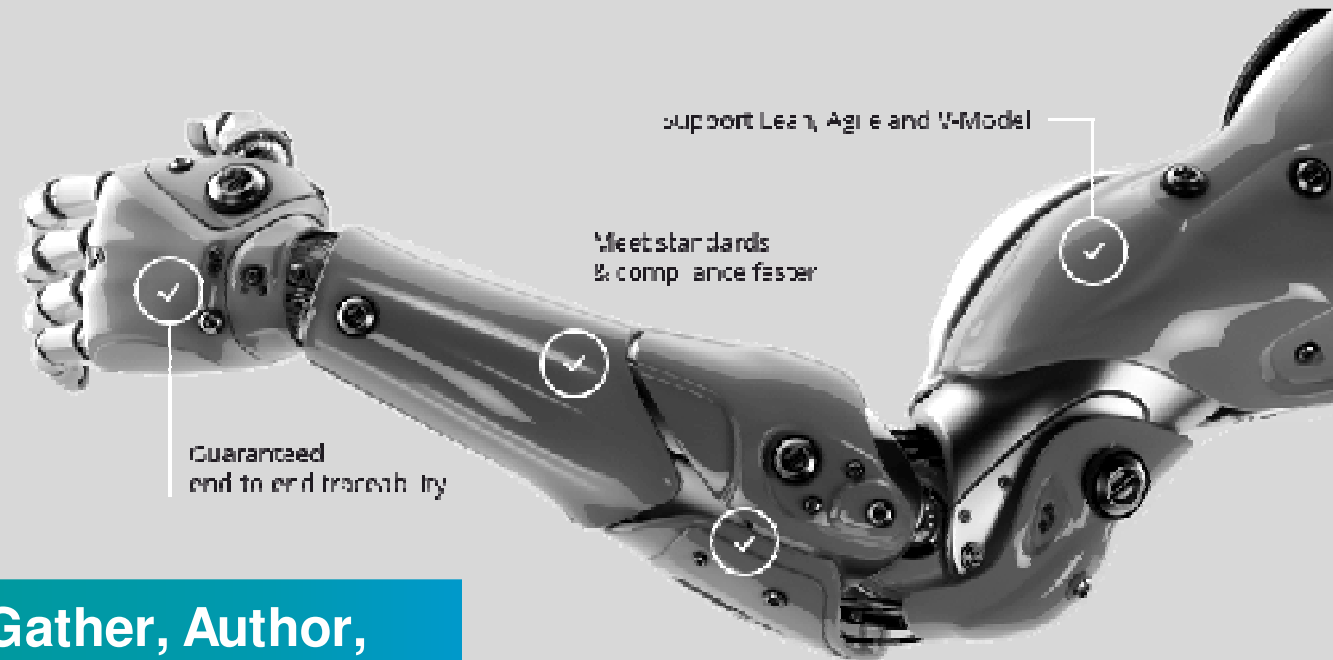
4 Easy Steps for BAs to Gather, Author, Approve and Manage Requirements

Speaker:

Jiri Walek, Polarion



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4 Easy Steps for BAs to Gather, Author, Approve and Manage Requirements

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Realize innovation.

Agenda



Jiri Walek

ALM Product Management
Siemens Industry Software

- 0 – Introduction
- 1 – Requirements
- 2 – Traceability
- 3 – Secure Collaboration
- 4 – Reuse

History



- ✓ **2004** Founded with Disruptive Vision
- ✓ **2005** First Unified, 100% Browser-Based ALM: Requirements Management, Quality Assurance and Development Lifecycle Solutions
- ✓ **10 Years** Focus on Unlocking Synergies: Full Traceability, Real-Time Collaboration, Intuitive UI
- ✓ **10 Years** Customer Satisfaction & Growth
- ✓ **2016** Acquisition by Siemens

250+

Fortune 1000
Deployments

2.5+M

Users

200+

Extensions

15K

Community
Members

Requirement types

The screenshot displays a software interface for managing requirements. On the left, a sidebar titled 'Work Items' lists various requirement types, with 'System Requirement' selected. The main area shows details for a specific requirement: 'SEP-477 - Test planne'. The details include the type 'System Requirement', the project 'SystemEngineeringProject', and the author 'Dmitry Levin'. There are also buttons for 'Description' and 'Custom Fields', and a section for 'LD Enumerations'.

Work Items

- System Requirement
- System Test Case
- Software Requirement
- Software Test Case
- Mechanical Requirement
- Mechanical Test Case
- Electrical Requirement
- Electrical Test Case
- Risk
- Change Request
- Work Package
- Task
- Issue
- Unit Test Case

SEP-477 - Test planne

Type: System Requirement

Project: SystemEngineeringProject

Author: Dmitry Levin

Categories:

Description

Custom Fields

LD Enumerations:

- Standalone Objects / Context Sensitive
- Stateless / Statefull
- Domain Specifics: System, Software, Mechanical

Standalone objects / Contexts sensitive

Standalone objects

- Read as it is
- Processed individually
 - Estimated
 - Approved
 - Planned

EL-111 Created: 2010-11-20 13:19, Updated: 2015-03-23 19:17

EL-122 - User likes to search also by any content - so full-text search is needed.

EL-79 EL-47 EL-48 EL-49 EL-39

Type: User Story	Assignee(s): Steve Developer	Estimate in Story Points: 13
Severity: Should Have	Status: In Progress	Time Spent:
Author: System Administrator	Resolution:	
Project: E-Library (ALM)	Priority: Low [46.0]	
Categories: Searching	Planned In: Iteration 34 (2015-01-24)	
	Version 1.0 (2015-06-30)	

Description

User likes to search also by any content - so full-text search is needed.

Context Sensitive

- Paragraphs in specifications
- Better this then verbal
- Process one by one and together

DP-315 - DrivePilot shall be easy to operate without extensive training. ✓

DP-316 - Before any user may engage DrivePilot on public roads, that user must successfully complete a tutorial and test DrivePilot exercise. ✓

DP-317 - DrivePilot will disengage with audible, visual notifications if the following occurs: ✓

- Gear change apparatus is manually actuated
- Brake is manually engaged
- User shouts "Stop"
- Accelerator pedal is manually engaged
- Turn signal is activated

DP-332 - DrivePilot is NOT compatible with any vehicle that has "auto parking" capability. Some models of vehicles come equipped with such capability. Not all models are so equipped, but only when correctly optioned out. ✓

Stateless / Statefull

Statefull (workable)

- This will be done for version A
- Status:
 - Planned
 - Implemented
 - Verified
- Attributes
 - Estimate
 - Cost

EL-111 +

↑ ↔ EL-122 - User likes to search also by any content - so full-text search

↑ EL-79 EL-47 EL-48 EL-49 EL-39 +

Type: User Story

Severity: Should Have

Author: System Administrator

Project: E-Library (ALM)

Categories: Searching

Assignee(s): Steve Developer

Status: In Progress

Resolution: In Progress

Priority: Perform action Stop Progress

Perform action Mark as Implemented

Planned In: Version 1.0 (2015-06-30)

Stateless (specification only)

- Status: Is applicable
- Not: is implemented

DP-465 Operation check - DrivePilot shall operate with input t

DP-331 The DCC will operate on 4.3 Volts, 500mA with a var

DP-350 DrivePilot shall operate with input power of 12 Volts, i

Edit Save Cancel

DP-350 DP-331 +

↑ ↔ DP-465 - Operation check - DrivePilot shall operate with input Amps.

↑ DP-466 DP-467 +

Type: Work Package

Severity: Nice to Have

Author: System Administrator

Project: Drive Pilot

Categories:

Priority: Medium [50.0]

Planned In: Iteration 32 (2013-12-27)

Version 1.0 (2013-12-27)

Initial Estimate: 7d

Time Spent: 6d

Remaining Estimate:

Traceability refers to the completeness of the information about every step in a supply chain.

The formal definition of traceability is the ability to chronologically relate uniquely identifiable entities in a way that is verifiable.

Components of traceability

1) **Accountability** - Understand the "Who, What, When" of any change.

- Every single change must identifiable and accountable

2) **Verification & Validation**

- Provide an evidence that requirements have been approved, designed, implemented and verified

3) **Change Management**

- Passive Approach – be accountable, report change, verify every step
- Active Approach – study and analyze the impact of a change before the change

Traceability - Best practices

1) Granularity

Good Coverage + Large Requirements = Still Bad

- Make sure that every piece of information is uniquely identifiable.
- Prevent unstructured documents

2) Link Reach

- Ensure the proper depth of traceability
- I.e. Not just specifications (design, test) but also outcome: code, test results
- Integrated/Unify Requirements Management into ALM/PLM

DrivePilot offers automated control of gearing, speed, steering and turn signals, and braking. DrivePilot also includes interfaces into the OBDII vehicle codes and monitors certain engine vibrations to identify existing and pending maintenance problems.

3 Requirements

3.1 General Operations

DP-313 - DrivePilot shall easily engage operations while the vehicle is at rest. [Version-1.0 \(2014-12-27\)](#)

DP-314 - DrivePilot may not be engaged while the vehicle is under manual control. [Version-1.0 \(2014-12-27\)](#)

- provide voice authentication
- provide handicap access

DP-315 - DrivePilot shall be easy to operate without extensive training. [Version-1.0 \(2014-12-27\)](#)

DP-316 - Before any user may engage DrivePilot on public roads, that user must successfully complete a tutorial and test DrivePilot exercise. [Version-1.0 \(2014-12-27\)](#)

DP-317 - DrivePilot will disengage with audible, visual notifications if the following occurs: [Version-1.0 \(2014-12-27\)](#)

- Gear change apparatus is manually actuated
- Brake is manually engaged
- User shouts "Stop"
- Accelerator pedal is manually engaged
- Turn signal is activated

DP-332 - DrivePilot is NOT compatible with any vehicle that has "auto parking" capability. [Version 2.0 \(2015-06-30\)](#)

Some models of vehicles come equipped with such capability. Not all models are so equipped, but only when correctly optioned out.

Manufacturer	Model
Toyota/Lexus	Prius, LX200

Collaborate securely in context

- Collaboration is a commodity
- Two goals:
 - **Secure Collaboration**
 - **Collaborate in Context: change, release, ...**

Workflow Aware Permissions

- Content locked if not in draft
- Policy to approve/review

Guide through Collaboration

- Approval Policy
- Do not estimate unless version is set

Ensure Change Processing

- Safety Risk to be reassessed on change
- Test Cases to be re-approved

Unified does not mean same – Role-based user interface

The screenshot displays two browser windows. The left window shows a requirements management tool with a tree view on the left and a main content area. The right window shows a user interface for LifeWatch, featuring a navigation menu and a main content area with a quote.

Requirements Management Window:

- 3 Requirements**
 - 3.1 General Operations**
 - DR-313 - DrivePilot shall be fully engaged prior to start of the vehicle at rest.
 - DR-314 - DrivePilot must be engaged while the vehicle is in a drive state and:
 - prevent vehicle start/stop
 - prevent gear/shift events
 - DR-315 - DrivePilot shall be able to operate without manual driving.
 - DR-316 - Before any user may engage DrivePilot on public roads, the user must be in vehicle.
 - DR-317 - DrivePilot will disengage with audible, visual notifications if the driver:
 - Gear change sequence is manually actuated
 - Clutch manually engaged
 - User selects "Play"
 - Accelerator pedal is manually engaged
 - Turn signals is actuated
 - DR-318 - DrivePilot must be able to operate with any vehicle that has a valid parking space (models of vehicles can be engaged with each capability - just if available in BOM).

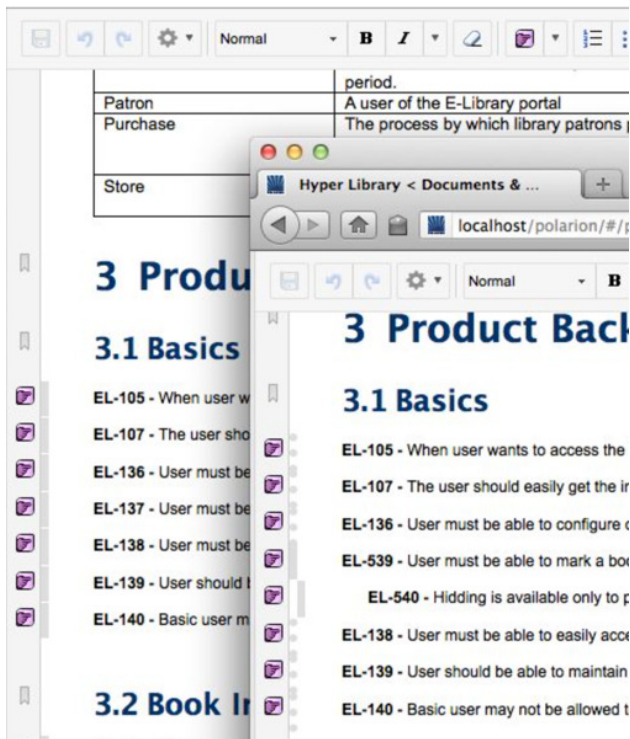
Item Reference	Model
DR-313, 314	DrivePilot
DR-315, 316, 317	DrivePilot
DR-318	DrivePilot

LifeWatch User Interface Window:

LifeWatch®
Watching Life™

"Polarion is easy to use, and you have the ability to track as you go.", "Polarion provides everything we need!"

Reuse



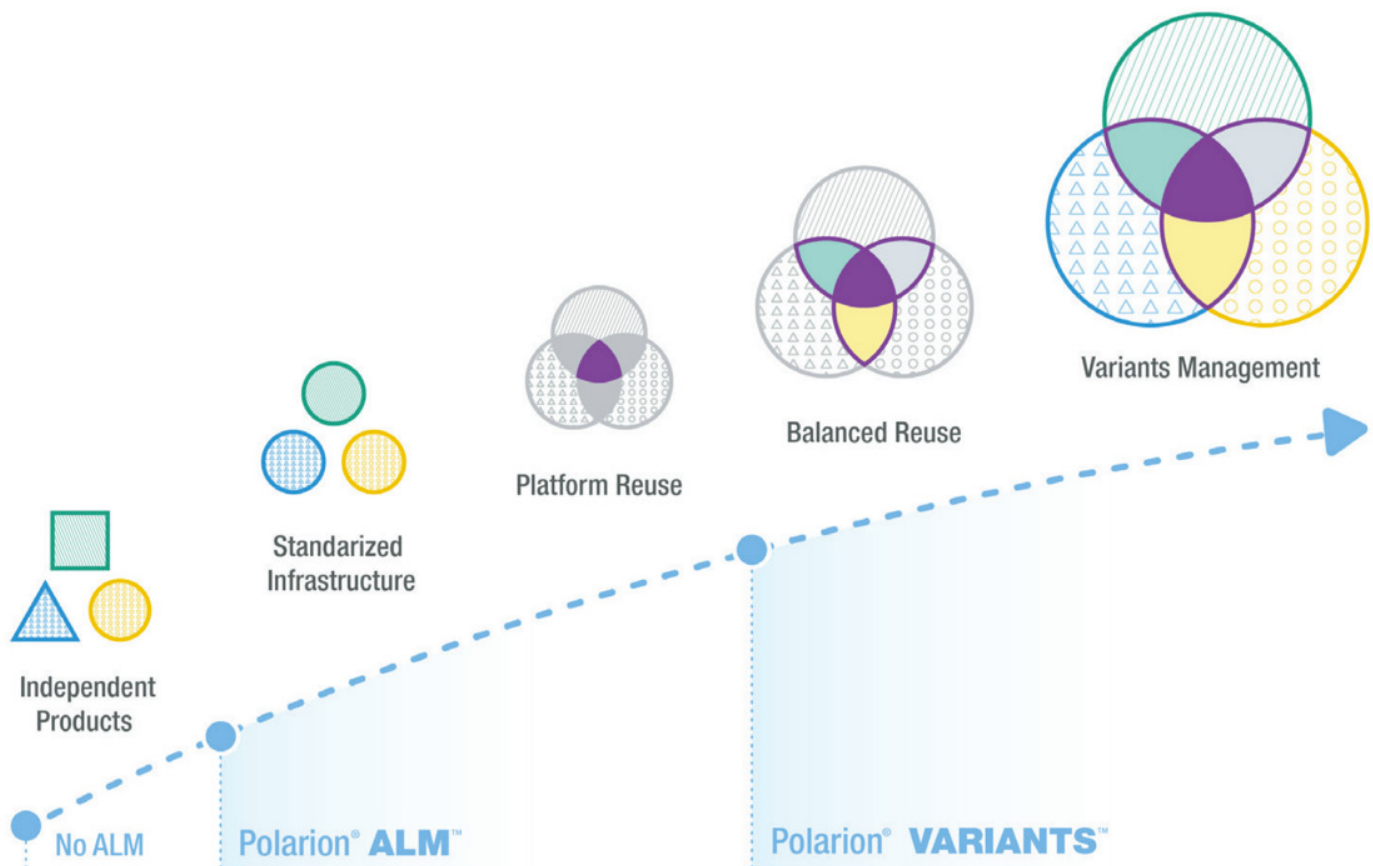
Statistics says that 60-80% of requirements, code and test are being shared between projects. With Polarion you can **reuse**, **branch** and **merge** your data for effective sequential or parallel project or product line development.



The biggest benefit for WaveLight is the ease of reuse (of artifacts such as Requirements) across different projects.”

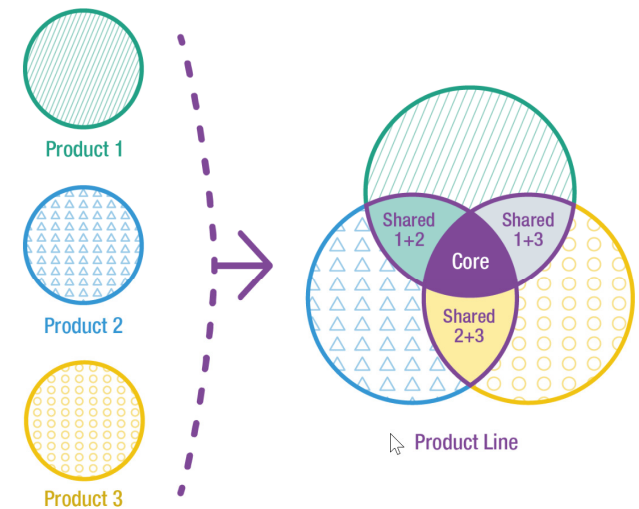
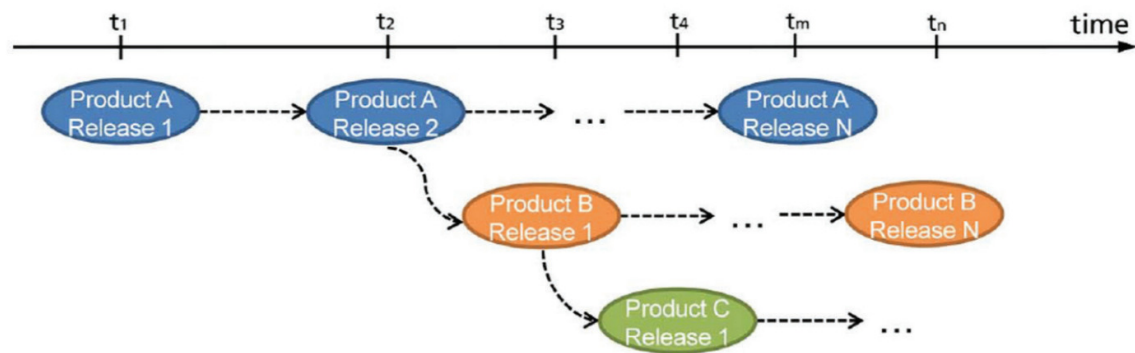
Werner Motzet,
WaveLight

Reuse maturity



Product Line Management

1) Clone and Modify



2) PLE – take advantage of commonalities

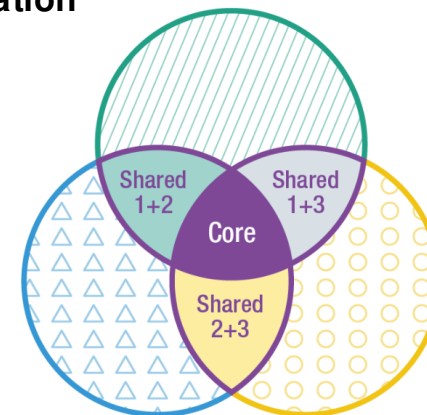
- Gather requirements for full product line
- Each variant / product specification is a subset

Common, Shared, Specific Requirements

- Gather and Collect all the PLE Requirements in one place
 - **Core/Common** – same for all
 - **Shared** – shared between couple of products
 - **Specific** – product specific, may become shared
- Not just Requirements but also Tests, Design ...

Master Requirements Specification

Req-1
Req-2
Req-3
...
Req-n

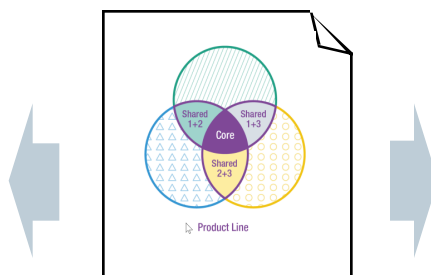


Product Line

Product A / B

Product A Specification

Req-1
 Req-3
 ...
 Req-x

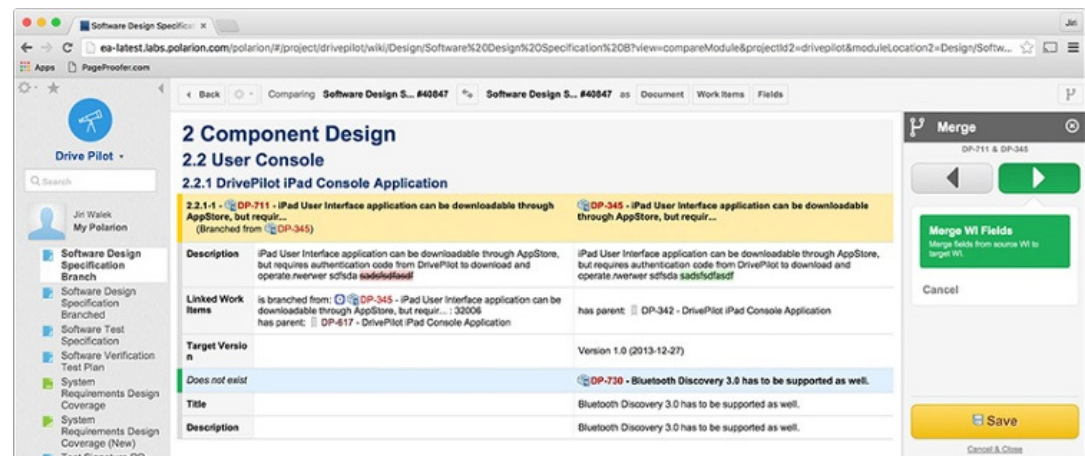


Product B Specification


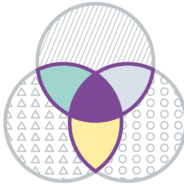
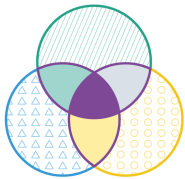
Req-3
 ...
 Req-y

Change processing

- 1) On Product change request change the Product Specification and merge to Master (**Merge to Master once needed elsewhere**)
- 2) On Product change request change the Master and merge to Product (**Always start from Master**)
- 3) If needed merge from one product to another (**Branch hell – not a best practice**)



How do you define a subset

Minimalistic (50%)	Balanced (90%)	Maximalistic (150%)
Common solutions only	Common and shared solutions only	Common, shared and specific solutions
		

- 1) **Modules:** Reuse the modules (component specifications)
- 2) **Classification / Linking:** Categorize requirements by component, by library. Link requirements to **features**, parts. Filter by category and/or link
- 3) **Constraints:** Most advanced, constraint the requirements by variant restrictions by referring to **features**.

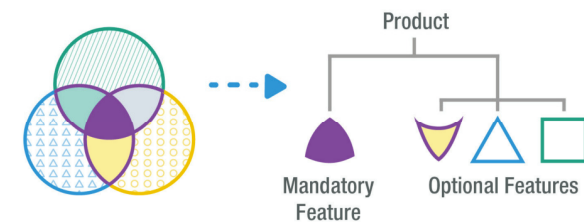
Feature model

Feature is a product line characteristic that may **differ** among members (functionality, quality attributes, environments, constraints...)

Feature management is a central component of **every** Product Line Engineering approach

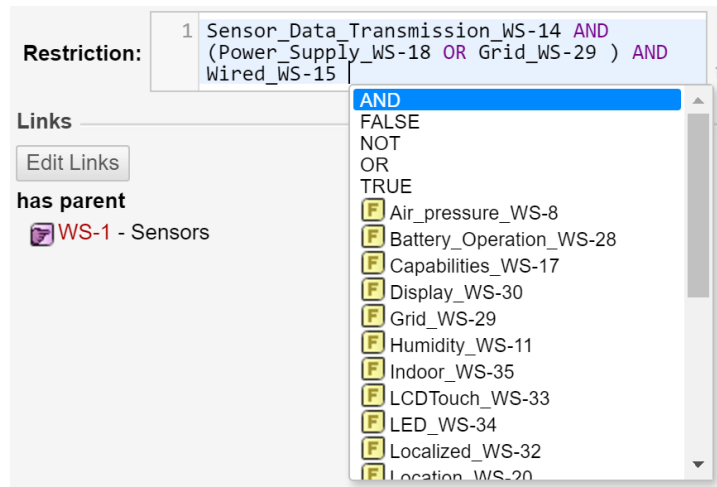
It allows managing **common** and **varying** parts as well as their interdependencies.

It allows configuring, building and managing product line members



▼ F 2-1	? Sensor Data Handling
F 2-1.1	! Temperature
F 2-1.2	? AirPressure
F 2-1.3	? Humidity
F 2-1.4	? Wind
▼ F 2-2	! SensorDataTransmission
▼ F 2-2.1	✕ Wired
F 2-2.1	✕ Wireless
▼ F 2-3	? Capabilities
F 2-3.1	? TemperatureCurve
F 2-3.2	? WeatherForecast
▼ F 2-4	? PowerSupply

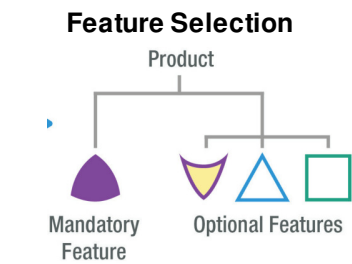
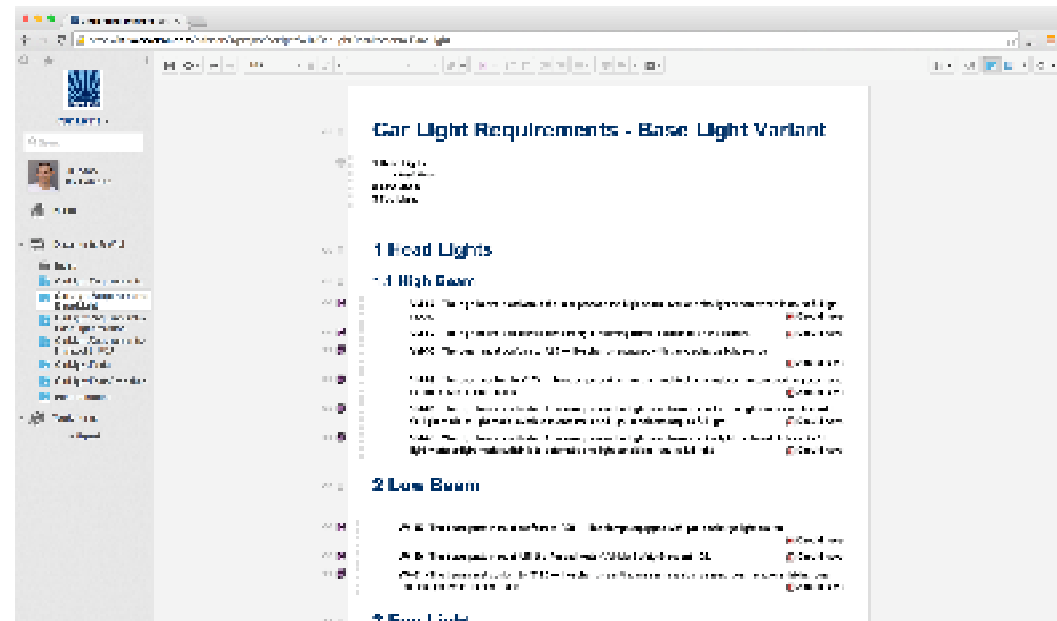
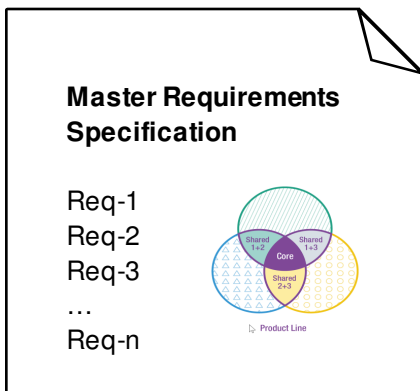
Restrictions



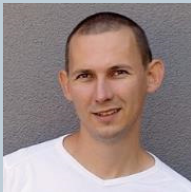
- Expression language to restrict requirements to features
- More powerful than just plain linking

	WS-54 - The system transmits measured data using a wireless link to a base station.	Wireless_WS-16
	WS-55 - The system transmits the measured data using a wired link to a base station. Sensor_Data_Transmission_WS-14 AND (Power_Supply_WS-18 OR Grid_WS-29) AND Wired_WS-15	
	WS-56 - Power Supply	N/A
	WS-57 - The power is supplied by a long life battery. Minimum operating period without change is 1 year.	N/A
	WS-58 - The power is supplied from mains. Input voltage range is 100 - 240V AC.	N/A

Generation



Thank you!



Jiri Walek

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Siemens Industry Software

with



- 0 – Introduction
- 1 – Requirements
- 2 – Traceability
- 3 – Secure Collaboration
- 4 – Reuse