

# PaR

methodical framework

## Development processes as requirements better under control

apply

reuse

create



Embedded Software Engineering Kongress



**Fraunhofer** &  
IESE



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# What is it about?

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- ✓ Standards and processes should be a kind of **exoskeleton**.
- ✓ Often the development processes are **huge** documentations.
- ✓ Rather a heavy **backpack** that the projects have to carry in addition.
- ✓ Finally, standards and processes are also just requirements.
  
- ✓ Bring **Processes as Requirements** into the project.



<https://ProcessesasRequirements.info>

## Martin Becker

- Embedded Systems Engineering at Fraunhofer IESE
- Strategic Reuse
- Focus: Requirements, Architecture, Analysis



## Ralf Bürger

- Coded much software in the past
- Today process development
- Platform based product development
- Developed PaR over many years



<https://ProcessesasRequirements.info>

# your challenges / PaR solutions

① *help* all types of projects with flexible corporate development processes

**PaR:** define and reuse the processes as requirements sets in your RE tool

② *merge* regulatory standards with corporate development processes

**PaR:** define also the standards as requirements and add traceability

③ *learn* with the project teams by established sustainable processes

**PaR:** unite process and product requirements, but improve both

④ *comply* continuously with processes and standards in the projects

**PaR:** use the features of your RE tool for bi-directional traceability

⑤ *monitor* actual project and product maturity progress

**PaR:** measure the status of all requirements, documents and reviews



<https://ProcessesasRequirements.info>

Session  
Focus

# PaRis (PaR information system) - Overview



<https://ProcessesasRequirements.info>

**KoDeCs PaR Process Platform**

Project: PaR Automotive

Explorer: Regulatory Standards, Legal, Norms, ISO 9001:2015, ISO 26262, ISO 26262-2: Management of functional safety, ISO 26262-3: 5.4 Requirements and test, ISO 26262-3: 5.4.1 make available, ISO 26262-3: 5.4.2 define further, ISO 26262-3: 5.5 Work products, ISO 26262-3: WP 5.5.1 Item definition, ISO/IEC 26550-26556 SW&Sys Product Line

Organizations: AVAG IATF 16949:2016, VDA ASPICE 3.0, ASPICE: Scope, ASPICE: Sub-Processes and Base Practices, ASPICE: Process Outcomes, ASPICE: Work Product Catalogue, ASPICE: Annex

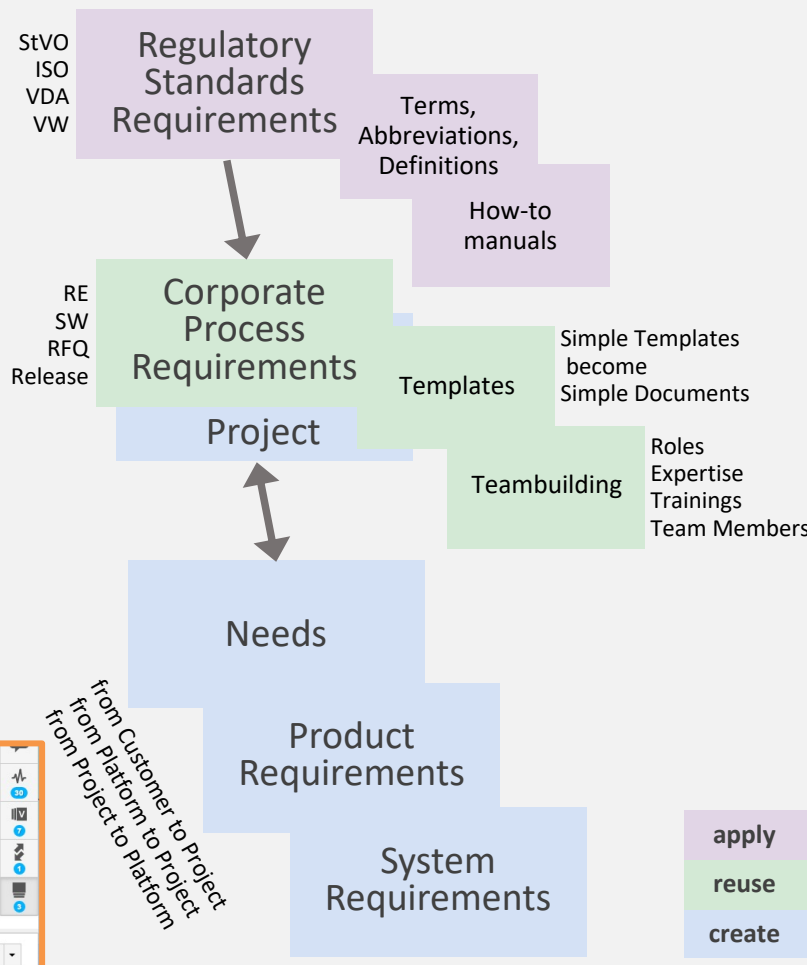
Customers: Corporate Processes, RfQ, RfQ: Project Organization, RfQ: Nominate Project Leader, RfQ: Staff the Team, RfQ: Ensure Safety Manager authority, RfQ: Instantiate Project, RfQ: Establish an escalation strategy, RfQ: Project Scoping, RfQ: Requirements Elicitation, RfQ: Requirements Analysis

**Action status overview**

Action status: Status in Project

Legend: to be determined, open, ongoing, completed, done, not applicable

ID	Name	Status in Project
BMSp-K_COP-45	RfQ: Categorize Project	to be determined
BMSp-K_COP-53	RfQ: Nominate owners for the feature...	to be determined
BMSp-K_COP-42	RfQ: Obtain the needs for the new...	completed
BMSp-K_COP-43	RfQ: Commonly understand the ne...	ongoing
BMSp-K_COP-44	RfQ: Define the purpose and scope...	open
BMSp-K_COP-46	RfQ: Obtain or define the product re...	ongoing
BMSp-K_COP-47	RfQ: Cluster product requirements t...	ongoing
BMSp-K_COP-48	RfQ: Establish bidirectional traceabi...	ongoing
BMSp-K_COP-55	for feature "Thermal Control"	open
BMSp-K_COP-56	for feature "AC charging"	open
BMSp-K_COP-57	for feature "DC charging"	open
BMSp-K_COP-62	for feature "Low voltage support"	open



Sync Status: (Current Item) Out Of Sync

Synchronize changes to this item

RfQ: Obtain the needs for the new product or product update - V13

PROJECT ID: K\_PaR\_K\_COP-21

GLOBAL ID: GID-56139

NAME: RfQ: Obtain the needs for the new product or product update

EXPLANATION: The needs describe what the product or product update or platform improvement will be good for.

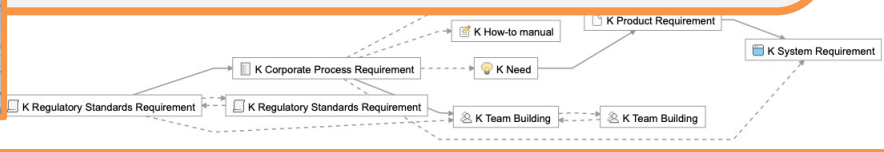
DIRECTIONS: Establish a communication to the potential product owners. Obtain the needs from the established communication. Document all meetings in meeting minutes and relate them to this activity in the project.

ID	Name	Type	Suspect
K_PaR_K_REG-105	ASPIRE SYS 1.8P1: Obtain stakeholder requirements and reports		No
K_PaR_K_REG-111	ASPIRE SYS 1.1: communication established		No
K_PaR_K_REG-40	ASPIRE WP 13.04: communication record		No
K_PaR_K_REG-53	ASPIRE WP 13.10: Review record		No
K_PaR_K_REG-119	ASPIRE WP 17.03: Stakeholder requirements		No

ID	Name	Status in Project	Effort estimated (hrs)
BMSp-K_COP-68	RfQ: V1: Obtain the needs for the new product	not applicable	
BMSp-K_COP-69	RfQ: V2: Obtain the needs for the product update	not applicable	
BMSp-K_COP-70	RfQ: V3: Obtain the needs for the platform improvement	ongoing	80

Item type fields

Order	Label	Unique Field Name	Field Type	Control	Pick List	Read Only	Allow API Overwrite	Required	Suspect	Sync	API-ID
1	Project ID	documentKey	Text Field			✓		✓			1325
2	Global ID	globalid	Text Field			✓		✓			1328
3	Name	name	Text Field			✓		✓	✓		1331
4	Variation Point	variation_point	Pick List		K Variation Point			✓	✓		1557
5	Explanation	description	Text Box		Rich Text			✓	✓		1334
6	Directions	directions	Text Box		Rich Text			✓	✓		1463
7	Status in Project	status_in_project	Pick List		K Status in Project			✓	✓		1466
8	Release	release	Text Field					✓	✓		1340
9	Budget estimated (€)	budget_estimated	Integer					✓			1526
10	Budget needed (€)	budget_needed	Integer					✓			1529
11	Effort estimated (hrs)	effort_estimated	Integer					✓			1532
12	Effort needed (hrs)	effort_needed	Integer					✓			1535



# Example 1: record the requirements

specify **Regulatories (REG)** as requirements in the tool

also describe **Corporate Processes (COP)** as requirements that support the regulatories

build the **Product Requirements (PRO)** according to the processes and link them



The screenshot shows the PaR ZRP Customer Project tool interface. On the left is a hierarchical tree of requirements. On the right is a detailed view of requirement C.1.1 ZRP einrichten.

**Tree Structure:**

- PaR ZRP Customer Project
  - Regelwerke
    - R.1 DWA
      - ZRP-503 R.1.1 DWA-M 151
      - ZRP-506 R.1.2 DWA 198
      - ZRP-547 R.1.3 DWA-M 1060 IT-Sicherheit
    - R.2 SüwVO Abw
      - ZRP-545 R.2.1 SüwVO Abw - Zusammenfassung
      - ZRP-190 R.2.2 MDMS (MessDatenManagementSystem)
      - ZRP-194 R.2.3 Geforderte Berichtsdaten
      - ZRP-195 R.2.4 Tabellarische Darstellung
      - ZRP-188 R.2.5 Datenverfügbarkeit > 90%
      - ZRP-189 R.2.6 Datenverfügbarkeit < 90%
      - ZRP-196 R.2.7 vollständige Abgabe
    - R.3 SüwV kom
    - R.4 Talsperren-Sicherheitsberichte
    - R.5 Umweltinformationsgesetz
  - Glossar (TAD)
  - Corporate-Prozesse
    - C.1 ZRP (ZeitreihenPlattform) betreiben
      - ZRP-560 C.1.1 ZRP einrichten**
      - ZRP-561 C.1.2 ZRP-Betrieb erhalten
    - C.2 Berechtigungen managen
    - C.3 Berichte erstellen
  - Needs - Hauptziele und Teilziele
  - Produkt - Anforderungen
    - KO
    - SP
    - PA
    - LH
    - GK
    - APP
    - ZRP
      - ZRP-154 A.GK.ZRP.1 Datenspeicherung
      - ZRP-155 A.GK.ZRP.1.1 Speicher-Konformität
      - ZRP-638 A.GK.ZRP.1.2 Dateneindeutigkeit
      - ZRP-156 A.GK.ZRP.1.3 Datenqualität
      - ZRP-168 A.GK.ZRP.1.4 Datensicherheit
      - ZRP-164 A.GK.ZRP.1.5 Data Provider
      - ZRP-157 A.GK.ZRP.1.6 Datenkomposition

PaR ZRP Customer Project / ZRP-560

## C.1.1 ZRP einrichten

PaR ZRP Customer Project/Corporate-Prozesse/C.1 ZRP (ZeitreihenPlattform) betreiben

### Details

Issue Type: **COP** Status: **IN REVIEW**  
Resolution: Unresolved Created: 2021-08-31 13:28:25  
Updated: 2021-10-12 14:03:06 Labels: None

### Description

Richte eine Plattform zur Verwaltung von Messdaten-Zeitreihen im Sinne eines MDMS ein.

### Attachments

### Child Requirements +

### Issue Links +

#### derives

**T** ZRP-504 MDMS = Messdatenmanagementsystem **ACCEPTED** Compare

#### is derived from

**R** ZRP-190 R.2.2 MDMS (MessDatenManagementSystem) **ACCEPTED** Compare

**R** ZRP-503 R.1.1 DWA-M 151 **FINAL** Compare

**R** ZRP-545 R.2.1 SüwVO Abw - Zusammenfassung **ACCEPTED** Compare

#### is satisfied by

**N** ZRP-22 H.GK.1 Hauptziel **ACCEPTED** Compare

**P** ZRP-154 A.GK.ZRP.1 Datenspeicherung **FINAL** Compare

**P** ZRP-164 A.GK.ZRP.1.5 Data Provider **FINAL** Compare

### Revisions

### Comments +

**R4J (ease solutions) in JIRA (Atlassian)**

# Example 2: Working off a requirement in an agile fashion

Projects now work **with** and **in** the processes instead of just **according** to the processes

plan a **Product requirement (PRO)** with an Epic in the Backlog

The screenshot displays a requirements management interface. On the left, a tree view shows a hierarchy of requirements. The right pane shows the details for requirement ZRP-671, including its status (DRAFT), relationships (Child Requirements, Issue Links, relates to, is derived from, is satisfied by, satisfies), and a Revisions table.

**Left Pane (Requirements Hierarchy):**

- C.1 ZRP (ZeitReihenPlattform) betreiben
  - ZRP-560 C.1.1 ZRP einrichten
  - ZRP-561 C.1.2 ZRP-Betrieb erhalten
- C.2 Berechtigungen managen
- C.3 Berichte erstellen
- Needs - Hauptziele und Teilziele
- Produkt - Anforderungen
  - KO
  - SP
  - PA
  - LH
  - GK
    - APP
    - ZRP
      - ZRP-154 A.GK.ZRP.1 Datenspeicherung
        - ZRP-155 A.GK.ZRP.1.1 Speicher Konformität
        - ZRP-638 A.GK.ZRP.1.2 Dateneindeutigkeit
        - ZRP-156 A.GK.ZRP.1.3 Datenqualität
        - ZRP-168 A.GK.ZRP.1.4 Datensicherheit
        - ZRP-164 A.GK.ZRP.1.5 Data Provider
        - ZRP-157 A.GK.ZRP.1.6 Datenkomposition

**Right Pane (Details for ZRP-671):**

- Child Requirements** + +  
Click to add a child requirement
- Issue Links** +  
relates to
  - ZRP-30 A.GK.ZRP.5.2 Schnittstelle Anwendungen/Plattform (DRAFT)
  - ZRP-626 A.GK.ZRP.5.2.2 Anlagenbezug (DRAFT)
- is derived from
  - ZRP-67 T.GK.9 Data Provider (ACCEPTED)
- is satisfied by
  - ZRP-671 Selection of facility sites (DRAFT)**
- satisfies
  - ZRP-560 C.1.1 ZRP einrichten (IN REV)
- Revisions**



# Example 3: Coverage view from standards to stories

PaR ZRP Customer Project

Tree Coverage Traceability Baselines

Add Coverage Level Refresh Clear All Display Fields Export

R.2.3 Getordnete Berichtsdaten	C.3.1.1 SuwVO Abw ertullen <i>(is derived from) ZRP-194</i>	A.GK.APP.ABW.1 Unterstützung der SuwVO Abw <i>(satisfies) ZRP-563</i>		
<b>R</b> ZRP-190 <b>ACCEPTED</b> R.2.2 MDMS (MessDatenManagementSystem)	<b>C</b> ZRP-561 <b>IN REVIEW</b> C.1.2 ZRP-Betrieb erhalten <i>(is derived from) ZRP-190</i>	<b>P</b> ZRP-611 <b>ACCEPTED</b> A.GK.APP.ABW.5.2 Messdatenbezug (Zeitreihen) <i>(satisfies) ZRP-561</i>	Not Covered	Not Covered
		<b>P</b> ZRP-154 <b>FINAL</b> A.GK.ZRP.1 Datenspeicherung <i>(satisfies) ZRP-561</i>	Not Covered	Not Covered
	<b>C</b> ZRP-560 <b>IN REVIEW</b> C.1.1 ZRP einrichten <i>(is derived from) ZRP-190</i>	<b>P</b> ZRP-164 <b>ACCEPTED</b> A.GK.ZRP.1.5 Data Provider <i>(satisfies) ZRP-560</i>	<b>E</b> ZRP-671 <b>ACCEPTED</b> Selection of facility sites <i>(satisfies) ZRP-164</i>	<b>S</b> ZRP-674 <b>DRAFT</b> Enable tagging and untagging <i>(has Epic) ZRP-671</i>
		<b>P</b> ZRP-154 <b>FINAL</b> A.GK.ZRP.1 Datenspeicherung	Not Covered	<b>S</b> ZRP-673 <b>DRAFT</b> Show tree of all facility sites <i>(has Epic) ZRP-671</i>
			Not Covered	Not Covered

regulatory  
(rules and standards)

process  
activity

product  
requirement

Epic

Story

PDF

process tool

RE tool

Prj-Mgmt

Boards

<= before



<https://ProcessesasRequirements.info>



# benefits

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- ① lightweight efficient processes are welcomed by developers
- ② uniting “what” and “how” in the teams’ tools is more agile
- ③ standards and processes are focusing on projects and learning culture
- ④ project teams are empowered to self-organize the compliance
- ⑤ step by step, teams apply flexible platform techniques also for processes
- ⑥ it’s a systematic holistic methodical framework that is easy to adopt and adapt
- ⑦ it makes true transparency for actual process and product maturity



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**Session  
Focus**

## Go!

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- ✓ Gain quick benefits from PaR, even if not fully applied.
- ✓ Start with a frequently used development sub-process, or try it with a small business process.
- ✓ Success-Stories motivate and gain support from stakeholders, quality managers and process departments.
- ✓ Start small and simple.
- ✓ Scale up in iterations.
  
- ✓ Consider reusing development processes in development projects of technical systems (scope of next presentation ;-)



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## Takeaway

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- ✓ define standards / processes in a lightweight efficient way
- ✓ bring the processes directly to the project teams
- ✓ unite “what” (product) and “how” (process)
- ✓ establish a culture of improvement by reuse
- ✓ work off the requirements by Epics and Stories
- ✓ let bi-directional traceability become a standard
- ✓ emphasize self-organization of teams
  
- ✓ visit <https://ProcessesAsRequirements.info>
- ✓ contact us when you have questions

