

Using Scripts with Jira and Confluence to Automate Processes in Software Development

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SERCO on Behalf of the Product Assurance Team at ESAC

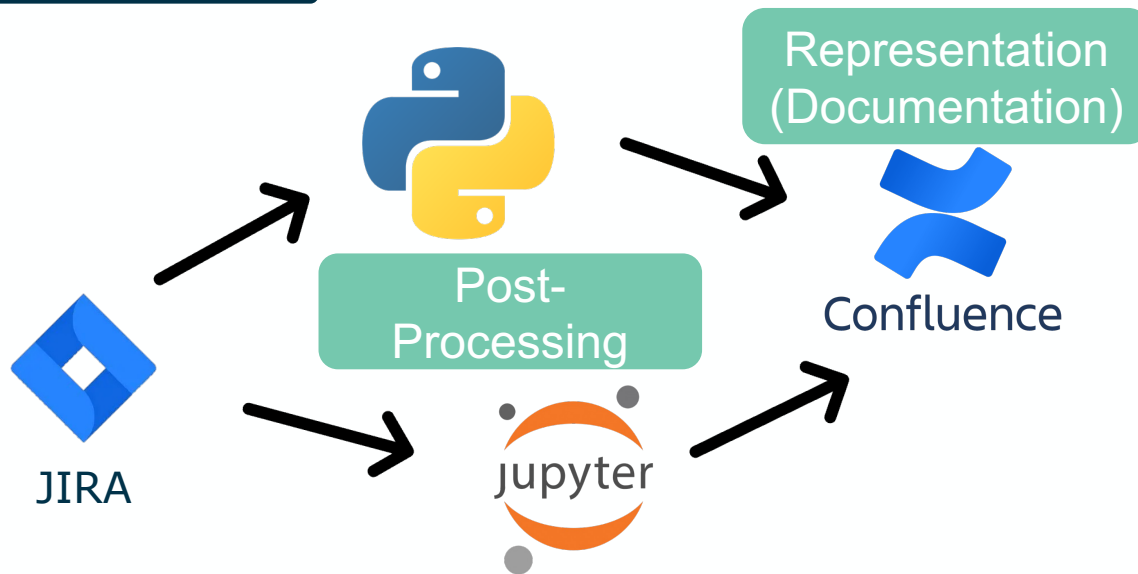
07/07/2025

Introduction

The **Product Assurance Team** supports **ESA Science Operations Department**. This area is part of the ESA's Directorate of Science, based at **ESAC (European Space Astronomy Centre)** in Spain.

The department plays a key role in **supporting the development and operations** of ESA's space **science missions** focusing on software engineering, data processing, and scientific analysis tools.

The department works closely with scientists, mission teams, and software engineers to **ensure that mission data is accessible, scientifically valuable, and supported by robust tools and infrastructure**.



Homogenization of Processes

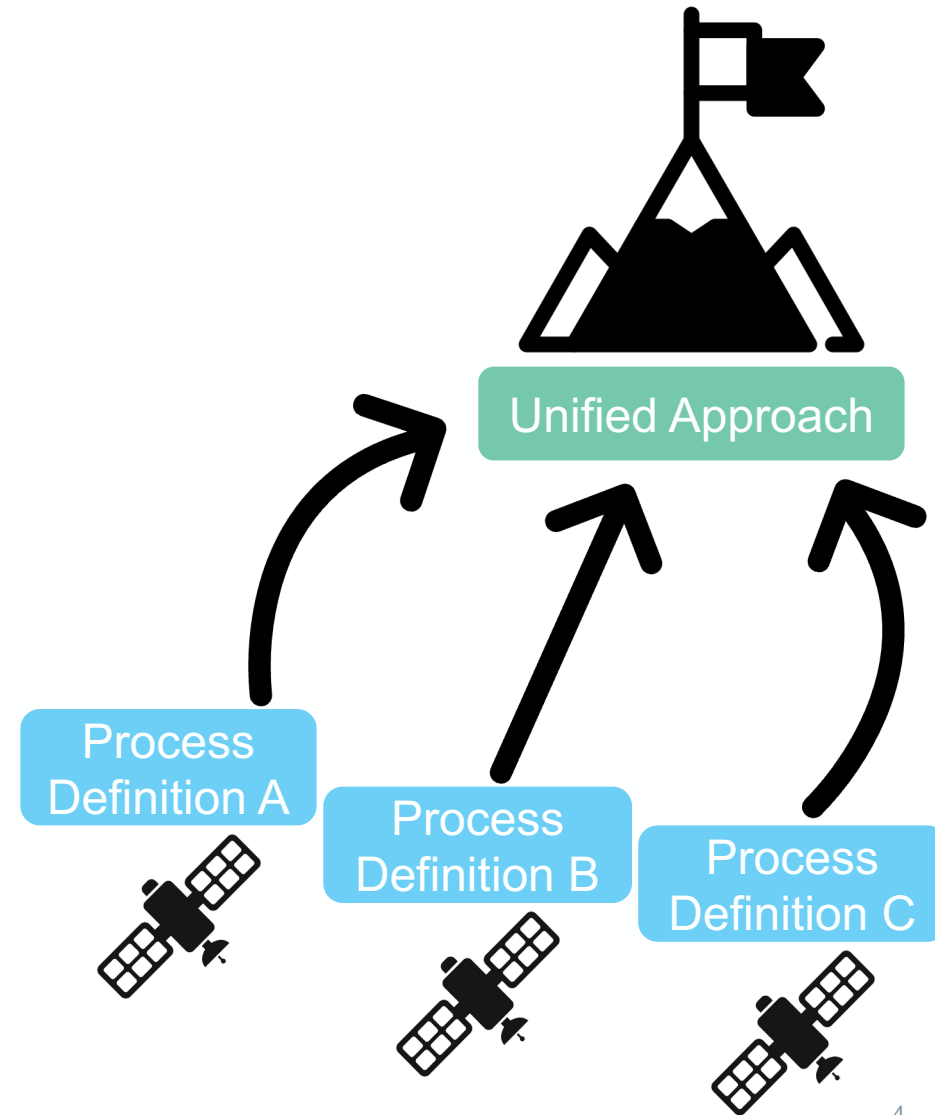
Such a rich and diverse working environment at ESAC also poses challenges:

Different approach to same activity

Deviation from established processes

Different quality culture

- **ESAC Missions Requirements & Test:** Contained in JIRA.
- **JIRA Requirements:** common process, but heterogeneous
 - Mission A
 - Mission B
 - Etc.
- **Verification Control Document (VCD):** support the traceability control and the Verification and Validation processes.





Improve on tools to
provide more value



Support the
processes with
proper tools



Remove the
repetitive tasks with
automation



Proposed solution
improves on
adherence to
processes and
reduces effort

First example: VCD Tool

1

The verification control document extracts information from the requirement and test repositories

2

Produces a full traceability from high level requirements down to verification

3

Easy to extract statistics from the data and highlight possible issues

Second example: Test Report Tool

1

Test repository with
defined structure:
Specifications,
Designs, Cases,
Records

2

Traceability is
embedded in the
definition of the
structure. Includes
requirements and
interfaces.

3

Full report is
produced
automatically, to be
completed by author.

The tools depend
on the process to
be followed

Any deviation of
the process is
identified and
corrected

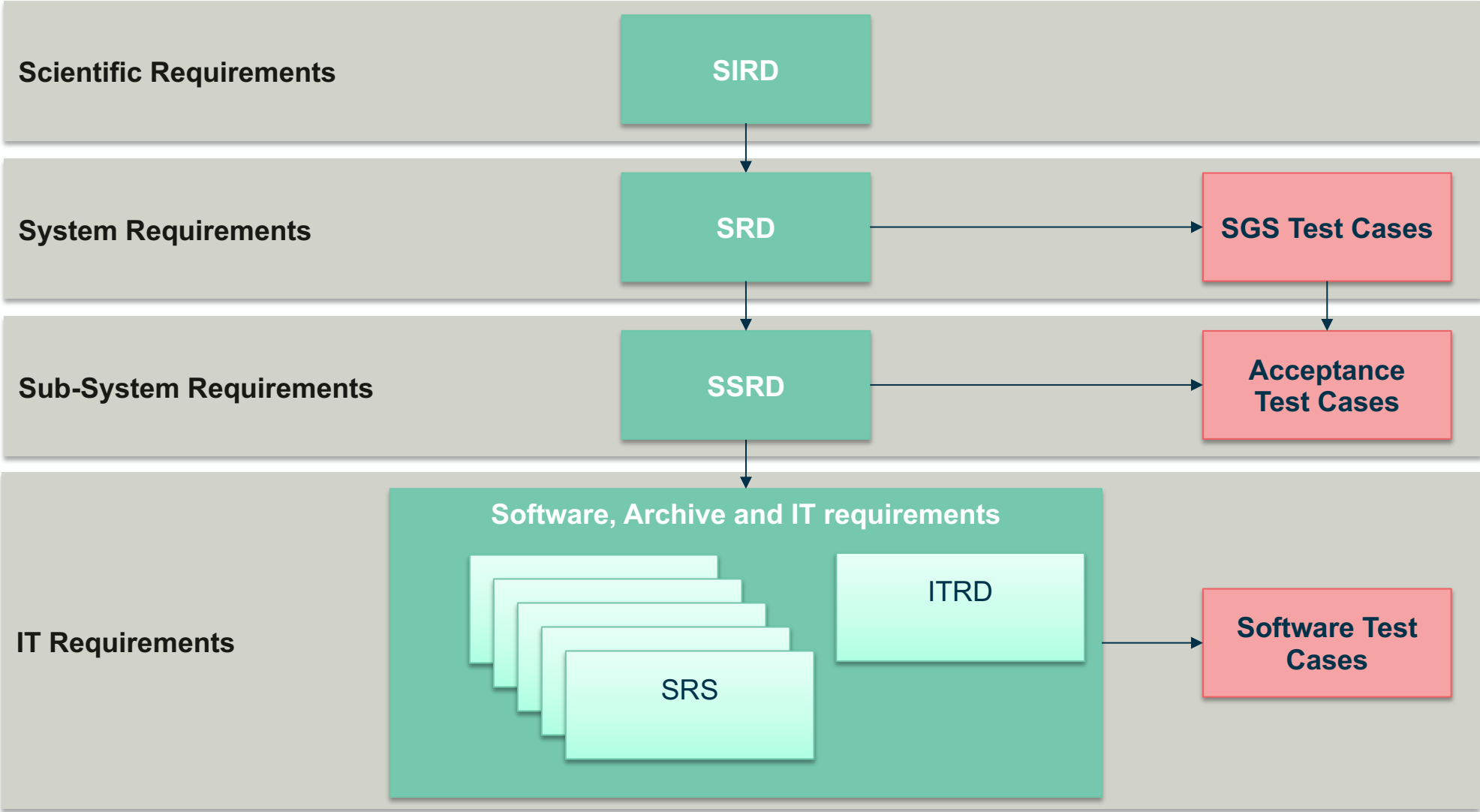
Provides added
value reducing
effort and
mechanical tasks

Example Case: VCD Generation at ESAC

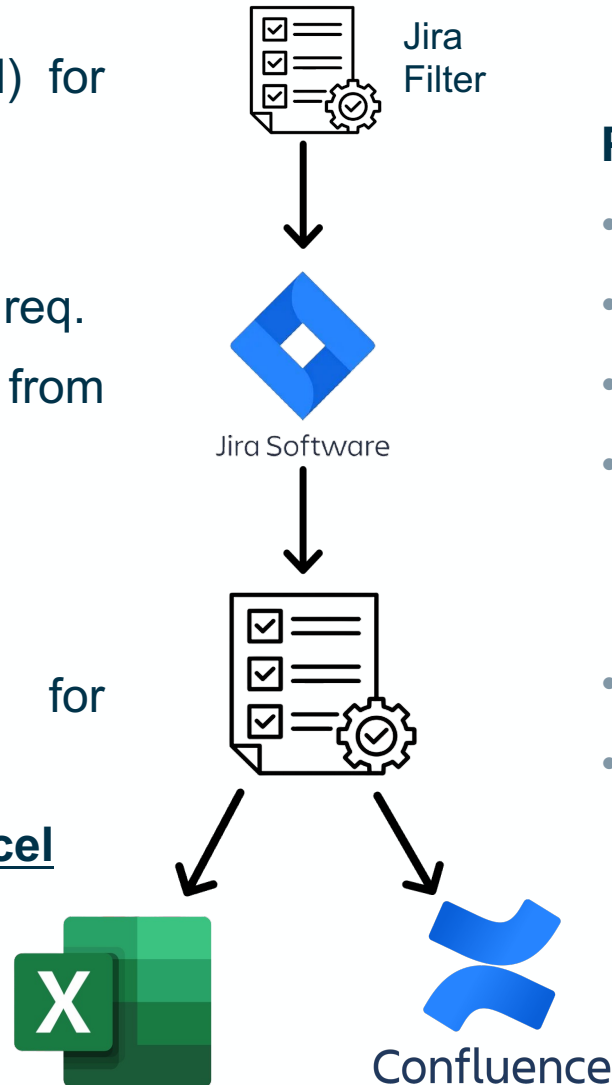
- Key artifact in the systems engineering lifecycle
- Defines the **verification strategy**
- Mapping **requirements to verification activities**

- **Traceability**
- **Consistency**
- **Planning**
- **Compliance**

- **GSCDR:** Ground Segment Critical Design Review
- **GSIR:** Ground Segment Implementation Review (Qualification Review)
- **GSRR:** Ground Segment Readiness Review (Acceptance Review)



- **Three similar tool codes** (but not equal) for **three different missions**
- **The process:**
 - Jira Filters and download all the req.
 - Post-process the information from multiples sources:
 - Loops
 - Conditionals
 - Information to Wiki format for Confluence
 - Transform the information into Excel



Points to improve:

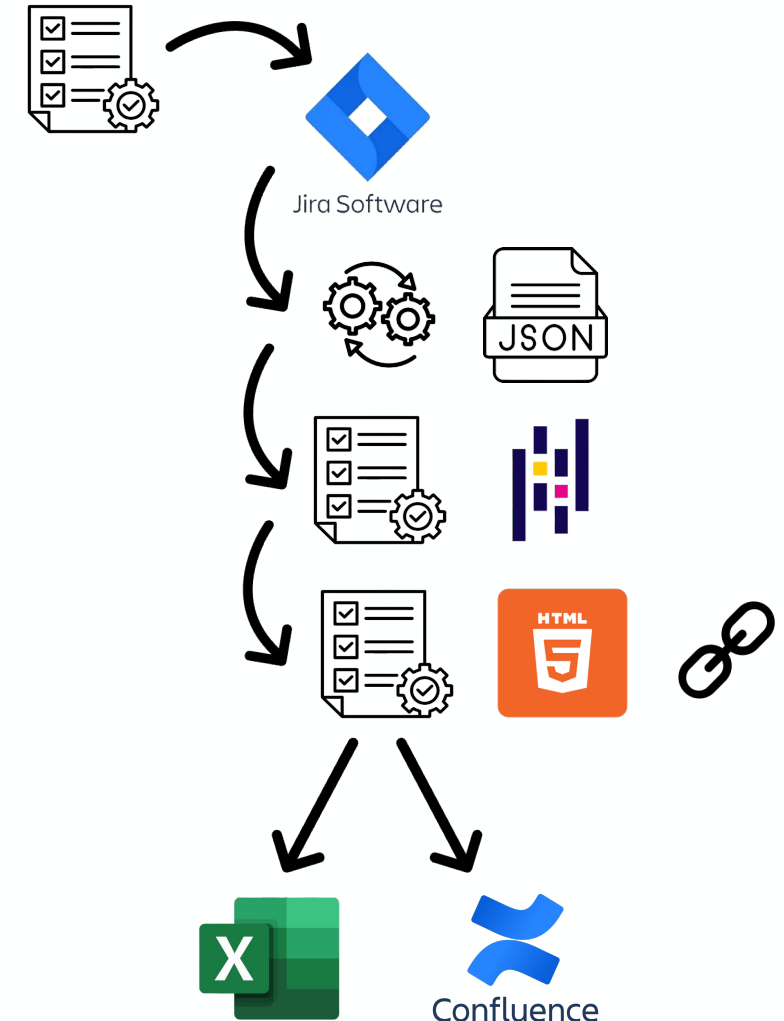
- Not flexible
- Slow processing
- Hard to reconfigure if needed
- The complex nature of the tables was hard to configure in Wiki and Excel
- No fast access to the Requirements
- Etc.....

SIRD JIRA KEY	SIRD Summary	Description	Status	Derives SRD (JIRA KEY)
BCSIRD-1	SOC270	Requirement Text	Open	BCSYSREQ-29 BCSYSREQ-64 BCSYSREQ-84 BCSYSREQ-26 BCSYSREQ-60 BCSYSREQ-78 BCSYSREQ-97 BCSYSREQ-102 BCSYSREQ-130 BCSYSREQ-136 BCSYSREQ-141
BCSIRD-2	SOC37	Requirement Text	Open	
BCSIRD-3	SOC87	Requirement Text	Open	BCSYSREQ-161 BCSYSREQ-18
BCSIRD-4	SOC139	Requirement Text	Open	BCSYSREQ-145
BCSIRD-5	SOC462	Requirement Text	Open	BCSYSREQ-13 BCSYSREQ-40
BCSIRD-6	SOC365	Requirement Text	Open	BCSYSREQ-1 BCSYSREQ-5 BCSYSREQ-105
BCSIRD-7	SOC19	Requirement Text	Open	

New Strategy:

- **Increase flexibility** generalizing the code and creating **common-structure config files** per mission that rule the tailoring of the general code for each case
 - Extract all the **Requirements information from 1 single source**
 - Treat the **post-processing problem** as a **database** (Pandas)
 - **Use of links** in the requirements, and to the confluence pages generated
 - **Use of HTML** instead of wiki format for Confluence generation.
- Additional benefits:
- Add Meta-data headers to the Documents
 - Add text content (Sections and paragraphs)
 - Direct transformation from HTML to Excel
 - Capability to capture of sub-Tables and list inside the requirement

Mission Config File and Jira Filter



Mission A - System to Subsystem Traceability Matrix

Created by Javier Palacios Calatayud, last updated less than a minute ago - 36 minute read

Metadata

reference

title

author

updated

aaaa-mm-dd

issue

0

revision

1

status

DRAFT

doctype

distribution

-

header

ESA UNCLASSIFIED - For ESA Official Use Only

footer

ESA UNCLASSIFIED - For ESA Official Use Only

organization

esac

address

European Space Astronomy Centre (ESAC)
European Space Agency (ESA)
Camino Bajo del Castillo s/n
Urb. Villafranca del Castillo
28692 Villanueva de la Canada - Madrid
SPAIN

Approval

Issue 0

Revision 1

Author

Date <YYYY-MM-DD>

Approved by <approver>

<YYYY-MM-DD>

-

-

Change log

Reason for change	Issue	Revision	Date
Initial version	0	1	aaaa-mm-dd

Change record

Issue 0	Revision 1		
Reason for change	Date	Pages	Paragraph(s)
Initial version	aaaa-mm-dd	All	All

Status	count	Percentage (%)
Open	Requirement Statistics	
In Progress		
Closed (Completed)		
Closed (Rejected)		
In Validation		
Closed (Done)		
Closed (Duplicate)		

JIRA Key	Summary	Requirement Type MPP	Fix Version/s	Component	Derives
EDSSRQ-13	Requirement Text				EDSSM-99 EDSSM-156 EDSSM-158 EDSSM-206 EDSSM-211 EDSSM-165 EDSSM-167 EDSSM-196 EDSSM-285 EDSSM-306 EDSSM-94
EDSSRQ-14	Requirement Text				EDSSM-279
EDSSRQ-15	Requirement Text				EDSSM-280
EDSSRQ-16	Requirement Text				EDSSM-279 EDSSM-462 EDSSM-327 EDSSM-344 EDSSM-345 EDSSM-346 EDSSM-356 EDSSM-176
EDSSRQ-13	Requirement Text				EDSSM-176 EDSSM-326 EDSSM-583 EDSSM-237
EDSSRQ-14	Requirement Text				EDSSM-99 EDSSM-156 EDSSM-158 EDSSM-206 EDSSM-211 EDSSM-165 EDSSM-167 EDSSM-196 EDSSM-285 EDSSM-306 EDSSM-94
EDSSRQ-15	Requirement Text				EDSSM-279 EDSSM-280

Introduction

Documentation Text

VCD (Verification Control Document) Matrix

Documentation Text

JIRA Key	Summary	Description	Status	Verification Method	Is Derived from	Derives
BCSYSREQ-1	Requirement Text		In Progress	Testing	BCSIRD-6	BCSUBREQ-955

Benefits of the Verification Control Document (VCD) process

- Traceability of Requirements
- Consistency and Standardization
- Risk Mitigation
- Compliance with Standards
- Improved Communication



Advantages of a custom Tool

- Automation and Efficiency
- Dynamic Updates
- Customization and Scalability



Advantages for PA Team

- Unify the different missions' approaches on our processes
- Automate mechanical/tedious processes
- Ease the monitorization of the missions and early issues identification

Q&A