

# Doing the deal of your lifetime – With the Procurement Quality Suite (PQS)



## › Webinar rules:

- › The Webinar will start in few minutes
- › You'll be muted throughout the Webinar
- › There's a chat box for you to ask questions at any time during the webinar
- › Please address comments and questions to the user "The REUSE Company" and not to the presenter directly
- › If you have any technical issues please use this chat box, or mail us at: [support@reusecompany.com](mailto:support@reusecompany.com)
- › The Webinar will be recorded. A link to the recording will be sent to you in few days time

**TRC**



**WEBINARS**

**2018**

**Doing the deal of your lifetime –  
With the Procurement Quality Suite  
(PQS)**

Friday, 01 June 2018

## Presenters' profile



**Christer Fröling**



**Elena Gallego**

- Introduction to Procurement Quality Suite - PQS
- Why requirements quality matter in procurement
- What is a complete, consistent and correct set of bidding documents?
- How can the REUSE tools enhance the quality of a bid?
- Demo of some key features in PQS
- Q&A

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# The REUSE Company – TRC - Worldwide

- Local partners: France, Germany, Italy, Spain and Japan
- Customers in different countries along United States, Europe and Asia
- TRC Headquarters is based on Madrid (Spain)
- United Kingdom TRC office
- Scandinavian TRC office (Sweden)



# The REUSE Company (TRC)

## Tools and solutions for knowledge **Traceability, Reuse and Quality** management

Specialized in the application of **Semantic Analysis Technologies** to a wide range of industries (Aerospace, Defense, Automotive, Railway, Energy...)

Focus: System/Software **Reuse, Traceability and Quality**. Integration of tools and technology from **The REUSE Company** facilitates the representation, analysis and exploitation of knowledge and enables a knowledge-centric systems engineering approach.

Mission: promoting system/software and knowledge reuse within any organization, by offering processes, methods, tools and services. Technology fully integrated within the organization production chain.

**Innovative technologies applied to  
Knowledge Reuse**

# Systems Engineering Studio v18.1



## Verification Studio (V&V Studio)

- Manages the preparation of verification actions
- Manages the realization of verification actions
- Manages and improves the quality of all types of work-products
- Manages the results of the verification process



## Authoring Tools (RAT)

- Assists you in the activity of writing requirements and other natural language text
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- Fully integrated in your Requirements Management Tool and Modelling Tool



## Knowledge Manager (KM)

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- Helps you in the creation of patterns
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- Manages knowledge evolution over time



## Traceability Studio

- Manages trace links between all sorts of information
- Discovers user-tailored trace links
- Monitors and reports trace links in a tailorable platform
- Connects every tool involved in the systems engineering processes



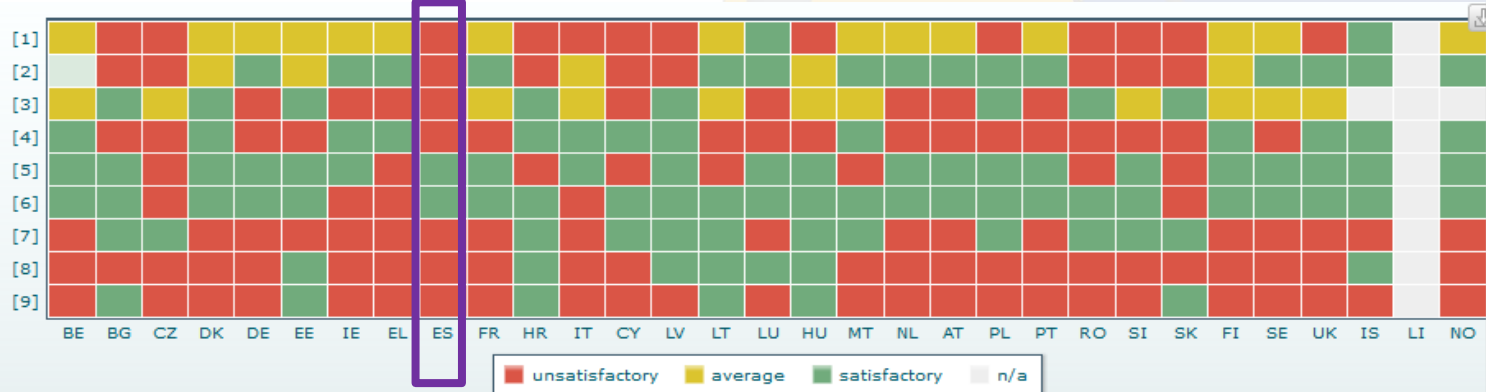
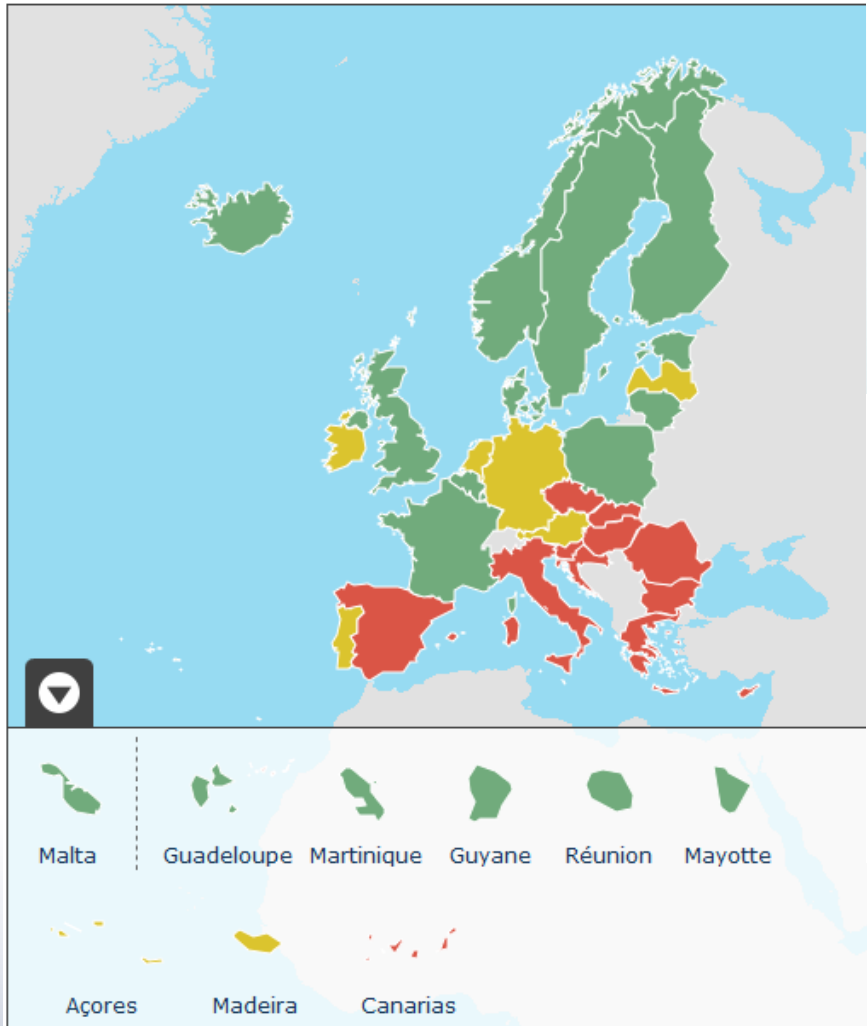
# The Procurement Quality Suite - PQS

## Setting the scene..

Public procurement, the buying of works, goods or services by public bodies, accounts for over 14% of EU GDP

**€ 2.3 trillion (2016)**

# Sound procedural management fulfilment (today)

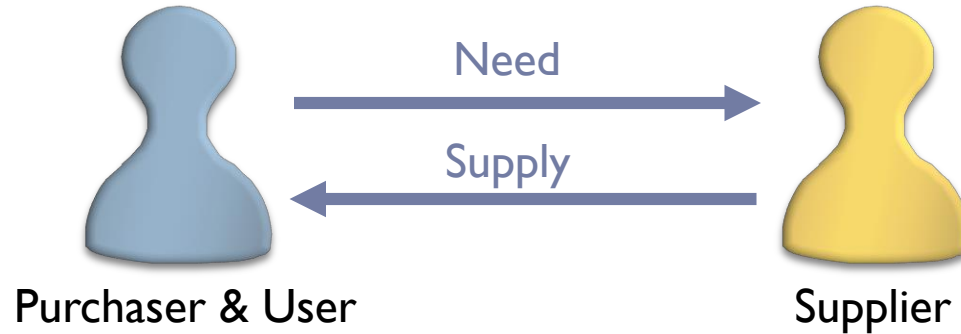


|                                  |            |            |
|----------------------------------|------------|------------|
| [1] One Bidder                   | ≤ 10%      | > 20%      |
| [2] No Calls for Bids            | ≤ 5%       | ≅ 10%      |
| [3] Publication Rate             | > 5%       | < 2,5%     |
| [4] Cooperative Procurement      | ≅ 10%      | < 10%      |
| [5] Award Criteria               | ≤ 80%      | > 80       |
| [6] Decision Speed               | ≤ 120 days | > 120 days |
| [7] Missing Values               | ≤ 3%       | > 3%       |
| [8] Missing Calls for Bids       | ≤ 3%       | > 3%       |
| [9] Missing Registration Numbers | ≤ 3%       | > 3%       |

[http://ec.europa.eu/internal\\_market/scoreboard/performance\\_per\\_policy\\_area/public\\_procurement/index\\_en.htm](http://ec.europa.eu/internal_market/scoreboard/performance_per_policy_area/public_procurement/index_en.htm)

# Simple Definitions:

## ➤ Acquisition



## ➤ Procurement



Rules, laws & regulations

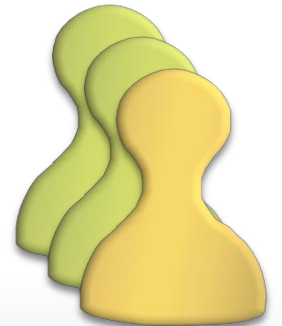


Publish request

Quote & Evaluate

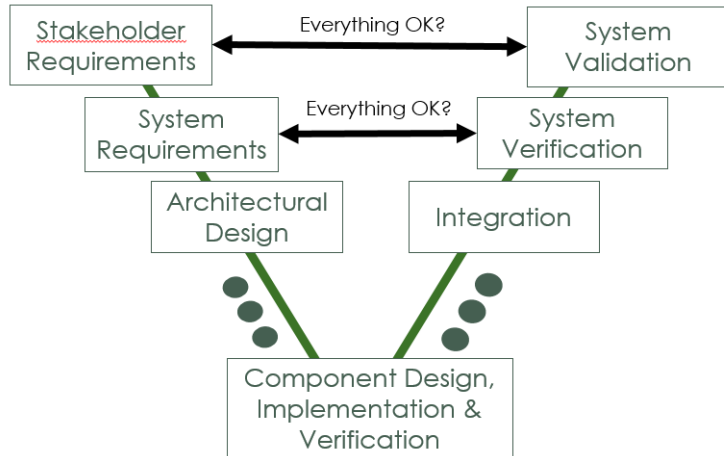
Negotiate & Contract

Develop & Supply



Bidders & Supplier

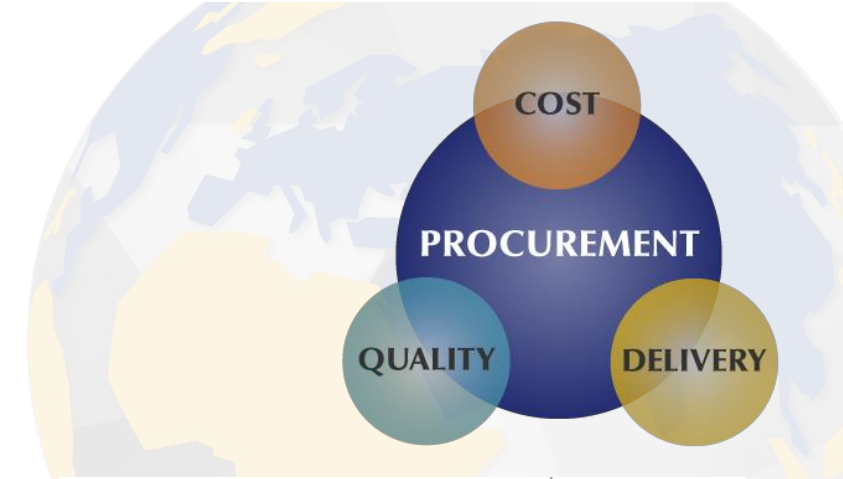
## Why the need for a Procurement quality suite?



**The System perspective**  
"Getting the right system  
and solving the right problem"



**The Business perspective**  
"Meeting financial constraints and  
procurement laws"



**The Asset perspective**  
"As a user I want my capability  
need fulfilled and maintained  
over time"

# Poor requirements = High odds of failure!



by Dr. Gina Guillaume-Joseph who studied over 200 failed projects with a total value of **15 billion dollars in sunken cost**. I was not surprised by the result. The main reason for project failure was ranked like this:

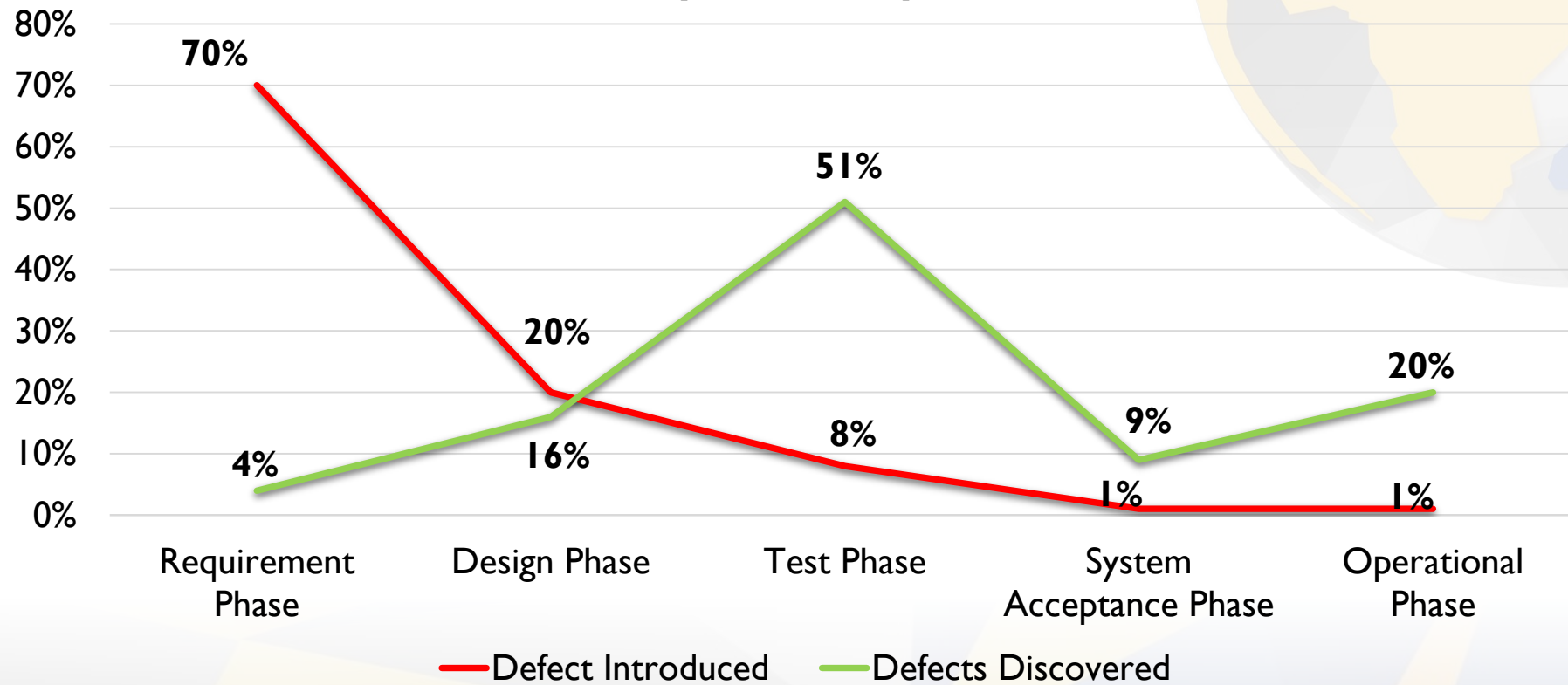
| Project failure factor           | Odds of project failure |
|----------------------------------|-------------------------|
| Project Schedule Delays          | 78,6%                   |
| Changing or Unclear Requirements | 29,9%                   |
| Project Failure in Test Phase    | 11,4%                   |

(Source: *Improving Software Project Outcomes Through Predictive Analytics*, ENGINEERING MANAGEMENT REVIEW, 2015)

Source: <https://requirementdoctor.blog/>

## REQUIREMENTS are the reason for FAILURE

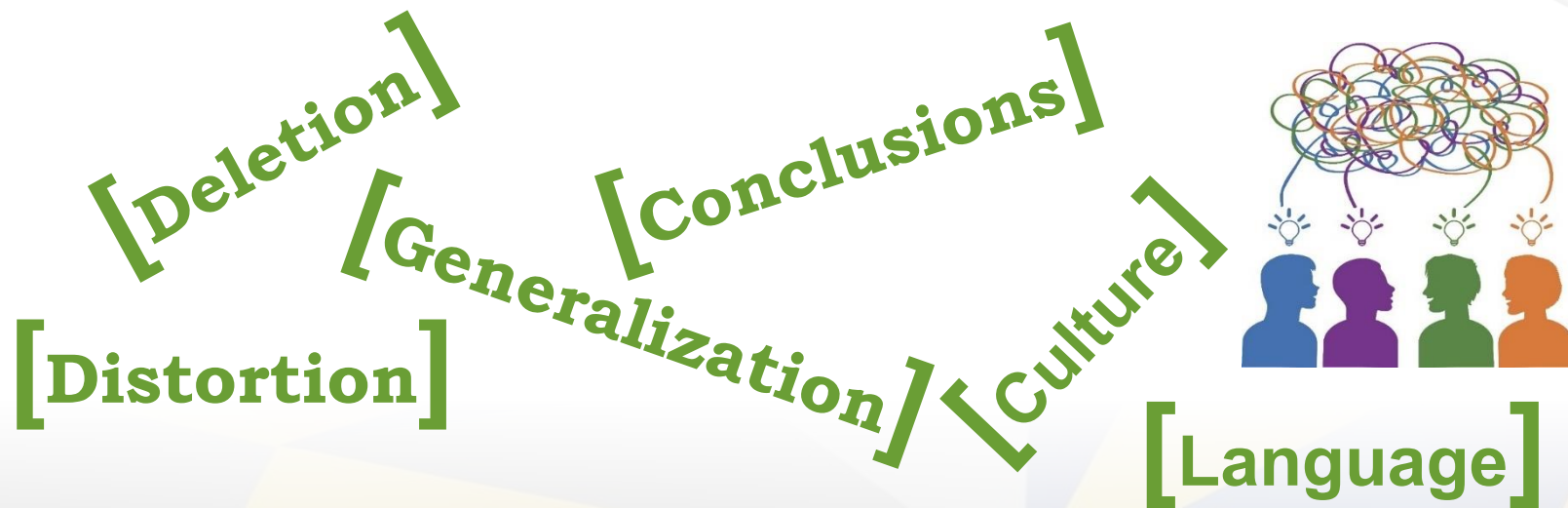
**When errors are introduced vs. when they are discovered during the system life cycle**



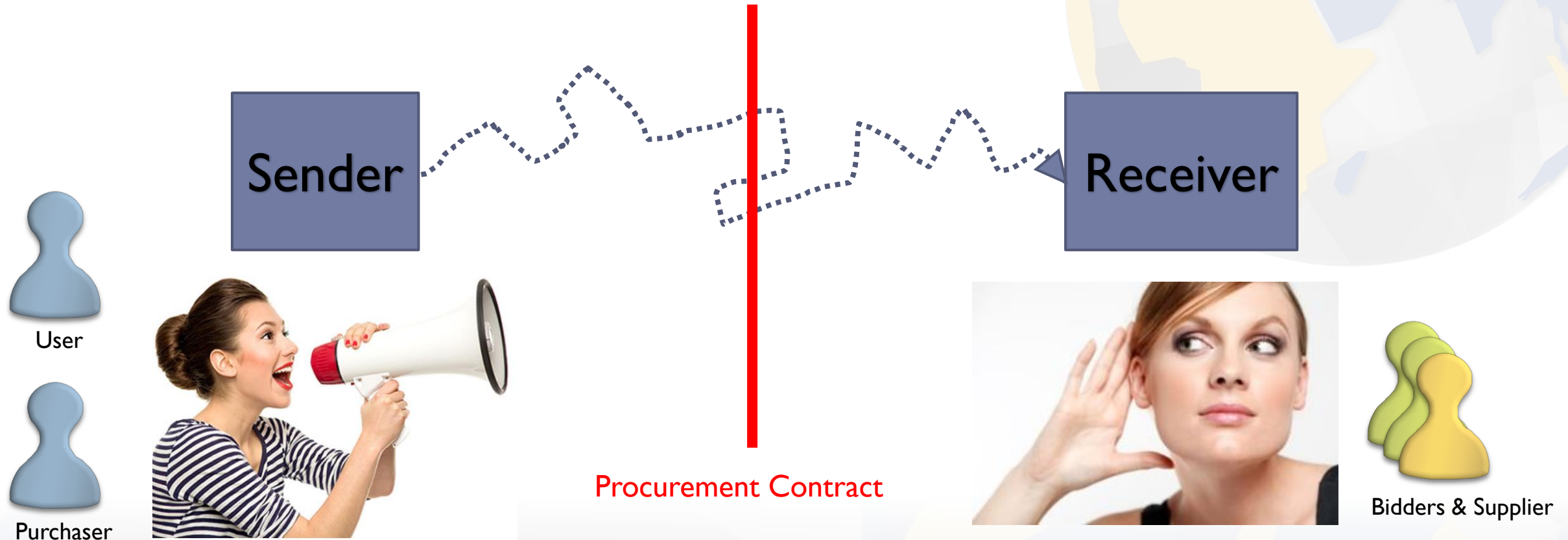
Source: IBM Business research 2017

## Why focusing on requirements quality

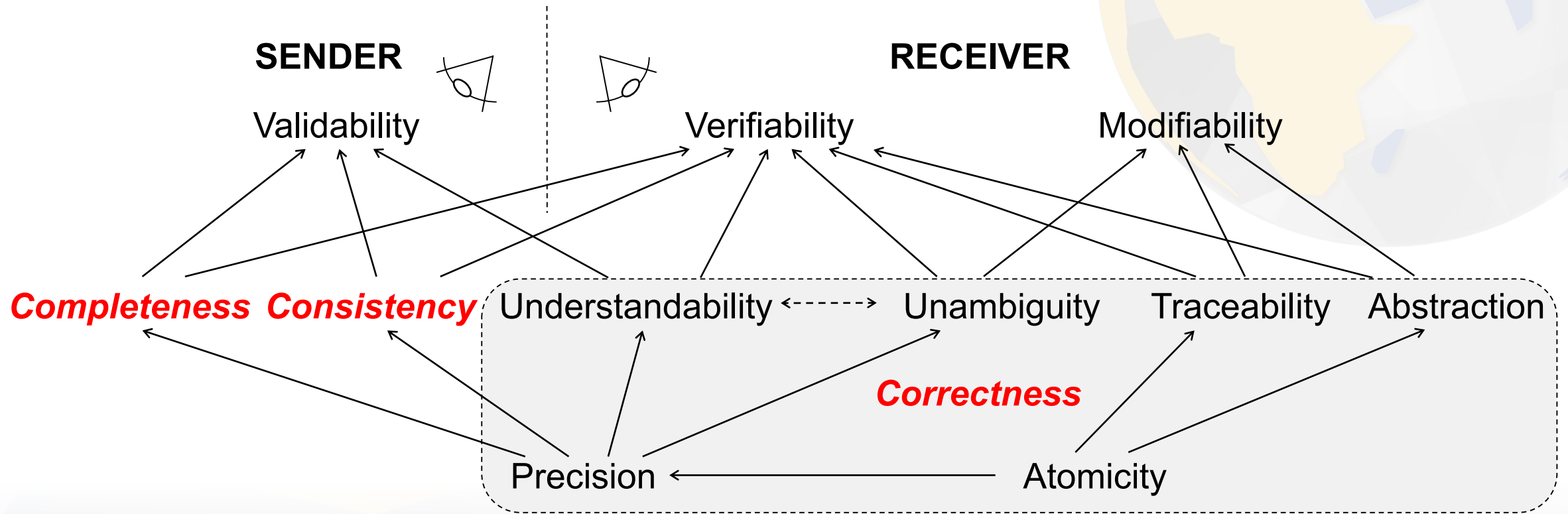
- Because communication among **humans** is not always that easy:
  - Neuro Linguistic Programming (NLP) principles:



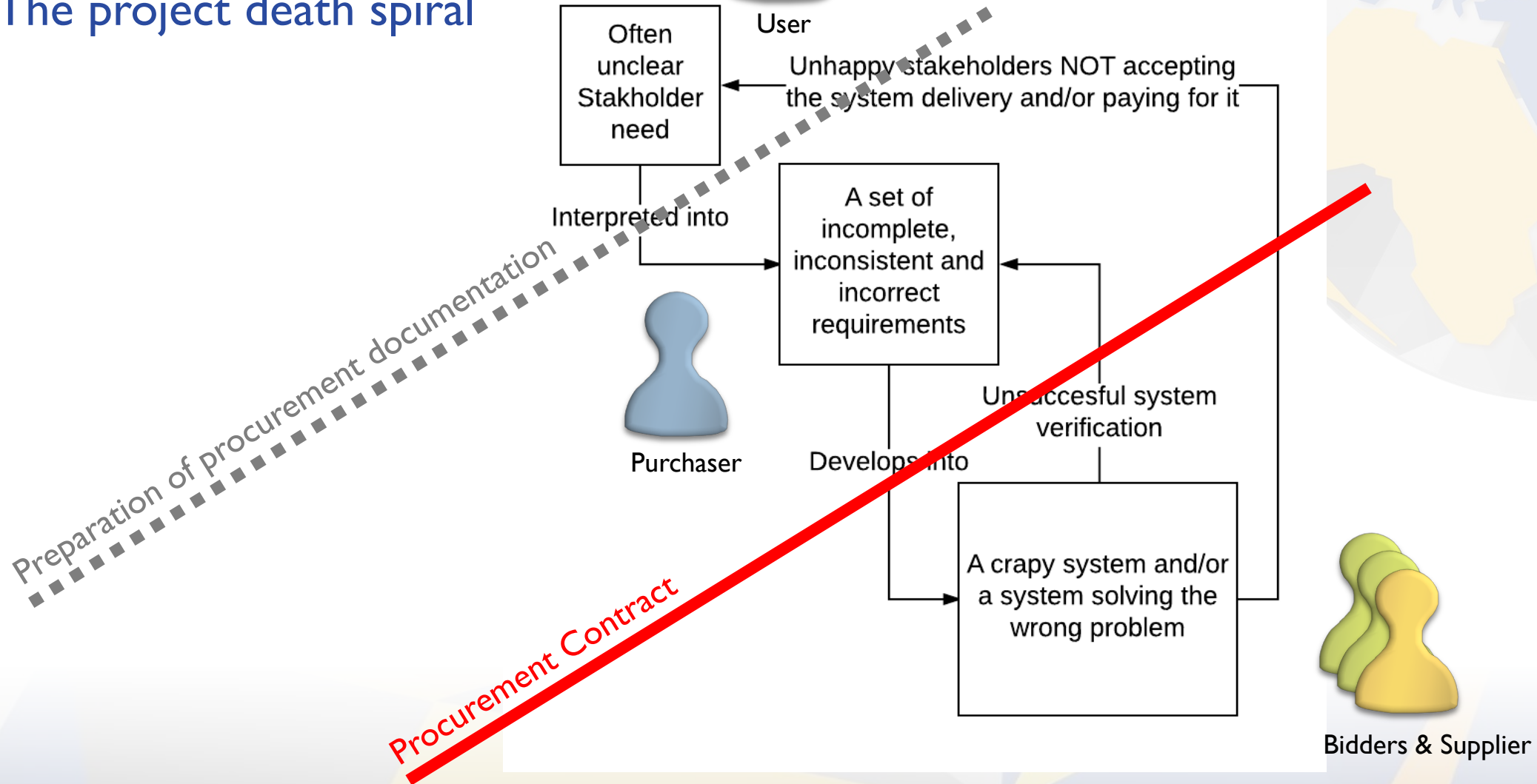
# Requirements are used to capture and describe a need



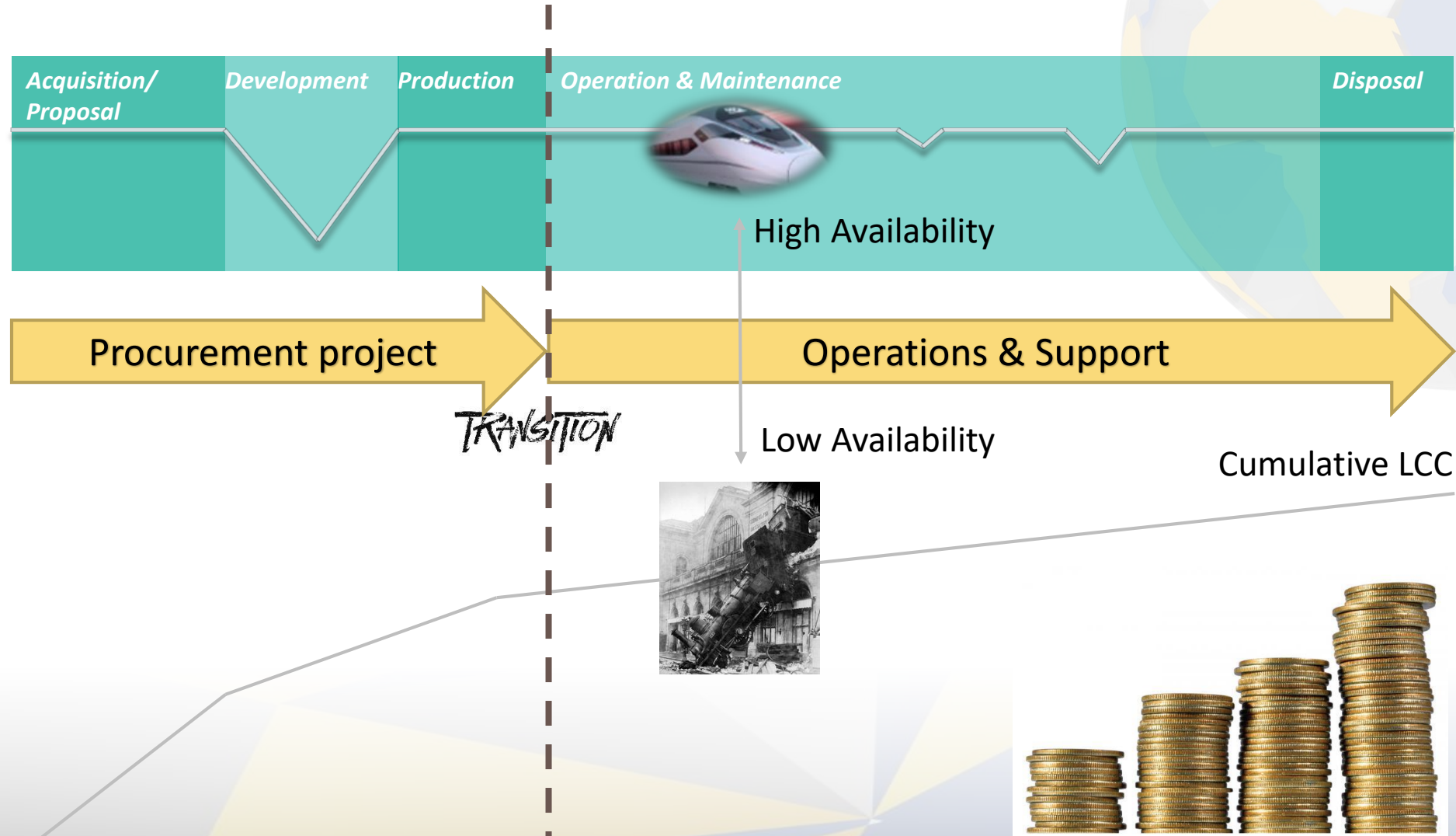
# The meaning of understanding each other



# The project death spiral



# The System Life cycle of Procurement: In theory



# The System Life cycle of Procurement: In practice



Google

bad procurement



Allt

Bilder

Kartor

Nyheter

Videor

Fler

Inställningar

Verktyg

Ungefär 48 200 000 resultat (0,38 sekunder)

## Consequences of Bad Procurement - Procurify Blog

<https://blog.procurify.com/.../consequences-of-bad-procuremen...> ▼ Översätt den här sidan

28 sep. 2015 - We've all heard the positive things that a streamlined procurement process can do for a company—lower costs, increased efficiency and increased profits, to name a few—but there are consequences of having bad procurement. Sure the consequences might not be as bad as having dinosaurs loose at a ...

## Bad Procurement: A Roundup of Recent Procurement Scandals ...

[spendmatters.com/.../bad-procurement-roundup-recent-procure...](https://spendmatters.com/.../bad-procurement-roundup-recent-procure...) ▼ Översätt den här sidan

6 apr. 2017 - Procurement scandals haven't been a priority coverage area on Spend Matters, but that may change soon. Monday's Afternoon Coffee column covered the news, broken by the New York Post, that the chief procurement officer for New York City's Metropolitan Transportation Authority (MTA) has been fired ...

## Best Of: Bad Procurement Lessons - Spend Matters

[spendmatters.com/2014/11/.../best-of-bad-procurement-lessons/](https://spendmatters.com/2014/11/.../best-of-bad-procurement-lessons/) ▼ Översätt den här sidan

27 nov. 2014 - Here on Spend Matters, we share our insights on how procurement can improve, expand, innovate, be efficient, etc. To do so, sometimes we talk about bad examples of procurement to show CPOs and other supply chain professionals what not to do in their organization to be successful. Here we provide a ...

## Avoid These Five Procurement Practices at All Costs | blur Group Blog

<https://www.bluraroup.com/.../procurement.../avoid-these-proc...> ▼ Översätt den här sidan

## Wrong requirements means 30 MEUR law suite

### SL kräver 300 miljoner för fiasko med signalsystem

Signalsystemet till t-banans röda linje skulle bana väg för förarlösa tåg. Men efter flera år av förseningar har SL tappat förtroendet för leverantören.

– Vi kräver i ett första steg tillbaka 300 miljoner kronor av förskottet, säger vd:n Caroline Ottosson.



Det nya signalsystemet på tunnelbanans röda linje är försenat flera år. Foto: Claudio Bresciani/TT

kräver tillbaka 300 miljoner kronor av förskottet. Enligt avtalet skulle de den 30 september i år kunna visa hur de skulle kunna slutföra uppdraget på ett trovärdigt sätt. Men vår genomgång visar att man inte uppfyller krav på grundläggande funktionalitet, säger Caroline Ottosson till SvD.

*”The delivered control system doesn't fulfil requirements for basic functionality and the Purchaser goes to court to get compensation...”*

## What is wrong with Canada's military procurement process?



Andy Radia

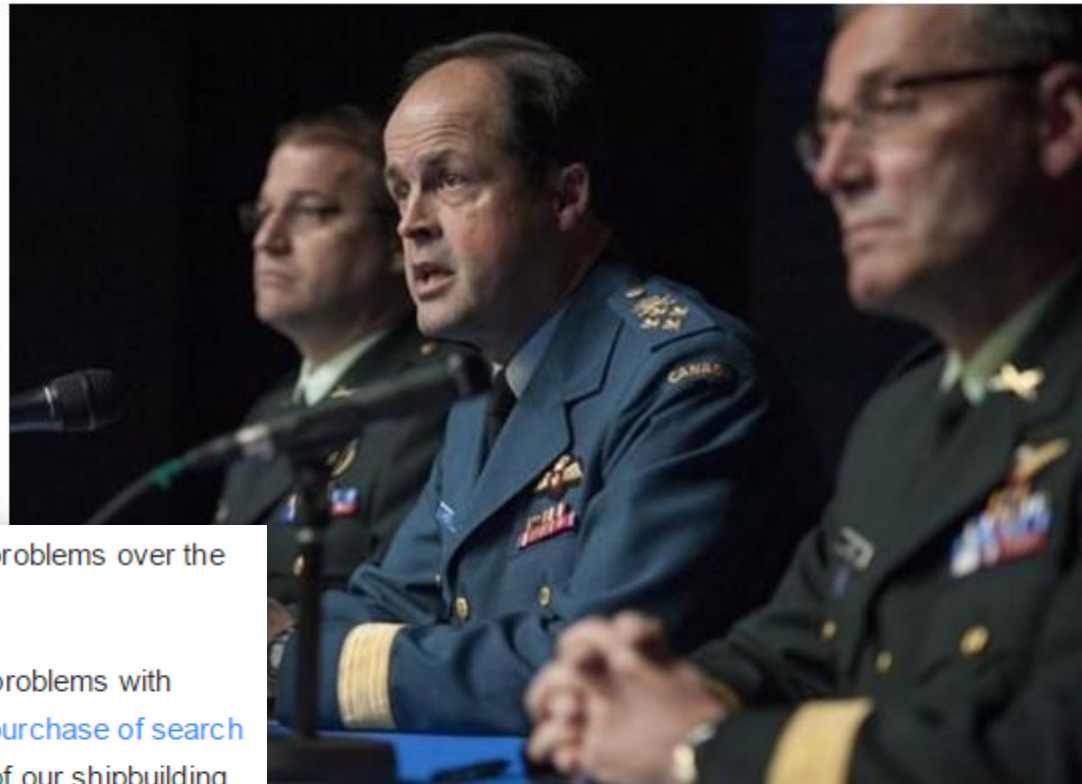
Canada Politics December 20, 2013



There has been a lot of negative press about Canada's procurement problems over the past several years.

Successive governments have had trouble procuring [military trucks](#), problems with [second-hand submarines](#) bought from the UK in 1998, [delays on the purchase of search and rescue planes](#) and have faced [ongoing questions](#) about the cost of our shipbuilding program.

And let's not forget about the F-35 fiasco and the government's "re-set" of that procurement process last year.



<https://ca.news.yahoo.com/blogs/canada-politics/wrong-canada-military-procurement-213306039.html>

# What is the result of a “bad” procurement documentation...

**WRONG PRODUCT**



and/or

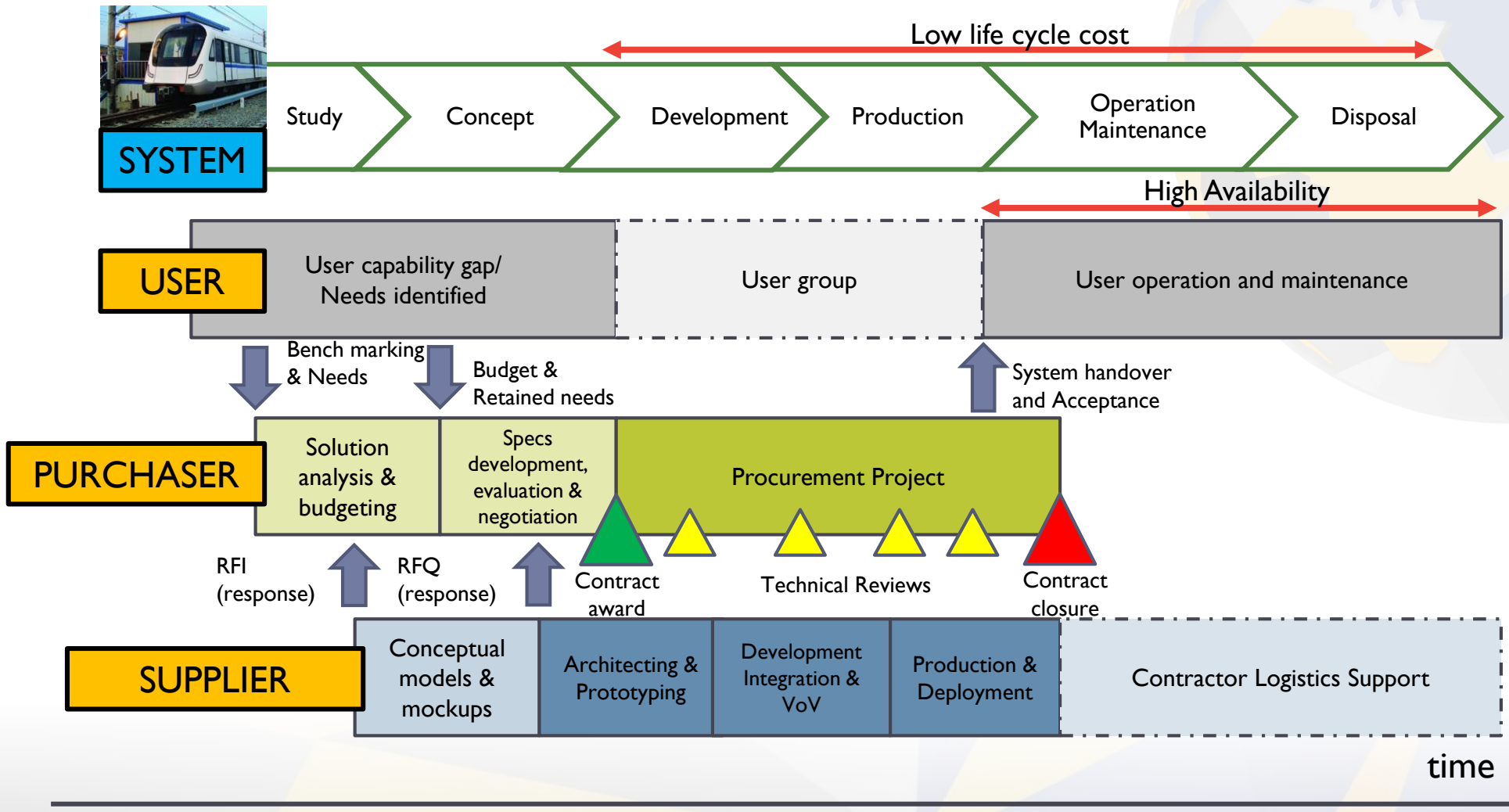


and/or

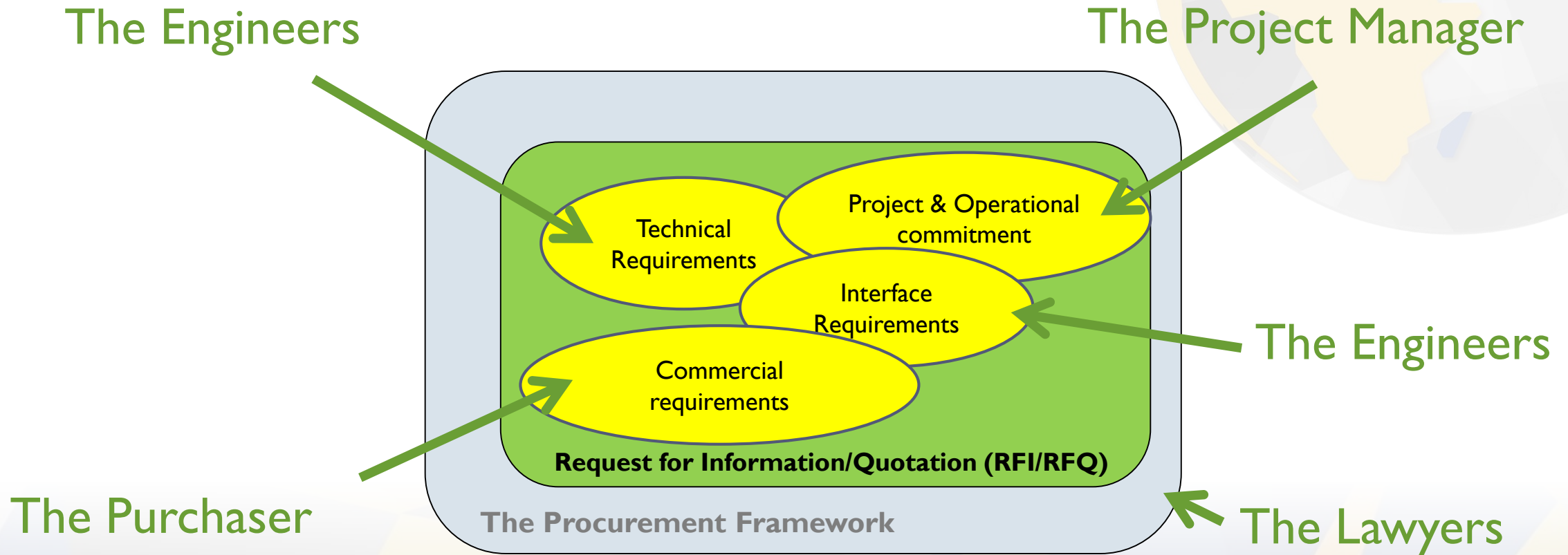


4190 appeals (8%)  
and 6,9 month average delay

Source: <http://www.upphandlingsmyndigheten.se/aktuellt/uppdrag-att-kartlagga-overprovade-upphandlingar/>

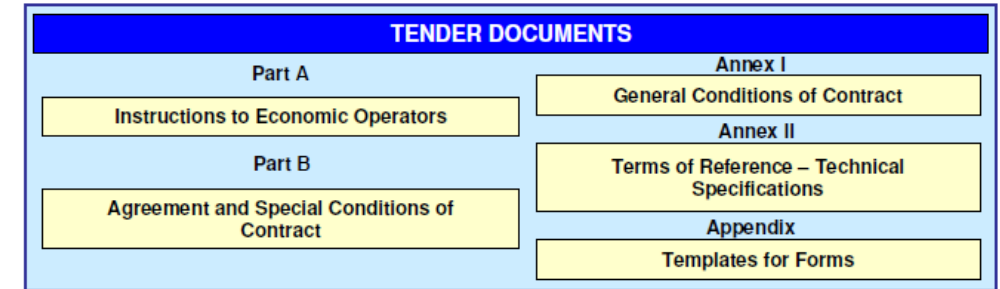


# Who are responsible for what in the procurement documentation?



# The content of the Procurement/Tendering documentation (example)

- There is **alot** of information in a typical Tender....
- We need to make sure that this information is:
- **Correct**
  - All data must be correct. Incorrect data adds risk, cost and delays after failed verification or validation
- **Complete**
  - Incomplete data increases project risk, efforts and possible late changes to contract/design after failed verification or validation
- **Consistent**
  - Inconsistent data increases project risk, effort and possible late changes to contract/design



**Part A: Instructions to Economic Operators**

The Table below lists the key information contained in Part A – "Instructions to Economic Operators" of the tender documents:

- Key details of the tender procedure
- Legal framework
- Provision of clarifications on the tender documents
- Eligibility and requirements for participation
- Format and submission of tenders
- Conduct of the tender procedure
- Conclusion of the tender procedure

**Part B: Agreement and Special Conditions of Contract**

The Table below lists the key contents of Part B – "Agreement and Special Conditions of Contract" of the tender documents:

- Structure of the contract
- Contract scope
- Contract value
- Project organisation and administration
- Date of commencement and period of implementation
- Conditions and procedure for payment
- Penalties for delay
- Settlement of disputes
- Communication between the parties

**Annex I: General Conditions of Contract**

The Table below lists the key contents of Annex I – "General Conditions of Contract" of the tender documents:

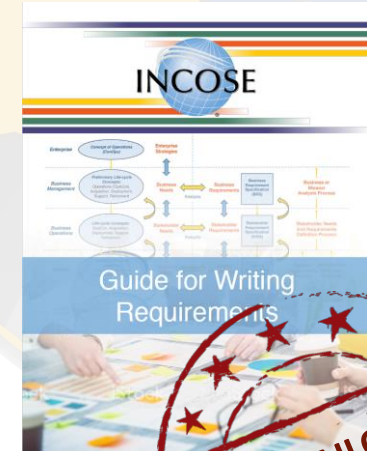
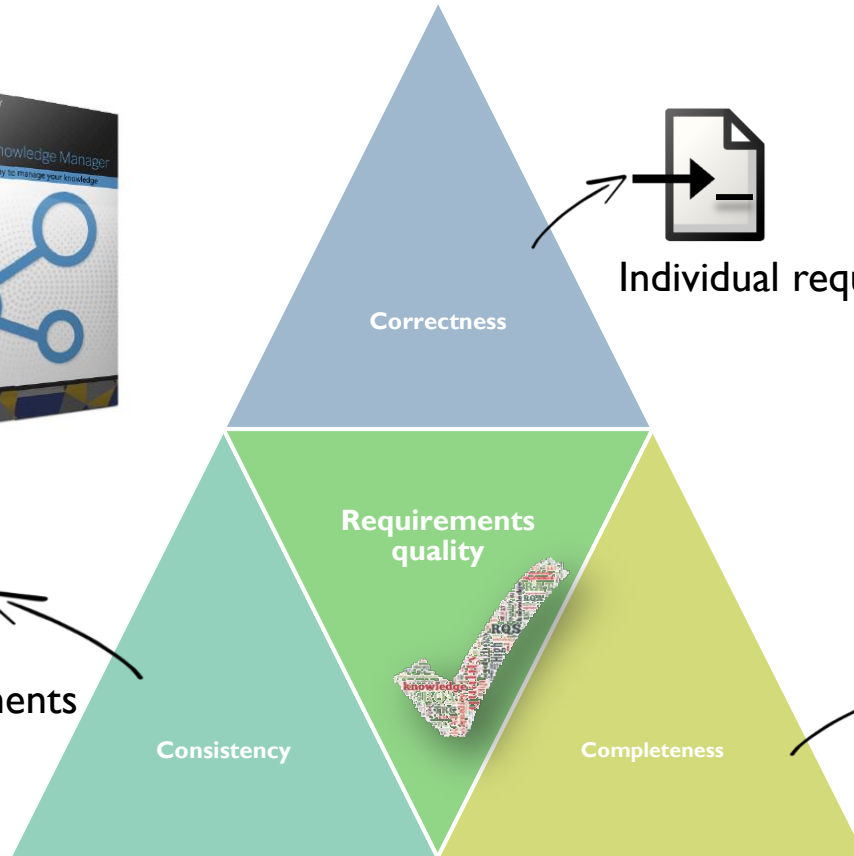
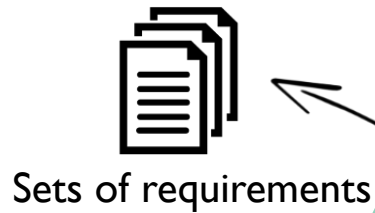
- Ownership – Intellectual and property rights
- Obligations of the Contracting Authority
- Performance Guarantee
- Assignment
- Subcontracting
- Confidentiality – Secrecy
- Code of ethics
- Conflict of interests
- Protection of employees
- Amendment to the contract
- Payments
- Administrative and financial penalties
- Breach of contract
- Insurance – indemnification
- Termination by the Contracting Authority
- Termination by the Contractor
- Force majeure
- Settlement of disputes

**Annex II: Terms of Reference – Technical Specifications**

The Table below lists the key contents of Annex II "Terms of Reference – Technical Specifications".

- Background information
- Objective and expected results
- Assumptions and risks
- Project scope (technical specifications)
- Delivery times
- Project location and duration of implementation
- Special requirements (staffing, equipment etc.)

# Requirements quality metrics - The CCC\* approach



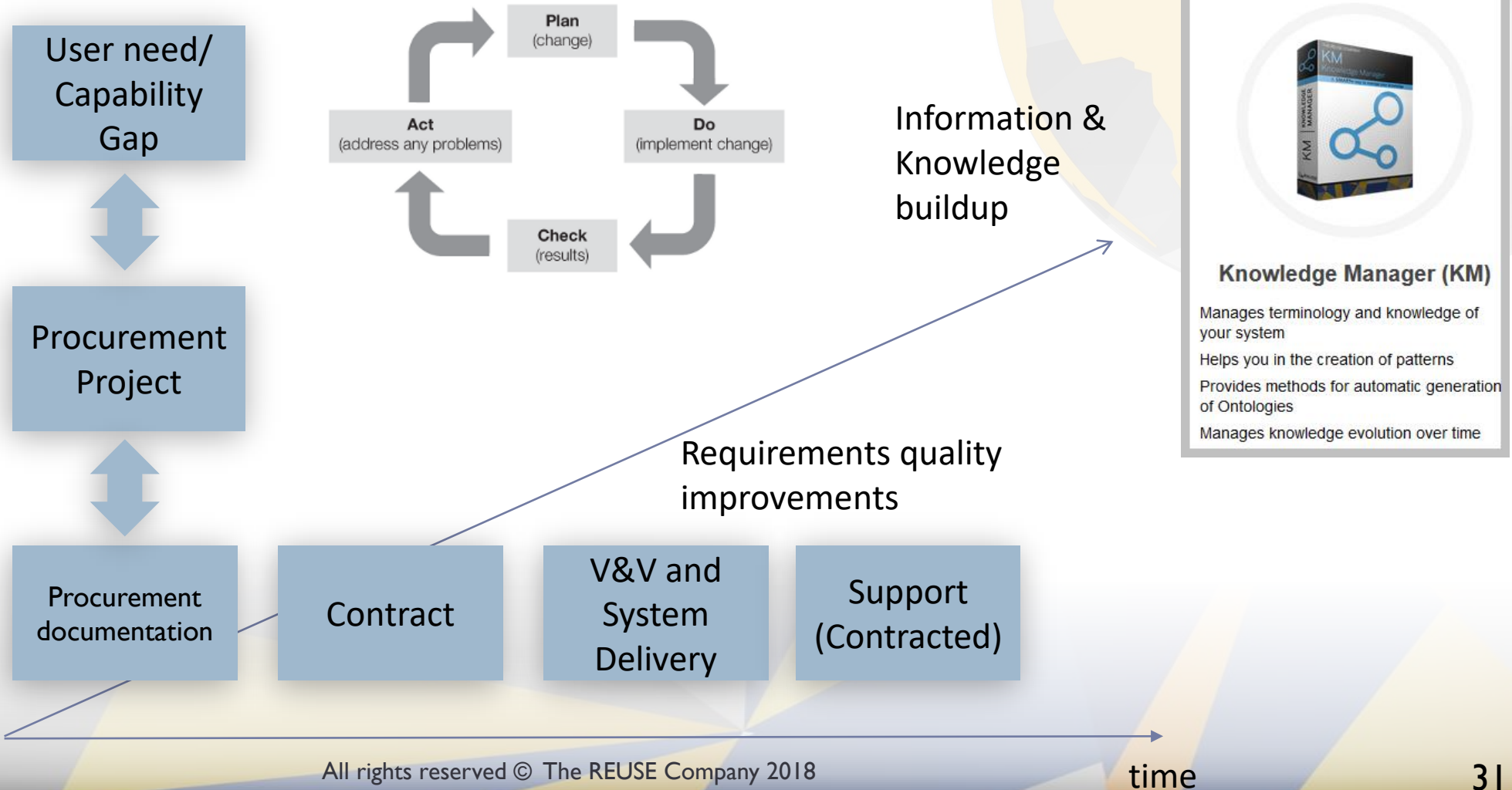
\*CCC – Correctness, Consistency and Completeness



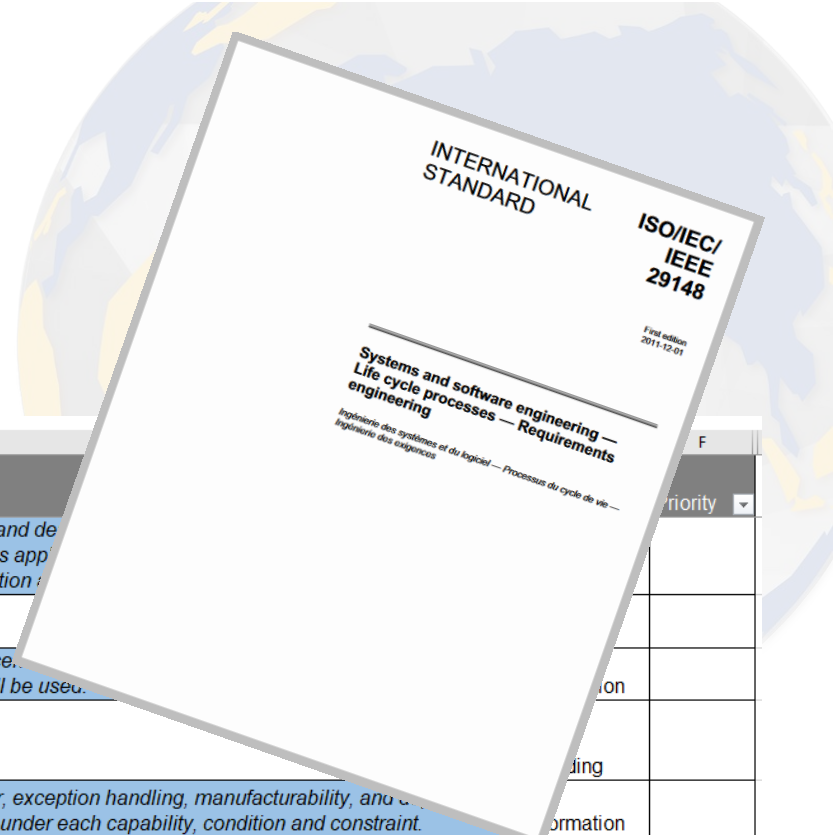
# Systems Engineering Studio v18.1: *The Procurement Quality Suite application*

Friday, 01 June 2018

# Knowledge increases over time – Reuse of knowledge



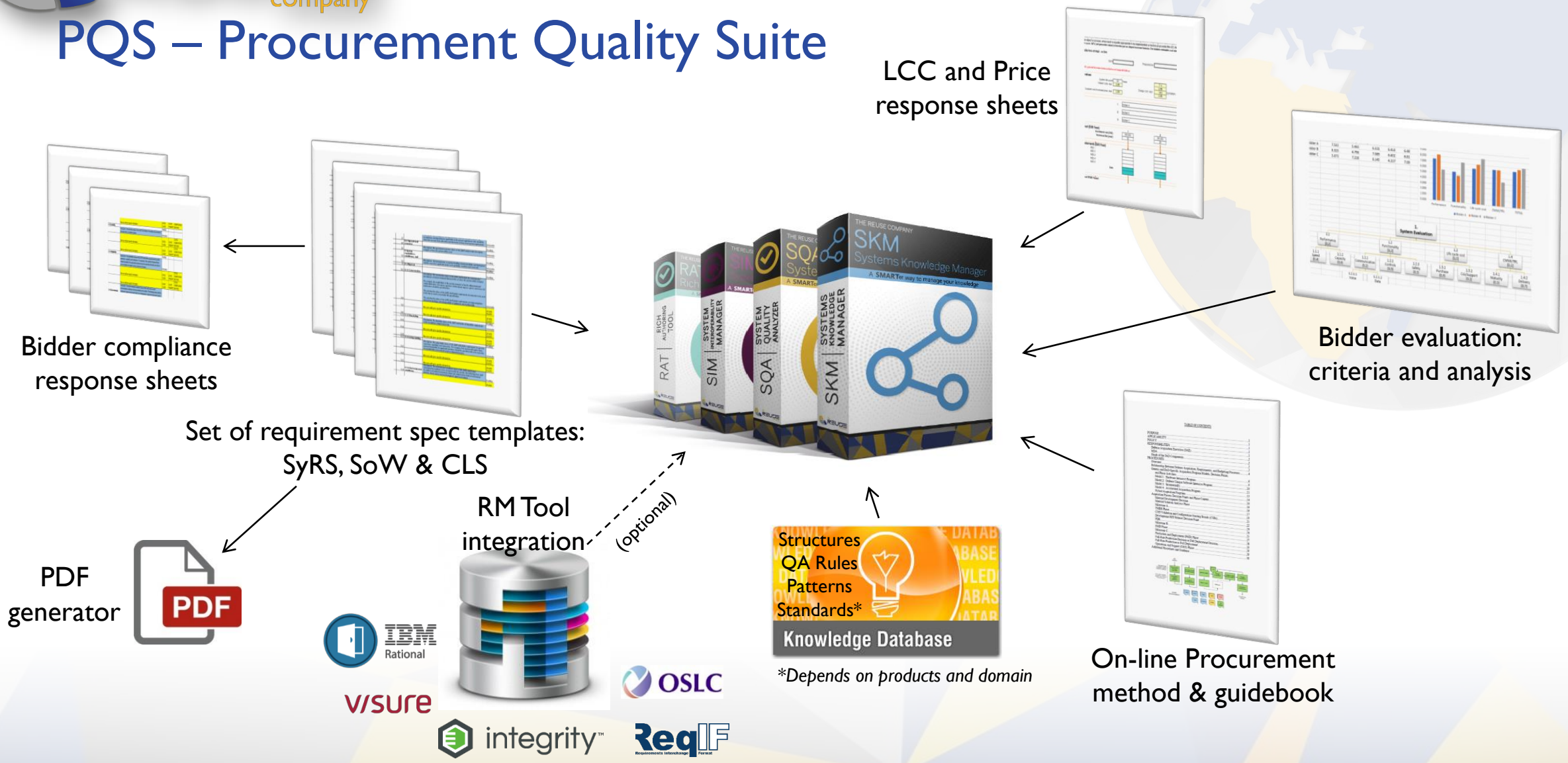
# Starting position for many procurement projects...



REQ001: The System Shall....

|   | A                 | B       | C   |  | F                 |
|---|-------------------|---------|---|--|-------------------|
| 1 | Object Identifier | Section | Object Heading  | Object Text  | Priority          |
| 7 | SyRS_026          | 2,7     |   | <i>Description: The assumptions and dependencies applicable to the allocation of resources shall be taken into account in the allocation process.</i>  |                   |
| 8 | SyRS_027          | 2,8     | <b>2.8 Operational scenarios</b>                          |  |                   |
| 9 | SyRS_028          | 2,8     |   | <i>Description: The operational scenarios shall include examples of how the system will be used.</i>   |                   |
| 0 | SyRS_029          | 3,0     | <b>3 System capabilities, conditions, and constraints</b> |  |                   |
| 1 | SyRS_030          | 3,0     |   | <i>Description: System behaviour, exception handling, manufacturability, and testability shall be covered as applicable under each capability, condition and constraint.</i>   |                   |
| 2 | SyRS_031          | 3,1     | <b>3.1 Physical</b>                                       |  | Heading           |
| 3 | SyRS_032          | 3,1,1   | <b>3.1.1 Construction</b>                                 |  | Heading           |
|   |                   |         |   | <i>Description: The construction clause of the SyRS shall include the environmental (mechanical, electrical, chemical) characteristics of where the system will be installed.</i><br><br><i>For example, the weight limits of the system, moments of inertia, dimensional and volume limitations, crew space, operator station layout, ingress, egress, and access for maintenance should be specified here.</i><br><br><i>The construction clause of the SyRS shall include requirements for materials to be used in the item or service covered by this specification.</i><br><br><i>The construction clause of the SyRS shall include requirements covering nameplates and system markings, interchangeability of equipment, and workmanship.</i> | Information       |
| 4 | SyRS_033          | 3,1,1   |   |  | Information       |
| 5 | SyRS_034          | 3,1,1   |   | The System shall...  | Requirement SHALL |

# PQS – Procurement Quality Suite

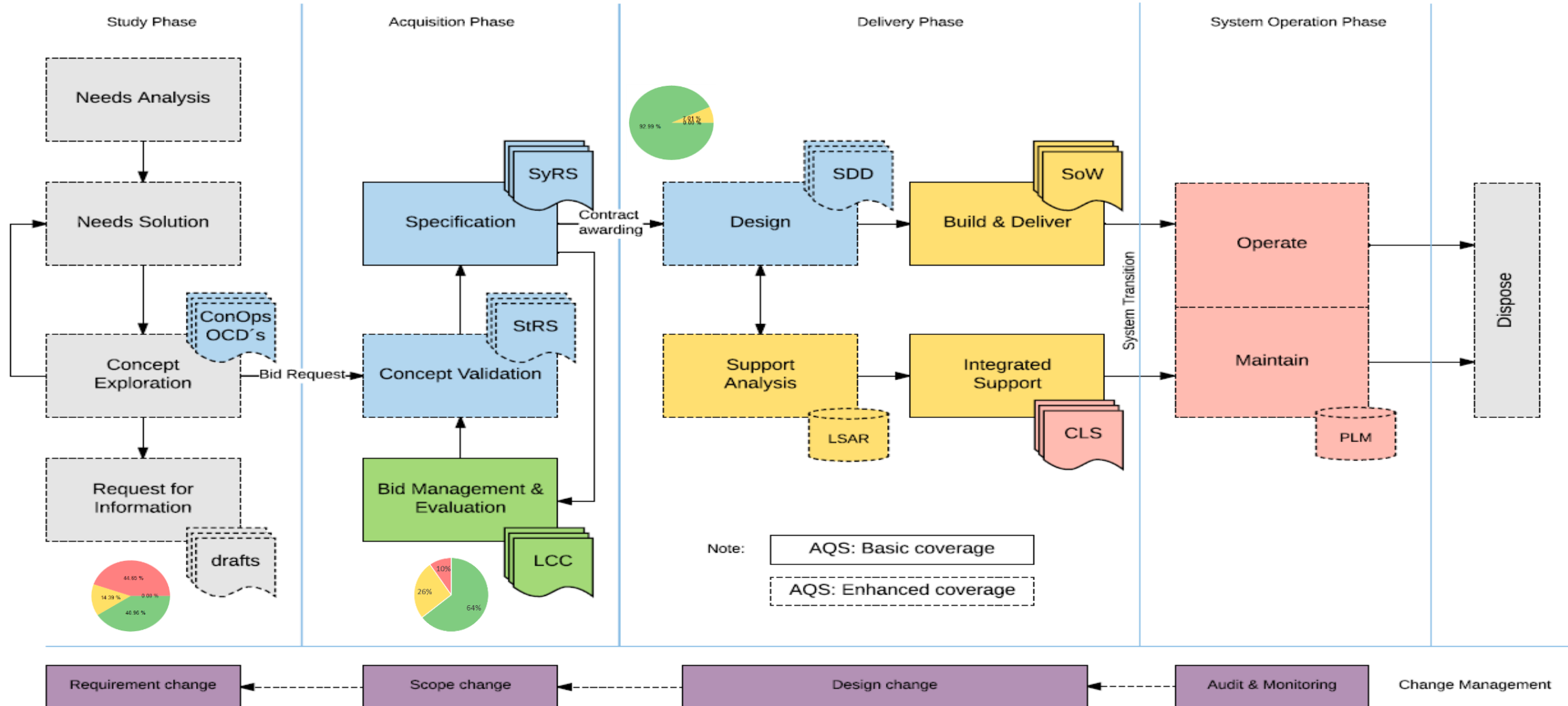


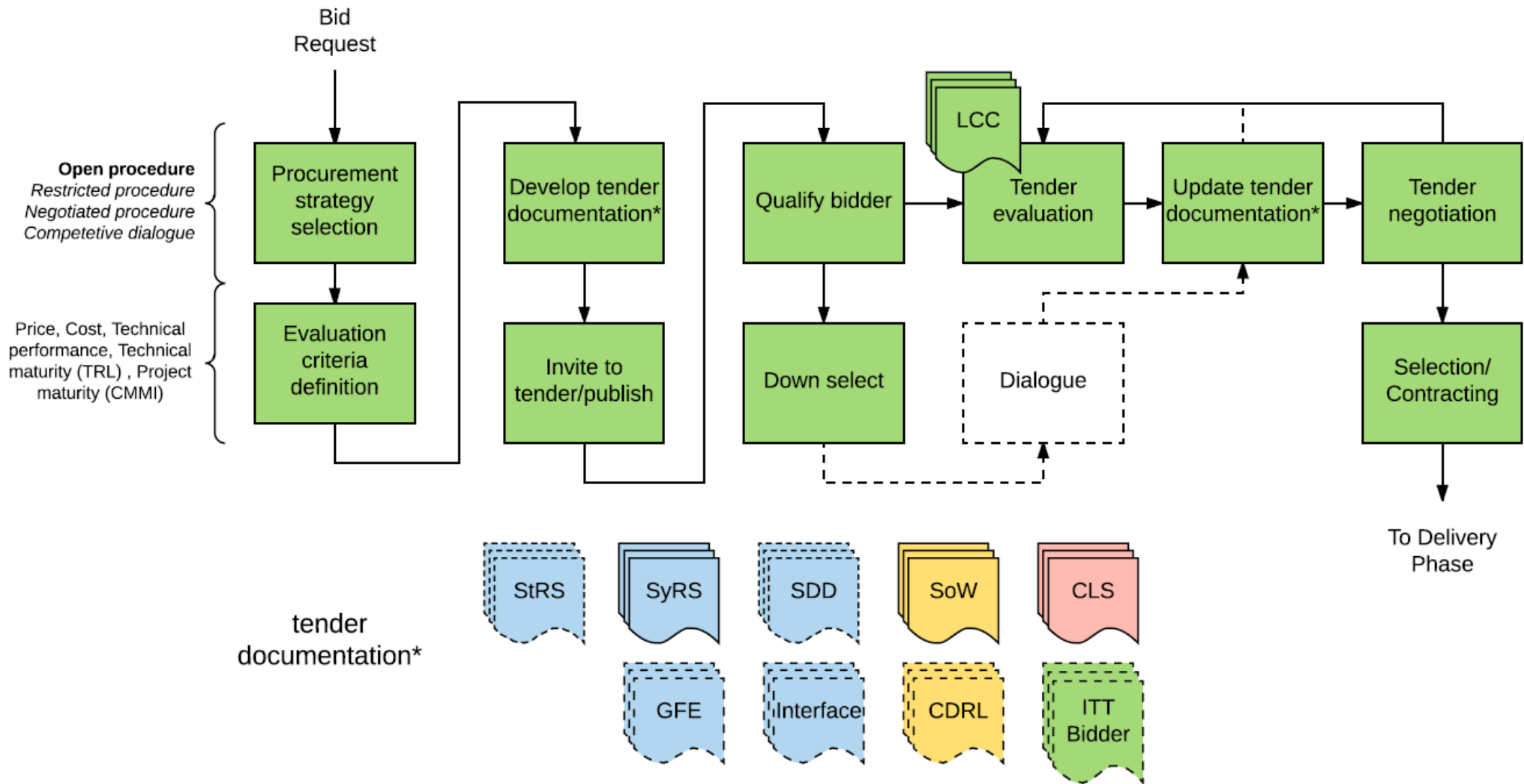
## Content in first PQS release

- REUSE V18.1 tool suite
- KM database with procurement content:
  - Standards and rules
  - Pattern for requirement development
  - Metrics for QA
- Process defined with "Procurement Assistant" Handbook
- Templates (excel) for SyRS, SoW, CLS specifications and Price/LCC response
  
- To come in future releases:
  - Traceability and Change management
  - Evaluation support (technology/price/other)
  - Reports
  - Plus....



## Aquisition life cycle process







the  
**REUSE**  
company



Systems Engineering Studio v18.1:  
*Demonstration for Procurement documentation analysis*

Friday, 01 June 2018

# Systems Engineering Studio v18.1



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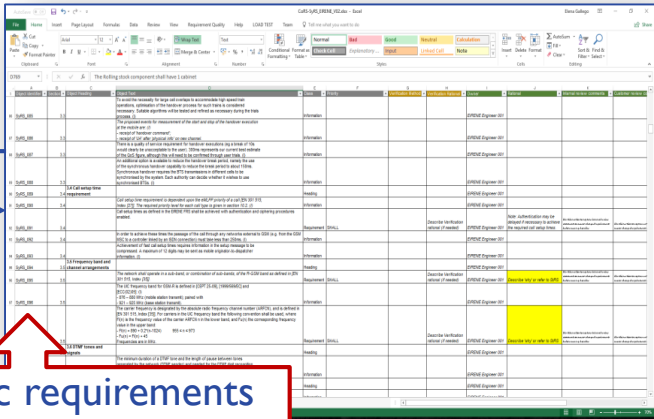
## Traceability Studio

- Manages trace links between all sorts of information
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# What you are going to see in the Demonstration of SES v18.1



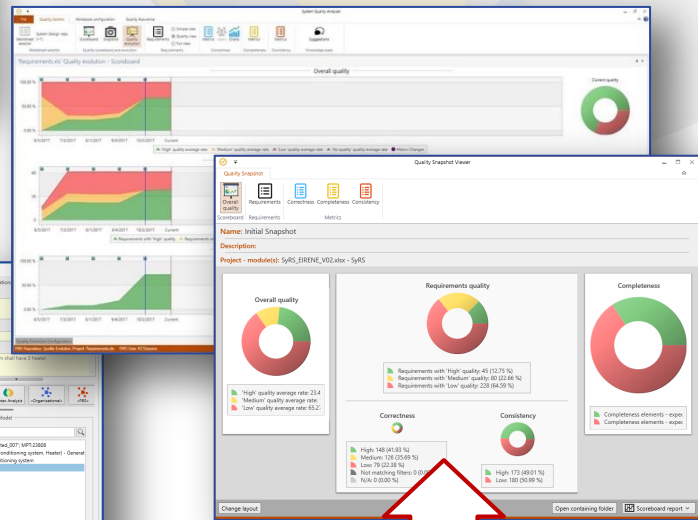
1. Automatic requirements elicitation from documents



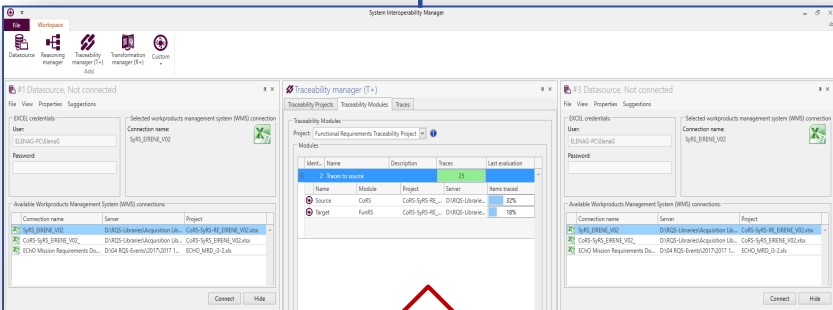
| Req ID  | Text  | Source     | Category    | Status |
|---------|---|------------|-------------|--------|
| REQ-001 | The building block component shall have a lifetime of 10 years. | Document A | Functional  | Valid  |
| REQ-002 | The system shall be able to handle up to 1000 concurrent users. | Document B | Performance | Valid  |
| REQ-003 | The system shall be able to handle up to 1000 concurrent users. | Document C | Performance | Valid  |
| REQ-004 | The system shall be able to handle up to 1000 concurrent users. | Document D | Performance | Valid  |
| REQ-005 | The system shall be able to handle up to 1000 concurrent users. | Document E | Performance | Valid  |
| REQ-006 | The system shall be able to handle up to 1000 concurrent users. | Document F | Performance | Valid  |
| REQ-007 | The system shall be able to handle up to 1000 concurrent users. | Document G | Performance | Valid  |
| REQ-008 | The system shall be able to handle up to 1000 concurrent users. | Document H | Performance | Valid  |
| REQ-009 | The system shall be able to handle up to 1000 concurrent users. | Document I | Performance | Valid  |
| REQ-010 | The system shall be able to handle up to 1000 concurrent users. | Document J | Performance | Valid  |



2. An application to check compliance with standards in the procurement projects



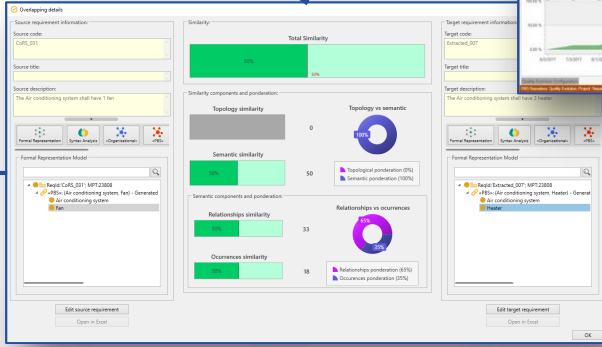
3. How are we performing?



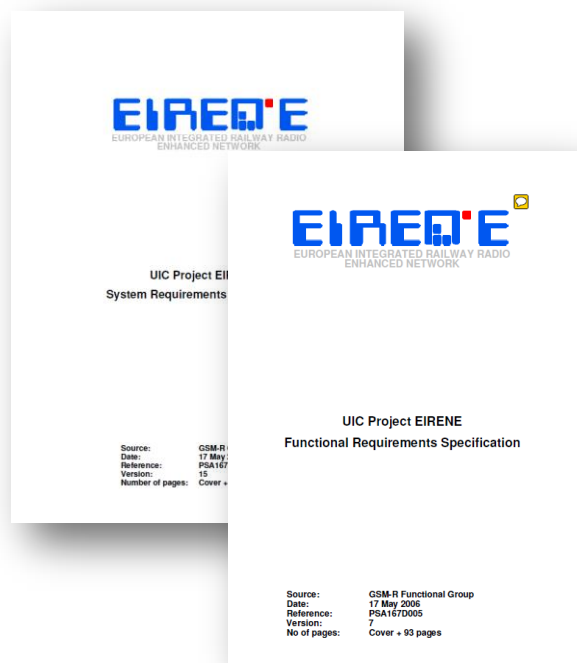
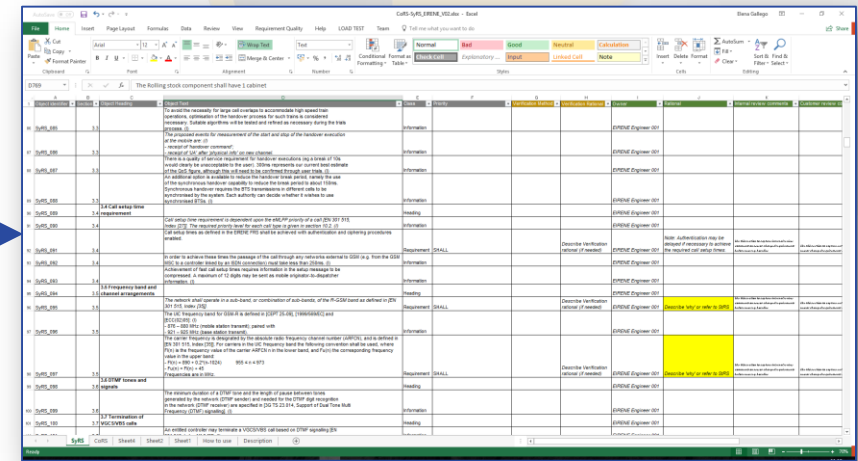
System Interoperability Manager

| Ident. | Name             | Description              | Hours | Last evaluation |
|--------|------------------|--------------------------|-------|-----------------|
| 1      | Source to source |                          | 25    |                 |
| 2      | Source           | CoS S4S-RE - CHRSO-Share | 32%   |                 |
| 3      | Target           | CoS S4S-RE - CHRSO-Share | 32%   |                 |

4. Keep tracing all the information back to their source.



# I. Automatic requirements elicitation from documents

| ID      | Requirement   | Category    | Priority | Source             | Status | Comments |
|---------|---|-------------|----------|--------------------|--------|----------|
| REQ_001 | The rolling stock component shall have 1 cabin              | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_002 | The cabin shall be equipped with a radio                    | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_003 | The radio shall be of type GSM-R                            | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_004 | The radio shall be capable of operating in full duplex mode | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_005 | The radio shall be capable of operating in half duplex mode | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_006 | The radio shall be capable of operating in simplex mode     | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_007 | The radio shall be capable of operating in GPRS mode        | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_008 | The radio shall be capable of operating in GPRS mode        | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_009 | The radio shall be capable of operating in GPRS mode        | Information | High     | UIC Project EIRENE | Valid  |          |
| REQ_010 | The radio shall be capable of operating in GPRS mode        | Information | High     | UIC Project EIRENE | Valid  |          |

Automatic Extraction based on **patterns**

Source Requirements Documents (Word, PDF)

Simple Index Process

Knowledge - Based Index Process

Requirements Documents (Excel, DOORS, Word, ...)

COMPLETE USE CASE

File Home Share View

Clipboard: Pin to Quick access, Copy, Paste, Copy path, Paste shortcut

Organize: Move to, Copy to, Delete, Rename

New: New folder, Easy access, New item

Open: Properties, Open, Edit, History

Select: Select all, Select none, Invert selection

← → ↕ ↑ This PC > Projects (D:) > 09 RQS-Libraries > Acquisition Library > v1.0 2017 > Library v1.0 > Ontology > COMPLETE USE CASE

Search COMPLETE USE CASE

- ★ Quick access
- v1.0 2017
- COMPLETE USE CASE
- 2018 01 30 Upp Stockholm
- 2018 01 23 - Webinar Quality
- 2018\_01\_29\_Use\_Cases\_Work
- Ontology Composition
- Quality Evolution
- Creative Cloud Files
- OneDrive
- This PC
- 02 - IEG (krnas.kr.inf.uc3m.es)
- 3D Objects
- 3-Videos (kcsnas.kcs.local (K
- 10-Sales (KCSNAS.kcs.local (
- Desktop
- Documents
- Downloads
- Music
- Pictures
- Videos
- OS (C:)
- Projects (D:)
- SDXC (E:)
- Elena (F:)

| <input type="checkbox"/>            | Name  | Date modified     | Type                  | Size      |
|-------------------------------------|---|-------------------|-----------------------|-----------|
| <input checked="" type="checkbox"/> | 2006 - eirene sys 15.docx                     | 1/22/2018 6:57 PM | Microsoft Word D...   | 2,559 KB  |
| <input type="checkbox"/>            | 20180131_08574486_First Quality Assessment... | 1/31/2018 8:57 AM | SNAPSHOT File         | 86 KB     |
| <input type="checkbox"/>            | CoRS-SyRS_EIRENE_V02 - Interoperability.eqa   | 1/22/2018 6:57 PM | EQA File              | 2 KB      |
| <input type="checkbox"/>            | CoRS-SyRS_EIRENE_V02 - Interoperability.xlsx  | 1/22/2018 6:57 PM | Microsoft Excel W...  | 190 KB    |
| <input type="checkbox"/>            | CoRS-SyRS-RE_EIRENE_V02.eqa                   | 1/30/2018 6:49 PM | EQA File              | 2 KB      |
| <input type="checkbox"/>            | CoRS-SyRS-RE_EIRENE_V02.xlsx                  | 1/31/2018 8:50 AM | Microsoft Excel W...  | 180 KB    |
| <input type="checkbox"/>            | CoRS-SyRS-RE_EIRENE_V03.xlsx                  | 1/30/2018 6:37 PM | Microsoft Excel W...  | 172 KB    |
| <input type="checkbox"/>            | PQS Railway - Interoperability - Quality.ldb  | 1/31/2018 9:11 AM | Microsoft Access R... | 1 KB      |
| <input type="checkbox"/>            | PQS Railway - Interoperability - Quality.mdb  | 1/31/2018 9:11 AM | Microsoft Access ...  | 10,596 KB |
| <input type="checkbox"/>            | PQS v18.1 - DoD Knowledge Base.lib            | 1/22/2018 6:57 PM | LIB File              | 914 KB    |
| <input type="checkbox"/>            | PQS v18.1 - LCC Knowledge Base.lib            | 1/22/2018 6:57 PM | LIB File              | 378 KB    |
| <input type="checkbox"/>            | PQS v18.1 - Master Knowledge Base.lib         | 1/22/2018 6:57 PM | LIB File              | 376 KB    |
| <input type="checkbox"/>            | PQS v18.1 - SoW Knowledge Base.lib            | 1/22/2018 6:57 PM | LIB File              | 389 KB    |
| <input type="checkbox"/>            | PQS v18.1 - SSS Knowledge Base.lib            | 1/22/2018 6:57 PM | LIB File              | 389 KB    |
| <input type="checkbox"/>            | PQS v18.1 - Support Knowledge Base.lib        | 1/22/2018 6:57 PM | LIB File              | 405 KB    |
| <input type="checkbox"/>            | PQS_Procurement_Library_v18.ldb               | 1/31/2018 9:55 AM | Microsoft Access R... | 1 KB      |
| <input type="checkbox"/>            | PQS_Procurement_Library_v18.mdb               | 1/31/2018 9:55 AM | Microsoft Access ...  | 24,752 KB |

17 items 1 item selected 2.49 MB

Windows taskbar with icons for File Explorer, Edge, Word, PowerPoint, and other applications. System tray shows network, volume, and date/time (ENG 9:57 AM).


# 2. An application to check compliance with standards



NOT MEASUREMENT SENSITIVE  
MIL-HDBK-24FD  
1 APRIL 1998  
SUPERSEDING  
MIL-HDBK-24FC  
10 SEP 1991

DEPARTMENT OF DEFENSE

HANDBOOK  
FOR PREPARATION OF  
STATEMENT OF WORK (SOW)



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AMSC N/A AREA MISC  
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

Statement of Work  
SoW

NOT MEASUREMENT SENSITIVE  
MIL-STD-961E  
w/CHANGE 2  
9 January 2014  
SUPERSEDING  
MIL-STD-961E  
w/CHANGE 1  
2 April 2008

DEPARTMENT OF DEFENSE  
STANDARD PRACTICE

DEFENSE AND PROGRAM-UNIQUE  
SPECIFICATIONS FORMAT AND CONTENT



AMSC D7500 AREA STDZ


Original: 1991-09-01 (24 FD) Downloaded: 2014-02-07 14:04Z  
Check the format to verify that this is the correct version. Version 3.0

Defence Technical  
Specification

SK0001 SX0006-86865-00000-00

International guide for  
the use of the S-Series  
Integrated Logistic Support (ILS)  
specifications

SX0006-86865-00000-00  
Issue No. 1.1



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- Aerospace and Defense Industries Association of Europe - AID  
- Association of Defense of the member countries of AID

Publication:  
ASD Aerospace and Defense Industries Association of Europe  
ATA Aerospace Industries Association


Applicable to: All SX0006-A-00-00-0000-00A-040A-A  
DMC:20000-A-00-00-0000-00A-040A-A\_002-01\_EN-US.docx 2016.07.15 Page 1

Support  
CLS / ILS

NOT MEASUREMENT SENSITIVE  
MIL-HDBK-881  
2 JANUARY 1998  
SUPERSEDING  
MIL-STD-881B  
25 MARCH 1993

DEPARTMENT OF DEFENSE  
HANDBOOK

WORK BREAKDOWN STRUCTURE



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AMSC N/A AREA MISC

Work Breakdown  
SoW

FINAL DRAFT INTERNATIONAL STANDARD ISO/IEC/IEEE FDIS 29148

ISO/IEC JTC 1  
Secretariat: ANSI  
ISO/IEC voting begins on:  
2011-03-18  
ISO/IEC voting terminates on:  
2011-05-18

Systems and software engineering —  
Life cycle processes — Requirements  
engineering

Ingénierie des systèmes et du logiciel — Processus du cycle de vie —  
Ingénierie des exigences

Please see the administrative notes on page iii  
and on the inside back cover

Reference number  
ISO/IEC/IEEE FDIS 29148-2011(E)

ISO IEC  
IEEE

© ISO/IEC 2011  
© IEEE 2011

Technical Specification  
SSS

File Terminology Conceptual Model Patterns Formalization Inference Configuration management Extensibility Assets store Settings

Terms

Term suggestions Integrity Generate terms and frequencies Tags Languages Tokenization Rules Affixes Substitutes Test Spell checker

Rules Bigrams rules Tags probabilities Test

Search fields:

Term:

Term tag:

Cluster:

Relationship type:

Identifier:  Equals to:

Greater than:

Lower than:

Relationship filters:  Belongs to domain  Belongs to SCM  Revised  Synonym

Flags:  Flag 1  Flag 2

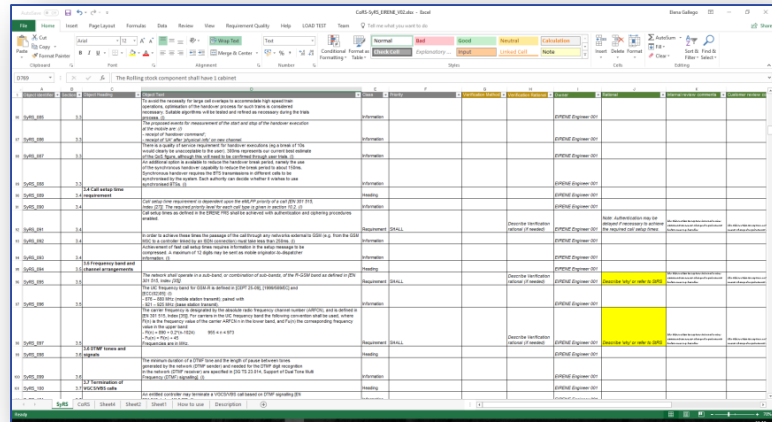
Advanced filters:

Terms:

| Identifier   | Term     | Term Tag | Cluster          | Relationship type          | Belongs to domain                   | Belongs to SCM                      | Includes content         | Scope Note  |
|--------------|----------|----------|------------------|----------------------------|-------------------------------------|-------------------------------------|--------------------------|---|
| 48,865 A-1   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | director of manpower, personnel, and services (Air Force)                     |
| 48,866 A2    | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | antiaircraft  |
| 48,868 A-2   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | intelligence staff officer (Air Force)  |
| 48,867 A2C2  | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | Army airspace command and control   |
| 48,869 A-3   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | operations directorate (COMAFFOR staff); operations staff officer (Air Force) |
| 48,870 A-4   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | director of logistics (Air Force)   |
| 48,564 A4A   | ACRONYMS | ACRONYMS | --- Locked ---   | --- Locked ---             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Airlines for America [Source: SX000i-B6865-0X000-00]                          |
| 48,871 A-5   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | plans directorate (COMAFFOR staff)  |
| 48,872 A-6   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | communications staff officer (Air Force)                                      |
| 48,873 A-7   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | director of installations and mission support (Air Force)                     |
| 48,874 AA    | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | assessment agent; avenue of approach  |
| 48,875 AA&E  | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | arms, ammunition, and explosives  |
| 48,876 AAA   | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | antiaircraft artillery; arrival and assembly area; assign alternate area      |
| 48,877 AABB  | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | American Association of Blood Banks   |
| 48,878 AABWS | ACRONYMS | ACRONYMS | < No «Cluster» > | < No «Relationship type» > | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> | amphibious assault bulk water system  |

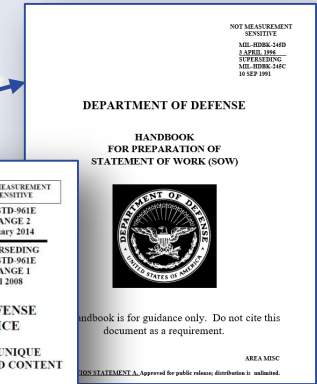
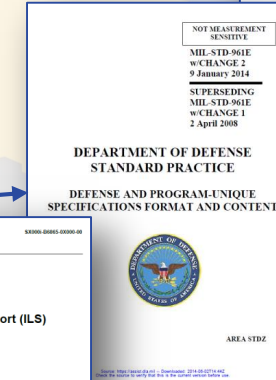
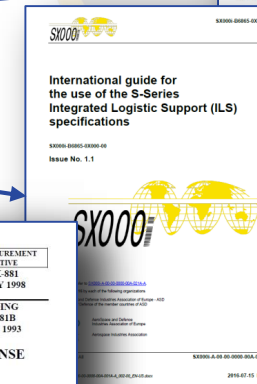
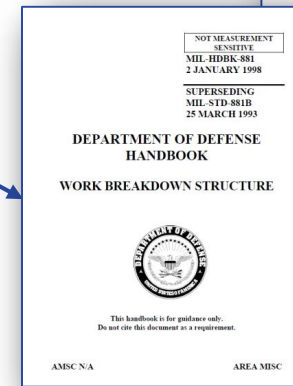
16096 term(s)

# 3. An application to check compliance with standards



Completeness  
Consistency

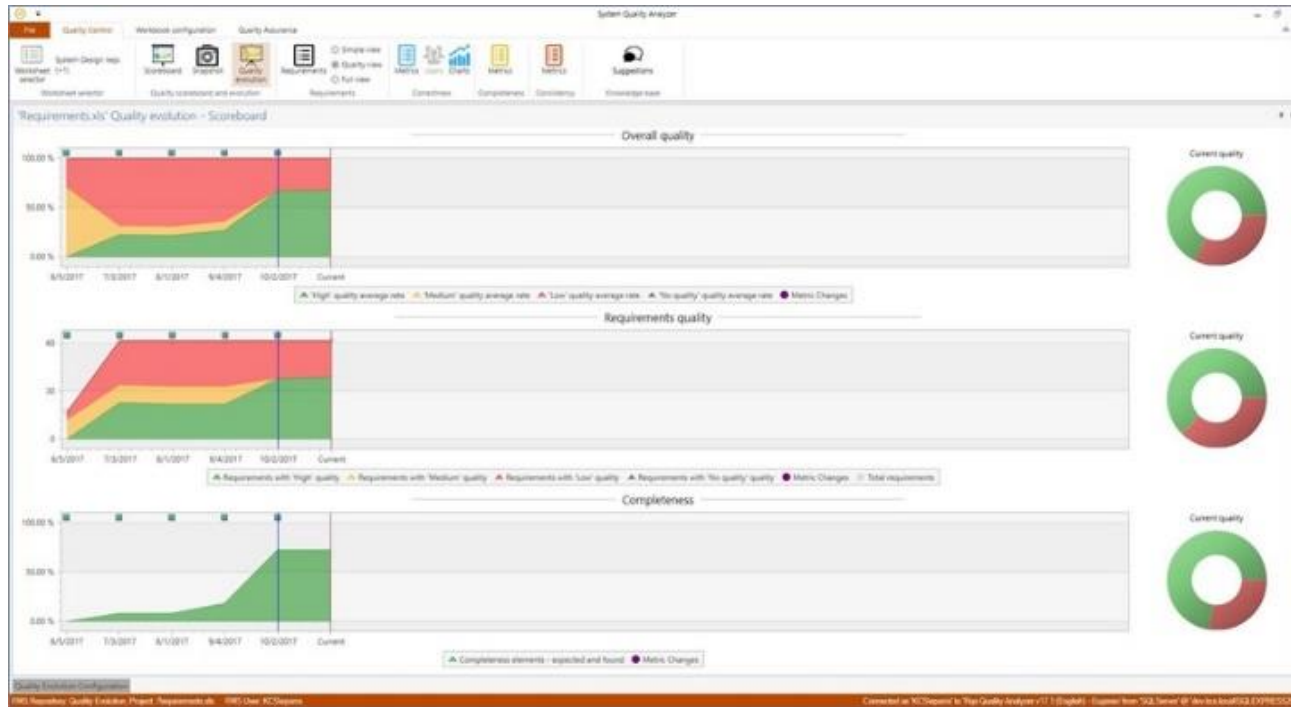
Correctness  
Completeness  
Consistency



### 3. Keep the performance under control

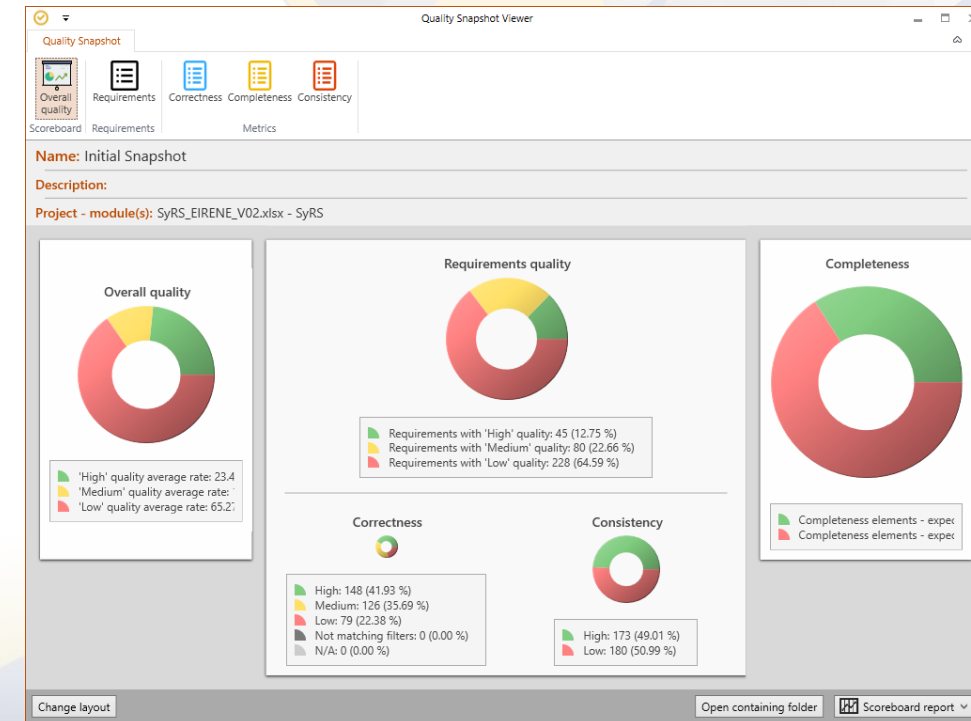


Key Performance Indicators from the beginning, up to today!

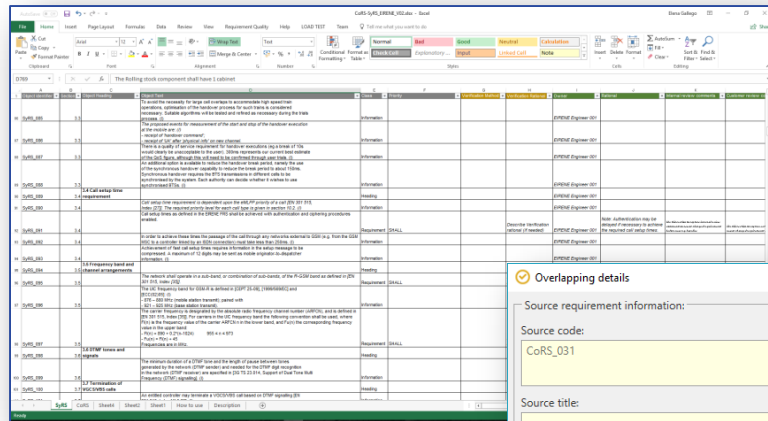


Acquirer viewpoint

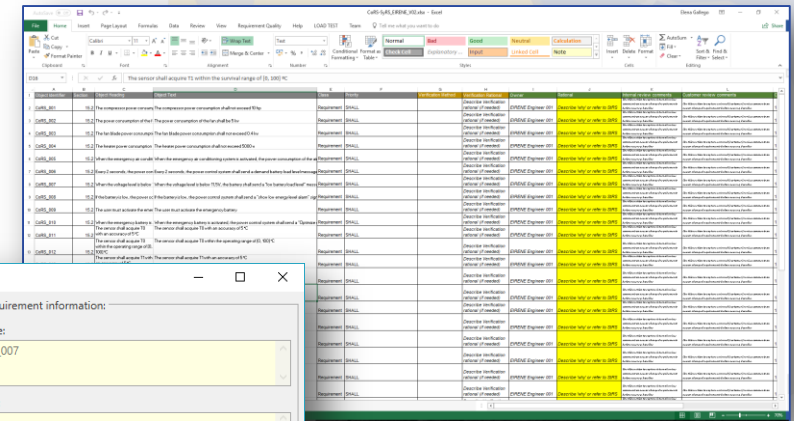
Automatic Evaluation of the different bidder's documentation!



# 3. Do we specify our projects too much (or not enough)?



| ID      | Requirement                                      | Priority | Category   | Source   | Target        |
|---------|--|----------|------------|----------|---------------|
| REQ_001 | The air conditioning system shall have 1 fan     | High     | Functional | CoRS_031 | Extracted_007 |
| REQ_002 | The air conditioning system shall have 3 heaters | High     | Functional | CoRS_031 | Extracted_007 |
| REQ_003 | The air conditioning system shall have 1 fan     | High     | Functional | CoRS_031 | Extracted_007 |



| ID      | Requirement                                      | Priority | Category   | Source   | Target        |
|---------|--|----------|------------|----------|---------------|
| REQ_001 | The air conditioning system shall have 1 fan     | High     | Functional | CoRS_031 | Extracted_007 |
| REQ_002 | The air conditioning system shall have 3 heaters | High     | Functional | CoRS_031 | Extracted_007 |
| REQ_003 | The air conditioning system shall have 1 fan     | High     | Functional | CoRS_031 | Extracted_007 |

**Overlapping details**

**Source requirement information:**

Source code: CoRS\_031

Source title:

Source description: The Air conditioning system shall have 1 fan

Formal Representation | Syntax Analysis | Organizational | PBS

Formal Representation Model

- ReqId:CoRS\_031; MPT:23808
- PBS: (Air conditioning system, Fan) - Generated
- Air conditioning system
- Fan

Edit source requirement | Open in Excel

**Similarity:**

Total Similarity: 50%

Similarity components and ponderation:

Topology similarity: 0

Semantic similarity: 50%

Semantic components and ponderation:

Relationships similarity: 33

Occurrences similarity: 18

**Target requirement information:**

Target code: Extracted\_007

Target title:

Target description: The Air conditioning system shall have 3 heater

Formal Representation | Syntax Analysis | Organizational | PBS

Formal Representation Model

- ReqId:Extracted\_007; MPT:23808
- PBS: (Air conditioning system, Heater) - Genet
- Air conditioning system
- Heater

Edit target requirement | Open in Excel

OK

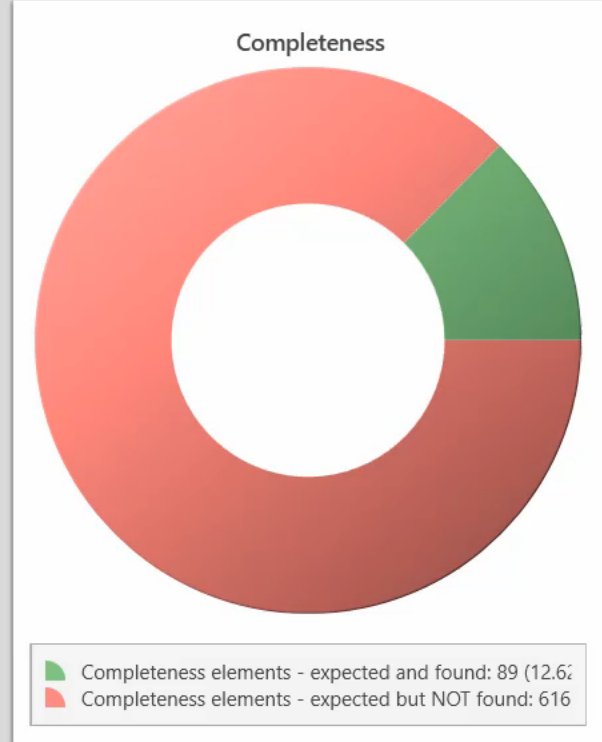
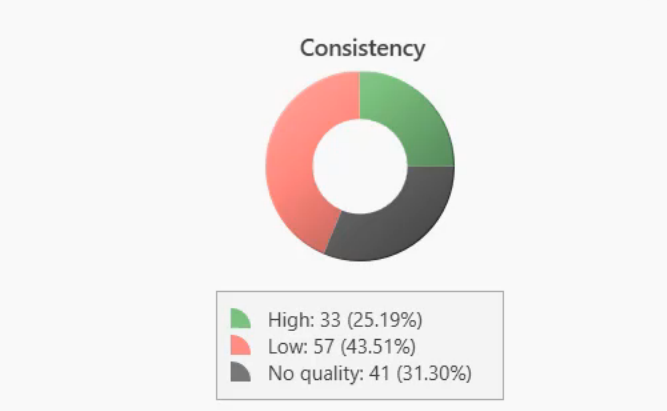
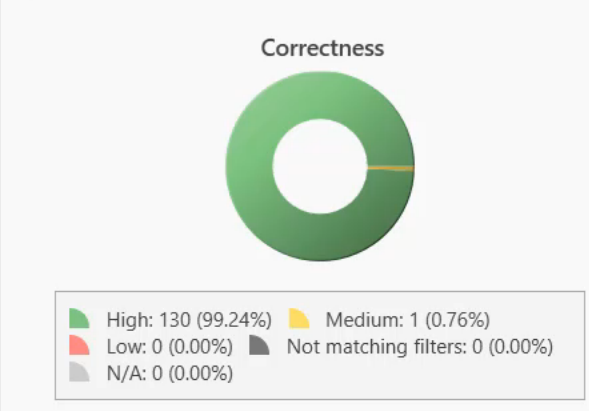
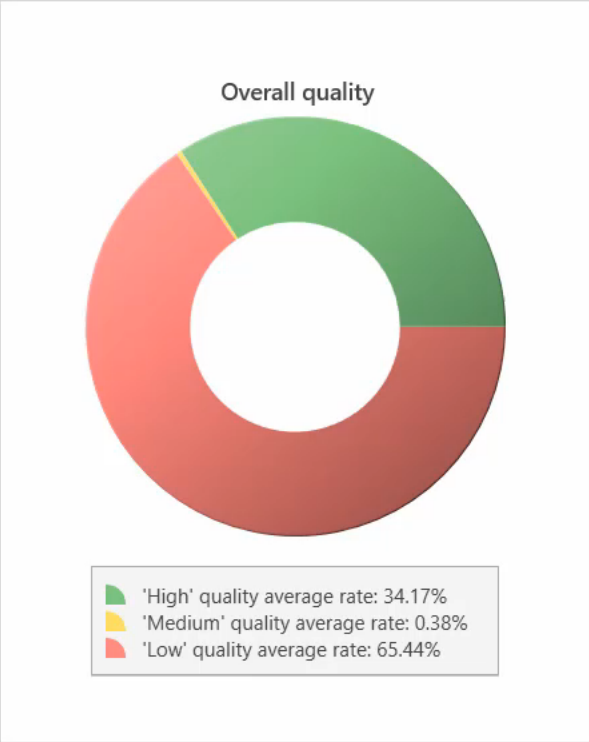
Worksheet selector CoRS (+2) Worksheet selector

Scoreboard Snapshot Quality evolution Quality scoreboard and evolution

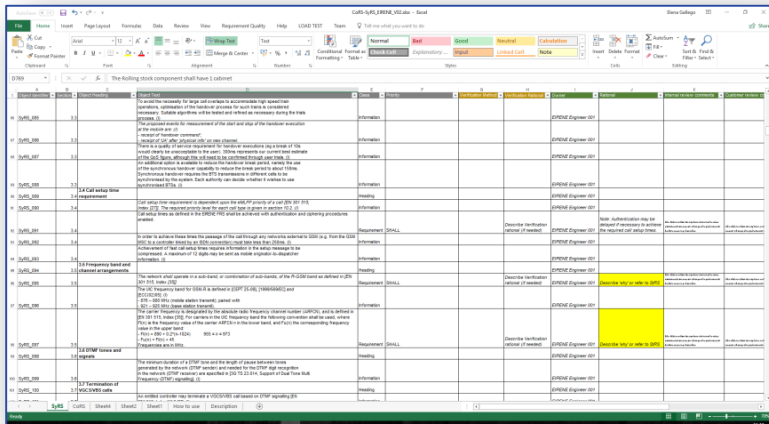
Requirements Requirements Simple view Quality view Full view

Metrics Users Charts Correctness Metrics Metrics Consistency Completeness

Suggestions Knowledge base

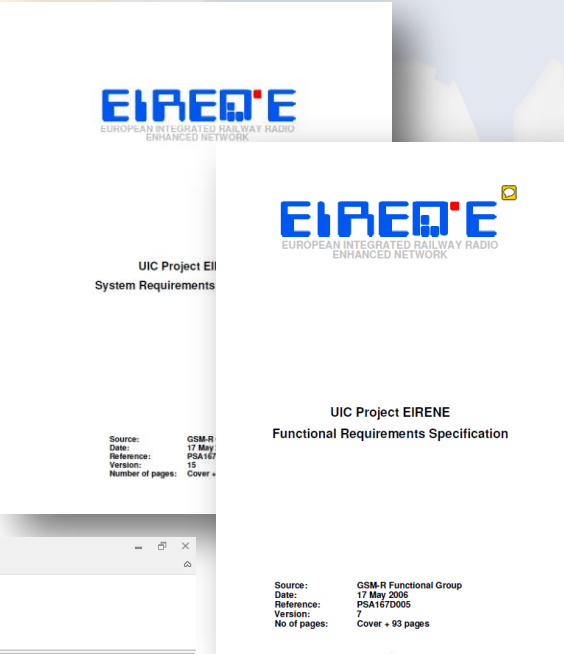
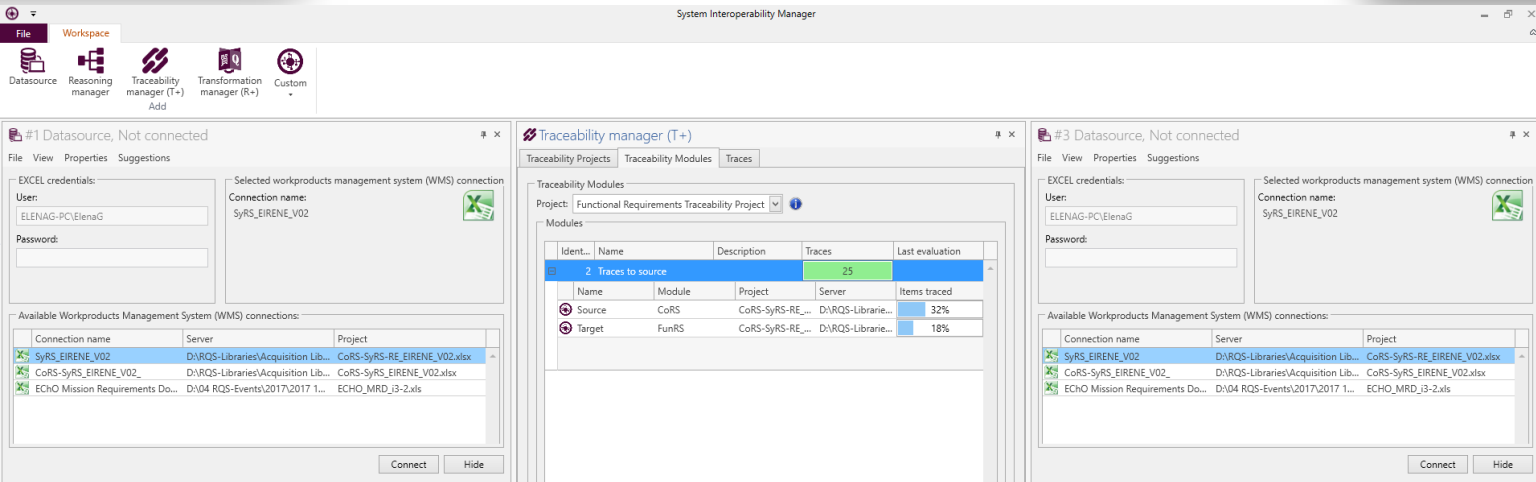


# 4. Keep tracing all the information back to their source



| ID | Name             | Description   | Category    | Version | Author | Creation Date | Last Modified |
|----|------------------|---|-------------|---------|--------|---------------|---------------|
| 1  | System component | The following track component shall have a cabinet                                | Information |         |        |               |               |
| 2  | System component | Information necessary for design and construction of acceptable high sensitive... | Information |         |        |               |               |
| 3  | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 4  | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 5  | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 6  | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 7  | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 8  | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 9  | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 10 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 11 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 12 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 13 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 14 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 15 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 16 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 17 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 18 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 19 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |
| 20 | System component | Information necessary for the hardware process for high sensitive...              | Information |         |        |               |               |

Smart Suggestion of Traces based on **Ontology**

System Interoperability Manager

File Workspace

Datasource Reasoning manager Traceability manager (T+) Transformation manager (R-) Custom

#1 Datasource, Not connected

EXCEL credentials: User: ELENAG-PC;ElenaG Password: [ ]

Selected workproducts management system (WMS) connection: Connection name: SyRS\_EIRENE\_V02

Available Workproducts Management System (WMS) connections:

| Connection name                 | Server                              | Project                      |
|---------------------------------|-------------------------------------|------------------------------|
| SyRS_EIRENE_V02                 | D:\RQS-Libraries\Acquisition Lib... | CoRS-SyRS-RE_EIRENE_V02.xlsx |
| CoRS-SyRS_EIRENE_V02            | D:\RQS-Libraries\Acquisition Lib... | CoRS-SyRS_EIRENE_V02.xlsx    |
| ECHO Mission Requirements Do... | D:\04 RQS-Events\2017\2017 1...     | ECHO_MRD_j3-2.xls            |

Traceability manager (T+)

Traceability Projects Traceability Modules Traces

Project: Functional Requirements Traceability Project

Modules:

| Ident... | Name             | Description     | Traces             | Last evaluation |
|----------|------------------|-----------------|--------------------|-----------------|
| 2        | Traces to source |                 | 25                 |                 |
| Source   | CoRS             | CoRS-SyRS-RE... | D:\RQS-Librarie... | 32%             |
| Target   | FunRS            | CoRS-SyRS-RE... | D:\RQS-Librarie... | 18%             |

#3 Datasource, Not connected

EXCEL credentials: User: ELENAG-PC;ElenaG Password: [ ]

Selected workproducts management system (WMS) connection: Connection name: SyRS\_EIRENE\_V02

Available Workproducts Management System (WMS) connections:

| Connection name                 | Server                              | Project                      |
|---------------------------------|-------------------------------------|------------------------------|
| SyRS_EIRENE_V02                 | D:\RQS-Libraries\Acquisition Lib... | CoRS-SyRS-RE_EIRENE_V02.xlsx |
| CoRS-SyRS_EIRENE_V02            | D:\RQS-Libraries\Acquisition Lib... | CoRS-SyRS_EIRENE_V02.xlsx    |
| ECHO Mission Requirements Do... | D:\04 RQS-Events\2017\2017 1...     | ECHO_MRD_j3-2.xls            |

#2 Datasource, {Use Case for Procurement PQS Dem...}

File View Properties Suggestions

CoRS

Drag a column header here to group by that column

|  | <input type="checkbox"/> |  | Label | Text   |
|--|--------------------------|--|-------|--|
|  | <input type="checkbox"/> |  | N/A   | Every 2 seconds, the power control system shall send...    |
|  | <input type="checkbox"/> |  | N/A   | When the voltage level is below 11,5V, the battery sh...   |
|  | <input type="checkbox"/> |  | N/A   | If the battery is low, the power control system shall s... |
|  | <input type="checkbox"/> |  | N/A   | The user must activate the emergency battery               |
|  | <input type="checkbox"/> |  | N/A   | When the capacity of the accumulator is lower than...      |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T0 with an accuracy of 5 °C       |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T0 within the operating ran...    |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T1 with an accuracy of 5 °C       |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T1 within the operating ran...    |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T1 within the survival range...   |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T2 with an accuracy of 5 °C       |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T2 within the operating ran...    |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T2 within the survival range...   |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T2 within the response time...    |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T2 within the response time...    |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T3 within the survival range...   |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T3 within the response time...    |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T4 with an accuracy of 5 °C       |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T4 within the operating ran...    |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T4 within the survival range...   |
|  | <input type="checkbox"/> |  | N/A   | The sensor shall acquire T4 within the survival range...   |

Total requirements: 34

Hide non-Requirement

RMS Repository: COMPLETE USE CASE; Project: CoRS-SyRS-f

Save Close

TRACEABILITY Studio

Traceability projects Traceability modules Traces

Traceability project scoreboard:

ID: 2      Number of projects: 2      Number of document

Name: Traceabili  
between  
Functiona      Number of traceability modules: 1

Traceability completeness:      Trace analysis:

Number of workproducts: 89      Number of traces: 0

Traced workproducts: 0      Non-suspects traces: 0

Untraced workproducts: 89      Suspect traces: 0

0%      0

Traceability projects:

|  | ▲                        | Name | Description       | Modific...                             | Creatio...           |
|--|--------------------------|------|-------------------|--|----------------------|
|  | <input type="checkbox"/> | 1    | Functional R...   | This traceability project will mana... | 1/31/2... 1/18/20... |
|  | <input type="checkbox"/> | 2    | Traceability b... | Traceability project to connect sy...  | 5/21/2... 5/21/20... |

Number of projects: 2

RMS Repository: COMPLETE USE CASE; Project: CoRS-SyRS-f

Save Close

#3 Datasource, {Use Case for Procurement Demonstr...}

File View Properties Suggestions

FunRS

Drag a column header here to group by that column

|  | <input type="checkbox"/> |  | Label | Text  |
|--|--------------------------|--|-------|---|
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the compresso...       |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the fan shall b...     |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the fan blade s...     |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the heater shal...     |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the air conditi...     |
|  | <input type="checkbox"/> |  | N/A   | The Air conditioning system shall have 3 heater         |
|  | <input type="checkbox"/> |  | N/A   | The Hydraulic system shall have 1 accumulator           |
|  | <input type="checkbox"/> |  | N/A   | The Hydraulic system shall have 1 Pump                  |
|  | <input type="checkbox"/> |  | N/A   | The Hydraulic system shall have 1 relief valve          |
|  | <input type="checkbox"/> |  | N/A   | The capacity of the pump shall be lower than 2 gallo... |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the Rolling Sto...     |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the Auxiliary s...     |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the Braking sy...      |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the cabinet sh...      |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the cabling sh...      |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the car body s...      |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the car body fi...     |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the communic...        |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the coupler sh...      |
|  | <input type="checkbox"/> |  | N/A   | The maximum power consumption of the coupler sh...      |

Total items: 55 , Requirements: 55

Hide non-Requirement

RMS Repository: Ontology; Project: CoRS-SyRS\_EIRENE\_V02.

Save Close





## NEXT WEBINAR – The SMARTER way to improve your requirement specifications

- Requirements are, with no doubts, the main source of re-work in both software and systems intensive projects.
- This webinar introduces these sources of problems and misunderstanding, and provides a set of basic tricks and techniques to overcome the problems and provide error-free requirements specifications to properly set the roots of successful projects.
- All these basic aspects of requirements quality will be covered using a default installation of the tools VERIFICATION Studio and the Rich Authoring Tool.

*Magic Tricks*



19<sup>th</sup> of June at 5.00 pm and 21<sup>th</sup> of June at 9.00 am

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# Webinar planner

## Next Dates:

- > Tuesday 19th June 2018 at 5.00 pm CET
- > Thursday 21st June 2018 at 9.00 am CET

| WEBINAR ID | NAME   | DATES                    | TIME                       |
|------------|--|--------------------------|----------------------------|
| TRCW-01    | Requirements Quality along the supply chain  | 16/01/2018<br>18/01/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-02    | Managing the quality ecosystem: DOORS, Rhapsody, Simulink and Modelica               | 20/02/2018<br>22/02/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-03    | Ontologies Configuration Management  | 13/03/2018<br>15/03/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-04    | Can script based languages, like DXL, hack Natural Language Processing?              | 10/04/2018<br>12/04/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-05    | Procuring systems: PQS for SMARTer acquisition                                       | 08/05/2018<br>09/05/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-06    | The SMARTER way to improve your requirement specifications                           | 19/06/2018<br>21/06/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-07    | Knowledge and Quality management milestones in a SE organization                     | 11/09/2018<br>13/09/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-08    | Automatic checking of quality metrics for logical and physical models                | 16/10/2018<br>18/10/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-09    | Following standards patterns in KCSE: An application to EARS patterns in RAT and SKM | 03/07/2018<br>05/07/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-10    | Tracing system work products: T+ Manager   | 06/11/2018<br>08/11/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-11    | Defining your own quality rules in KCSE: A one-hour practical approach               | 11/12/2018<br>13/12/2018 | 5.00 pm CET<br>9.00 am CET |
| TRCW-12    | The KCSE approach in a nutshell  | 15/01/2019<br>17/01/2019 | 5.00 pm CET<br>9.00 am CET |
| TRCW-13    | Requirements Transformations   | 12/02/2019<br>14/02/2019 | 5.00 pm CET<br>9.00 am CET |



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