

## Introduction: Webinar rules

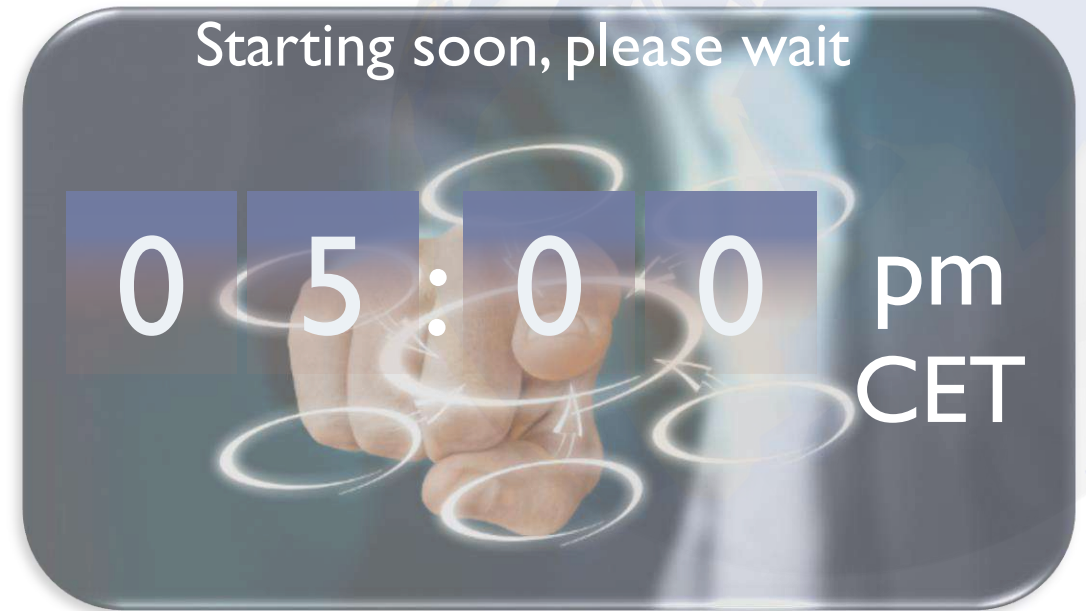
# RAT for



**IBM Rational**  
DOORS Next Generation

### › Webinar rules:

- › You'll be muted all along the Webinar
- › There's a chatting box to ask your questions or send your comments when you want
- › Please address these comments and questions to the user "The REUSE Company" and not to the presenter directly
- › If you have any technical issue please use this chatting 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



# RAT – Authoring Tools: a widget for IBM DOORS Next Generation to strengthen requirements authors



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THE  
**REUSE**  
COMPANY

### Contents

- Introduction to The REUSE Company and the speakers
- Brief introduction to IBM Doors Next Generation
- Why consider requirements quality right at the authoring phase?
- Presentation of the widget and its functionalities
- Live demo
- Q&A

### About The REUSE Company (TRC)



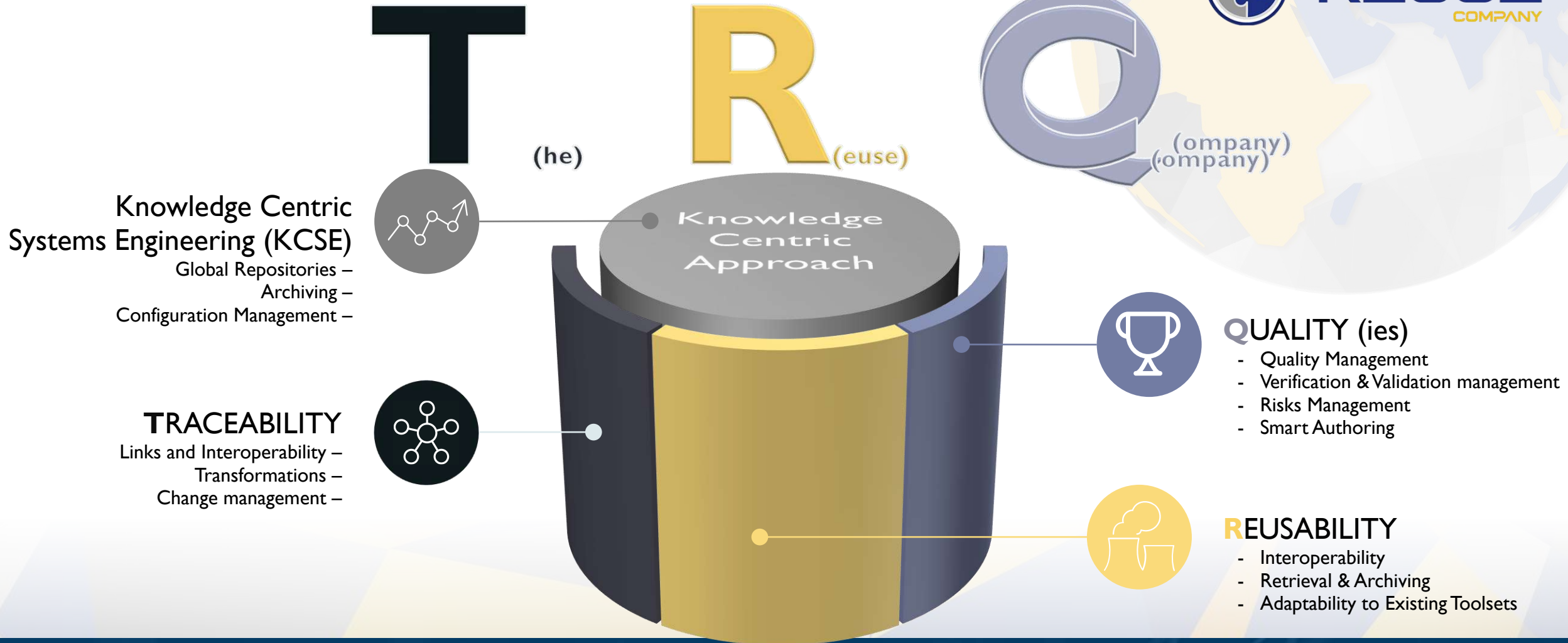
**01** The company was established in **1999**  
As a spin-off of a University in Madrid

**02** **System + Software Engineers**  
Smart combination between Company staff and R&D from Academia

**03** **Headquarters:** Madrid (Spain)  
**International offices:** Stockholm (Sweden) Tokyo (Japan) Delegation  
**2021:** USA Chicago/Detroit/Miami

**04** To promote a **reusable, scalable** and global solution to a **smart** and **interoperable** Systems Engineering environment, by offering a **semantic knowledge centric** approach.

### Introduction to The REUSE Company



## The presenters



**Ilyes Yousfi**

- **Current position:** Sales & Consulting Engineer at The REUSE Company

Ilyes Yousfi got his Master's degree from the University of Montreal (Canada) and the IMT Atlantique School of Engineering (France). Ilyes has 5 years of experience in sales, technical background in energy and mechanical engineering and was involved in a research project around the environmental impacts of end-of-life management of aircrafts.

Passionate about international projects and learning languages, Ilyes speaks 4 languages fluently: English, French, German and Spanish.



**Brief  
introduction to  
IBM Doors Next  
Generation**

## What is IBM Doors Next Generation ?

- Requirements Management Tool
- Developed on the IBM Jazz Platform (Web client)
- Main features
  - Creating and Managing Functional and Non-Functional requirements
  - Business Processes Diagrams
  - Use Case Diagrams
  - UI Sketches and Storyboarding
  - Approval process
  - Impact Analysis
- Designed to enhance team collaboration





### What is IBM Doors Next Generation ?

The screenshot displays the IBM Doors Next Generation interface for a project named 'Railway Demo'. The main view is a table of CoRS (Common Object Request Broker Service) artifacts. The table has columns for ID, Artifact Type, Primary Text, QS\_Qua..., QS\_Quality\_Date, QS\_Qua..., and QS\_Summary. The artifact with ID 421 is highlighted in orange. A 'Mini Dashboard' is visible on the left side, and a search bar is at the top right. The bottom of the screen shows 'Showing 61 of 61 (100%)' and '1 selected (Clear All Selected)'.

ID	Artifact Type	Primary Text	QS_Qua...	QS_Quality_Date	QS_Qua...	QS_Summary
377	/Railway project/CoRS - Object	The braking system shall be designed to be very flexible	3	Oct 29, 2020 10:15 AM	Low	Avoid passive voice out of condition blocks; Avoid vague terms in requirement statements: "flexible"; Avoid superfluous infinitives: "Superfluous infinitives <be capable to>", "be designed to"; Avoid imprecise quantifiers: "very".
389	/Railway project/CoRS - Object	When the emergency hydraulic system is activated, the capacity of the accumulator shall be lower than 10 liter	3	Oct 29, 2020 10:15 AM	Low	Invalid measurement unit for a given property: "{Capacity, Liter}"; "«MEASURE»: {Capacity, Liter}"
390	/Railway project/CoRS - Object	The heater power consumption shall not exceed 6 w	3	Oct 29, 2020 10:15 AM	Low	Invalid measurement unit for a given property: "{Power consumption, W}"; "«MEASURE»: {Power consumption, W}"; Avoid negative expressions: "not"
393	/Railway project/CoRS - Object	Every 2 seconds, the power control system shall send a demand battery load level message to the battery	3	Oct 29, 2020 10:15 AM	Low	Avoid universals keywords: "every"; Avoid unachievable Absolutes expressions: "every".
397	/Railway project/CoRS - Object	The Passenger information system shall have 22 displays	1	Oct 29, 2020 10:15 AM	High	
402	/Railway project/CoRS - Object	The air fan power consumption shall not exceed 300 w	3	Oct 29, 2020 10:15 AM	Low	Invalid measurement unit for a given property: "{Power consumption, W}"; "«MEASURE»: {Power consumption, W}"; Avoid negative expressions: "not"
421	/Railway project/CoRS - Object	The train shall be always available	3	Oct 29, 2020 10:15 AM	Low	Avoid universals keywords: "always"; Avoid unachievable Absolutes expressions: "always".
422	/Railway project/CoRS - Object	When accumulator abort air conditioning system, air conditioning system shall accede to accumulator	1	Oct 29, 2020 10:15 AM	High	
426	/Railway project/CoRS - Object	The fan power consumption shall not exceed 1200 w	3	Oct 29, 2020 10:15 AM	Low	Invalid measurement unit for a given property: "{Power consumption, W}"; "«MEASURE»: {Power consumption, W}"; Avoid negative expressions: "not".
428	/Railway project/CoRS - Object	The MTBF of the train shall be 20000 hours	1	Oct 29, 2020 10:15 AM	High	
433	/Railway project/CoRS - Object	When the braking system is in Fail mode, the train shall stop an alarm in less than 20 seconds	1	Oct 29, 2020 10:15 AM	High	
402	/Railway project/CoRS - Object	The MTBF of the system shall be 100000 hours	1	Oct 29, 2020 10:15 AM	High	
478	/Railway project/CoRS - Object	When the temperature = 40, the a/c system shall start emergency mode	3	Oct 29, 2020 10:15 AM	Low	Missing quantifier (Measurement unit or noun); Invalid measurement unit for a given property: "{Temperature, A}"; "«MEASURE»: {Temperature, A}"

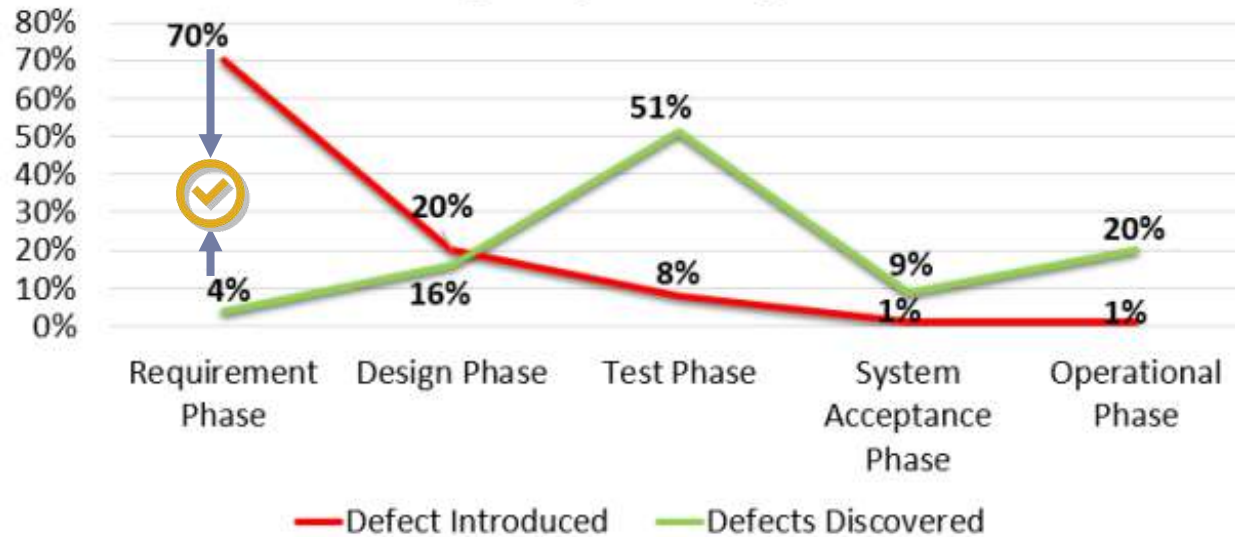


**Why focusing  
on  
Requirements  
quality**

## Why consider requirements quality at authoring phase ?

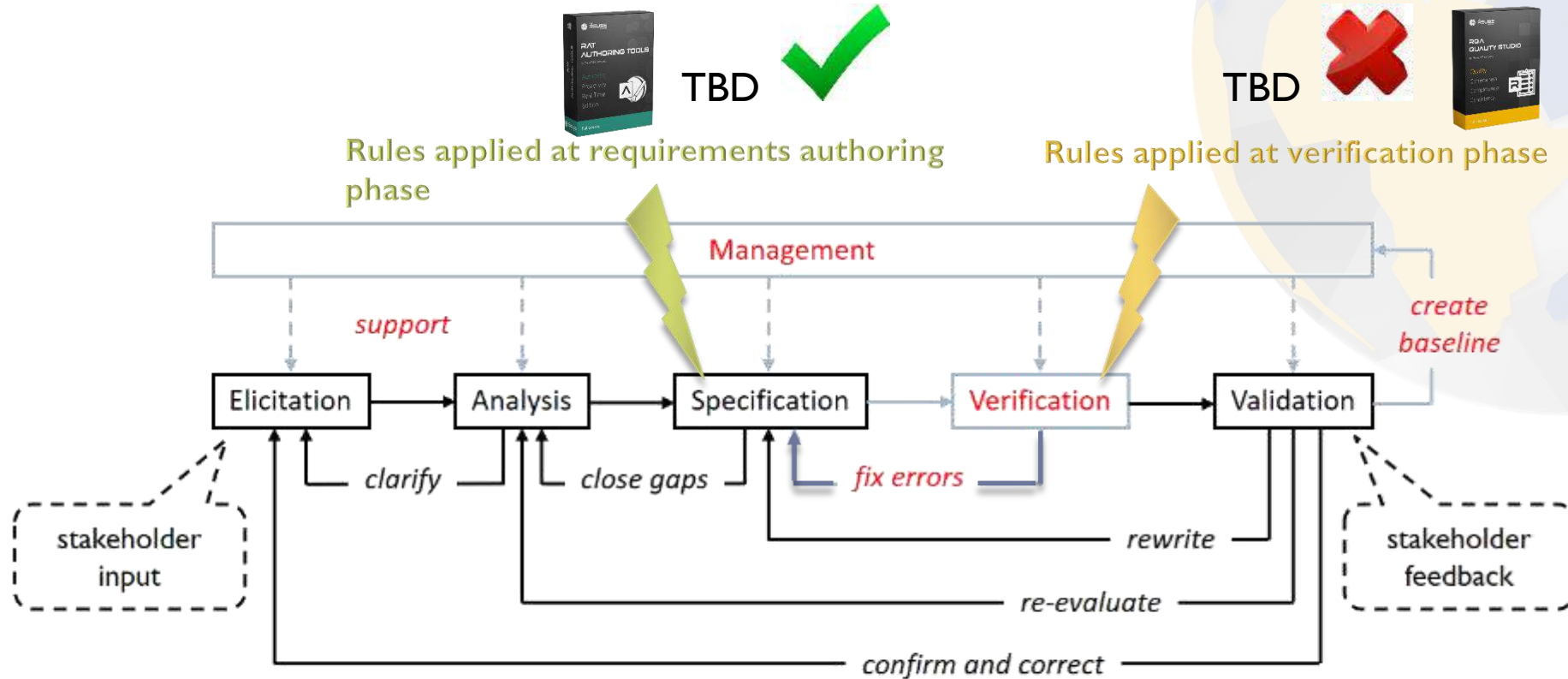
# REQUIREMENTS are the reason for FAILURE

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



Source: IBM Business research 2017

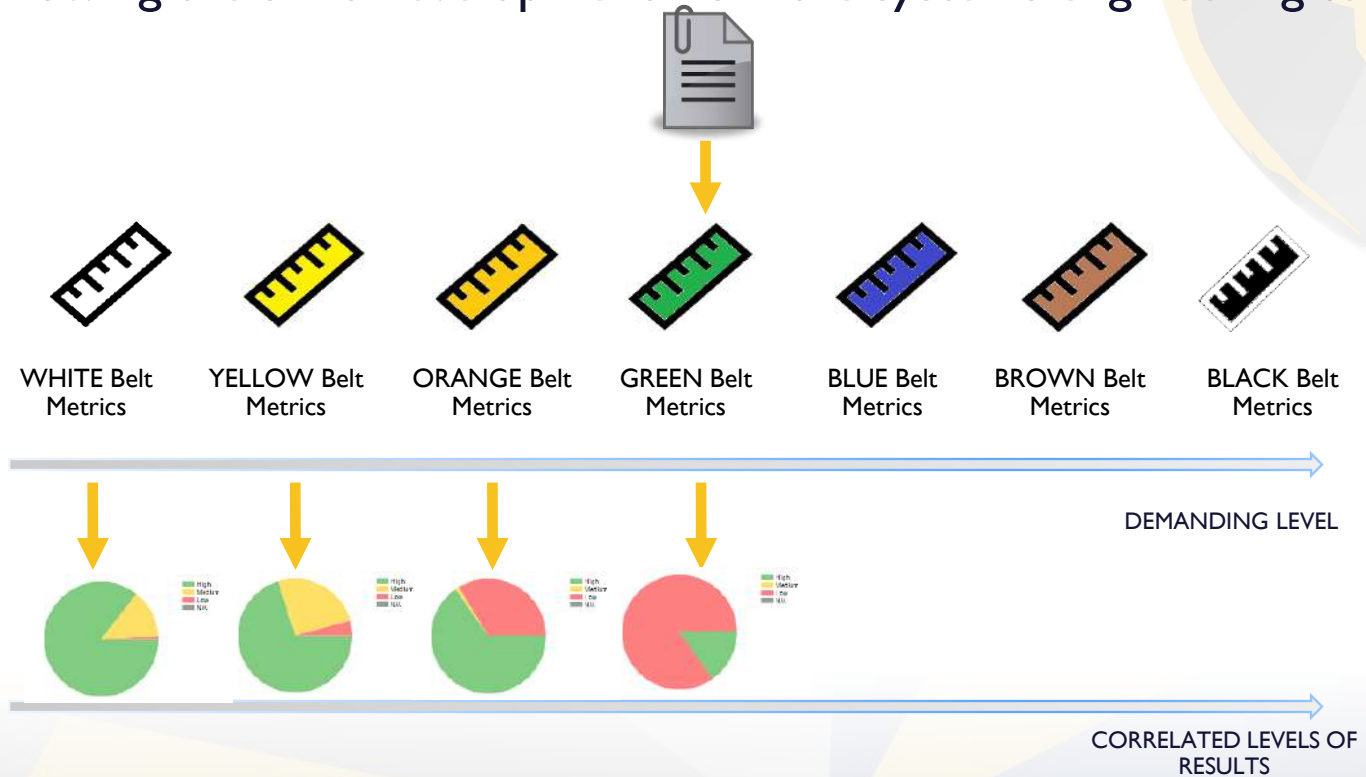
### Why consider requirements quality at authoring phase ?



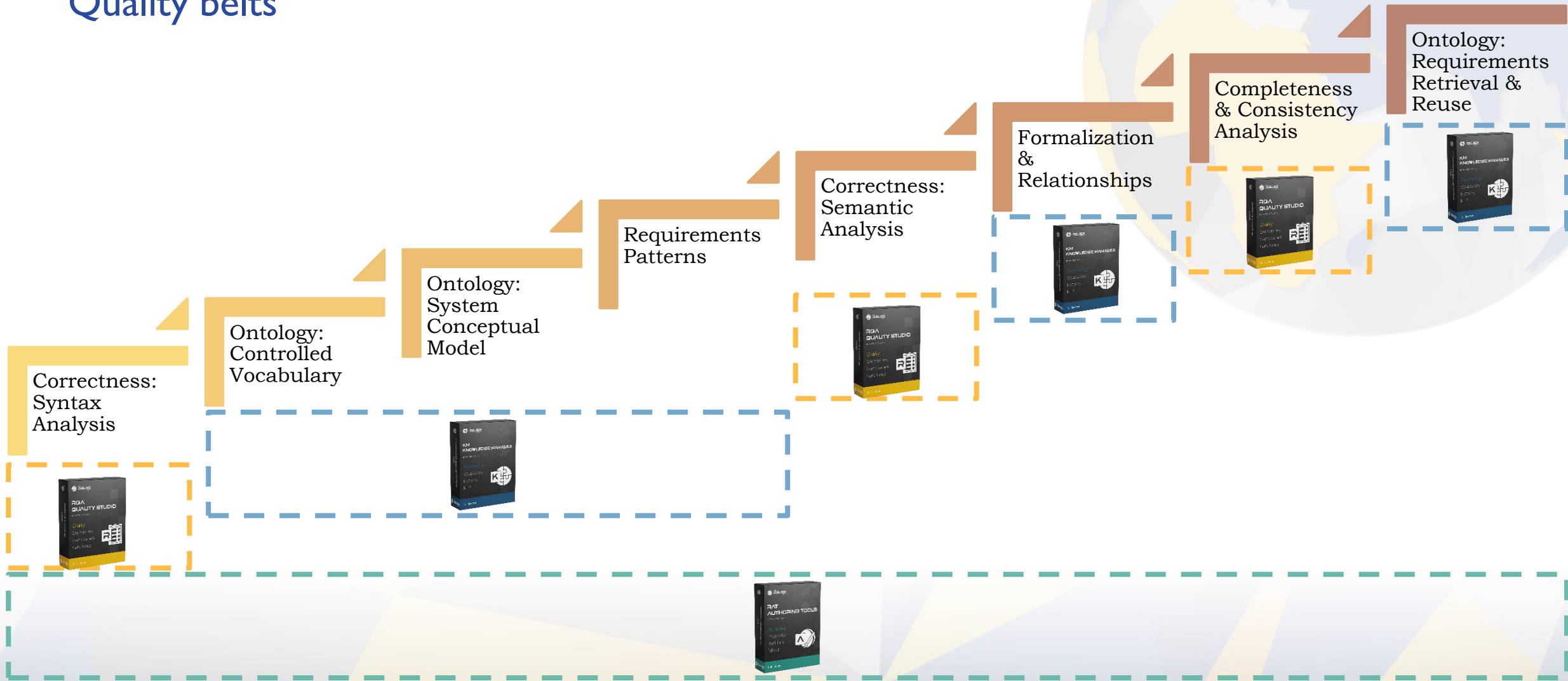
Adapted from: Karl Wiegers

### Quality belts

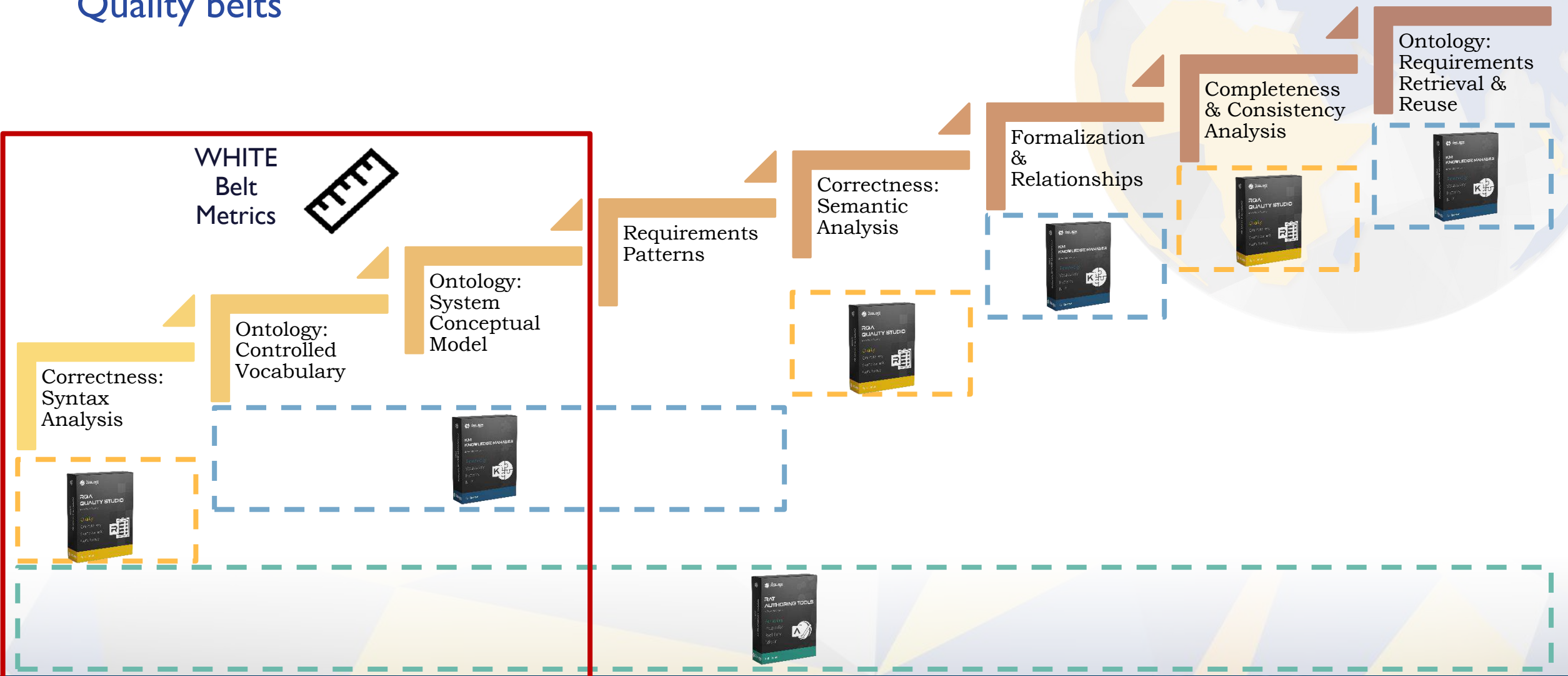
- Design a roadmap based on the concept of belts, like in martial arts, to gradually increase the complexity and following the skills development from the systems engineering team.



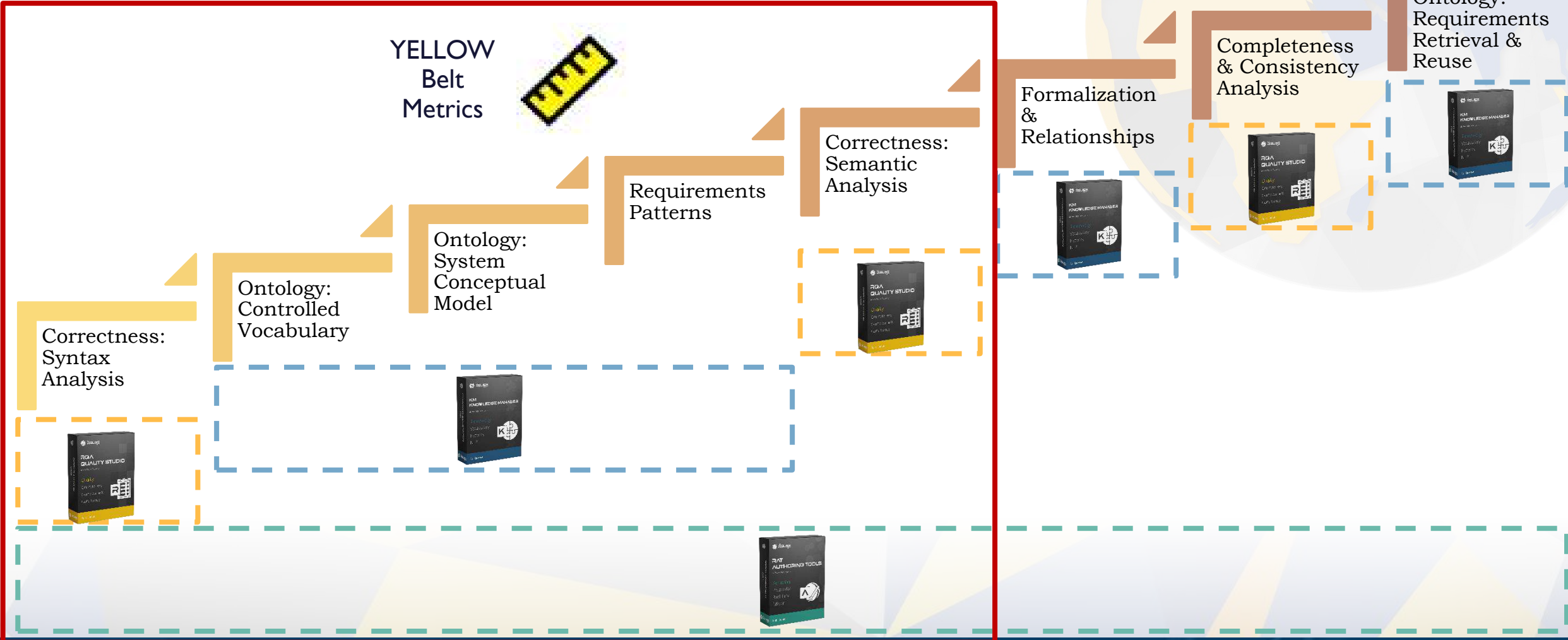
### Quality belts



### Quality belts

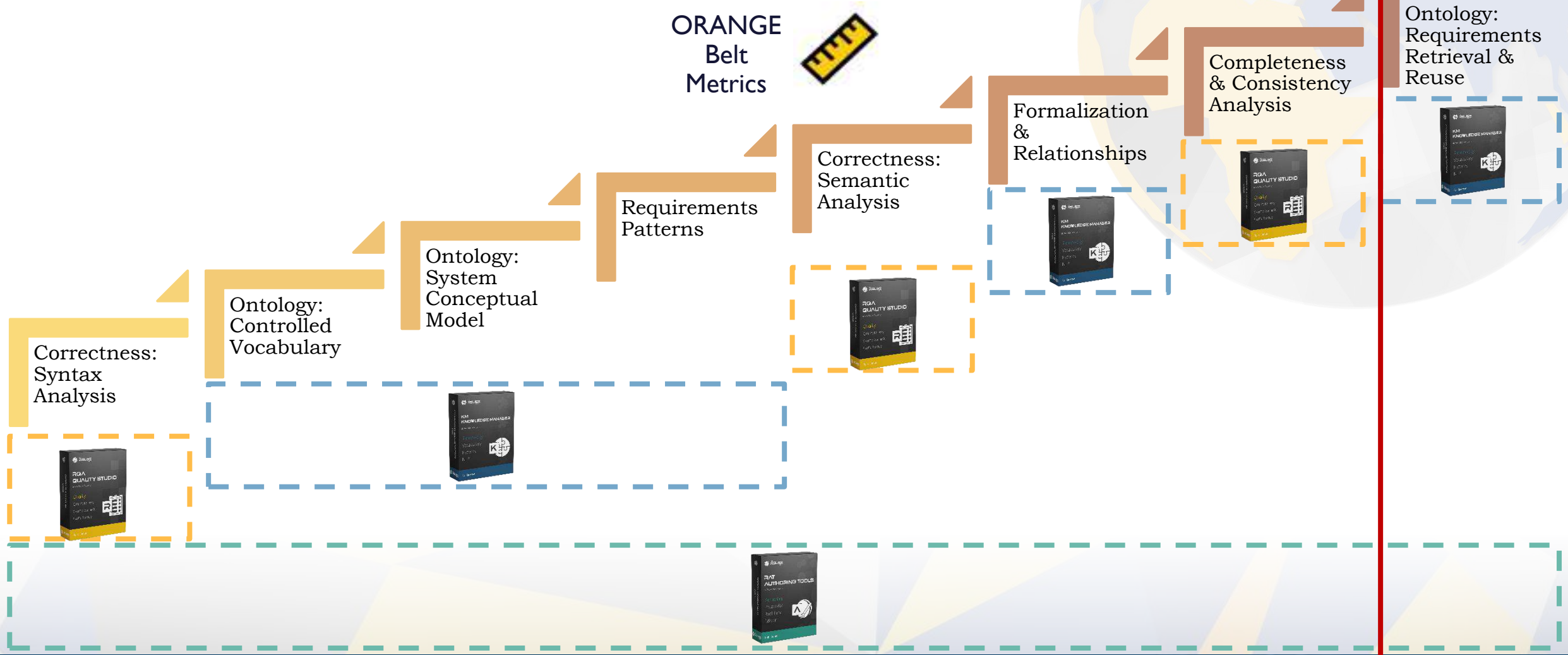


### Quality belts

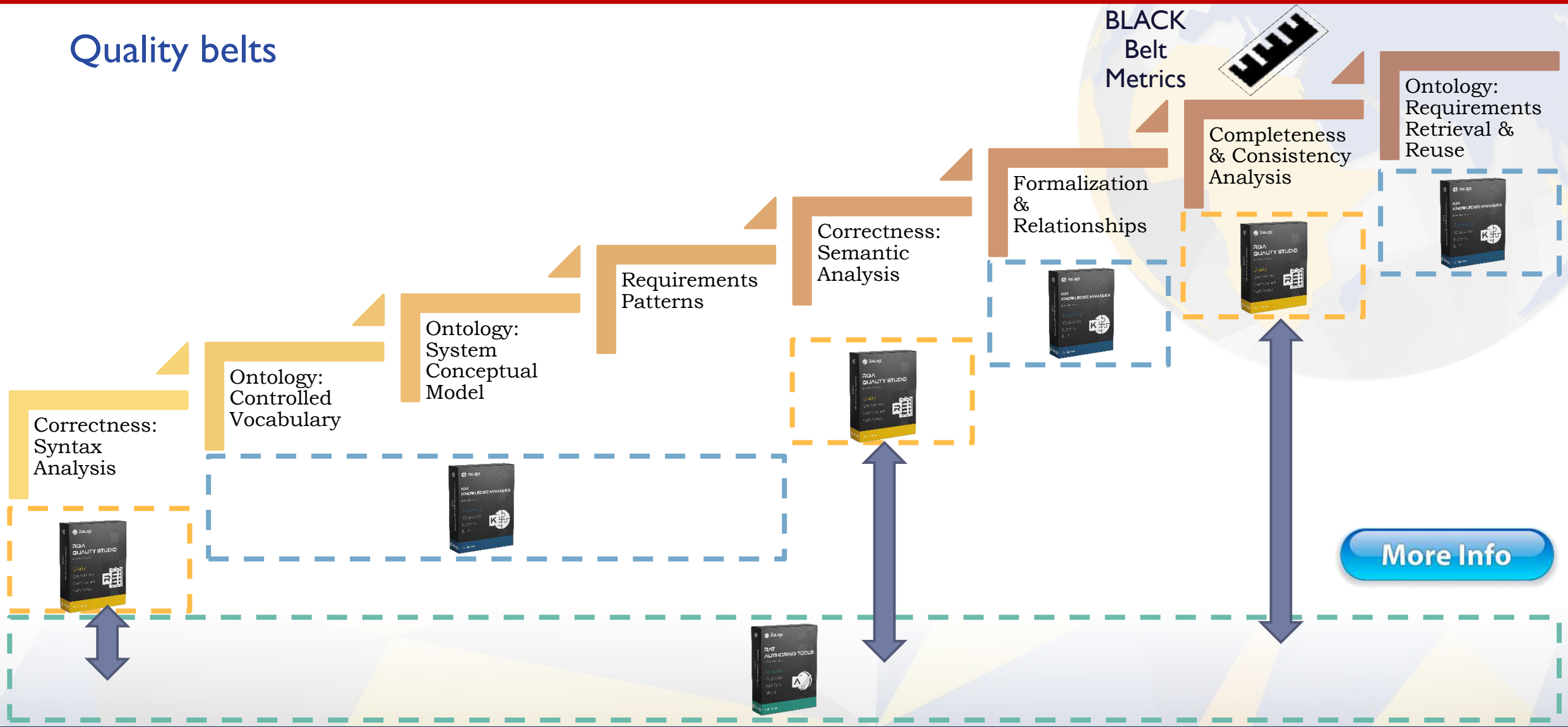




### Quality belts



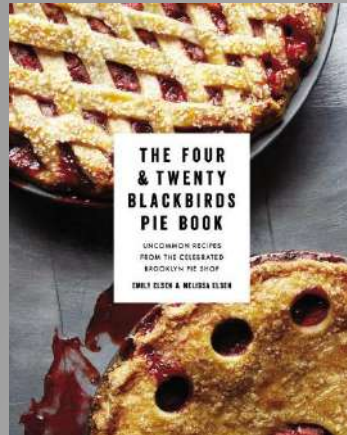
### Quality belts



## Why consider requirements quality at authoring phase ?

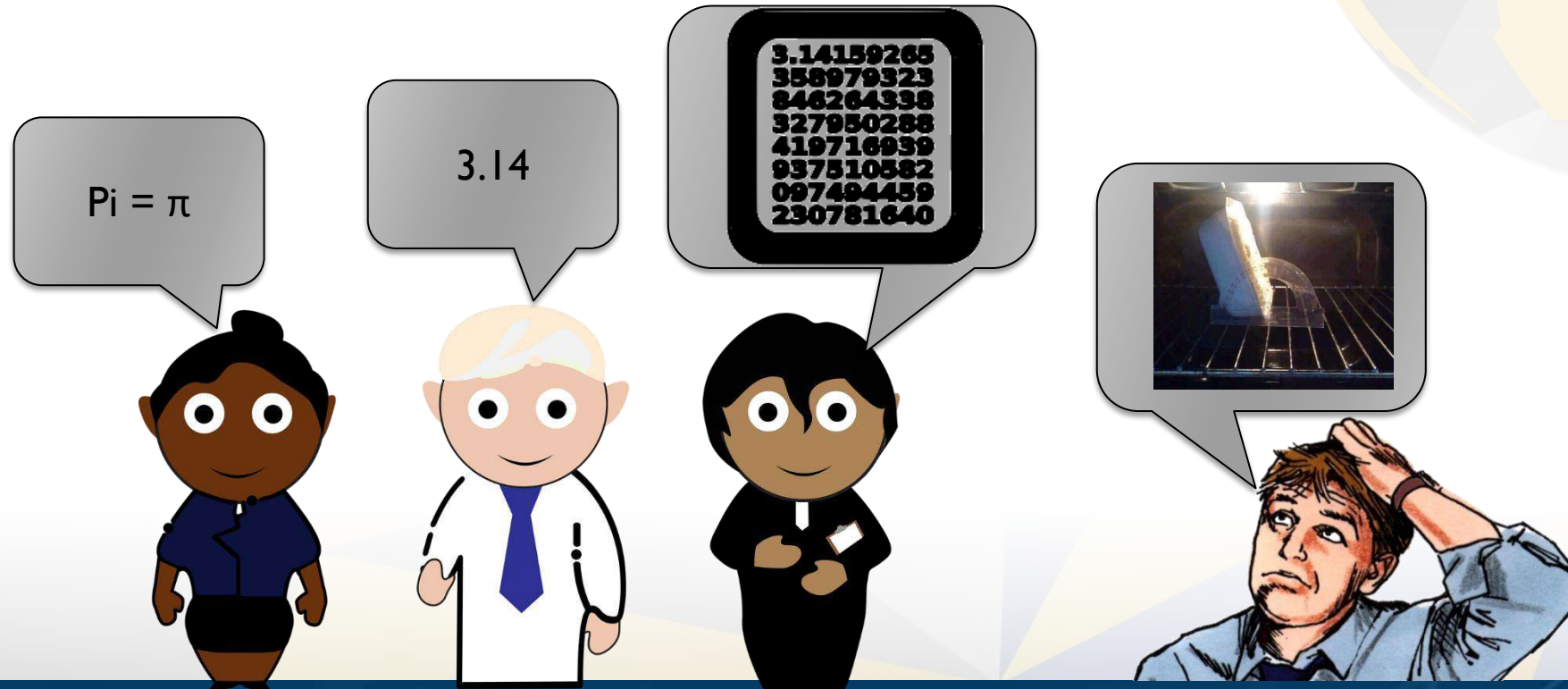
- Because communication is not always that easy:

**THE RECIPE TOLD  
ME TO PUT THE  
PIE IN THE OVEN  
AT 120 DEGREES**



## Why consider requirements quality at authoring phase ?

- Because communication is not always that easy:





# RAT for IBM Doors NG

## Main features

### Main features of RAT – Authoring Tool : integration in the RMS interface

The screenshot displays the IBM DOORS NG interface with the RAT Authoring Tool widget integrated into the left-hand Mini Dashboard. The widget is titled 'RAT Authoring Tool' and includes a 'Home' tab and a 'General' sub-tab. It features a large checkmark icon and the text: 'Select a requirement to view its details' and 'Select one requirement to see quality information and able to calculate quality for the complete module.' At the bottom of the widget, it shows a connection status: 'CONNECTED TO https://msg.reusecompany.com:54413/'.

The main interface shows a list of requirements under the 'RQS\_Quality\_View' view. The requirements are as follows:

ID	Contents	QS_Summary
729	The weight of the antenna shall be 200 gr	Invalid measurement unit for a (Weight, G)"; "«MEASURE»"; {
727	When the voltage level is below 11.5V, the battery shall send a "low battery load level" message to the power control system	Invalid measurement unit for a (Voltage, V)"; "«MEASURE»"; {
711	The radio shall have a lifetime of at least 30 years	
704	The train shall have 10 fan blades	
702	The fan blade power consumption shall not exceed 400 w n	Invalid measurement unit for a (Power consumption, W)"; "«M consumption, W)"; Avoid negative expressions: "nc
701	The train should be designed to be very fast	Avoid passive voice out of conc Avoid the use of Banned Mod Avoid vague terms in requirem statements: "fast". Avoid superfluous infinitives: "S infinitives <be capable to>"; "D Avoid imprecise quantifiers: "vei
698	The number of errors of the system shall be 0	Missing quantifier (Measureme
695	If the battery is low, the power control system shall send a "show low energy level alarm" signal to the information display system	Check the number of action ver requirement.
693	The train should communicate with as many stations as possible	Avoid the use of Banned Mod Avoid vague terms in requirem statements: "possible". Avoid imprecise quantifiers: "ms
691	The train shall reach 200 km/h	
688	The number of errors of the compressor in one month shall be (x): ((x > 0)(x < 2)/2)	Missing quantifier (Measureme Avoid oblique symbols (or "slas Avoid parentheses: """).
685	the magnetic field of battery should be 100 µBq	Invalid measurement unit for a (Magnetic field, µBq)"; "«MEAS field, µBq)"; Avoid the use of Banned Mod Avoid misspelling: "µbq".
675	When requested by the driver, the train shall send an emergency signal in less than 1 second	Avoid Escape clauses: "when re

### Main features of RAT – Authoring Tool : edition of requirements using advanced semantics

The screenshot displays the RAT Authoring Tool interface. At the top, there is a green header with a checkmark icon and the text "RAT Authoring Tool". Below this, a navigation bar includes "Home", "General" (selected), and "View". A secondary bar contains icons for "Save", "RAT Rich Editor", "Assess Quality", and "Generate Quality Report".

The main area is divided into two panels. On the left is the "Metrics & Patterns Panel", which shows a "Low quality (0.29)" status. It includes a search bar and tabs for "Issues found" and "Metrics". A red-bordered box highlights an issue: "Invalid measurement unit for a given property" with a warning icon, a three-star rating, and a "More metric information" link.

On the right is the "Requirement Type (20)" editor, showing a "Paragraph" type with various formatting options (bold, italic, underline, strikethrough, list, link). The requirement text "The length of the antenna shall be 200 kg" is displayed, with "length" and "kg" circled in red to indicate the focus of the quality issue.

### Main features of RAT – Authoring Tool : edition of requirements using advanced semantics

The screenshot displays the RAT Authoring Tool interface. At the top, there is a green header with the tool name and a REUSE logo. Below the header, a navigation bar includes 'Home', 'General', and 'View' tabs, along with buttons for 'Save', 'RAT Rich Editor', 'Assess Quality', and 'Generate Quality Report'. The main workspace is divided into two sections. On the left, the 'Metrics & Patterns Panel' shows a 'Low quality (0.29)' status and a search bar. It lists a matching pattern: '[Maximum] <Property> of <System> shall be [<Operator>] N...' with 30,000 matches. Below this, a warning message states 'One modal verb is necessary for the requirement.' with a star rating and a link for 'More metric information'. The main editor area on the right shows a requirement text: '02.01 - System Physical Requirements (3) [Maximum] <Property> of <System> shall be [<Operator>] NUMBER UNIT'. A red box highlights the rich text editor toolbar above the text, which includes options for Paragraph, font color, background color, bold, italic, underline, strikethrough, list, link, and unlink. The text 'The length of the |' is visible in the editor, and a dropdown menu is open, listing terms: Accumulator, Air conditioning system, Antenna, Auxiliary electric system, Auxiliary systems, and Battery.



### Main features of RAT – Authoring Tool : edition of requirements using advanced semantics

Metrics & Patterns Panel

● Low quality (0.29)

Search

Metrics Authoring Patterns **Live Matching Patterns & Metrics**

[Maximum] <Property> of <System> shall be [<Operator>] N...  
[[Maximum] <Property> of <System> shall be [<Operator>] NUMBER U...  
**Matching** 30,000

Examples

**One modal verb is necessary for the requirement.**  
Singularity / Conditions / TRC-M360: Check the number of Modal Verbs  
☆☆☆ 1 0

More metric information

REUSE COMPANY

Requirements (3) [Maximum] <Property> of <System> shall be [<Operator>] NUMBER UNIT

A<sup>≠</sup> AI B I U S [Table] [Link] A [Text] [List] [Table]

The length of the |

- Accumulator
- Air conditioning system
- Antenna
- Auxiliary electric system
- Auxiliary systems
- Battery

### Main features of RAT – Authoring Tool : edition of requirements using advanced semantics

#### Metrics & Patterns Panel

● Low quality (0.29)

Search

Home Metrics Authoring Patterns Live Matching Patterns & Metrics



[Maximum] <Property> of <System> shall be [<Operator>] N...

[[Maximum] <Property> of <System> shall be [<Operator>] NUMBER U...

Matched

30,000

Examples

#### Example 1

"the maximum weight of the complete system shall be < generic number > kilogram"

#### Example 2

"The weight of the system shall be 200 kilograms"

Physical Requirements (3)

[Maximum] <Property> of <System> shall be [<Operator>] NUMBER UNIT

Paragraph



The length of the antenna shall be 222 meters

### Main features of RAT – Authoring Tool : Quality results stored in a View

The screenshot shows the RAT Authoring Tool interface. On the left is a 'Mini Dashboard' with a 'RAT Authoring Tool' widget. The main area displays a table of requirements with associated quality results. A red box highlights the 'Quality Results' table, and a red arrow points from the text 'Collaboration between quality analysts and requirement authors' to it.

ID	Contents	QS_Quality_Name	QS_Summary
671	The air conditioning system shall have an MTBF of 369000 working hours	High	
670	The capacity of the fuel tank shall be 8800 liters	High	
691	The length of the train shall be 240 m	High	
704	The train shall have 10 fan blades.	High	
711	The radio shall have a lifetime of at least 30 years	High	
727	When the voltage level is below 11.5V, the battery shall send a "low battery load level" message to the power control system	High	
729	The weight of the antenna shall be 200 kg.	High	
733	The system shall have a maximum height of 80 cm.	High	
781	The train shall have 3 wings	High	
771	The train shall have an alarm	High	
801	The pis shall contain 33 display	High	
817	the train shall reach a speed of 320	Low	Missing quantifier (Measurement unit or noun):
377	The braking system shall be designed to be very flexible.	Low	Avoid passive voice out of condition blocks: Avoid vague terms in requirement statements:"flexible". Avoid superfluous infinitives: " Superfluous infinitives <be capable to>]", "be designed to". Avoid imprecise quantifiers:"very".
393	Every 2 seconds, the power control system shall send a demand battery load level message to the battery	Low	Avoid universals keywords:"every". Avoid unachievable Absolutes expressions:"every".
402	The air fan power consumption shall not exceed 300 w	Low	Avoid negative expressions:"not".
421	The train shall be always available	Low	Avoid universals keywords:"always". Avoid unachievable Absolutes expressions:"always".
426	The fan power consumption shall not exceed 1200 w	Low	Avoid negative expressions:"not".
495	When the voltage = 5 v, the radio shall send a message to the station with the low_voltage signal	Low	Avoid misspelling:"low_voltage".
496	There shall be a system to communicate between the train and the station	Low	Avoid inadequate grammar structures:" ANTIPATTERN 1 - There/It shall be)", "there shall be".

Quality results stored in DNG  
 Collaboration between quality analysts and requirement authors

Select a requirement to view its details

Select one requirement to see quality information and able to calculate quality for the complete module.

CONNECTED TO <https://dng.reusecompany.com:54413/>



Jazz





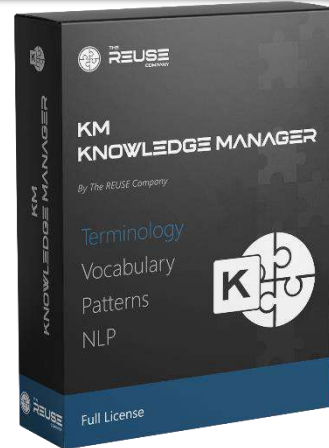
# Integration to the Systems Engineering Suite



### KCSE areas and tools

## Knowledge Management

Capture, creation, **representation**, and **exchange of knowledge** across targeted groups of **stakeholders**



## Traceability

Support the **integration** among assets through semantic **interoperability** to discover and keep the **traces** among related elements

**Authoring**  
**Definition** of requirements and other textual engineering assets based on **real-time analysis** (NLP), **writing assistance**, **identification of similar items...**



## Quality Management

Define, implement and perform **measures** to meet the **quality priorities** that satisfy the **verification** of any engineering element

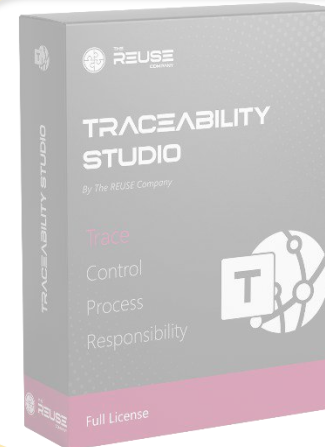
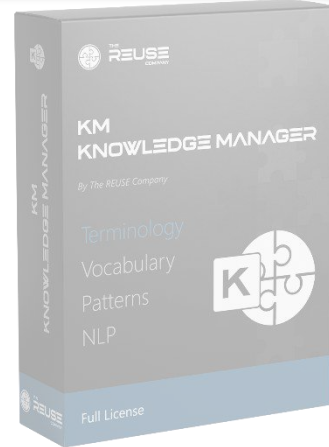




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## Quality Management

Define, implement and perform **measures** to meet the **quality priorities** that satisfy the **verification** of any engineering element



## The TRC Systems Engineering Suite

- The Systems Engineering Suite tackles requirements quality management by offering a set of tools and processes
- Automatic measurement of requirements quality metric
- Support to Requirements Authoring
- SES Suite models requirements quality metrics using the CCC approach (Correctness, Consistency and Completeness)



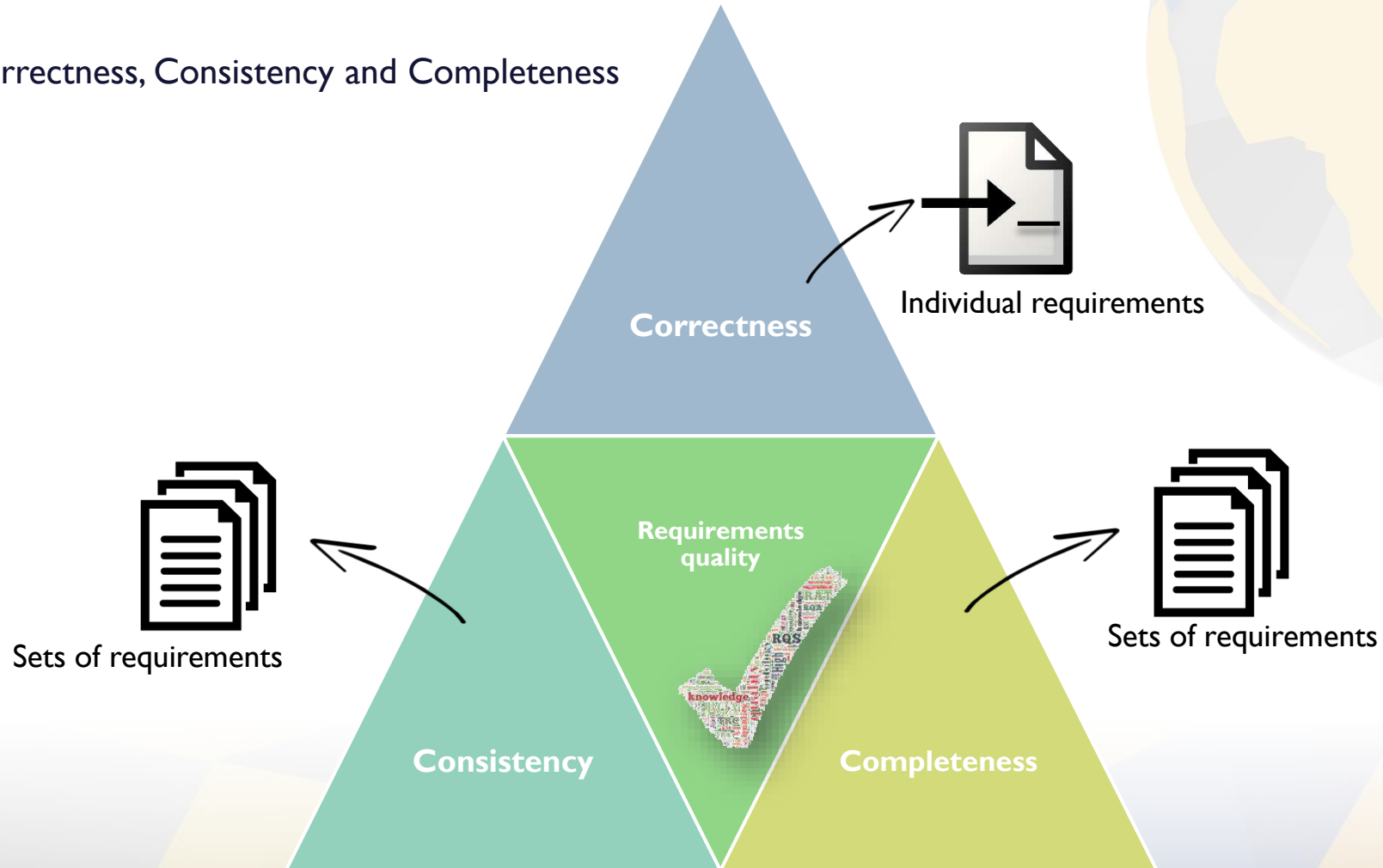
- **RQA – Quality Studio:** to setup, check and manage the quality of a requirements specification
- **V&V Studio:** verification and validation of both sides of the “V” model
- **Rich Authoring Tool (RAT):** to assist authors while they are creating or editing requirements
- **Knowledge Manager (KM):** to manage knowledge around a requirements specification: dictionaries, glossaries, concept maps, knowledge models, ontologies, patterns...
- **TRACEABILITY Studio:** to link together different types of artifacts generated with other Systems Engineering tools





## Real-time quality analysis: CCC Approach

➤ CCC – Correctness, Consistency and Completeness





41 Rules / 14 Characteristics

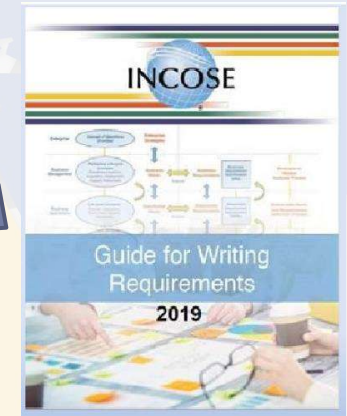
INCOSE GfWR

➤ **Characteristics** of individual and sets of needs and requirements, provides rationale and guidance for helping understand the characteristics.

➤ **Rules** for individual and sets of needs and requirements that help to formulate them. Included an explanation of the rule and examples of the application of the rule.

➤ **Attributes** that can be attached to a need or requirement statements to form need or requirement expressions. Also included is guidance on the use of attributes.

Type	Rule Number	Rule name	CHARACTERISTICS OF NEED AND REQUIREMENT STATEMENTS							SETS OF NEEDS AND REQUIREMENTS					
			C1 - NECESSARY	C2 - APPROPRIATE	C3 - UNAMBIGUOUS	C4 - COMPLETE	C5 - SINGULAR	C6 - FEASIBLE	C7 - VERIFIABLE	C8 - CORRECT	C9 - CONFORMING	C10 - COMPLETE	C11 - CONSISTENT	C12 - FEASIBLE	C13 - COMPREHENSIBLE
Accuracy	R01	Sentence Structure			1				1						
	R02	Use Active Voice			1				1						
	R03	Subject Verb	1	1					1						
	R04	Use Defined Terms		1					1						
	R05	Use Definite Articles			1				1						
	R06	Units			1	1			1	1					
	R07	Avoid Vague Terms			1	1			1						
	R08	No Escape Clauses			1	1			1						
	R09	No Open Ended			1	1	1		1						
Concision	R10	Superfluous Infinitives			1				1						
	R11	Separate Clauses			1										
Non Ambiguity	R12	Correct Grammar			1						1				
	R13	Correct Spelling			1										
	R14	Correct Punctuation			1										
	R15	Logical Condition			1										
	R16	Avoid Not			1					1					
	R17	Oblique			1					1					
	R18	Single Sentence			1	1	1		1	1				1	
Singularity	R19	Avoid Combinators			1		1								
	R20	Avoid Purpose						1							
	R21	Avoid Parentheses						1							
	R22	Enumeration			1		1								
	R23	Context			1		1								
	R24	Avoid Pronouns			1	1			1						
Completeness	R25	Use Of Headings				1									
	R26	Avoid Absolutes						1	1						
Realism	R27	Explicit				1			1			1			
	R28	Explicit Lists			1				1						
Conditions	R29	Classify									1	1	1		
	R30	Express Once	1							1		1	1		
Abstraction	R31	Solutionfree		1											
	R32	Universals			1				1	1					
Quantifiers	R33	Value Range			1	1			1	1			1		
	R34	Measurable			1	1			1				1		
Tolerance	R35	Temporal Indefinite			1	1			1						
	R36	Use Consistent Terms			1					1	1		1	1	1
Quantification	R37	Define Acronyms			1					1		1	1	1	1
	R38	Avoid Abbreviations								1		1	1	1	1
	R39	Style Guide					1	1			1	1	1	1	1
	R40	Related Requirements								1		1	1	1	1
Uniform Language	R41	Structured									1	1	1	1	1
	R42	Related Requirements								1		1	1	1	1
Modularity	R43	Structured									1	1	1	1	1
	R44	Related Requirements								1		1	1	1	1



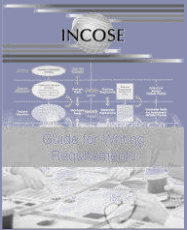
46 Attributes

Attribute	Attributes to Help Define the Requirement and its Intent	Associated with the System of Interest (SOI) Verification	Attributes to Help Maintain the Requirements	Attributes to Show Applicability and Allow Reuse
A01	Rationale*	1		
A02	SOI Primary Verification or Validation Method*	1		
A03	SOI Verification or Validation Approach	1		
A04	Trace to Parent*	1		
A05	Trace to Source*	1		
A06	Condition of Use	1		
A07	States and Modes	1		
A08	Allocation*	1		
A09	SOI Verification or Validation Level		1	
A10	SOI Verification or Validation Phase		1	
A11	SOI Verification or Validation Results		1	
A12	SOI Verification or Validation Status		1	
A13	Unique Identifier*			1
A14	Unique Name			1
A15	Originator/Author*			1
A16	Date Requirement Entered			1
A17	Owner*			1
A18	Stakeholders			1
A19	Change Board			1
A20	Change Status			1
A21	Version Number			1
A22	Approval Date			1
A23	Date of Last Change			1
A24	Stability			1
A25	Responsible Person			1
A26	Need or Requirement Verification Status*			1
A27	Need or Requirement Validation Status*			1
A28	Status (of the Need or Requirement)			1
A29	Status (of Implementation)			1
A30	Trace to Interface Definition			1
A31	Trace to Peer Requirements			1
A32	Priority*			1
A33	Criticality or Essentiality*			1
A34	Risk (of Implementation)*			1
A35	Risk (Mitigation)			1
A36	Key Driving Need or Requirement (K)			1
A37	Additional Comments			1
A38	Type/Category			1
A39	Applicability			1
A40	Region			1
A41	Country			1
A42	State/Province			1
A43	Application			1
A44	Market Segment			1
A45	Business Unit			1
A46	Business (Product) Line			1




### Knowledge Libraries

ECSS and NASA  
Glossary, patterns and rules



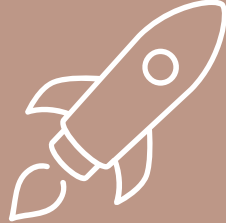
**INCOSE Guide for Writing Requirements**

**INCOSE**  
Quality rules for the analysis of textual requirements



**EARS Patterns**

**EARS**  
Requirements patterns




**ECSS and NASA Libraries**



**ISO 26262 Library**

**ISO 26262**  
Glossary, patterns and rules



**MASTER patterns**

**MASTER**  
Quality rules for requirements and requirements patterns

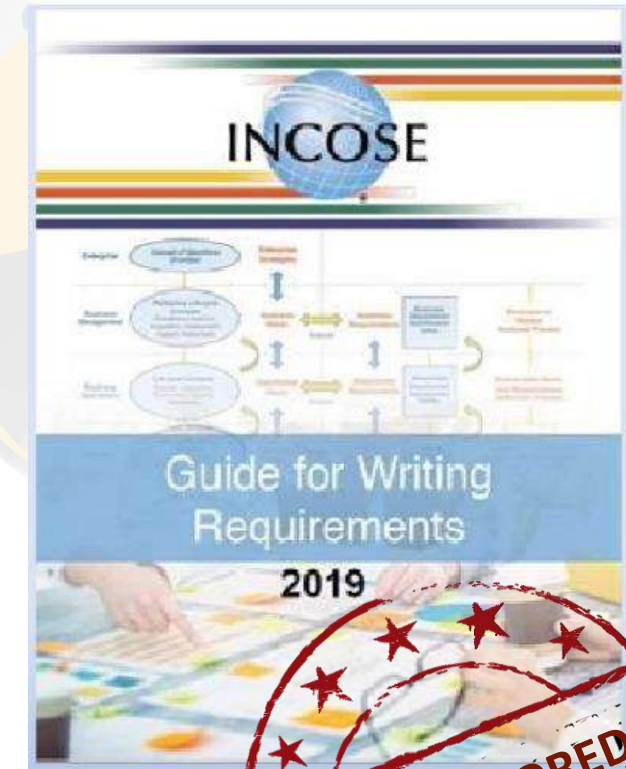
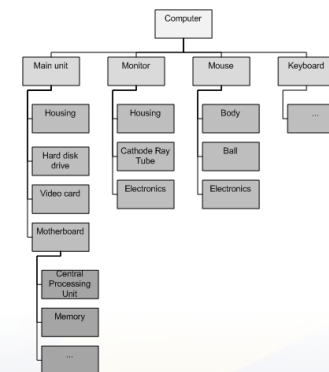
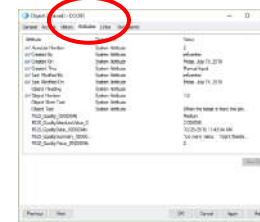
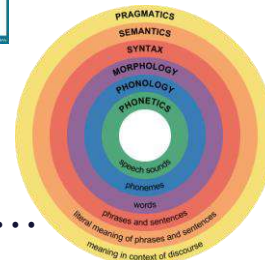


**Knowledge Base**

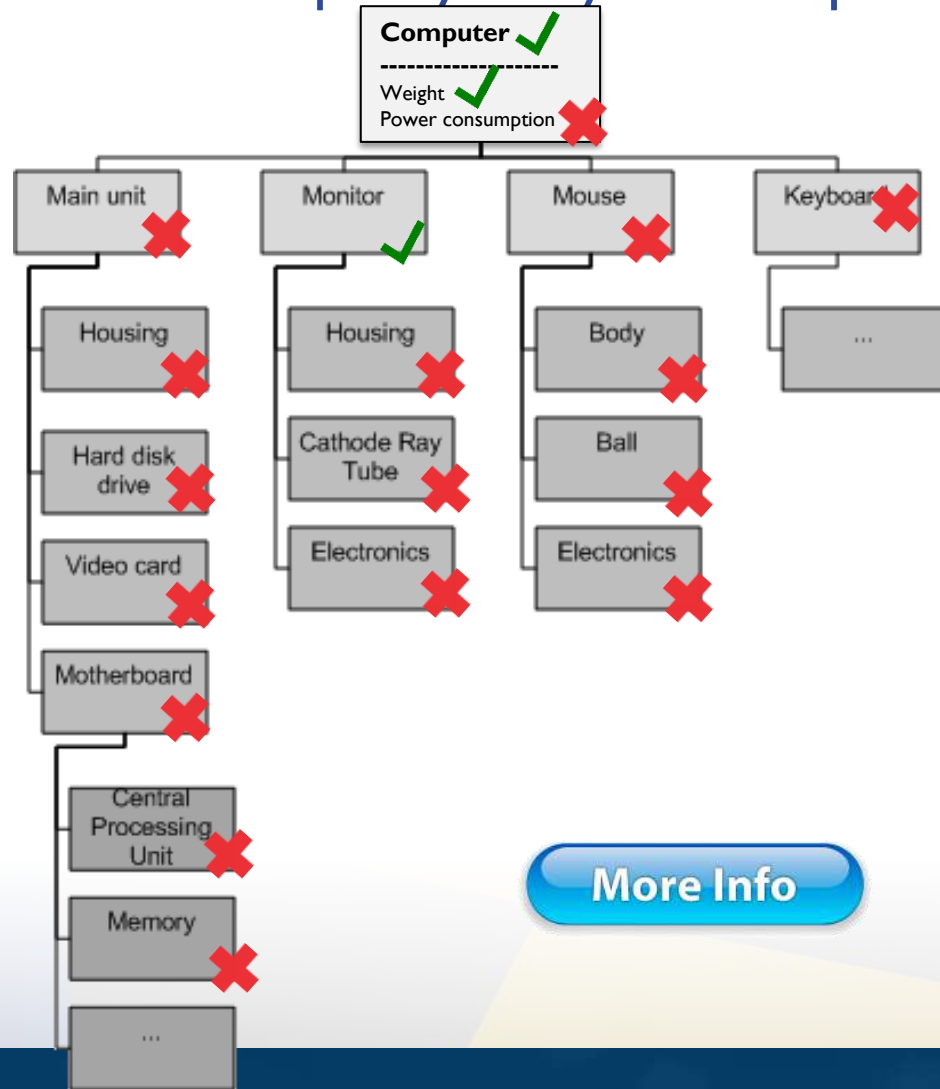


### Real-time quality analysis: Correctness

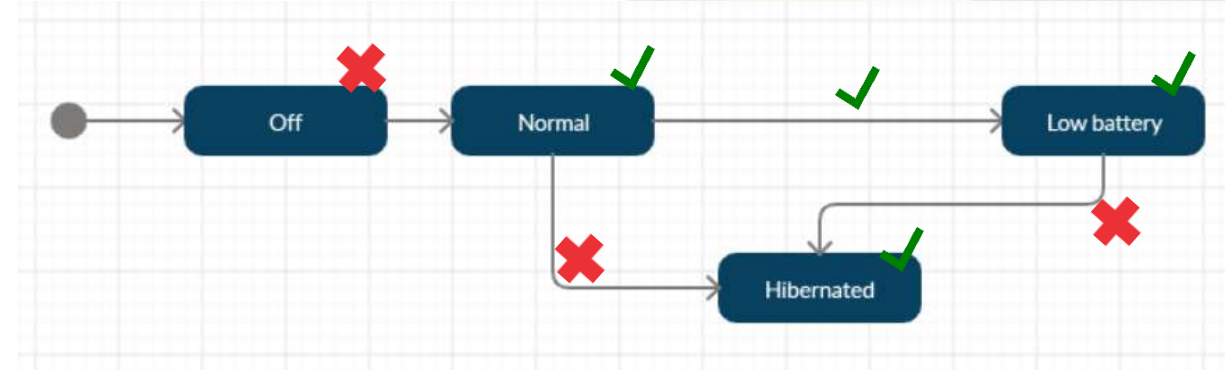
- Metrics based on information coming from the RMS:
  - Attributes, links, versions...
- Metrics based on lists of terms:
  - Forbidden: ambiguous, pronouns...
  - Restricted: negations...
  - Mandatory: 'shall', 'will', 'should'...
- Metrics based on linguistic algorithms:
  - Text length, misspelling, readability....
  - Detection of passive voice, imperative tense...
- Metrics based on the conformance with models:
  - Concepts in your requirements coming from PBS, FBS...
- Metrics based on patterns:
  - Compliance with different types of requirements patterns
  - Detection of specific structures within the requirements



## Real-time quality analysis: Completeness



[More Info](#)



The computer shall have 2 monitors

The computer shall have 2 engines

When the Computer is not plugged in, and the computer is in Normal state and the level of battery drops below 10%, the computer shall transit to Low battery mode

When the Computer is in Hibernated mode, the monitor shall turn black

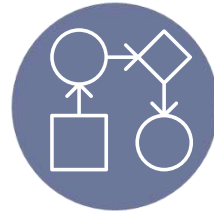
The weight of the computer shall be 1.2 kg +/- 10%

## Real-time quality analysis: Consistency

Requirements-  
models

**Consistency**

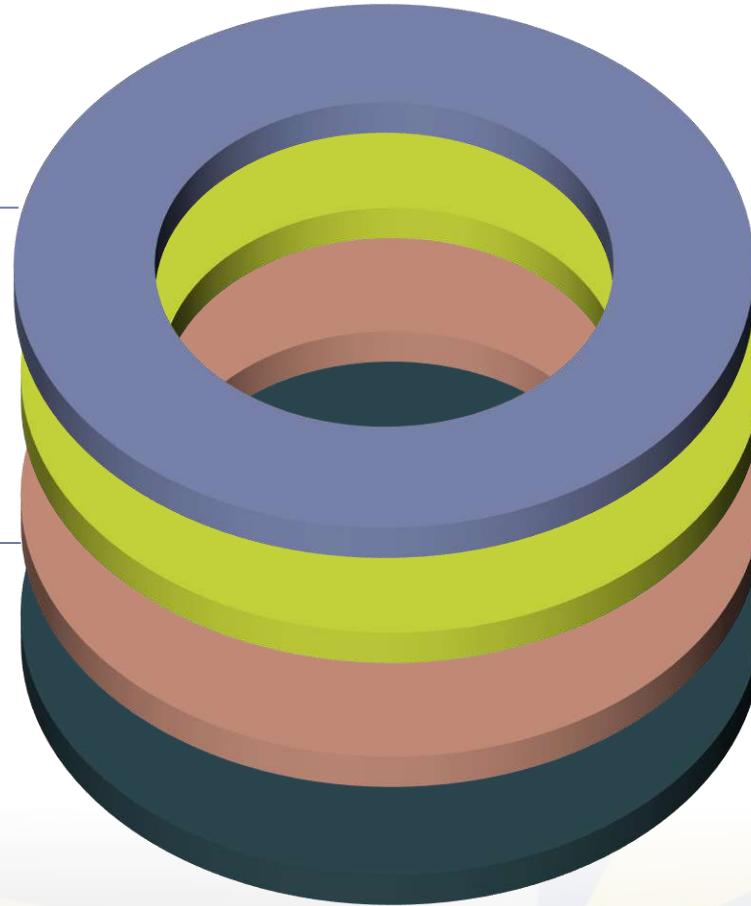
e.g. allocation of  
properties



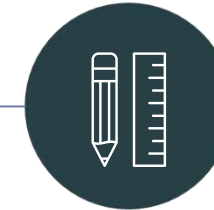
**Naming**

**consistency**

Among model elements  
and elements in textual  
requirements



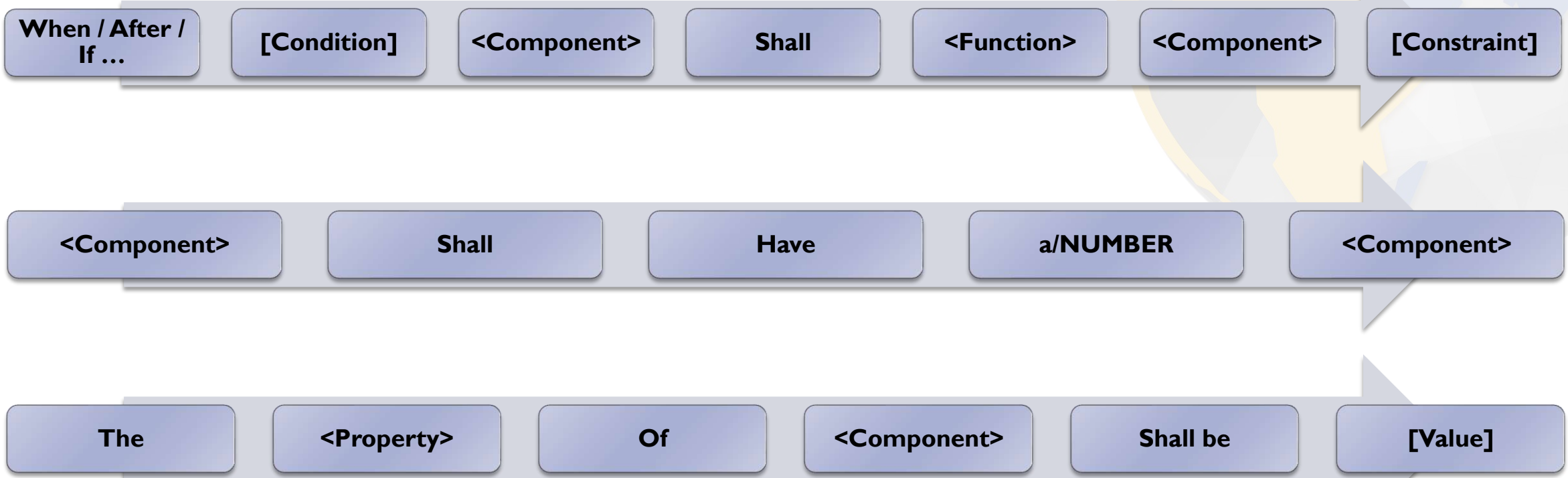
**Consistency  
Among  
requirements:**  
e.g. overlapping



**Pattern-based  
writing**

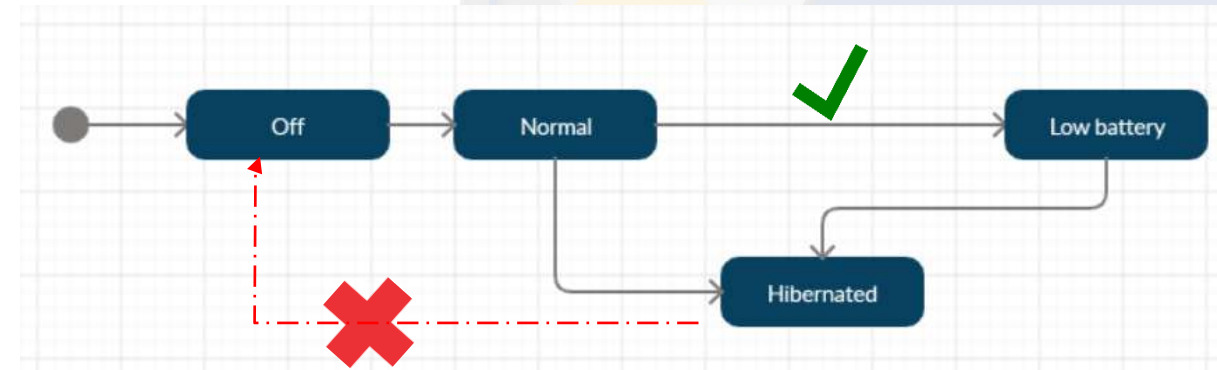


## Real-time quality analysis: Patterns



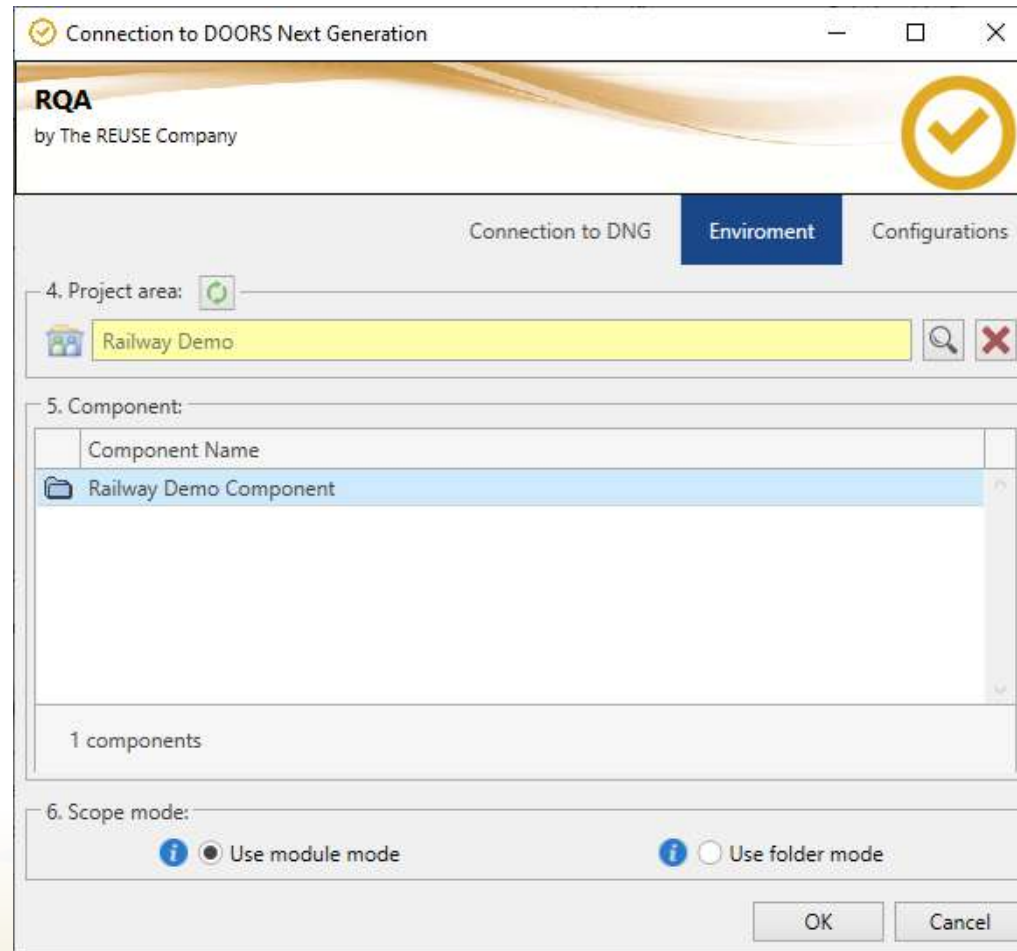


### Real-time quality analysis: Consistency



- The computer shall have 2 monitors (Green checkmark)
- The computer shall have 2 engines (Red X)
- When the Computer is not plugged in, and the computer is in Normal state and the level of battery drops below 10%, the computer shall transit to Low battery mode (Green checkmark)
- When the Computer is in Hibernated state and EventX is received, the computer shall transit to Off mode (Red X)

### Connection of the SES to IBM Doors NG modules/projects



### Connection of the SES to IBM Doors NG modules/projects



**Mini Dashboard**

RAT Authoring tool

Home General View

Save RAT Rich Editor

CONNECTED TO https://rdng.reusecompany.com:54113/

Views

Views	ID	Contents	QS_Summary	QS_Summary
QS_View				
RQS_Quality_View				
	729	The weight of the antenna shall be 200 gr	Low	Avoid the use of Banned Modes Avoid superfluous intensives: "S intensives <be capable to>"; "D Avoid imprecise quantifiers: "ve Invalid measurement unit for a (Weight, g)"; "MEASURE"; ("
	727	When the voltage level is below 11.5V, the battery shall send a "low battery load level" message to the power control system	Low	Invalid measurement unit for a (Voltage, V)"; "MEASURE"; ("
	711	The radio shall have a lifetime of at least 30 years	High	
	704	The train shall have 10 fan blades	High	
	702	The fan blade power consumption shall not exceed 400 w n	Low	Invalid measurement unit for a (Power consumption, W)"; "M consumption, W)"; "M Avoid negative expressions: "n Avoid passive voice out of conc Avoid the use of Banned Modes Avoid vague terms in requirem statements: "fast"; Avoid superfluous intensives: "S intensives <be capable to>"; "D Avoid imprecise quantifiers: "ve Missing quantifier (Measureme
	701	The train should be designed to be very fast	Low	Avoid the use of Banned Modes Avoid vague terms in requirem statements: "fast"; Avoid superfluous intensives: "S intensives <be capable to>"; "D Avoid imprecise quantifiers: "ve Missing quantifier (Measureme
	698	The number of errors of the system shall be 0	Low	Missing quantifier (Measureme
	695	If the battery is low, the power control system shall send a "show low energy level alarm" signal to the information display system	Medium	Check the number of action ve requirement.
	693	The train should communicate with as many stations as possible	Low	Avoid the use of Banned Modes Avoid vague terms in requirem statements: "possible"; Avoid imprecise quantifiers: "ms
	691	The train shall reach 200 km/h	High	
	688	The number of errors of the compressor in one month shall be $(x) \cdot ((x > 0) \cdot (x < 2) / 2)$	Low	Missing quantifier (Measureme Avoid oblique symbols (or "slas Avoid parentheses: "));
	685	the magnetic field of battery should be 100 $\mu$ Bq	Low	Invalid measurement unit for a (Magnetic field, $\mu$ Bq)"; "MEAS field, $\mu$ Bq)";
	675	When requested by the driver, the train shall send an emergency signal in less than 1 second	Low	Avoid Escape clauses: "when re requirement.

Showing 31 of 61 (100%)

RQA

File Quality Control Project configuration Quality Assurance

Module selector CORs Current state Snapshot Evolution scoreboard Quality view Metrics Users Charts Metrics Metrics Suggestions

Module selector Quality scoreboard Require... Correctness Consistency Completeness Knowledge base

Drag a column header here to group by that column

	C.	Project	Module	ID	Workproduct name	Correctness	Score	M...	Correctn...	Consistency	Iss...
		Railwa...	CoRS	544	The air conditioning system shall have 3 accumulators	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	785	The train driver shall have the capability to change the given radi...	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	561	The fan shall have 3 fan blade	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	626	The weight of the fan blade shall be TBD lb	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	556	the accumulator shall interface with the battery according to the...	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	402	The air fan power consumption shall not exceed 300 w	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	729	The weight of the antenna shall be 200 kg	★★★★	N/A	0	14/12/20...	★★★★	N/A
		Railwa...	CoRS	781	The train shall have 3 wings	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	629	The fan shall have a MTBF of 250000 hours working in nominal c...	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	557	The user shall activate the emergency	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	428	The MTBF of the train shall be 20000 hours	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	666	When the braking system is in emergency state, the braking syst...	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	496	There shall be a system to communicate between the train and t...	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	733	The TBD should be designed to be very low	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	397	The Passenger information system shall have 22 displays	★★★★	N/A	0	29/10/20...	★★★★	N/A
		Railwa...	CoRS	619	The radio shall operate on 122 VAC facility power as defined in l...	★★★★	N/A	0	29/10/20...	★★★★	N/A

Total requirements: 61

Hide non-requirement Show HTML text format Custom report Short module quality report Full module quality report Assess quality

RMS Repository: https://rdng.reusecompany.com:5443/rms Project: Railway Demo | Railway Demo Component RMS User: demo Connected to 'SalesDemo06' at 'dev.local\SQLEXPRESS2008'

### Connection of the SES to IBM Doors NG modules/projects

#### Quality configuration (Metrics)

- Correctness
- Consistency
- Completeness

Metrics set baseline configuration: TRC Metrics: Advanced Configuration

Name: TRC Metrics: Advanced Configuration

Description:

Metrics configuration:

Correctness Consistency Completeness

Correctness metrics:

Metric Identifier	Custom Metric...	Name	Rationale	Weight	Enabled	Correctness type
13,441	N/A	Abstraction / TRC-M49...	This quality metric che...	1	<input checked="" type="checkbox"/>	Parameterized - Cluster
13,442	N/A	Abstraction / TRC-M50...	This metric checks the...	1	<input checked="" type="checkbox"/>	Parameterized - Cluster
13,443	N/A	Accuracy / TRC-M020...	This metric checks the...	1	<input type="checkbox"/>	Parameterized - Term tag
13,444	N/A	Accuracy / TRC-M030...	This metric checks the...	1	<input type="checkbox"/>	Parameterized - Pattern matching
13,445	N/A	Accuracy / TRC-M035...	This metric checks the...	1	<input type="checkbox"/>	Parameterized - Pattern matching
13,446	N/A	Accuracy / TRC-M040...	This metric checks the...	1	<input checked="" type="checkbox"/>	Parameterized - Pattern matching

No. of metrics: 47, Enabled: 36

Quality function for selected metric:

Range	Mandatory	Quality Level	Summary	Description
[0, 1)	No	★★★★		
[1, 2)	No	★★★☆☆	Sentences and words...	Top level requirement...
[2, ∞)	No	★★☆☆☆	Sentences and words...	Top level requirement...

No. of ranges: 3

Authoring pattern groups:

Pattern grou...	Name
826	01 - System Functionality
827	04 - Structural  System Structure...
828	02 - System Properties
829	02.01 - System Physical Require...
830	03.01 - Performance Requirements
831	03.02 - Safety Requirements
832	03.03 - Security Requirements
833	03.04 - Reliability Requirements
834	03 - System NON Functional Req...
835	03.05 - Usability Requirements
836	03.05 - Availability Requirements
837	03.07 - Maintainability Requirem...
838	03.08 - Portability Requirements
839	03.09 - Life Duration Requireme...
840	03.10 - Ergonomics Requirements
841	03.11 - Other NF Requirements
842	05 - User requirements
843	02.02 - Quality Properties Requir...

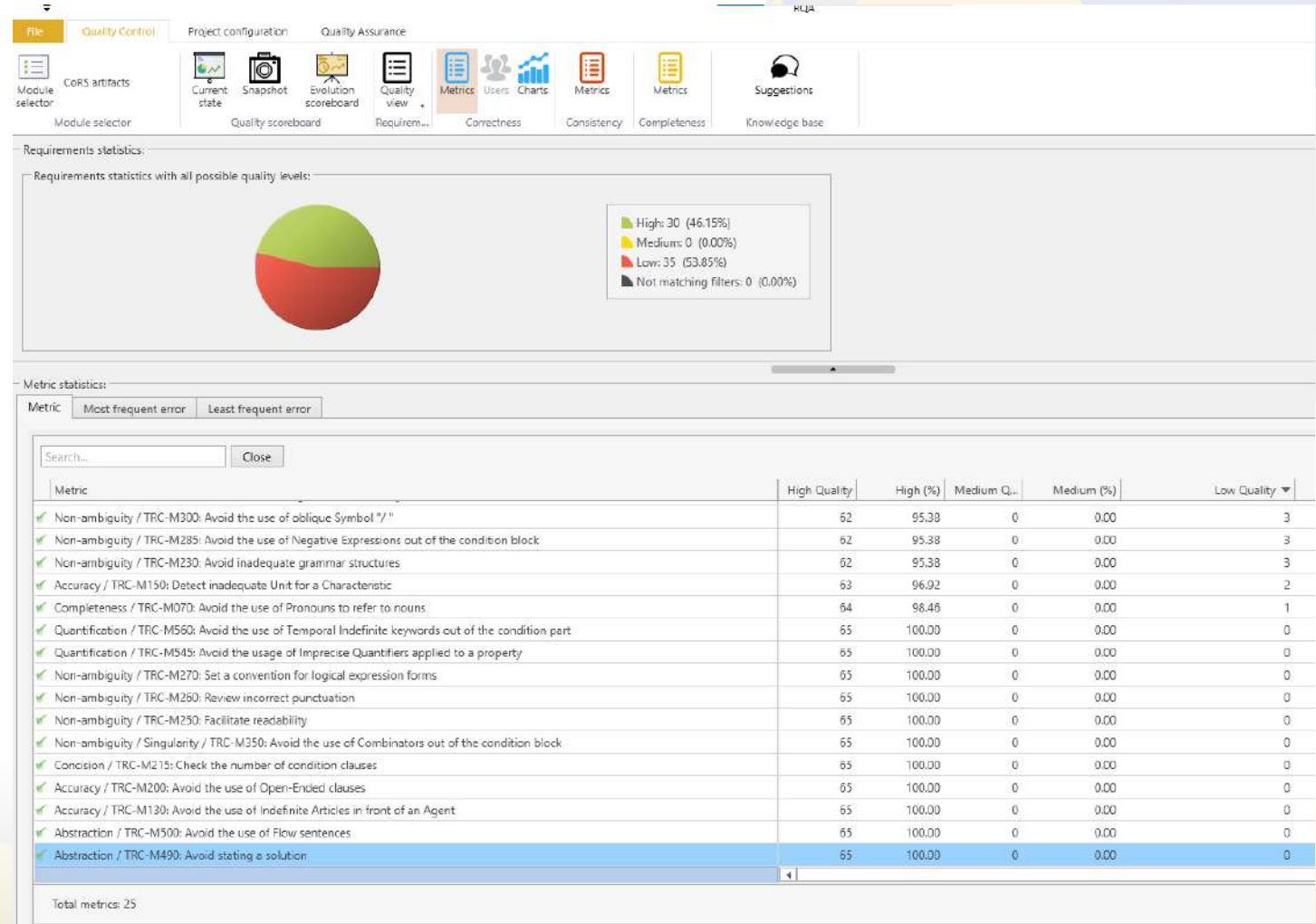
No. of Pattern Groups: 18

OK Cancel

### Connection of the SES to IBM Doors NG modules/projects

#### Quality results summary

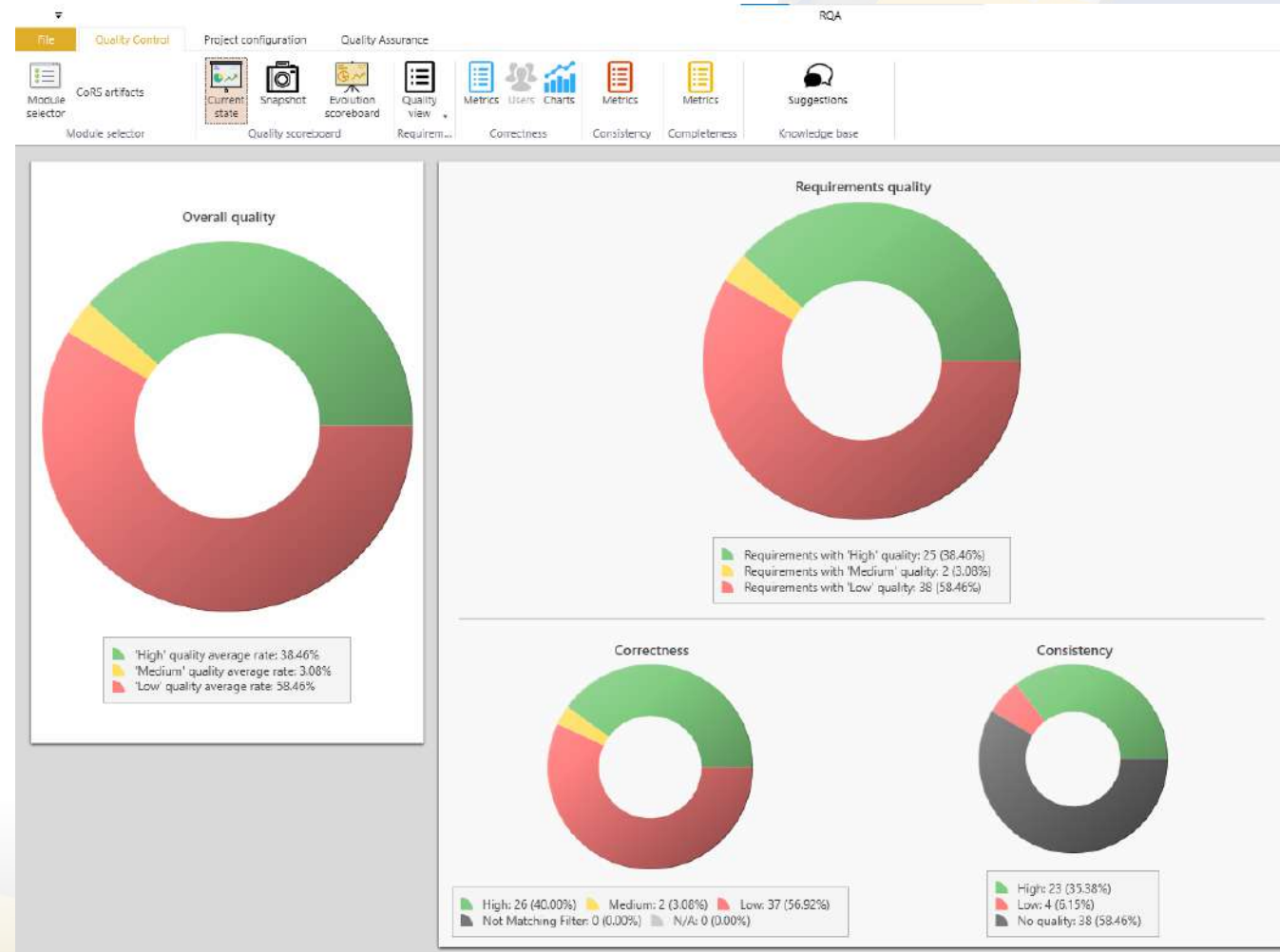
- Correctness
- Consistency
- Completeness



### Connection of the SES to IBM Doors NG modules/projects

#### Quality reports :

- Extraction of results (.pdf, .xlsx, .docx)
- Evolution scoreboard



### Connection of the SES to IBM Doors NG modules/projects

#### Quality reports :

- Extraction of results (.pdf, .xlsx, .docx)
- Evolution scoreboard





# RAT for IBM Doors NG

## Next steps



## Next developments / wish-list of the widget

- Consistency / Completeness metrics in the widget
- Overlapping = Identification of similar requirements
- Extraction of requirements based on patterns
- Improvement of the quality report generation from the widget

Next steps



The screenshot displays the RAT (Railway Authoring Tool) interface. On the left, a 'Mini Dashboard' shows the 'RAT Authoring Tool' with a 'Low Quality' indicator (three stars) and a list of metrics that need attention, including 'Missing quantifier (Measurement unit or noun)'. The main area shows a table of quality rules for the 'Railway Demo Component' with 374 CoRS. A large blue play button is overlaid on the table. The table has columns for ID, Contents, QS\_Quality\_Name, and QS\_Summary. The selected rule (ID 817) is: 'the train shall reach a speed of 320' with a quality level of 'Low' and a summary note: '\* A quantifier must be specified without quantifiers imply a lack...'. The interface also shows a search bar, a 'Create' button, and a 'View: RQS\_Quarry\_View' dropdown.

ID	Contents	QS_Quality_Name	QS_Summary
695	If the battery is low, the power control system shall send a "show low energy level alarm" signal to the information display system		
698	The number of errors of the system shall be 0		
701	The train should be designed to be very fast.		
702	<b>The fan blade power consumption shall not exceed 400 w n</b>		
704	The train shall have 10 fan blades.		
711	When the battery is low, the power control system shall send a "low battery load level" signal to the information display system		
717	The train shall have a weight of 80 cm.		
771	When a clear message is received, the screen shall be activated		
774	When the doors are closed and the train is stopped, a passenger shall be able to open the doors in less than 1 second.		
778	The train shall have 3 wings		
781	The train driver shall have the capability to change the given radiofrequency		
785	The train shall contain 33 display		
801	the train shall reach a speed of 320	Low	* A quantifier must be specified without quantifiers imply a lack...
883	The power consumption of the antenna shall be lower than or equal to 55.9 hp		



## Next webinar

- **Implementing ISO 15288 V&V Processes using the V&V Studio**
- The **ISO 15288** clearly defines what must be done when performing **Verification and Validation processes**. We must use and manage verification actions and collect evidences. But how should we do it? How to integrate them all in one environment? How to delegate **V&V** to specialized tools for specific work-products? How to deal with interoperability? This webinar intends to provide insight for these kind of questions.
- The Reuse Company has created the **V&V Studio** as a software tool ready to provide support to the **ISO15288 V&V processes** by using (and reusing) information from **RQA – Quality Studio** and the **Ontology**. The **V&V Studio** merges the three concepts (**Verification, Validation and Quality**) and offers **V&V** by managing the corresponding verification and validation actions through quality and other measures. It uses the concept of metrics and quality functions to verify all kinds of work-products, as well as providing evidences management.
- **Dates:**
  - January 26 and 28, 2021





# TRC WEBINARS 2020

## Contact information



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