

➤ Webinar rules:

- You'll be muted all along the Webinar
- There's a *Question* section to ask your questions or send your comments when you want
- The Webinar will be recorded. A link to the recording will be sent to you in few days

Data Dictionaries

The springboard towards high-quality system requirements



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THE
REUSE
COMPANY

Introduction to The REUSE Company

01



02



Data Dictionaries: What? Why?

03



Data Dictionaries & Requirements Quality

04



Tailoring your Data Dictionary

05



Live Demo

06



Q&A



The REUSE Company is a tool vendor specialized in the application of **semantic technologies** and artificial intelligence to improve the **digitalization of the Systems Engineering** processes.

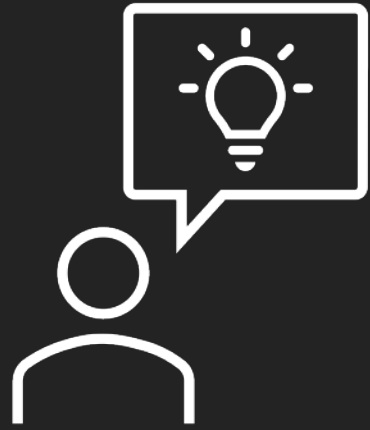


- RQA – QUALITY Studio
- RAT – AUTHORIZING Tool
- KM – Knowledge Manager
- TRACEABILITY Studio
- V&V Studio
- REx – REQUIREMENTS Engineering Tool for MS Word
- SES ENGINEERING Studio



Ilyes Yousfi

- **Current position:** Senior Key Account Manager at The REUSE Company
- Master's degree from the University of Montreal (Canada) and the IMT Atlantique School of Engineering (France).
- Background in energy and mechanical engineering
- Involved in a research project around the environmental impacts of end-of-life management of aircrafts (2014)
- Consulting services to help industry actors leverage and digitalize Systems Engineering activities.
- Passionate about international projects and learning languages, Ilyes speaks 4 languages fluently: English, French, German and Spanish.



Data Dictionaries

What?
Why?



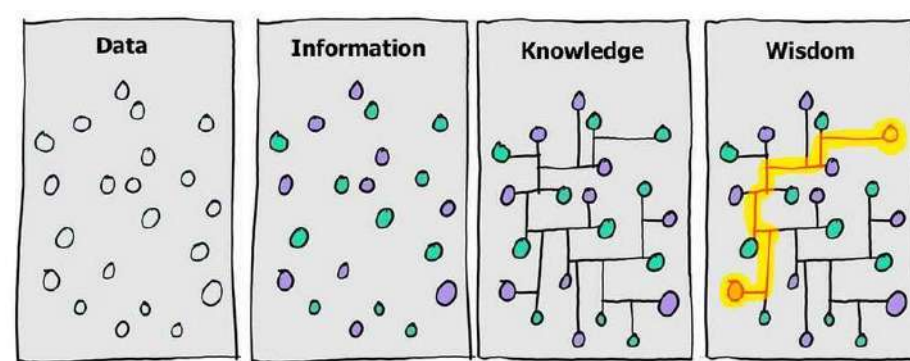
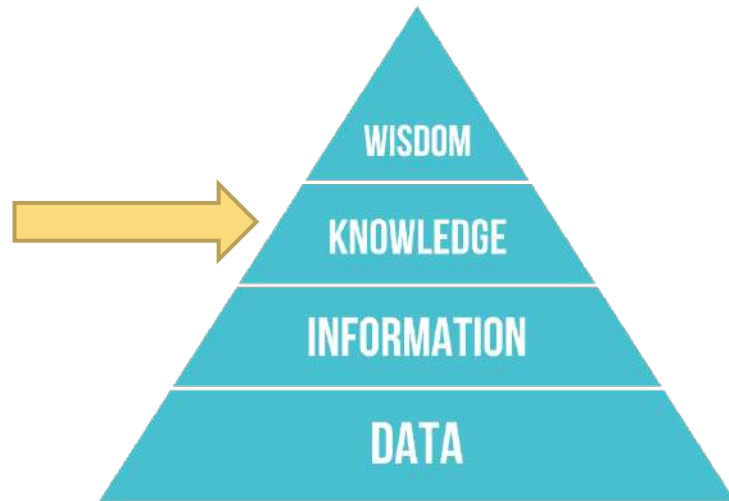
- Data Dictionary:
 - “centralized repository of information about data such as meaning, relationships to other data, origin, usage, and format” (IBM Dictionary of Computing, 1993)
 - Usually defined at **Organization** Level

- **Project** Data Dictionary:
 - ✓ Suggests the Organization-wide Data Dictionary shall be tailored, adapted to the project!

- In the “Needs & Requirements Definition” field:
“Agreed-upon set of standards and guidelines to enforce the use of common vocabulary and concepts, thus ensuring consistency of Needs and Requirements across the project team”

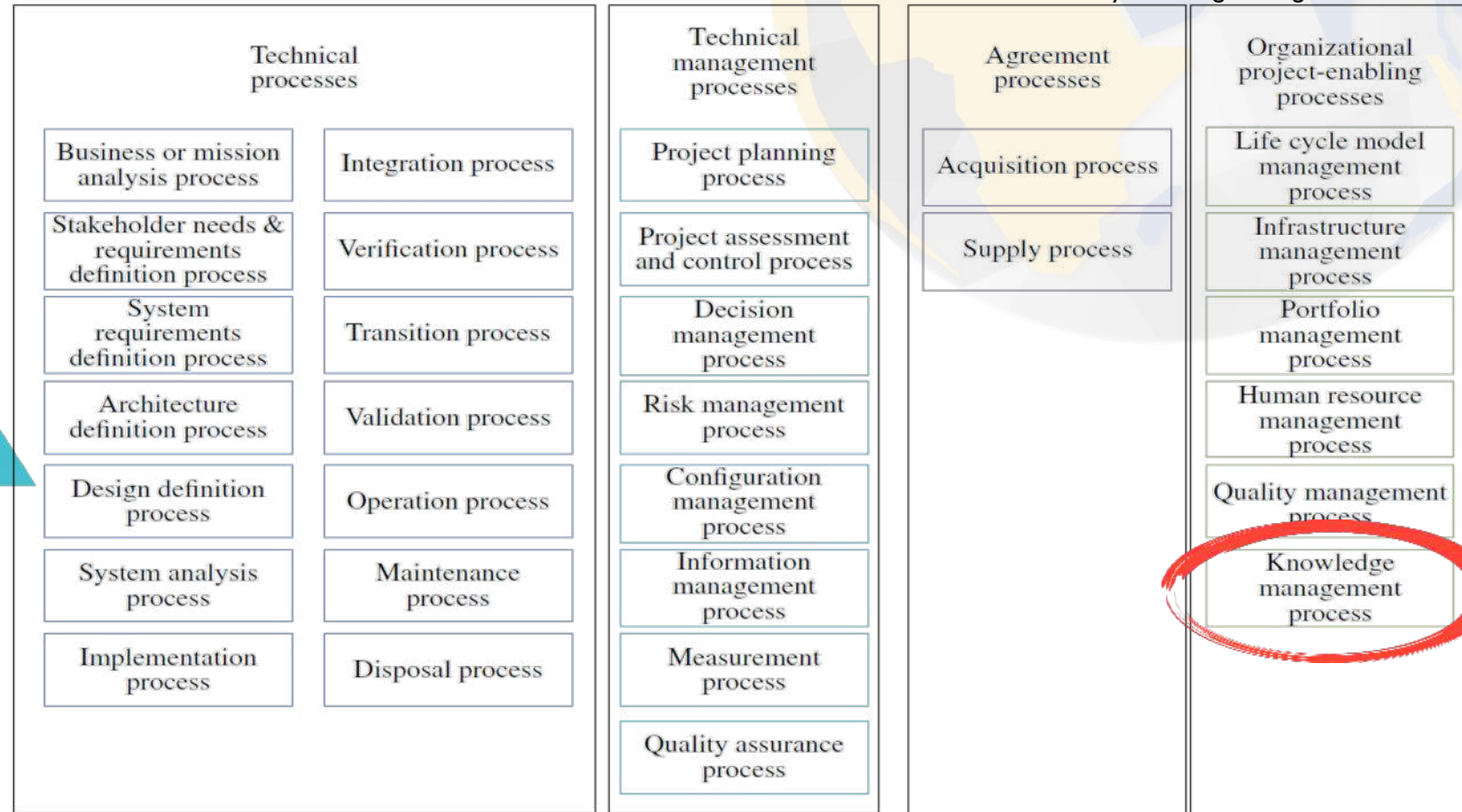
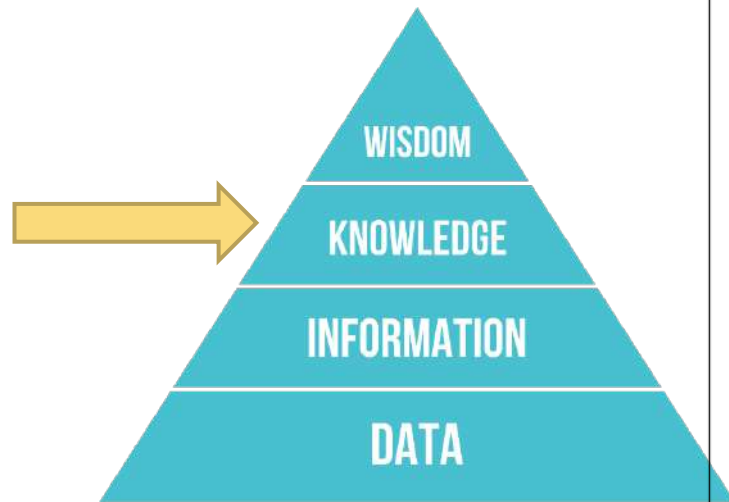


➤ Data -> Knowledge



Source: The[i]Factory

➤ Data -> Knowledge

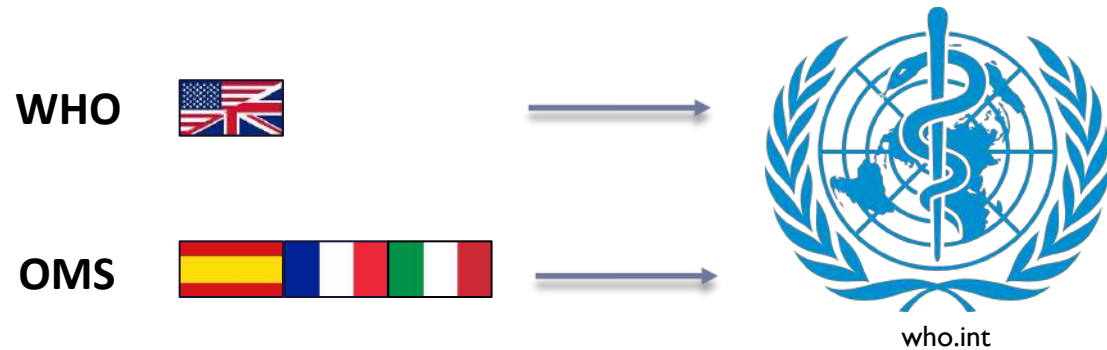




➤ Simple Example #1



➤ Simple Example #2



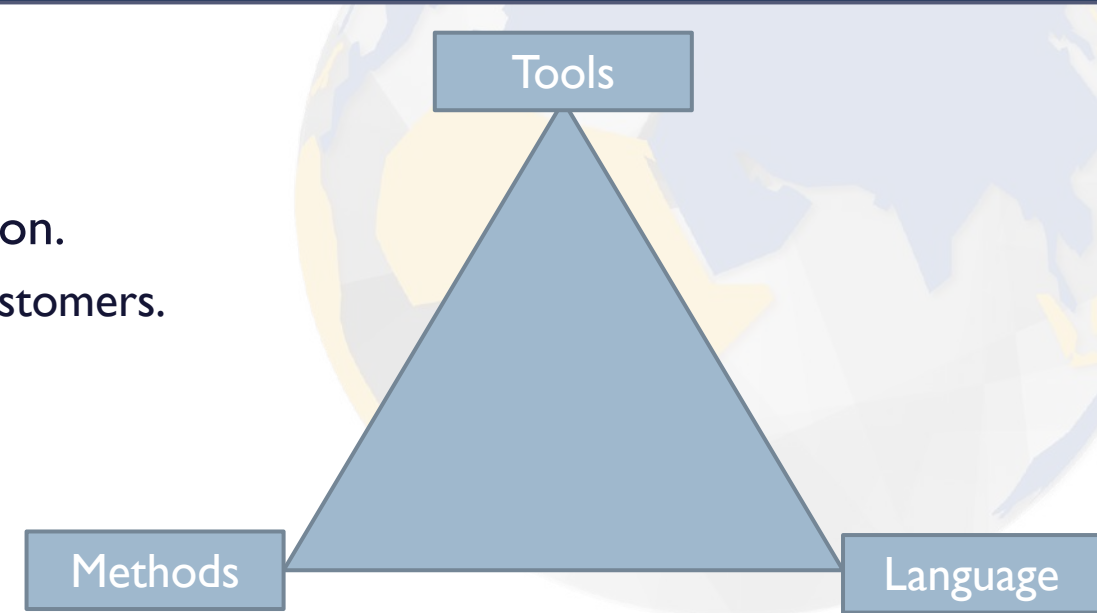
➤ Let's imagine the ambiguity that might be introduced while dealing with **Complex Systems!**



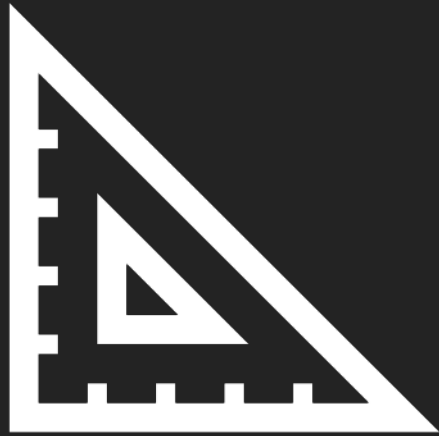
- **Consistent** wording / formatting (pre-established by the subject matter experts)
- **Standardized** way of drafting requirements using PATTERNS: “SMART Authoring”
- Enhanced **traceability** (either manual or based on NLP) across the system life cycle
- Avoid and **inconsistent** statements
- **Completeness** of requirement specification vs. model architecture
- Improve the **semantic** analysis to identify **redundant** or **inconsistent** statements



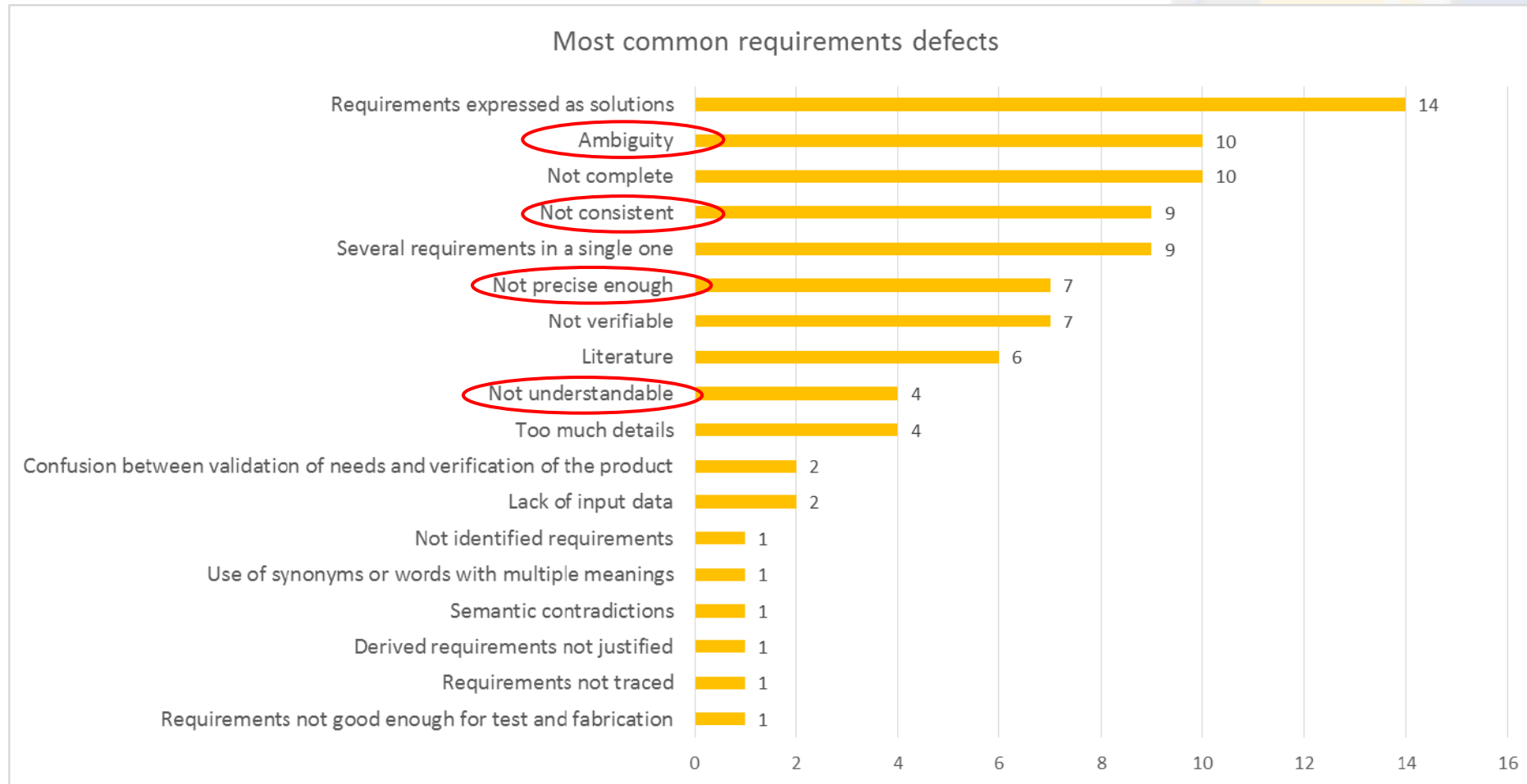
- The **language** is primarily containing the human dimension.
 - Cultural, social aspects of the stakeholders and targeted customers.
- Modelling languages lack this human dimension
 - Technical & design-oriented
 - Neutralizes cultural aspects
- Human needs are transformed into **TEXTUAL** requirements written in **NATURAL LANGUAGE**



“The best language for requirements is natural language” (Abbott & Moorhead)



**Data Dictionaries
and
Requirements
Quality**



Source: Gauthier Fanmuy - the RAMP project: - AFIS (2015)



- **Ambiguity**
 - Misused acronyms
- **Not consistent**
 - Wrong definition level (FBS/SBS)
 - Similar requirements
- **Not precise enough / Not understandable**
 - Undefined terminology



➤ Well-known requirements quality characteristics

▶ IEEE Std. 830 / ISO 29148 and others...

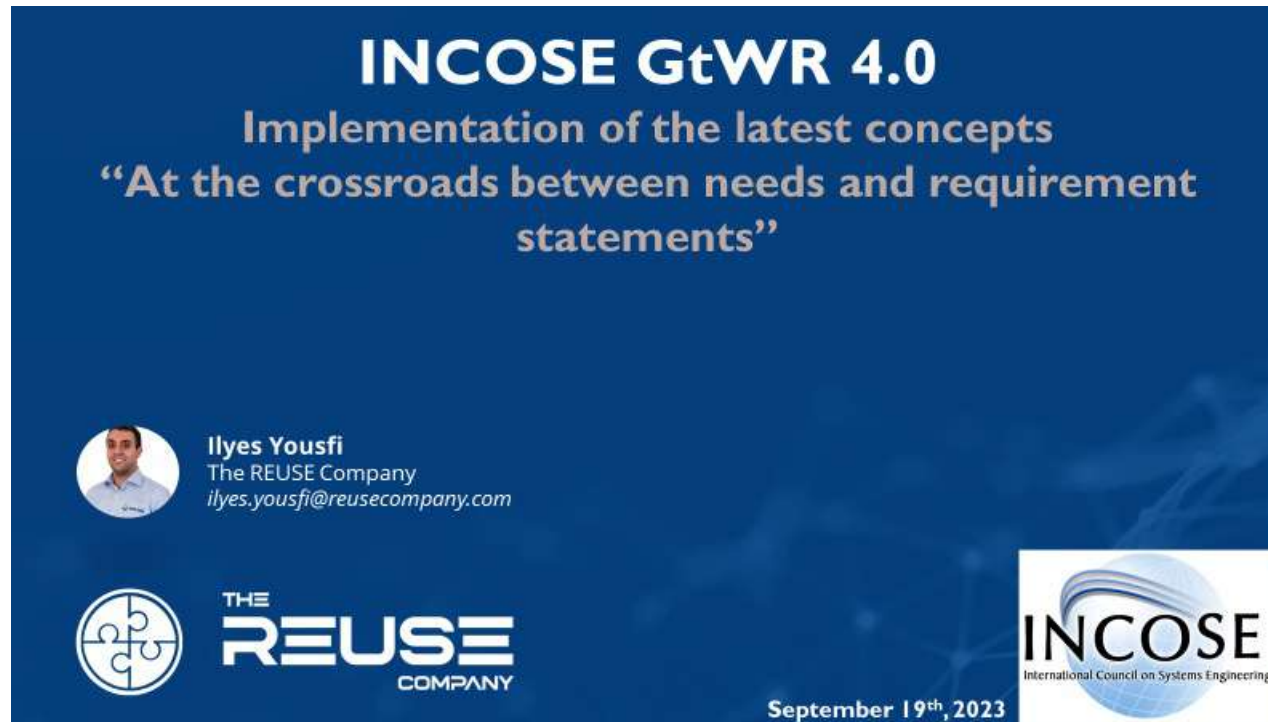
- ▶ **Correct**
- ▶ **Unambiguous**
- ▶ Complete
- ▶ **Consistent**
- ▶ Ranked
- ▶ Verifiable
- ▶ Modifiable
- ▶ Traceable

➤ Data Dictionaries help comply with those characteristics!





Presented on September 19 – INCOSE RWG Meeting


Link to recording and presentation slides : <https://appurl.io/PKLX5Lb3Ky>



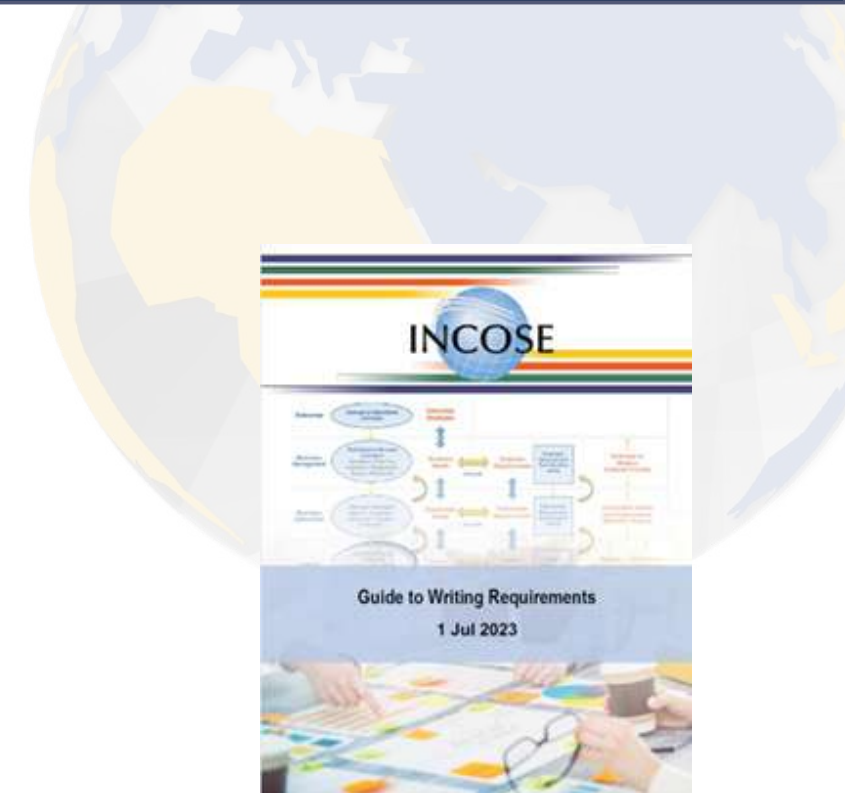
INCOSE GtWR 4.0
Implementation of the latest concepts
“At the crossroads between needs and requirement statements”

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 THE REUSE COMPANY

 **INCOSE**
International Council on Systems Engineering

September 19th, 2023





➤ Rule 03: Appropriate Subject-Verb

- “Ensure the subject and verb of the need or requirement statement are appropriate to the entity to which the statement refers.”

Defined Subjects :

- ✓ **Systems** (“Temperature Warrior”, “TW”)
- ✓ **Components** (“Sensor”)
- ✓ **Functions** (“Register Temperature”)
- ✓ **Users** (“Operator”)

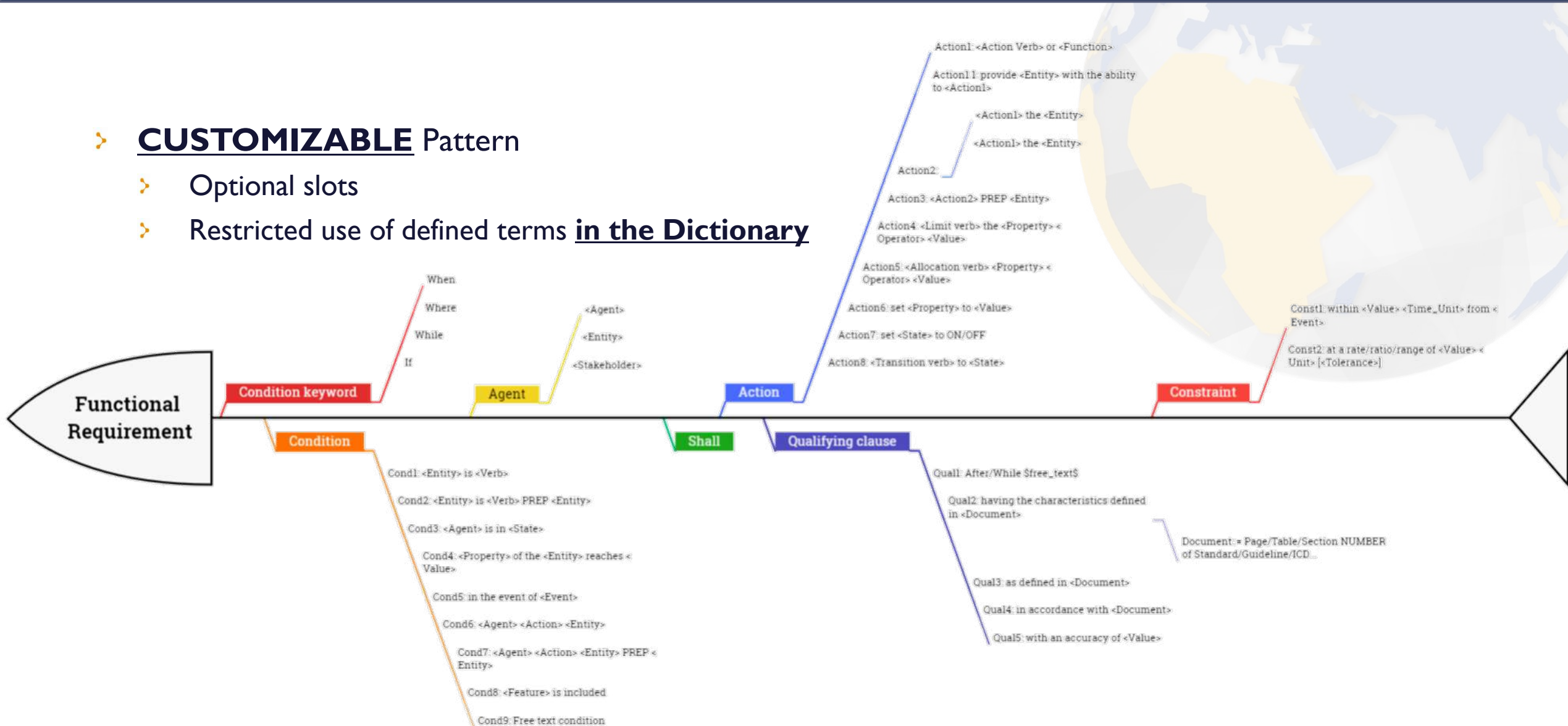
Defined Verbs :

- ✓ **Action verbs** (“Connect [to]”)
- ✓ **System Composition** (“contain” / “feature”)
- ✓ **State Transition** (“transit [to]”)

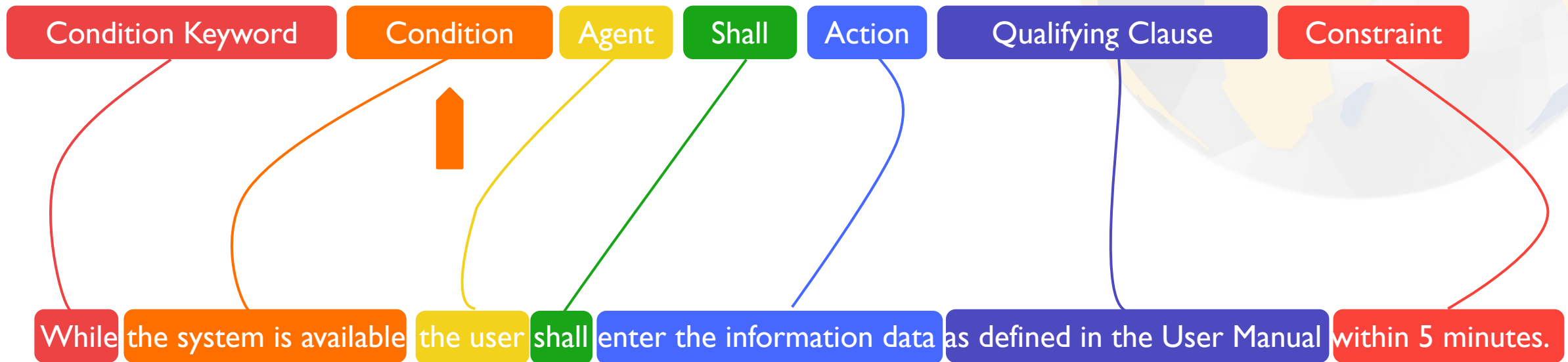
- Backbone of the requirement syntax

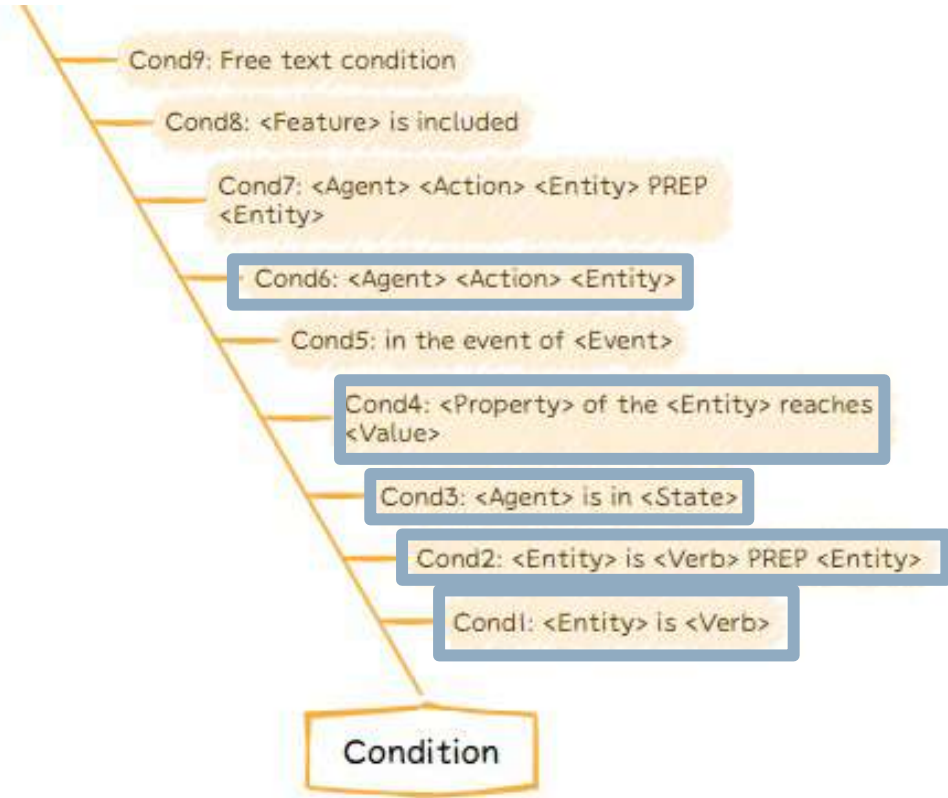
- **APPENDIX C of the Guide** to create a set of patterns for appropriate Subject-Verb structures

- > **CUSTOMIZABLE** Pattern
- > Optional slots
- > Restricted use of defined terms **in the Dictionary**



➤ **CUSTOMIZABLE** Pattern





Some examples that match the <Condition> Slot:

- “Control System is in Ready Mode”...
- “Control system is initialized”...
- “the temperature of the sensor reaches 90°C”...
- “the temperature warrior is switched off by the user”...
- “the enemy launches an attack”
- ...

42 Rules / 15 Characteristics

➤ **15 Characteristics** of individual and sets of needs and requirements.

➤ **42 Rules** to help formulate individual and sets of needs and requirements.

➤ **49 Attributes** are attached to need or requirement statements to form need or requirement expressions.

Type	Rule Number	Rule name	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	C14 - ABLE TO BE VALIDATED	C15 - CORRECT	
Accuracy	R01	Sentence Structure	1	1	1	1	1	1	1	1								
	R02	Use Active Voice	1	1	1	1	1	1	1	1								
	R03	Subject Verb	1	1	1	1	1	1	1	1								
	R04	Use Defined Terms	1	1	1	1	1	1	1	1								
	R05	Use Definite Articles	1	1	1	1	1	1	1	1								
	R06	Units	1	1	1	1	1	1	1	1								
	R07	Avoid Vague Terms	1	1	1	1	1	1	1	1								
	R08	No Escape Clauses	1	1	1	1	1	1	1	1								
	R09	No Open Ended	1	1	1	1	1	1	1	1								
Concision	R10	Superfluous Infinitives	1	1	1	1	1	1	1									
	R11	Separate Clauses	1	1	1	1	1	1	1									
Non Ambiguity	R12	Correct Grammar	1	1	1	1	1	1	1									
	R13	Correct Spelling	1	1	1	1	1	1	1									
	R14	Correct Punctuation	1	1	1	1	1	1	1									
	R15	Logical Condition	1	1	1	1	1	1	1									
	R16	Avoid Not	1	1	1	1	1	1	1									
	R17	Oblique	1	1	1	1	1	1	1									
Singularity	R18	Single Sentence	1	1	1	1	1	1	1									
	R19	Avoid Combinators	1	1	1	1	1	1	1									
	R20	Avoid Purpose	1	1	1	1	1	1	1									
	R21	Avoid Parentheses	1	1	1	1	1	1	1									
Completeness	R22	Enumeration	1	1	1	1	1	1	1									
	R23	Context	1	1	1	1	1	1	1									
	R24	Avoid Pronouns	1	1	1	1	1	1	1									
Realism	R25	Use Of Headings	1	1	1	1	1	1	1									
	R26	Avoid Absolutes	1	1	1	1	1	1	1									
Conditions	R27	Explicit	1	1	1	1	1	1	1									
	R28	Explicit Lists	1	1	1	1	1	1	1									
Uniqueness	R29	Classify	1	1	1	1	1	1	1									
	R30	Express Once	1	1	1	1	1	1	1									
Abstraction	R31	Solutionfree	1	1	1	1	1	1	1									
	R32	Universals	1	1	1	1	1	1	1									
Tolerance	R33	Value Range	1	1	1	1	1	1	1									
	R34	Measurable	1	1	1	1	1	1	1									
Quantification	R35	Temporal Indefinite	1	1	1	1	1	1	1									
	R36	Use Consistent Terms	1	1	1	1	1	1	1									
Uniform Language	R37	Define Acronyms	1	1	1	1	1	1	1									
	R38	Avoid Abbreviations	1	1	1	1	1	1	1									
	R39	Style Guide	1	1	1	1	1	1	1									
	R40	Decimal Format	1	1	1	1	1	1	1									
Modularity	R41	Related Requirements	1	1	1	1	1	1	1									
	R42	Structured	1	1	1	1	1	1	1									



49 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 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 (KDN/KDR)			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

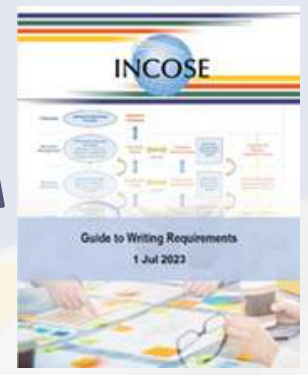
INCOSE GtWR with tailoring

- Characteristics
- Rules
- Attributes
- **Metrics:** A quality metric is a property which aims to quantify a qualitative indicator. It enables answering the question *'How should we measure?'*
- **Quality Function:** After defining the metric, the quality function is the conversion of the obtained result (quantitative value) to a quality level. Different profiles can be set (binary, concave, convex...)



...From the Project Data Dictionary!

- Defined Terms & Acronyms
- Main Terms vs. Synonyms
- Disambiguation (2 acronyms with different meanings)
- Taxonomy
- Etc.



Code	Definition	Associated	Associated	Associated	Associated
		with the	with the	with the	with the
		Project	Project	Project	Project
		Requirements	Requirements	Requirements	Requirements
		Model	Model	Model	Model
REQ-001	Requirement	1	1	1	1
REQ-002	Requirement	1	1	1	1
REQ-003	Requirement	1	1	1	1
REQ-004	Requirement	1	1	1	1
REQ-005	Requirement	1	1	1	1
REQ-006	Requirement	1	1	1	1
REQ-007	Requirement	1	1	1	1
REQ-008	Requirement	1	1	1	1
REQ-009	Requirement	1	1	1	1
REQ-010	Requirement	1	1	1	1
REQ-011	Requirement	1	1	1	1
REQ-012	Requirement	1	1	1	1
REQ-013	Requirement	1	1	1	1
REQ-014	Requirement	1	1	1	1
REQ-015	Requirement	1	1	1	1
REQ-016	Requirement	1	1	1	1
REQ-017	Requirement	1	1	1	1
REQ-018	Requirement	1	1	1	1
REQ-019	Requirement	1	1	1	1
REQ-020	Requirement	1	1	1	1
REQ-021	Requirement	1	1	1	1
REQ-022	Requirement	1	1	1	1
REQ-023	Requirement	1	1	1	1
REQ-024	Requirement	1	1	1	1
REQ-025	Requirement	1	1	1	1
REQ-026	Requirement	1	1	1	1
REQ-027	Requirement	1	1	1	1
REQ-028	Requirement	1	1	1	1
REQ-029	Requirement	1	1	1	1
REQ-030	Requirement	1	1	1	1
REQ-031	Requirement	1	1	1	1
REQ-032	Requirement	1	1	1	1
REQ-033	Requirement	1	1	1	1
REQ-034	Requirement	1	1	1	1
REQ-035	Requirement	1	1	1	1
REQ-036	Requirement	1	1	1	1
REQ-037	Requirement	1	1	1	1
REQ-038	Requirement	1	1	1	1
REQ-039	Requirement	1	1	1	1
REQ-040	Requirement	1	1	1	1
REQ-041	Requirement	1	1	1	1
REQ-042	Requirement	1	1	1	1
REQ-043	Requirement	1	1	1	1
REQ-044	Requirement	1	1	1	1
REQ-045	Requirement	1	1	1	1
REQ-046	Requirement	1	1	1	1
REQ-047	Requirement	1	1	1	1
REQ-048	Requirement	1	1	1	1
REQ-049	Requirement	1	1	1	1
REQ-050	Requirement	1	1	1	1
REQ-051	Requirement	1	1	1	1
REQ-052	Requirement	1	1	1	1
REQ-053	Requirement	1	1	1	1
REQ-054	Requirement	1	1	1	1
REQ-055	Requirement	1	1	1	1
REQ-056	Requirement	1	1	1	1
REQ-057	Requirement	1	1	1	1
REQ-058	Requirement	1	1	1	1
REQ-059	Requirement	1	1	1	1
REQ-060	Requirement	1	1	1	1
REQ-061	Requirement	1	1	1	1
REQ-062	Requirement	1	1	1	1
REQ-063	Requirement	1	1	1	1
REQ-064	Requirement	1	1	1	1
REQ-065	Requirement	1	1	1	1
REQ-066	Requirement	1	1	1	1
REQ-067	Requirement	1	1	1	1
REQ-068	Requirement	1	1	1	1
REQ-069	Requirement	1	1	1	1
REQ-070	Requirement	1	1	1	1
REQ-071	Requirement	1	1	1	1
REQ-072	Requirement	1	1	1	1
REQ-073	Requirement	1	1	1	1
REQ-074	Requirement	1	1	1	1
REQ-075	Requirement	1	1	1	1
REQ-076	Requirement	1	1	1	1
REQ-077	Requirement	1	1	1	1
REQ-078	Requirement	1	1	1	1
REQ-079	Requirement	1	1	1	1
REQ-080	Requirement	1	1	1	1
REQ-081	Requirement	1	1	1	1
REQ-082	Requirement	1	1	1	1
REQ-083	Requirement	1	1	1	1
REQ-084	Requirement	1	1	1	1
REQ-085	Requirement	1	1	1	1
REQ-086	Requirement	1	1	1	1
REQ-087	Requirement	1	1	1	1
REQ-088	Requirement	1	1	1	1
REQ-089	Requirement	1	1	1	1
REQ-090	Requirement	1	1	1	1
REQ-091	Requirement	1	1	1	1
REQ-092	Requirement	1	1	1	1
REQ-093	Requirement	1	1	1	1
REQ-094	Requirement	1	1	1	1
REQ-095	Requirement	1	1	1	1
REQ-096	Requirement	1	1	1	1
REQ-097	Requirement	1	1	1	1
REQ-098	Requirement	1	1	1	1
REQ-099	Requirement	1	1	1	1
REQ-100	Requirement	1	1	1	1



	APPLICABILITY	SCOPE (Requires Project Data Dictionary?)
Rule 03 <i>Subject Verb</i>	CNCR*	Yes
Rule 04 <i>Use Defined Terms</i>	CNCR*	Yes
Rule 13 <i>Correct Spelling</i>	CNCR*	Yes
Rule 37 <i>Define Acronym</i>	CNCR*	Yes

*Compulsory for Needs / Compulsory for Requirements

- **Example:** “While in Combat Mode, The **TWa** shall Receive Attacks”
 - Rule 03: Invalid subject (not known as a system, entity, stakeholder, function, activity, etc.)
 - Rule 04: Undefined term (not defined in the glossary)
 - Rule 13: Detection as misspelled word
 - Rule 37: Undefined acronym

Editing 169 - SES ENGINEERING Studio

File Tools View Log

Authoring without patterns

< No pattern group >

No selected pattern group implies no writing assistance

Font: Calibri, Font Size: 12

While in Combat Mode, The **TWA** shall Receive Attacks.

Metric: Uniformity of Language R37 / TRC-M580: Avoid the use of unknown acronyms
N/A

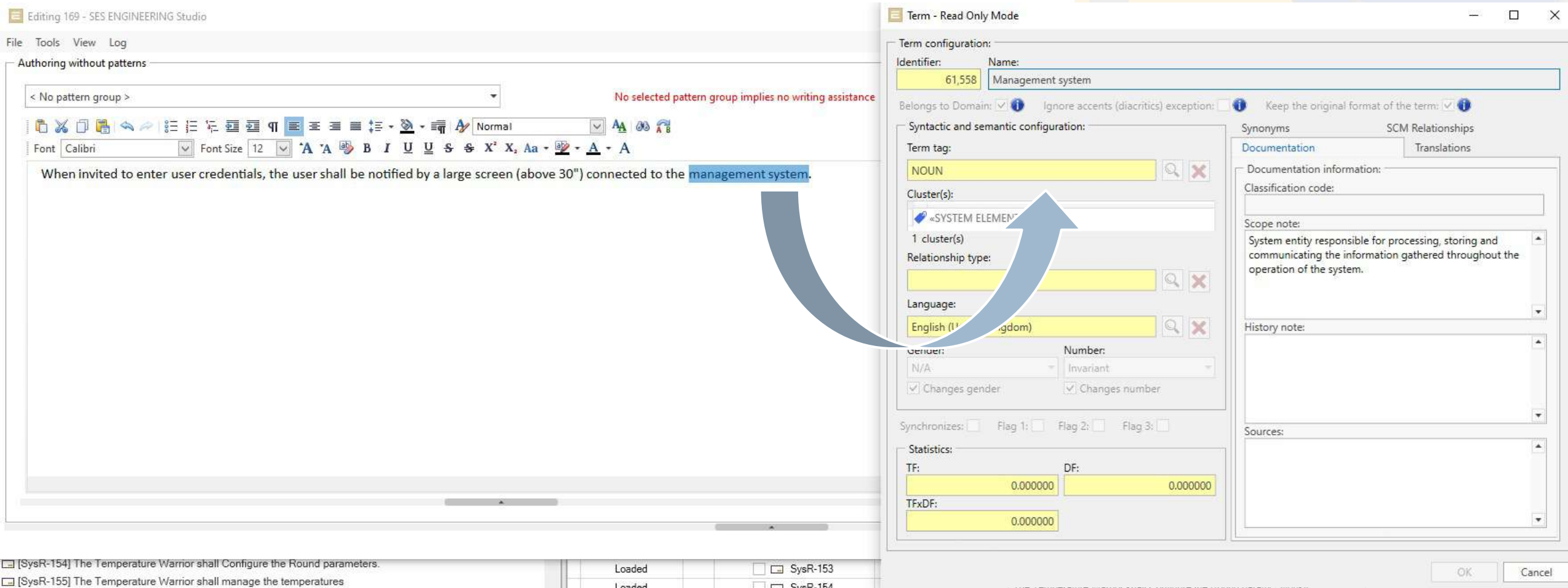
Correctness metrics summary:

Low Quality 0.71

Metric	Value
Accuracy R03 / TRC-M050: Determine if the subject is a recognized Agent term	0
Accuracy R04 / TRC-M225: Avoid Unclassified Terms	1
Uniformity of Language R37 / TRC-M580: Avoid the use of unknown acronyms	1

[Edit manual assessment](#) Ready

Save and close Cancel



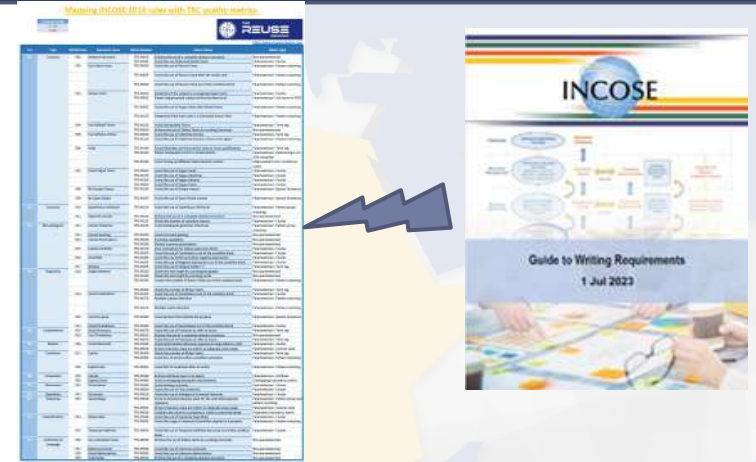
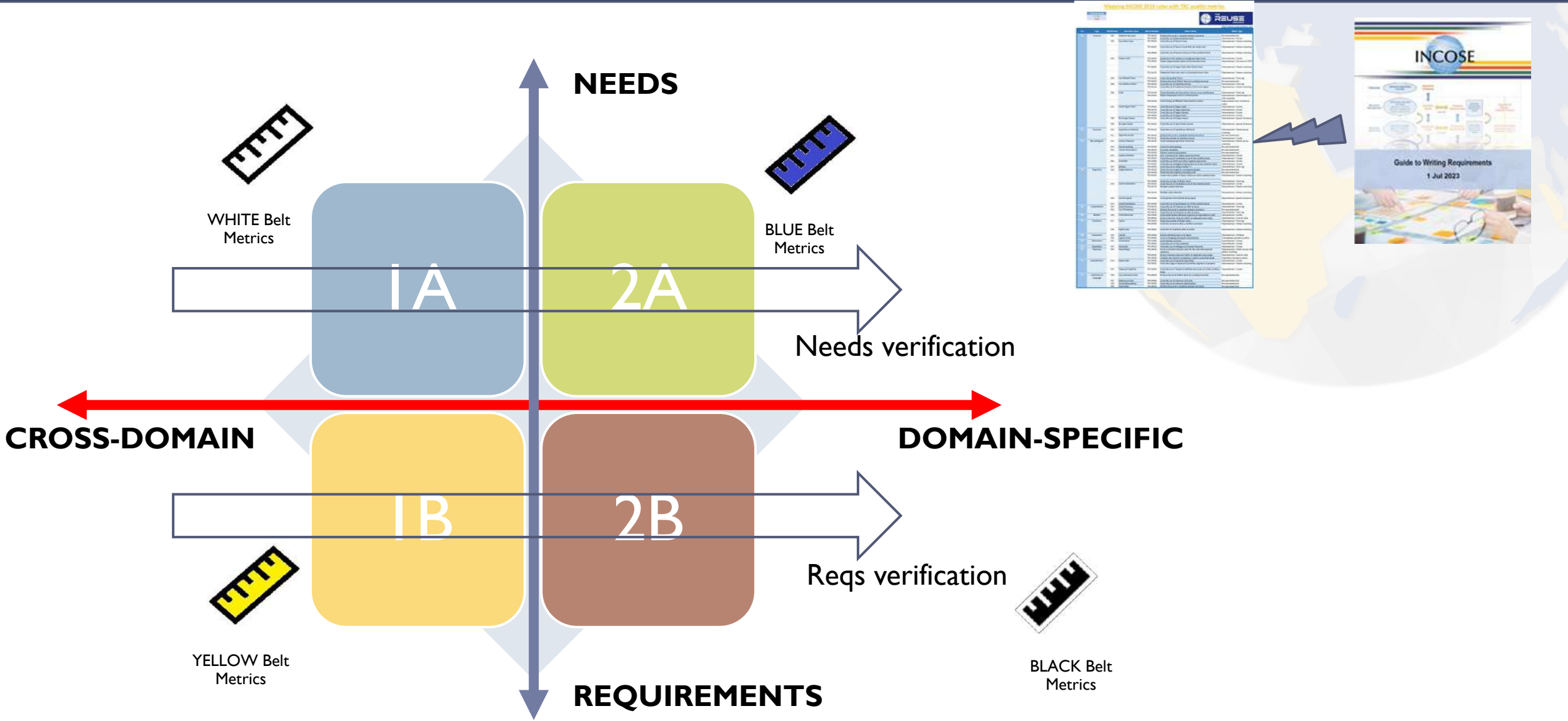
The screenshot shows the REUSE ENGINEERING Studio interface. The main text area contains the requirement: "When invited to enter user credentials, the user shall be notified by a large screen (above 30") connected to the management system." The phrase "management system" is highlighted in blue. A red message above the text reads: "No selected pattern group implies no writing assistance".

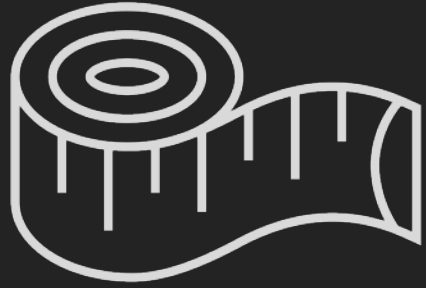
The "Term - Read Only Mode" dialog box is open, showing the configuration for the term "management system".

- Identifier:** 61,558
- Name:** Management system
- Belongs to Domain:** **Ignore accents (diacritics) exception:** **Keep the original format of the term:**
- Syntactic and semantic configuration:**
 - Term tag:** NOUN
 - Cluster(s):** «SYSTEM ELEMENT»
 - 1 cluster(s)**
 - Relationship type:** (empty)
 - Language:** English (United Kingdom)
 - Gender:** N/A
 - Number:** Invariant
 - Changes gender
 - Changes number
- Synchronizes:** Flag 1: Flag 2: Flag 3:
- Statistics:**
 - TF:** 0.000000
 - DF:** 0.000000
 - TFxDF:** 0.000000
- Documentation information:**
 - Classification code:** (empty)
 - Scope note:** System entity responsible for processing, storing and communicating the information gathered throughout the operation of the system.
 - History note:** (empty)
 - Sources:** (empty)

At the bottom of the screen, a table of requirements is visible:

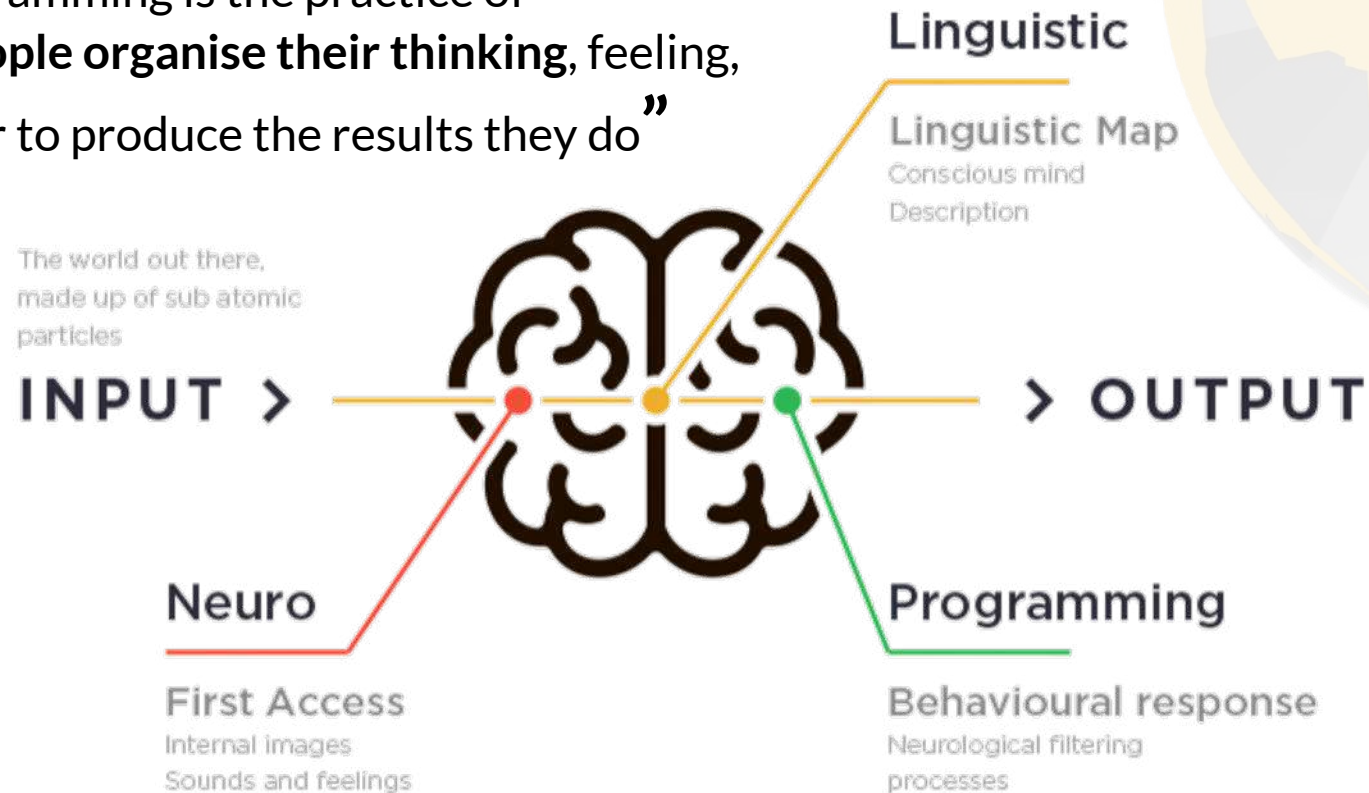
<input type="checkbox"/> [SysR-154] The Temperature Warrior shall Configure the Round parameters.	Loaded	<input type="checkbox"/> SysR-153
<input type="checkbox"/> [SysR-155] The Temperature Warrior shall manage the temperatures	Loaded	<input type="checkbox"/> SysR-154





**Tailoring
your
Data
Dictionary**

“Neuro Language Programming is the practice of **understanding** how people organise their thinking, feeling, **language** and behaviour to produce the results they do”



Source: The NLP Academy

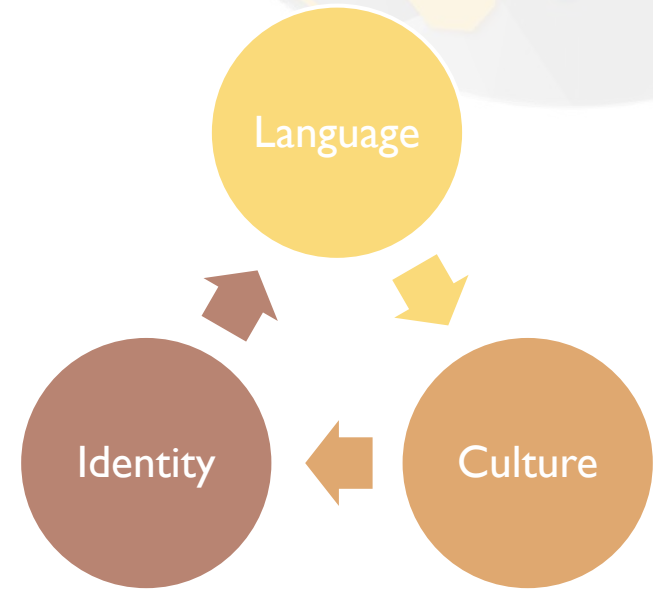


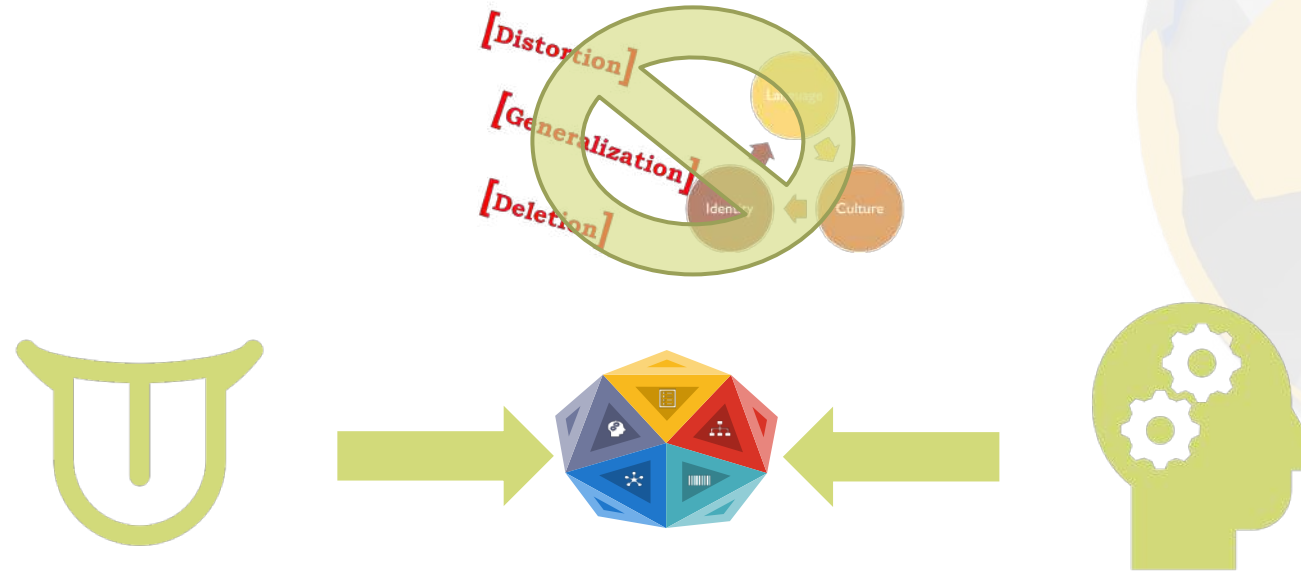
[Distortion]

[Generalization]

[Deletion]

[Language vs. Culture]





Neuro-linguistic programming

Communication between stakeholders

Natural Language Processing

Converting human communication into machine-understandable language



05 Reasoning

A combination of rules, tasks and groups to infer information from valuable assets

04 Formalization

Representation of assets semantic through SRL – System Representation Language



01

Vocabulary

Controlled Organizational and Project Vocabulary for a common understanding among stakeholders

02

SCM/Architectures

Recreate and capture the system architectures represented in views and models. Stablish relationships among system and system elements

03

Patterns

Represent requirements similarities and enable formal representation, automatic recognition and aid authors

05 Reasoning
A combination of rules, tasks and groups to infer information from valuable assets


04 Formalization
Representation of assets semantic through SRL – System Representation Language



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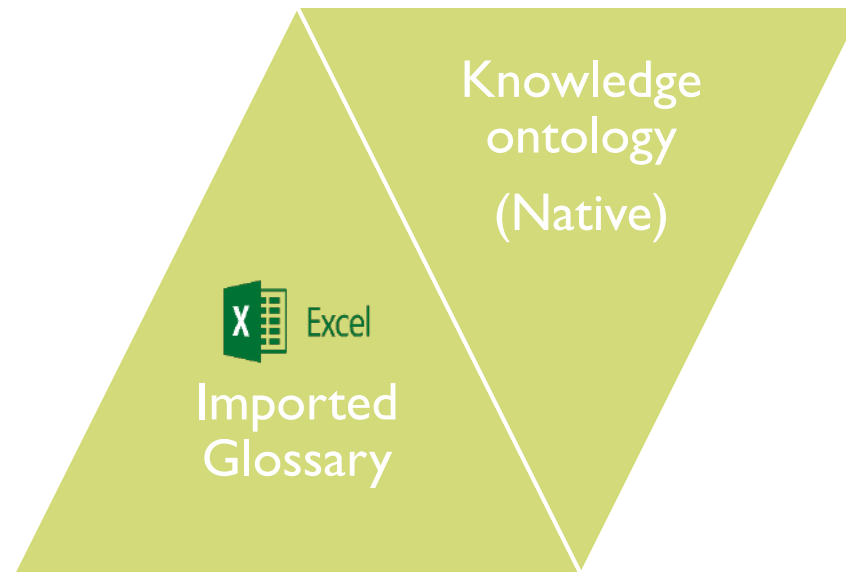
Knowledge
ontology
(Native)



- 05 Reasoning**
A combination of rules, tasks and groups to infer information from valuable assets
- 04 Formalization**
Representation of assets semantic through SRL – System Representation Language



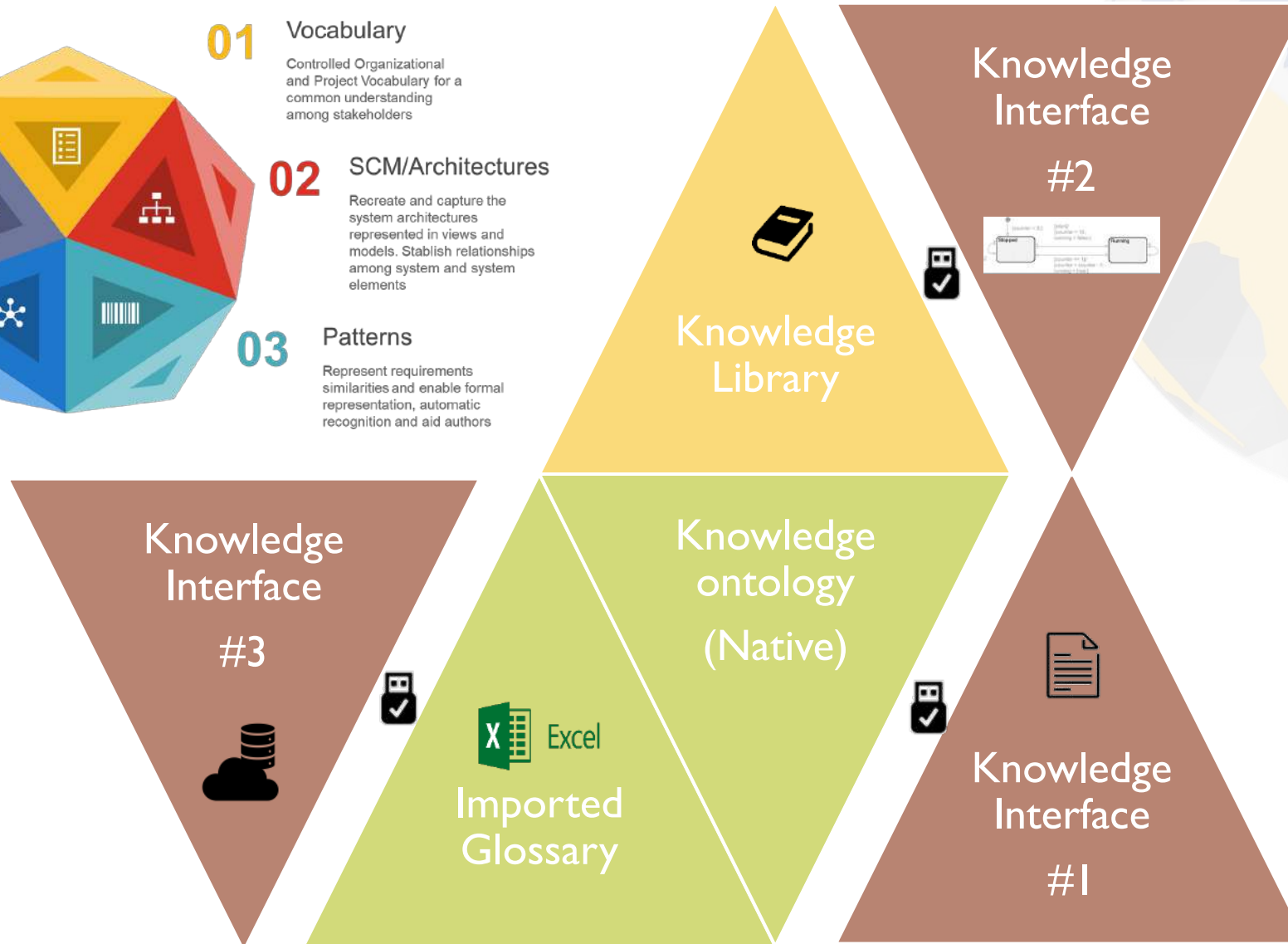
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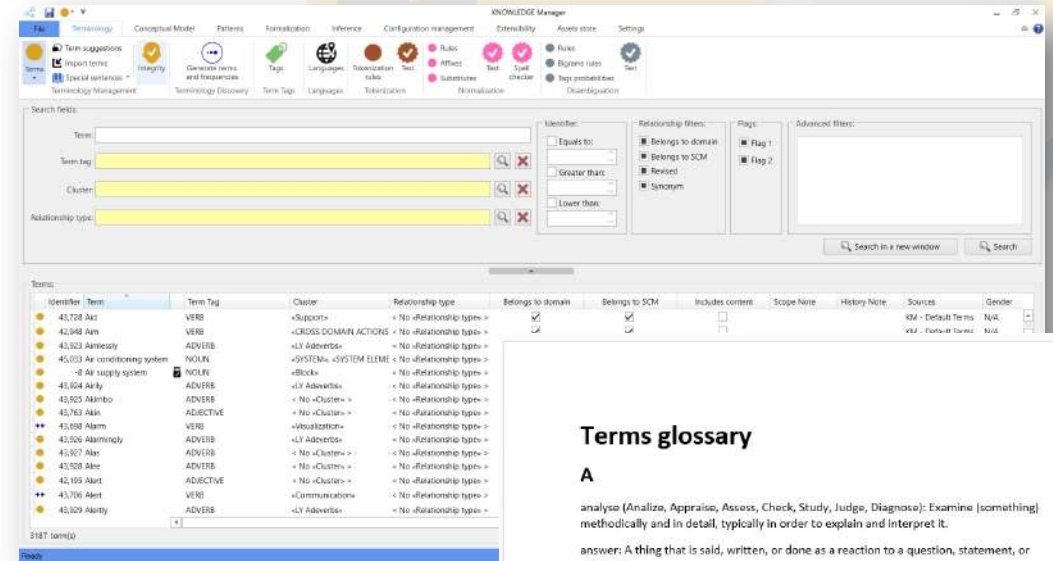
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01

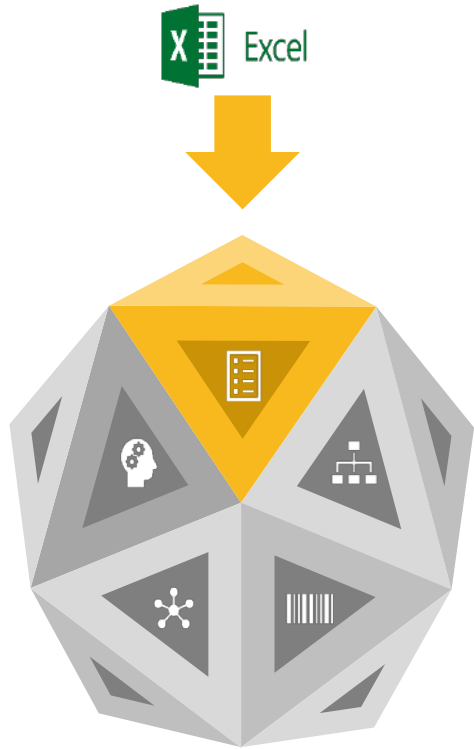
Vocabulary

Controlled Organizational and Project Vocabulary for a common understanding among stakeholders

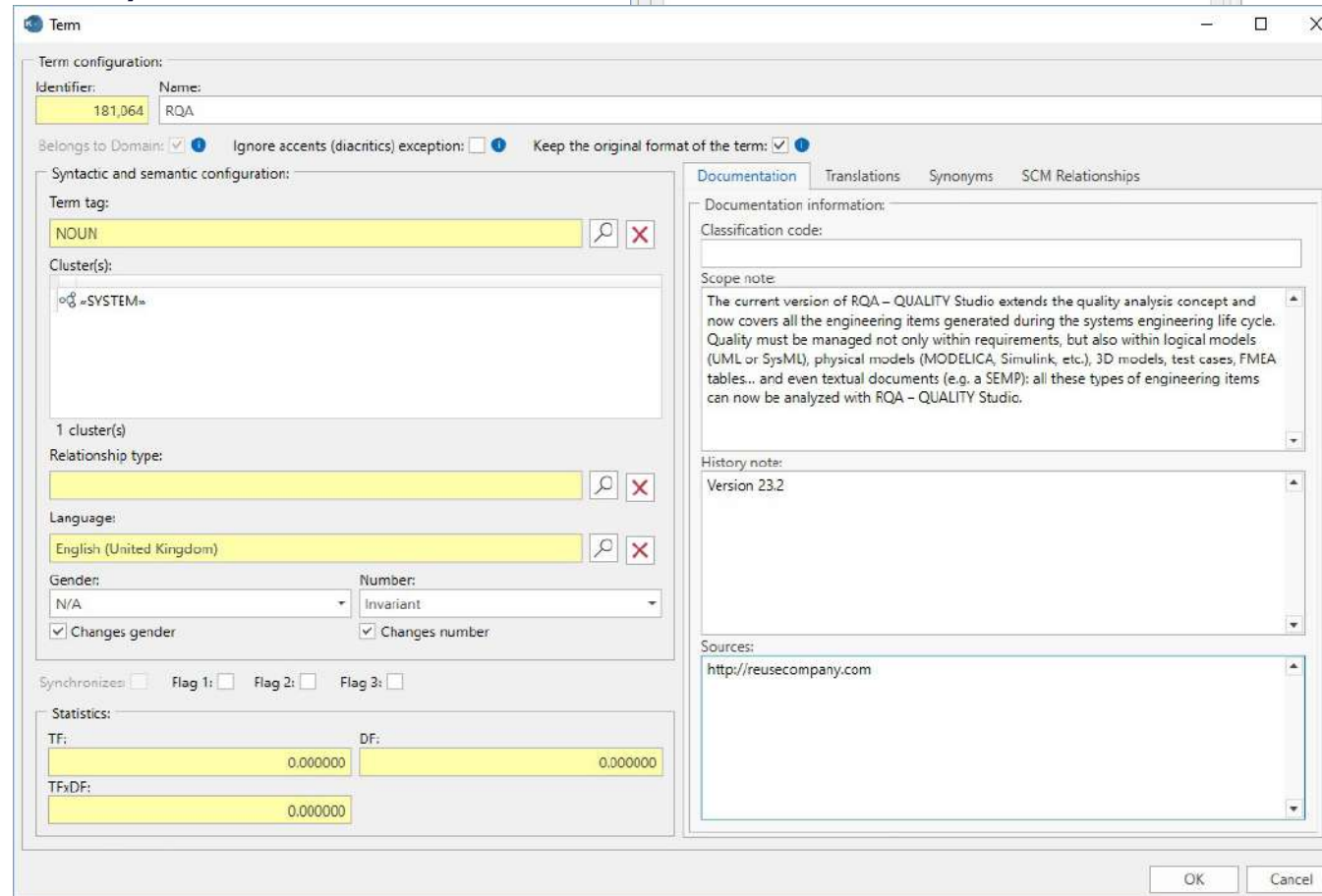
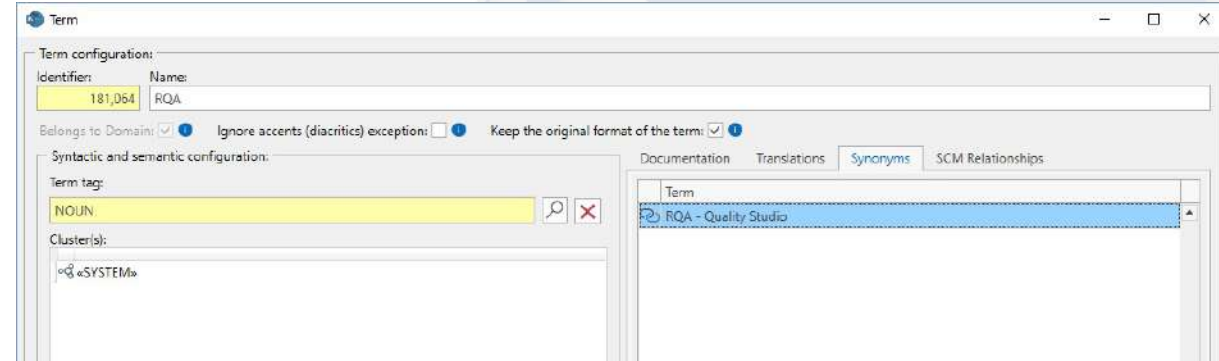


Terms glossary

- A**
- analyse (Analyze, Appraise, Assess, Check, Study, Judge, Diagnose): Examine (something) methodically and in detail, typically in order to explain and interpret it.
- answer: A thing that is said, written, or done as a reaction to a question, statement, or situation.
- ask (Ask for, Request): Say something in order to obtain an answer or some information.
- C**
- cancel (Abort, Interrupt, Shut, Suspend): Decide or announce that (a planned event) will not take place.
- communicate (Announce, Broadcast, Speak, Say, Tell, Enumerate): Share or exchange information, news, or ideas.
- customize (Customise, Parametrize, Personalise, Personalize): Modify (something) to suit a particular individual or task.
- D**
- deny (Refuse, Decline, Avoid, Ban, Disable, Disallow, Elude, Forbid, Inhibit, Provent, Reject): State that one refuses to admit the truth or existence of.
- deteriorate (Aggravate, Worsen):
- E**
- esa: The European Space Agency (ESA; French: Agence spatiale européenne) is an intergovernmental organisation dedicated to the exploration of space.



- > Project glossary
 - > Terms & Definitions
 - > Synonyms
 - > Term classification
 - > History...



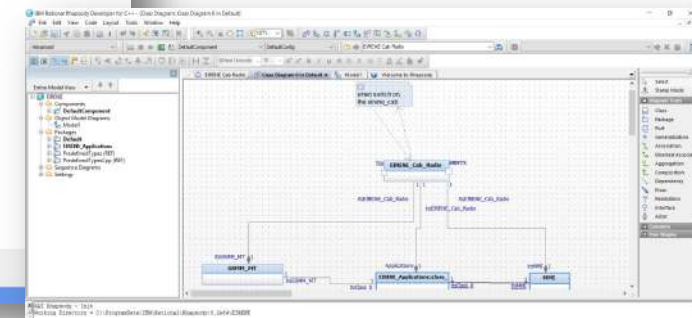
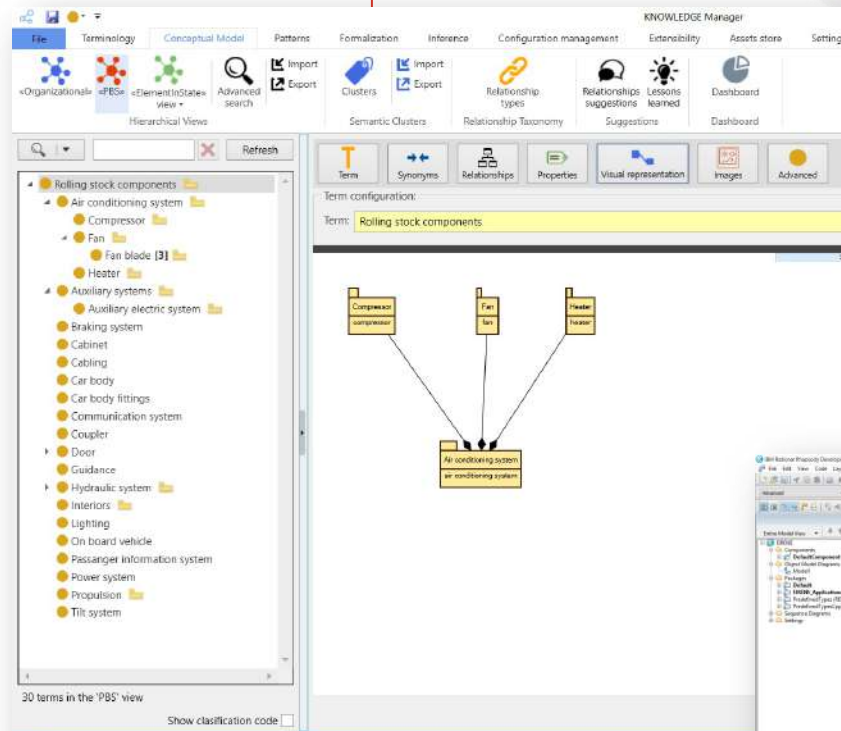
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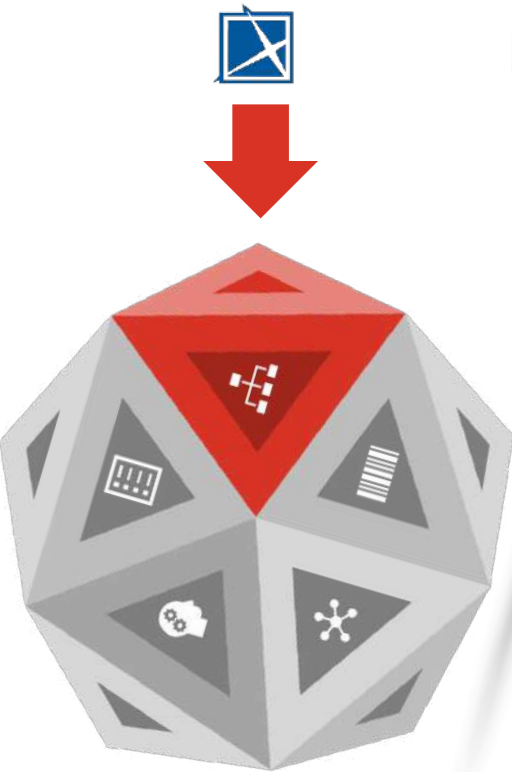
Architectures

Recreate and capture the system architectures represented in views and models. Establish relationships among system and system elements.

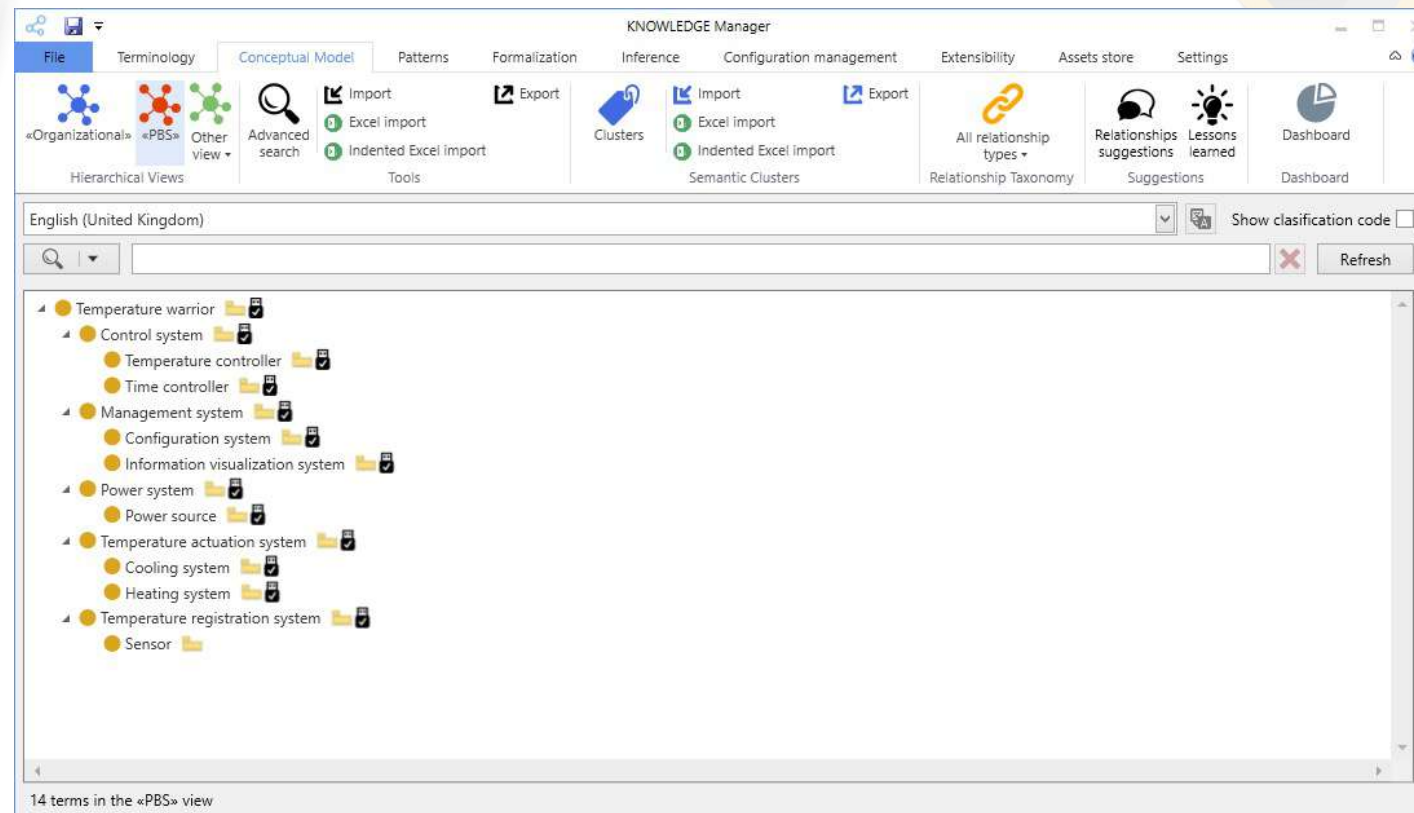
Linking terms together and classifying terms

Useful to define lists of tags for properties





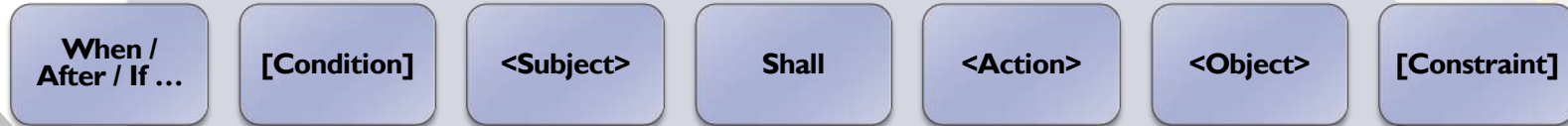
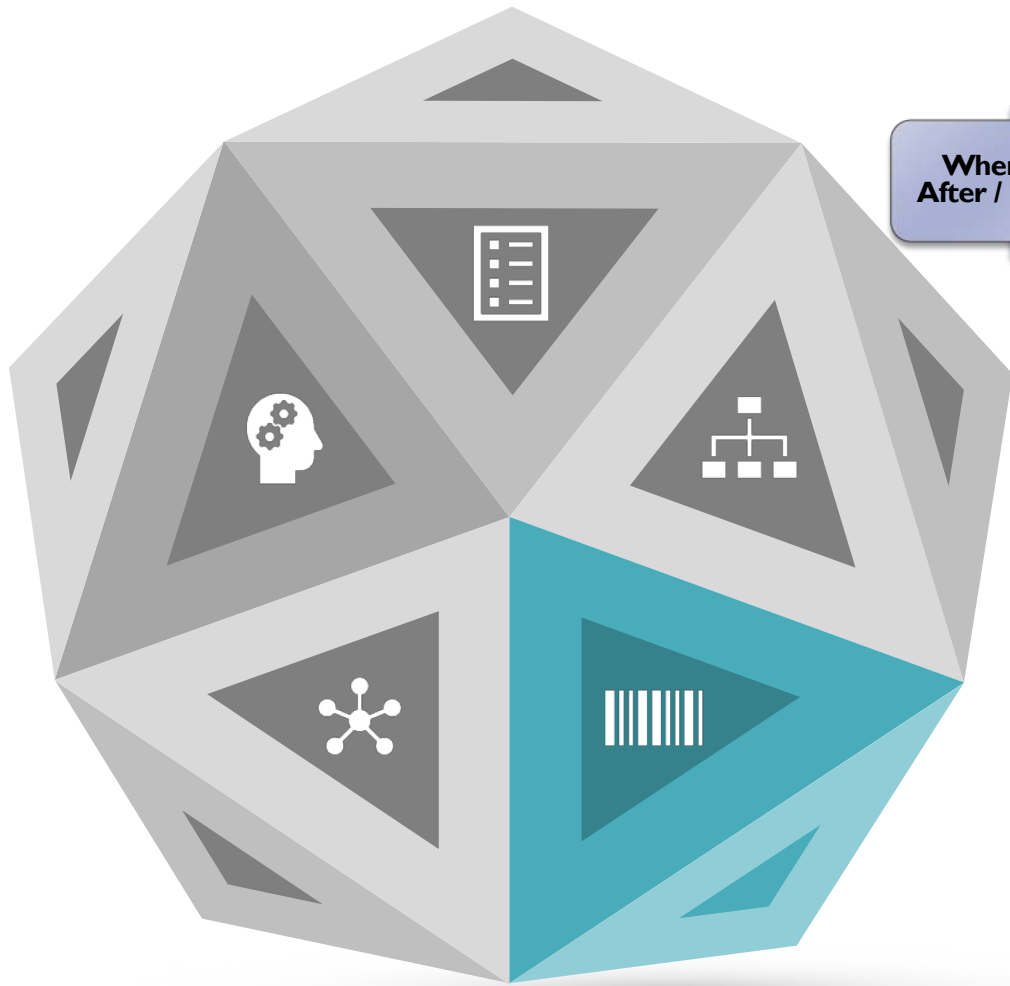
- System Architecture
 - Functional Breakdown Structure
 - System Breakdown Structure
 - Property Allocation
 - Use Case Diagram...



03

Patterns

Represent requirements similarities and enable formal representation, automatic recognition and aid authors



Name:
[METRIC - System Component Definition (Completeness & Consistency)]

Description:
N/A

Pattern group(s):
• METRIC - System Component Definition Requirements (Completeness & Consistency) (150)

Example:
N/A

Indexable:	Enabled:	Weight:
Yes	Yes	1,200

Syntax:

DEFINITE ARTICLE + «SYSTEM ELEMENT» + «MODAL COMPULSORY» + VERB TO HAVE + NUMBER + «SYSTEM ELEMENT»

or

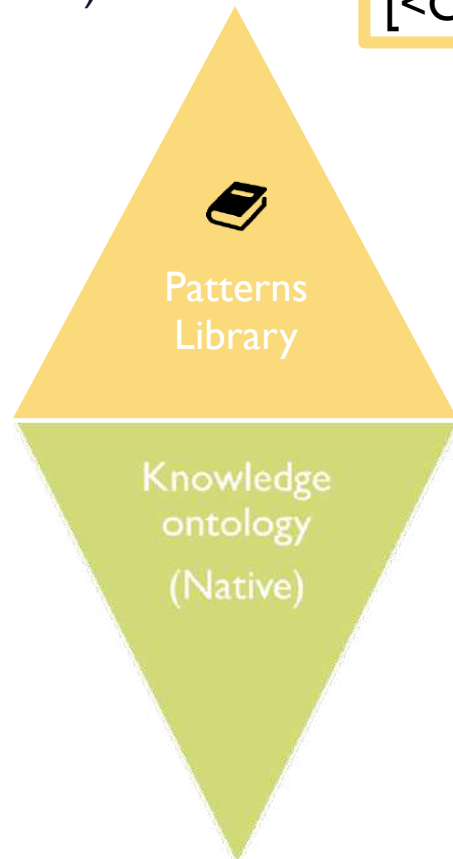
«SYSTEM» MODAL VERB

Properties:
N/A

Relationships:
[[«PBSa» [C.O. = 0; Forced relationship type = «PBS»] :: «SYSTEM ELEMENT»] [C.O. = 1] || «SYSTEM ELEMENT» [C.O. = 2]]



- Requirement patterns
 - Functional Requirements
 - Non-functional Requirements
 - Conditions: State-driven, Event-driven, Combined...
 - Signals (CAN Bus)...



[<Condition1>] [<Condition2>] <System> <shall> <System_response>

Name:
[Complex Requirement: While <state> + when <trigger> + system + shall + system response]

Description:
WHILE <system state>, when trigger, the <system name> shall <system response>
 - State driven requirements are active while the system is in a defined state
 - But it's not ubiquitous for the state, only when the trigger condition is met the system shall respond
 - They are denoted by the keywords "While" + "When".

Pattern group(s):
 - EARS Patterns (-1)

Example:
 - While RQA is in real-time mode, when the author presses the keyboard, the RQA shall analyze the quality of the requirement.

Indexable:	Enabled:	Weight:
Yes	Yes	905.000

Syntax:

While + [In a specific state] + COMMA + When + [Trigger] + COMMA + [System name] + [Shall/Will/Should] + [System response]

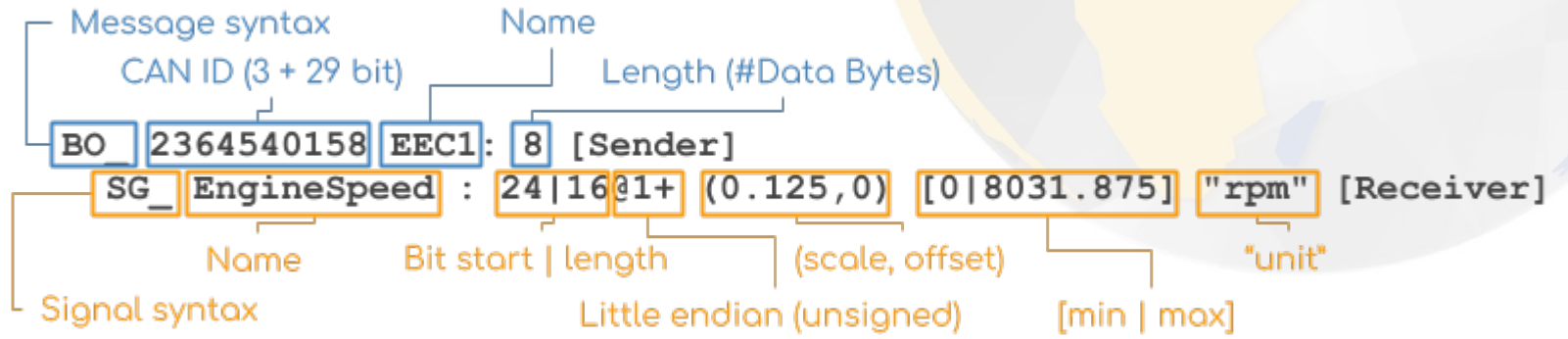
Properties:
N/A

Relationships:
N/A

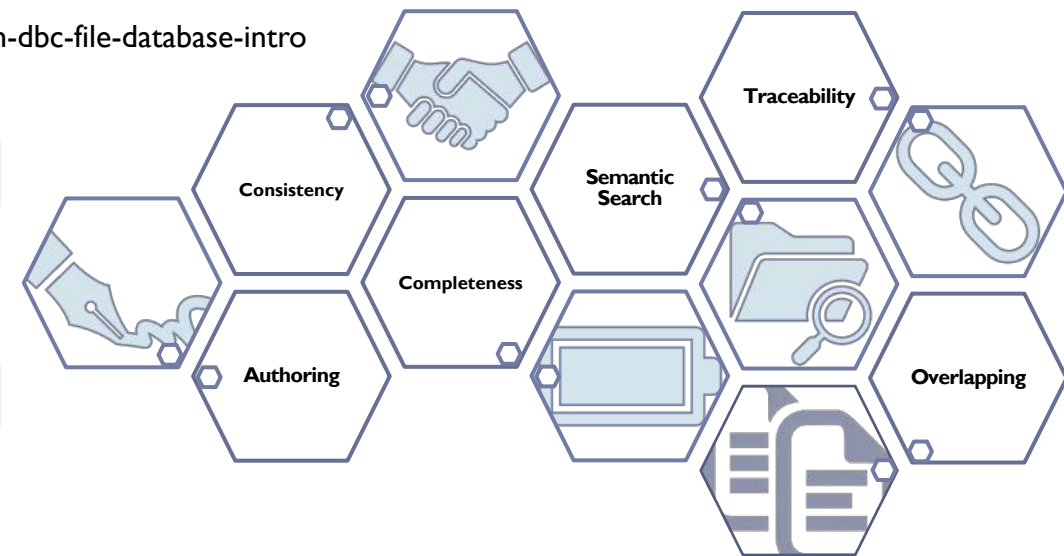
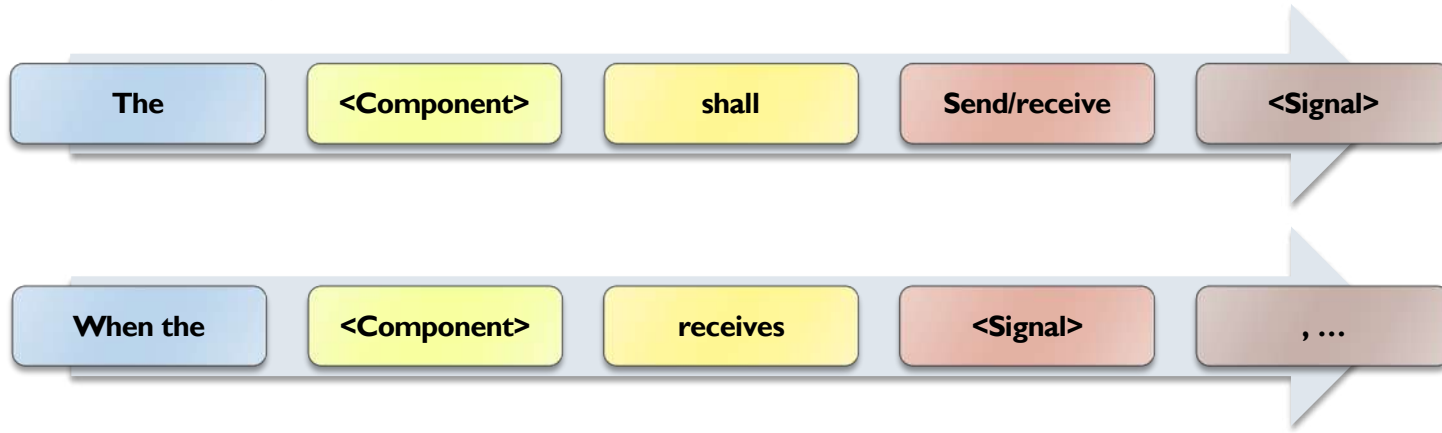
Available libraries for patterns:

- EARS
- SOPHIST MASTER Patterns
- INCOSE GtWR v4.0 – Appendix C

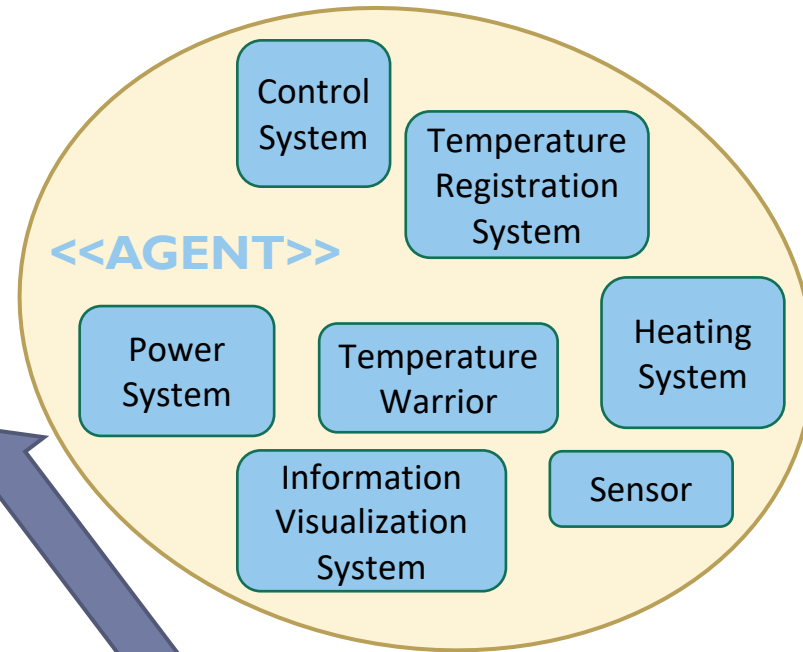
- > Requirement patterns
 - > Functional Requirements
 - > Non-functional Requirements
 - > Conditions: State-driven, Event-driven, Combined...
 - > **Signals (CAN Bus)...**



Source: <https://www.csselectronics.com/pages/can-dbc-file-database-intro>



Multiple sources



Component	Signal	Send-Receive
Temperature warrior	Start	Send
Control system	Attack	Receive
Temperature sensor	Temperature	Send
Peltier plate	Temperature	Receive

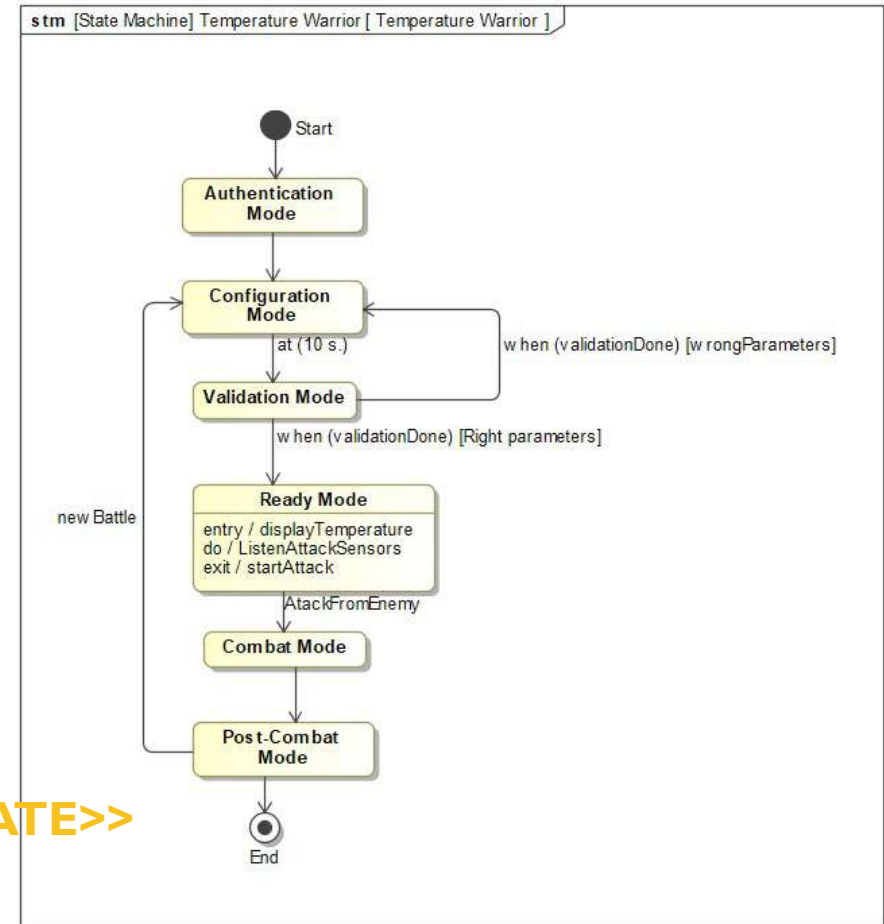
<<SIGNAL>>

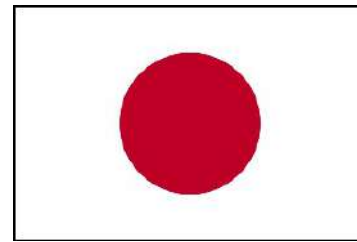
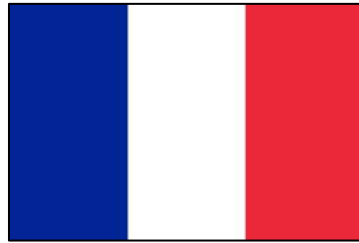


Data Dictionary



<<STATE>>



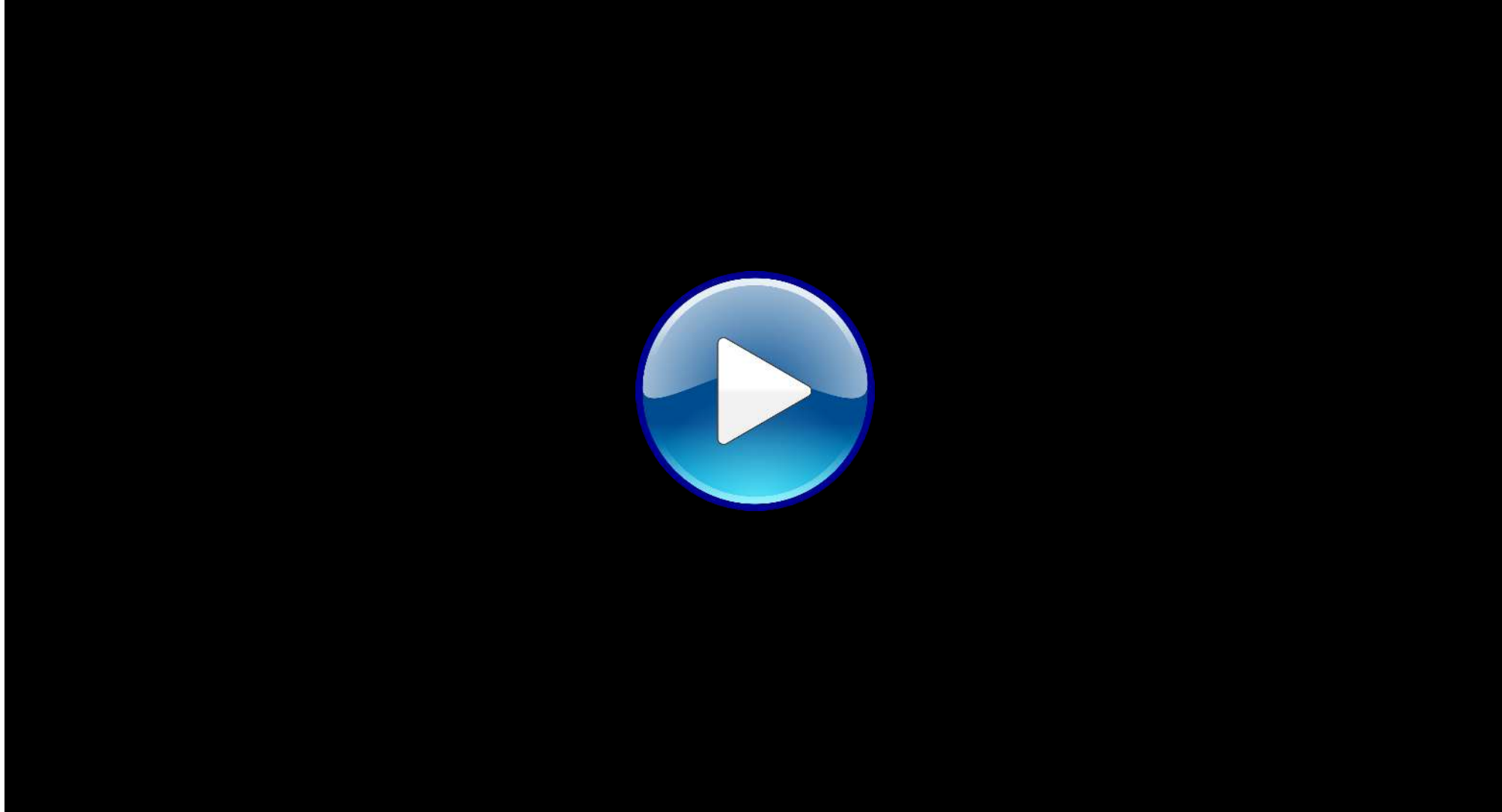




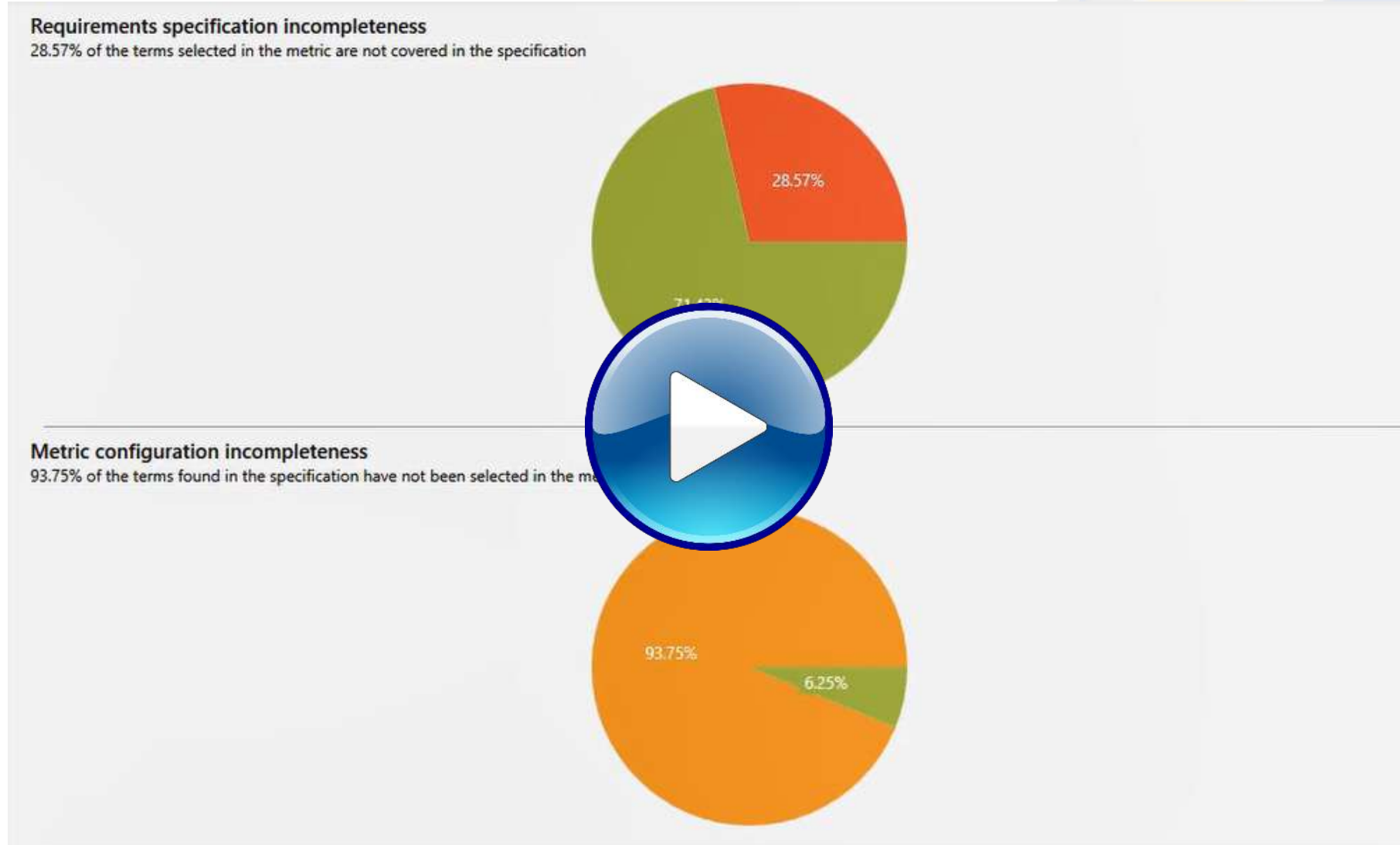
Live Demo

Data
Dictionaries
& Requirements
Quality

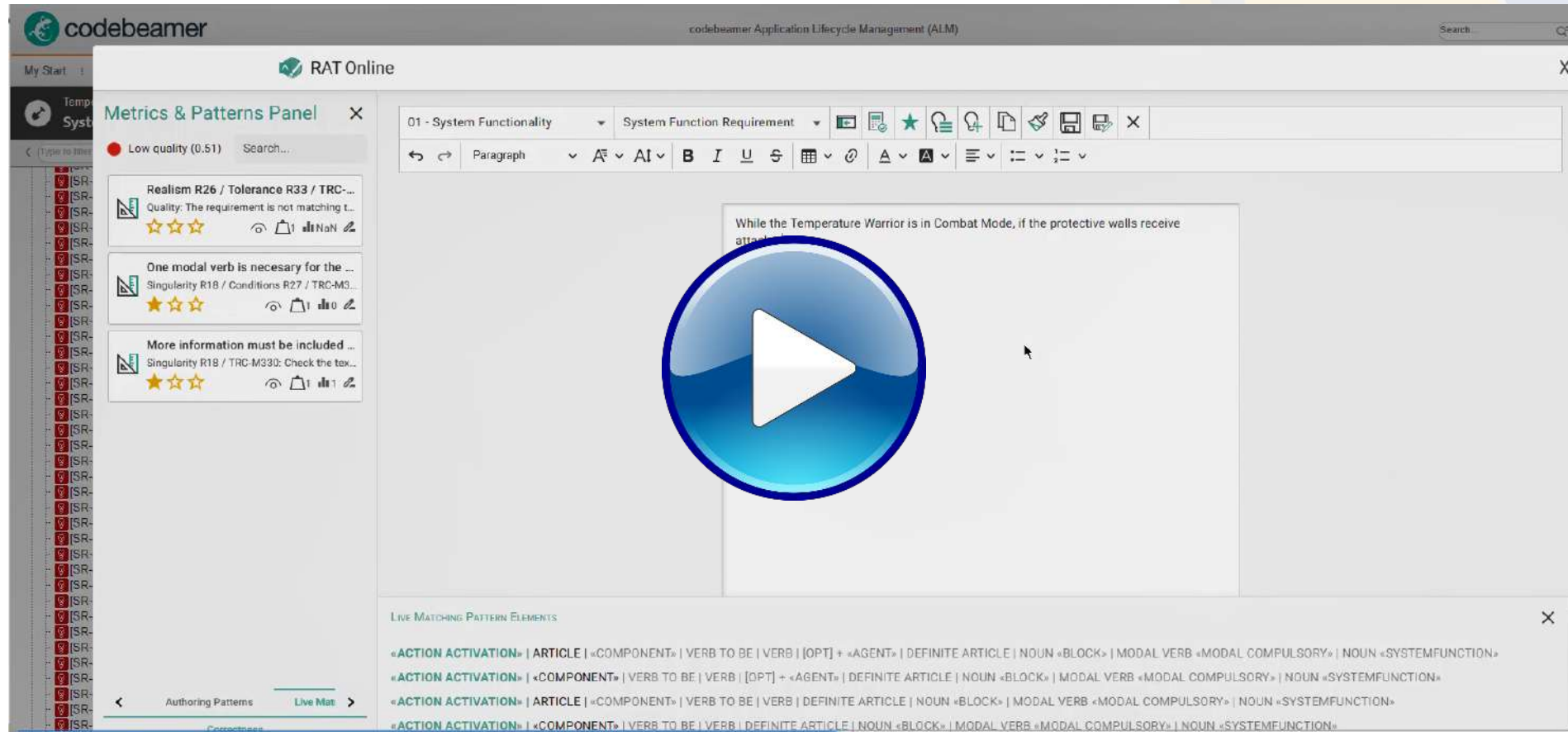
> **#1: Domain Vocabulary Management**



> #2: Knowledge interface with MBSE content: RQA – Completeness quality check



> #3: Knowledge interface with MBSE content: RAT – Pattern-based authoring with contextual restriction







HOW TO AVOID DUPLICATED OR OVERLAPPED REQUIREMENTS TO GET A MORE PROFITABLE PROJECT

- ✦ *Writing requirements takes a lot of time and effort, so is there a way to avoid duplicating information?*
- ✦ *RAT – AUTHORIZING Tool can be connected to most of the common requirements management tools (IBM DOORS, PTC Codebeamer, Siemens Polarion... and also PDF, MS Word, and Excel) and offers detection of duplicates in real-time.*
- ✦ *SES ENGINEERING Studio (which also connects to most RM tools) is a more sophisticated tool that allows finding duplicates within a document and also comparing two different documents to highlight a list of those couples with the most semantic proximity.*
- ✦ **Dates:** December 12 and 14, 2023





> www.reusecompany.com

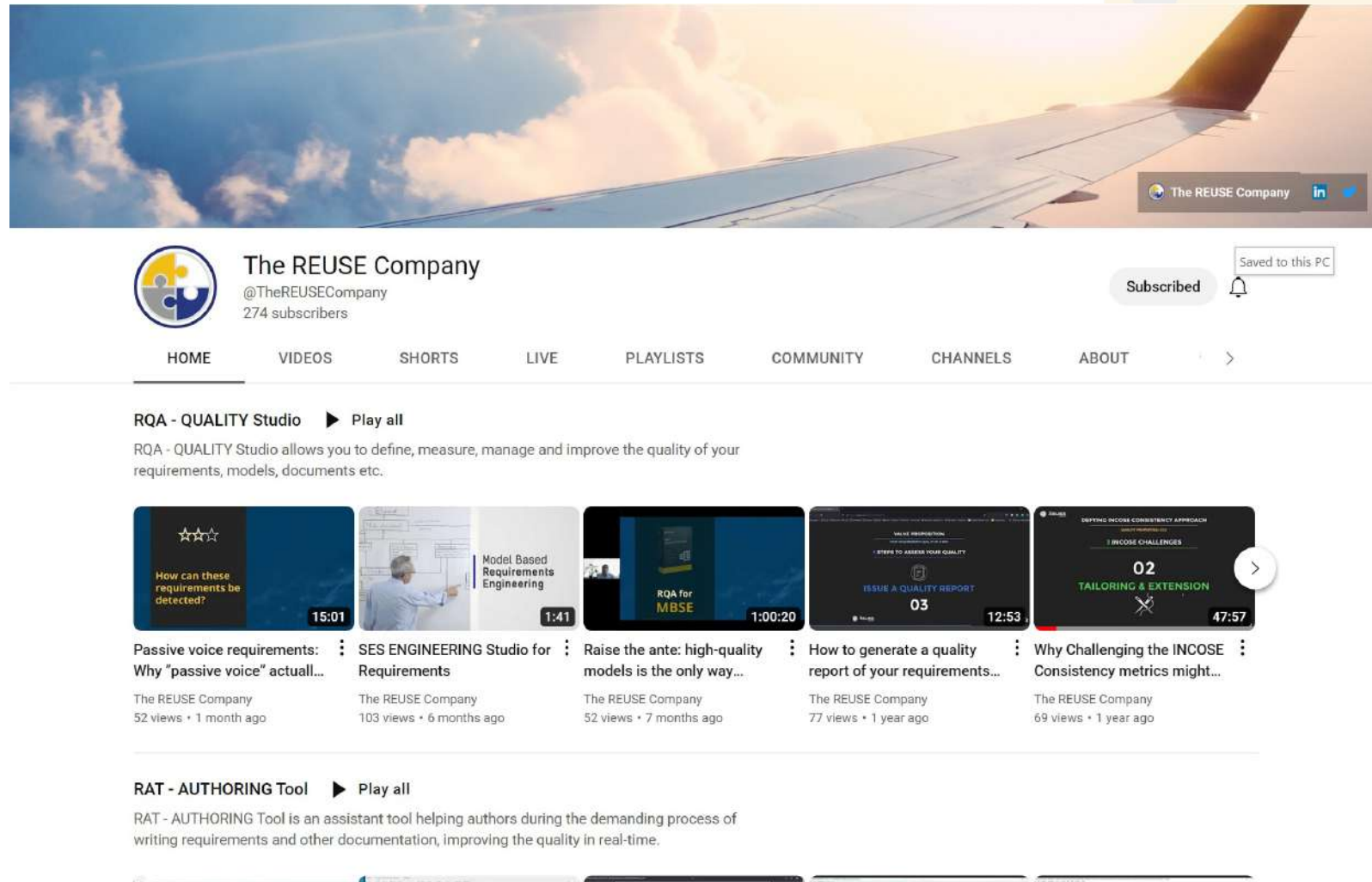
- > Resources -> Webinars (15' and 1hr)
- > Services
- > Support Forum

Enabling SMART Systems Engineering

Products Services Resources TRC Forum Support Company Contact

<p>Requirements management through AIIG Contracts</p>	<p>Connecting the Dots: Interoperability between your favourite Systems Engineering tools</p>	<p>Semantic traceability: how to keep the digital thread all along the SE lifecycle</p>	<p>The MBSE Podcast Trust us we are Systems Engineers MBSE around the world: Spain with Juan Llorens</p>
<p>Passive voice requirements: Why "passive voice" actually can become a nightmare</p>	<p>(In Spanish) Invitados al podcast 'Sistemistas': V&V ¿Qué es qué?</p>	<p>Connecting textual requirements and Capella models (Invited presenters)</p>	<p>Requirements Management: Managing data over entire life cycles</p>
<p>How to kick off your KM – KNOWLEDGE Management project</p>	<p>Taming the System Engineering Life cycle using Connectivity and Interoperability: the SES ENGINEERING Studio</p>	<p>Raise the ante: high-quality models is the only way forward after high-quality requirements</p>	<p>Digitalizing the V&V process on both sides of the V-Model</p>

➤ The REUSE Company in Youtube:
<https://www.youtube.com/user/TheREUSECompany>



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RQA - QUALITY Studio ▶ Play all
RQA - QUALITY Studio allows you to define, measure, manage and improve the quality of your requirements, models, documents etc.

- How can these requirements be detected? 15:01
- Model Based Requirements Engineering 1:41
- RQA for MBSE 1:00:20
- VALUE DEFINITION - STEPS TO ASSESS YOUR QUALITY - ISSUE A QUALITY REPORT 03 12:53
- DEPENDENT INCOME CONSISTENCY APPROACH - INCOME CHALLENGES - 02 TAILORING & EXTENSION 47:57

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Why Challenging the INCOSE Consistency metrics might... The REUSE Company 69 views • 1 year ago

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RAT - AUTHORING Tool is an assistant tool helping authors during the demanding process of writing requirements and other documentation, improving the quality in real-time.



Ilyes Yousfi



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<https://www.linkedin.com/in/ilyesyousfi/en>





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