Requirements Authoring: towards the concept of standard requirement

The problem: requirements engineering process is identified as the most important success/failure factor for the quality of software and systems projects (chaos report, Systems Engineering Effectiveness Survey by SEI…). A huge effort on the definition of quality characteristics for requirements has been done (IEEE 830, ISO 29148, PSS-05…). Nevertheless those characteristics are neither sufficient nor SMART enough. A requirement is deemed as standard requirement when it meets the quality criteria of an organization. Thus, tools are expected to automatically check conformance and help authors “Right the first time”.

The solution: RAT – Requirements Authoring Tool – is a plugin on top of the most common RM tools in the market (IBM DOORS, VISURE Requirements, CATIA Reqtify…), providing all the authoring support described in this poster. RAT, together with RQA (Requirements Quality Analyzer) and knowledgeMANAGER, form up the Requirements Quality Suite, a set of tools aiming to manage and improve the quality of requirements specifications. RQS is widely used in the safety critical industry (aerospace, automotive, healthcare…) and is currently available in English, French and Spanish.

Ontologies are the cornerstone of the Knowledge Centric Systems Engineering – KCSE, including different layers of knowledge.

Requirements patterns: an important element in the ontology during the authoring stage.

The reader shall identify hits at a minimum rate of 10 units per second.

Consistency among requirements: semantic-based techniques to identify overlapped requirements.

Consistency wrt models: heuristics to check consistency among requirements and UML/SysML models (e.g., PBS models, class diagrams, statecharts).

Requirements Reuse and Requirements Traceability: implemented through semantic indexing&retrieval:
- Traceability: looking for related requirements all along different documents within the same project
- Reuse: searching in previous projects and empowered by high quality and properly traced assets

The requirements author is a key role in this approach. However, it’s strongly connected to other roles.

Conclusions:
- Early focus on quality
- Improved quality “right the first time”
- Less re-work
- Dramatic reduction of the iterations among authors and reviewers/approvers

About the authors:
- Anabel Fraga (afraga@kr.inf.uc3m.es)
- José Álvarez (jose.alvarez@kr.inf.uc3m.es)
Professors at Carlos III University of Madrid
- José Fuentes (jose.fuentes@reusecompany.com): Chief Commercial Officer at The REUSE Company