



Requirements Quality Analyzer for DOORS

Requirements Authoring Tool

User Guide



Margarita Salas, 16 2nd Floor Innovation Center LEGATEC Technology Park 28919 Leganés – Madrid SPAIN – EU



http://www.reusecompany.com



Tel: (+34) 91 146 00 30 Fax: (+34) 91 680 98 26



contact@reusecompany.com



Table of revisions

| Version | Date | Author | Changes |
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1. Introduction

The Requirements Quality Analyzer (RQA) for DOORS is a product that enables defining, measuring, improving and managing the quality of requirements specifications in systems and software projects based on DOORS.

RQA for DOORS provides:

- Metrics based models for measuring and improving quality
- A formal semantic requirements meta-model
- Text based and *non-text* based measures
- Metrics for individual requirements, but also for whole specifications
- Calculations of quality that can be performed on-line
- Quality assessment of requirements on a regular basis (every night) or user defined
- Multi roles operability (Engineer, Project Manager, QA Manager)
- Customizable measures calculation engine
- Full support for the customer's domain representation
- Incorporation for Domain Specific Languages to the application

How does it work?

- Quality Assurance (QA) people define a set of quality functions for every metric
- For every requirement and every metric, a numerical value is generated
- Using a set of quality functions, every metric is qualified as of high, medium or low quality
- An aggregated quality value is generated for every requirement



2. Glossary

This section presents a list of terms that are central to RQA for DOORS, along with their definitions and examples.

- Metric: every of the features analyzed for every requirement
 - Examples: number of ambiguous sentences, text length...
- > Individual metrics: those metrics are analyzed requirement by requirement
- Global metrics: are analyzed for the whole set of requirements within a project
 - Examples: inconsistent units and overlapping tasks
- **Quality function:** represents how a quantitative quality value can be translated into a qualitative value.
 - Every individual metric is represented by means of a quality function
 - Quality functions for a given metric are customizable from a project to another
 - Quality functions for a given project/metric can evolve over the time
- Quality function examples:
 - Convex quality function:



Decreasing quality function:





- Maturity Level: requirements quality improvement is a cyclic process. Quality functions could be fitted as maturity level improves (more and more metrics and more tighten quality functions)
- **Ontology:** stores all the information needed for the quality analysis:
 - Stores several sets of forbidden sentences (a.k.a. special terms): ambiguous sentences, flow sentences...
 - Stores a set of domain concepts and relationships
 - Stores a set of domain verbs and semantic clusters
 - Stores some Natural Language Processing (NLP) inference rules that allows RQA to 'understand' the content of every single requirement



Controlled vocabulary: valid terms, forbidden terms... Optionally can include a Glossary (description for every term)

Taxonomy: terms hierarchically organized

Thesaurus: hierarchies, associations, synonyms...

Light Ontology: syntactic and Semantic groupings for Terms and Actions (verbs). Domain terms and verbs

Patterns and Representation Schemas for Identifying (patterns) and representing (Schemas) the semantics of knowledge

- Quality database: stores all the quality information
 - Stores quality function configurations for every project/metric
 - Stores the results of the quality analysis
 - Stores an ontology for a given business area. The ontology is stored used a proprietary schema into this relational database
 - DOES NOT store the requirements themselves
- DOORS Database: stores
 - The requirements themselves
 - The privileges granted for DOORS and RQA users
 - Optionally stores the results of the quality analysis
- RQA Server:
 - Allows the initial configuration of RQA (see details)
 - Stores the license information for a set of RQA Clients (see details)
 - Allows RQA Admins to configure the RQA Synchronizer process (see details)



• A single server may analyze requirements quality from many DOORS databases

RQA Client:

- Allows Quality Assurance Team (QA) to customize how quality should be analyzed (see details)
- Allows Business Analysts (BA) or Systems Engineers (SE) to check the results of the quality analysis (see details)
- Allows Project Managers (PM) to check the quality configuration as well as the results of the quality analysis for a given project (see details)
- **RQA Synchronizer (a.k.a. Batch process):**
 - Allows all the time consuming tasks to be executed in a batch mode
 - Can be executed manually in the RQA Server or as a programmed task
 - See configuration details
- **Batch state:** represents the way the Synchronizer is going to work with every module
 - No batch process (without metrics): there're no quality functions defined for the module
 - No batch process (with metrics): there're metrics and quality functions defined for the module, but you can only analyze quality manually using RQA Client
 - Batch process: there're metrics and quality functions defined for the module; furthermore, you can analyze quality both, with RQA Client and with Synchronizer



3. Installation

The installation procedure for both the RQA Server and the RQA Clients is described in detailed in the *RQA for DOORS Installation Guide*, provided with this product.



4. Initial Configuration

4.1 Accessing the server by the first time

Once the server is installed and configured, it is configured to start the RQA service when Windows starts. It is also executed automatically when the installation process ends. If for any reason the RQA Server has not started or has been stopped, the RQA Server can also be started using the Windows Start Menu.

During the first execution, a valid **key** will be required

| Every field is ma | andatory. No @yahoo or @hotmail mail will be valid |
|-------------------|--|
| Product version: | 4.0 |
| PreKey: | 1681260257 |
| Name: | |
| Company: | |
| Telephone: | |
| Mail: | |

Credentials for the first access to the tool are the following:

- MS Access Quality Databases:
 - Login: Admin
 - Password: <empty> (no chars)
- SQL Server Quality Databases:
 - Login: Admin
 - Password : <empty> (no chars)
 - Click Setup to select the Quality Database for the first usage of the Server



| 😨 Requirements Quality Analyzer Serve | r | — |
|---------------------------------------|---------------------|-------------------|
| Requirements Quality An | alyzer Server | |
| Bi | / The REUSE Company | ¥ |
| Login Password | Admin | |
| Setup Configure licence | About us Help | Qk <u>C</u> ancel |

Please click on the **Setup** button to configure. For more help, see the RQA for DOORS Installation Guide

| r Requirement | s Quality Analyzer Server | | | | |
|---|---|--|--|--|--|
| Requirem | ents Quality Analy By Th | rzer Server ne REUSE Company | License service | e started | |
| Databases Access Configuration RQA Objects | Quality database Type: Server: Database path: Log on to the server © Use Windows authe © Use database authe User: RQA database configuratio Oracle installation path: Admin user Login: Current password: | Access C:\Program Files (x86)\Tr ntication ntication n (only if the requirement de Admin | he REUSE Company\Requir Password: atabase is Oracle) | ements Quality Analyze Quality level litera High value: Medium value: | er Server for DOORS\Rqa Quality Analy: Save my password Save und Save |
| Licensing | New password: | | | Low value: | Low |
| Batch process | Confirm new password: | | | | |
| Help | | | Save | | Save |
| Exit | | | | | |

- RQA database configuration (only if the requirement database is Oracle): this option does not make sense with DOORS, only if you want to connect RQA with other requirements management products.
- Admin User: configure the admin user credentials.
- Quality level literals: configure the three quality level literals.



4.2 **Providing licenses to RQA Clients**

In the main RQA Server window:

- 1. Select the Licensing tab on the left
- 2. RQA Clients licenses are:
 - Nominal licenses based on the Visure Requirements licensing system.
 - They are configured on the server in this **Licensing** tab:
 - a. Select your hard disk
 - b. Click on Get Prekey and send this number to your product representative
 - c. Store the license file provided by the representative in the selected hard disk
 - d. Select the license file and click on Get License
 - e. License information is shown in the Current license group box
 - f. Provide a set of valid user accounts for the clients (see next slide)
 - g. Stop and re-start the process if needed



| requirement: | s Quality Analyzer Server | |
|---|---|------------|
| Requirem | ents Quality Analyzer Server By The REUSE Company License service started | |
| Databases Licensing License License Users | Prekey Hard disk drive: D:\ ▲E53C27 License file Select the license file: D:\malonso_infinite_v4_1.dat | Get Prekey |
| | Current license License path: D:\malonso_infinite_v4_1.dat Expiration date: 24/04/2013 Reuse users: 0 Quality users: Infinite users | |
| Batch process Help Exit | Net service configuration Port: 16555 Computer name or net address: LUISMA-LAPTOP | |

- Clients licensing is based on DOORS accounts
- Go to *Users* tab and provide a set of quality granted accounts
 - 1. Right click on the list and then Add User
 - 2. Type the name of the DOORS account (case sensitive)
 - 3. Check Quality user
 - 4. Check Administrator if you want this DOORS user to be able to:
 - i. Modify quality configuration
 - ii. See and aggregate the quality analysis for all the requirements, even those not created/modified by himself
 - 5. Click Ok



- 6. Now you can grant as Admin or remove a user (to leave a license available) using the contextual menu
- Once a user has been removed, <u>it cannot be added again for 1 week</u>, the next time the user will be available to be added to the valid user is the date under the "Will be released" column.

| Requireme | ents Quality Analyze | er Server | | | 62 |
|------------------------------|---|---------------|--------------------------|---------|---------------------|
| • | By The F | REUSE Company | License service starte | d | |
| Databases | Users | | | | |
| Licensing | Login | Administrator | Reuse | Quality | Will be released on |
| 0 | Administrator | | V | | |
| License E Users | W 7X86ENG-PC/Kga fraining | Ā | | V | |
| atch process Help Exit | Used licenses Remaining Reuse users: | 4 | Remaining Quality users: | 3 | |

| 😨 User | | | × |
|------------------|---------------|----|--------|
| User information | | | |
| Login | Administrator | | |
| Reuse user | | | |
| Quality user | | | |
| Administrator | | | |
| | | Ok | Cancel |
| | | | |

LEGATEC Technology Park | Margarita Salas 16, 2nd Floor | 28919 Leganés – Madrid - SPAIN Tel.: (+34) 91 146 00 30 | Fax: (+34) 91 680 98 26 | contact@reusecompany.com | www.reusecompany.com



4.3 Configuring the Synchronizer

For the configuration of the synchronizer, please select the *Batch process* tab on the left and click on the Configure Batch icon. Then choose the appropriate values for the process parameters:

| 😨 Requirement | s Quality Analyzer Server | | | | |
|-------------------------------|---------------------------|-------------------------------------|----------------|--|-------------|
| Requirem | ents Quality Ana | yzer Server | | | 63 |
| | By T | The REUSE Company L | icense service | e started | |
| Databases | Batch process info | | | | |
| Batch process | Quality process level | Don't delete already computed quali | Log file | rogram Files\The REUSE Company\rqa.log | |
| | Verbose mode | | • | | |
| Configure Batch | Periodicity (in days): | | | | |
| | | | | | |
| Configure email notifications | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Help | | | | | Delete Save |
| Exit | | | | | |

- 1. Quality process level:
 - a. Don't delete already computed quality: should be the default value in order to avoid analyzing the same requirement over and over even if it has not been modified
 - b. Delete already computed quality: forces the quality process to be executed for every requirement even if the text of the requirement has not been updated. Use this configuration if Quality Functions have been updated and you want to force the quality to be analyzed again
- 2. Verbose mode: represents the amount of information stored in the log file. Error level should be enough almost in every case
- 3. Launch hour: from 0 to 23 hours and 0 to 59 minutes, representing the exact time when the task is going to be executed automatically
- 4. Periodicity: this task could be executed every day (type 1), every week (type 7)...
- 5. Log file: the path where the RQA log is stored by the Synchronizer



6. Click on *Delete* if you want to delete the Windows Scheduled task

4.4 Configuring email notifications

For the configuration of email notifications, please select the *Batch process* tab on the left and click on the Configure email notifications icon. Then choose the appropriate values for the process parameters:

| 😨 Requirements | s Quality Analyzer | Server | | |
|-----------------|---------------------|----------------------|-------------------------|------------------------|
| Requirem | ents Quality | Analyzer Server | | 23 |
| | | By The REUSE Company | License service started | |
| Databases | Email notifications | s configuration | | |
| Licensing | Server | venus.itinf.es | | |
| Batch process | | | | |
| . | Port: | 25 🌩 | | |
| | User: | administrator | | |
| Configure Batch | Password: | | | |
| | Domain: | | | |
| Configure email | Source email: | | | |
| nounodaono | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Help | | | | Test and the met |
| Exit | | | | Test sending mail Save |

- 1. Server: The IP address or name of the mail server
- 2. Port: Port number of the mail server
- 3. User: username for the mail server
- 4. Password: password for the above username
- 5. Domain: the domain where the username belongs (e.g. Windows domain)
- 6. Source email: the email address of the sender

User can send a test mail to check that values for the process parameters are correct.



5. More Server functionality

5.1 Managing RQA Objects in the Quality Database

There are several cases where older quality information could remain in a Quality Database and must be removed. These cases may occur:

- when a Quality Database is reused from one business area to another
- when a project/module has been removed from the DOORS database

The RQA Objects tab shows all the information stored in the current Quality Database

| 😨 Requirement | s Quality Analyzer Ser | ver | | | | | |
|---|---|---|---|-------------------------------------|-------------------------|---|---|
| Requirem | ents Quality A | nalyzer Sen By The REUSE Co | ver mpany L | icense service sta | arted | | |
| Databases Access Configuration RQA Objects | Use RQA databases To delete a databases RQA databases Generation Control Contr | and Add filters to se , project, block or m > /7X86ENG-PC .DWS 017361 W/S NHTSA | et search criteria. Then cli nodule use the RQA data | ck on 'Show blocks/n pases tree. | nodules' button to show | Add filters Add filters Add filters Only show to process Last Quality o Between and | ks. v blocks or modules s lient access 11/30/2012 11/30/2012 xcks/modules |
| | Details | | | | | | |
| | Server | Database | Database Type | Parent Project | Blocks/modules Name | Process State | Last access |
| | W7X86ENG-PC | 36678 | DOORS | DQA LDWS | ISO17361 | With metrics, qualit. | 11/30/2012 1:32: |
| Licensing Batch process | | | | | | | |
| Help Exit | No. blocks: 1 | | | | | | |

- 1. Click on *Show blocks/ modules* to check which modules have associated Quality Functions
- 2. Right click on the *RQA Databases* list and click on *Delete project* if you want to remove a project from the Quality Database
- 3. Even if you remove a project from the Quality Database, you could analyze it again with RQA and the quality information will be generated and stored again



6. Accessing the RQA for DOORS Client

The RQA Client can be launched using the Windows Start Menu





6.1 Providing a valid client license

RQA Client licenses are:

Nominal license, it must have been setup on the server before. So in the clients the only thing to do is indicating the RQA Server name or IP address and the port:

| RQA Client: Lice | nse Configuration | |
|--|---|----------------------|
| Requirements Qu Server. | uality Analyzer clientlicensing needs o | connection to a RQA |
| Please set up the RQA Server is lis | RQA Server machine name or its IP tening to. | address and the port |
| Requirements Quali | ty Analyzer Server | |
| Server: | | W7X86ENG-PC |
| Port: | | 16555 |
| | <u></u> K | <u>C</u> ancel |

- 1. Click on *Configure server*
- 2. Type the server name and the service port in the RQA server
 - a. Default port value: 16555
 - b. Start the RQA server and click on *Licensing* to see this values
- 3. Click OK in the License Configuration dialog



Fixed (local) license:

| Requirements Quality Analyzer f | or DOORS | | | | | |
|---|---|--|--|--|--|--|
| By The REUSE Company | | | | | | |
| Crendentials Username Administrator Password Cality database crendentials Username Password Remember password Remember password Available servers Port Server 36678 W7X86ENG-PC 36677 W7X86ENG-PC | Open project Version 9.4 Server W7X86ENG-PC Port 36678 Additional parameters -a Projects Load projects Select a project OCALDWS | | | | | |

- 1. Click on Configure server
- 2. Check Fixed License
- 3. Fill all the contact information and send the PreKey to a tool representative
- 4. When you receive a valid key, paste the provided key
- 5. Click on *Validate key*



6.2 Logging in

RQA accounts are based on currently existing DOORS accounts. In the log-in window of the RQA Client:

| Requirements Quality Analyzer for DOORS | - Connection |
|--|---|
| Requirements Quality Analyze By Th | er for DOORS |
| Crendentials Username Administrator Password Crendentials Password Quality database crendentials Username Password Password Remember password Available servers Pot Server 36678 W7X86ENG-PC 36677 W7X86ENG-PC | Open project Version 9.4 Server W7X86ENG-PC Port 36678 Additional parameters -a Projects Load projects Projects Select a project Select a project Select a DOALDWS Keep the DOORS console open when it appears |
| Configure server About us | Lelp <u>Ok</u> <u>E</u> xit |

- 1. Type your credentials: Username and Password
- 2. Type you quality database credentials: Username and Password.
 - a. Only necessary if the RQA Server administrator has not saved the Quality Database credentials to avoid the users to write them live every time they connect to a DOORS project from RQA Client
- 3. Select the version of the DOORS database you want to connect to
 - a. Only available DOORS clients versions are shown
- 4. Type the DOORS Server, Port and Additional parameters (see your DOORS shortcut if needed)



- 5. Select the DOORS project you want to work with
- 6. Click on OK to see/configure the quality of the selected project and its modules
- 7. The list of Available servers represents the set of Version + Server + Port + Additional parameters you have logged in in the past



7. Supported individual metrics

The Requirements Quality Analyzer for DOORS assesses the quality of a DOORS repository by involving Natural Language Processing techniques that extract, out of every individual object, information about the metrics listed in the table below.

In the second column you can find the justification for each metric, while in the third column the default sentences included in each of the metric, as well as the way to customize the metric according to customer needs.

| Metric | Description | Default content |
|------------------------------|--|--|
| Acronyms | Avoid using acronyms which are not declared into the ontology. In order for all stakeholders to fully understand the acronyms used in your requirements, they must be declared in the ontology. Please avoid this acronym or contact your domain architect in order to insert this acronym into the ontology | List of acronyms in the ontology (included in the ontology terms) |
| Ambiguity | Ambiguous sentences make the requirement difficult to understand, and can provoke other stakeholders to understand something different than the idea initially planned by the author of the requirement. Ambiguous sentences are difficult to understand, as two stakeholders may understand different needs in the same requirement | Ambiguous words/expressions to be avoided: adequate, approximately, approximate, as a maximum, as a minimum, maximum, minimum, minimal, as appropriate, appropriate, reasonable, as possible, as required, bad, be able to, be capable of, best practices, best possible, better, capability of, capability to, close quickly, easy, easy to, easy to use, effective, efficient, fast, flexible, good, high performance, high speed, if practical, improved, maximize, minimize, medium-sized, optimize, optimal, optimum, nominal, normal, typical, typically, useable, suitable, not limited to, provide for, prompt, quick, quickly, rapid, reliable, routine, safe, slow, sufficient, sufficiently, timely, too, user friendly, user-friendly, versatile, worst, at least, enough, clearly, based on, some, any, several, many, many of, a lot of, a few, few, about, very nearly, manage, about, easily, close to, small, significant, vague, flexible, ancillary, relevant, routine, common, generic, customary, so far as is possible, as far as possible, as little as possible, as much as possible, if it should prove necessary, as necessary, necessary, all, any, both |
| Boilerplates matching | The structure (grammar) of your requirements must fulfill one of the agreed grammars (boilerplates). Doing so will increase the readability of the requirement and you will ensure that the automatic tool will perfectly understand the requirement. | Number of boilerplates matched |
| Chars between punctuation | If you write long sentences without punctuation marks, the requirement will be difficult to understand. You must introduce more punctuation marks in order to get more readable requirements. | Number of counted characters between punctuation marks. |



| Conditional | A requirement must be written in an assertive way. Whether a requirement is mandatory or not must be indicated as an attribute, and not by using conditional expressions. | Examples of conditional words/expressions: May be, May be not, Can, Can't, Cannot, Could, Couldn't, Could not, Should, Shouldn't, Should not, Ought to, Oughtn't, Ought not, Would |
|-----------------------|---|--|
| Connectors | Using too many connectors, in most of the cases, may mean that either your requirement is over specified or you are mixing two or more different needs into the same requirement. | Examples of connectors: and, and / or, and/or, or, as well as, but also, however, whether, meanwhile, whereas, on the other hand, otherwise, / |
| Dependencies | An object with too many dependences could be difficult to understand | Number of in and out links |
| Design Sentences | Top level requirements or user requirements must be focused on a necessity (asking "what") instead of focusing on the solution to that necessity (asking "how"). By involving the concepts included in this list, you are clearly including the solution of the need (design). | Examples of terms to be avoided: .NET, ADSL, Array, Bit, C, C#, cache, cgi, check box, checkbox, COM, combo box, combobox, CORBA, Cursor, design, diagram, DLL, exception, FTP, Hash, HTTP, installation, IP, JAVA, kb, Kilobit, Kilobyte, Loop, mb, megabit, megabyte, object, OCX, parameter, PHP, source code, testing, thread, visual basic |
| Domain Concepts | Involving too many domain concepts means that the requirement is either over-specified or even different needs are involved in the same requirement. Try to reduce the number of domain concepts involved in the requirement. | List of concepts defined in the ontology |
| Domain Verbs | A requirement may involve a set of different concepts and verbs. Nevertheless, some of them, the most relevant, must be included into the ontology of your business unit. In case you consider that the verbs you are using in your requirement should be included into the ontology, please contact your domain architect. | List of verbs defined in the ontology |
| Flow Sentences | A requirement must avoid flow sentences or pseudocode in order to be more focused on the problem (the need) and not on the solution. | Examples of flow sentences: although, as well as, but, Else, except, if, if not, then, unless, when, While |
| Imperatives | Every requirement must have, at least, one verb in imperative mode. This is the way the assertiveness of the requirement is expressed. | Shall, Will, Must, Won't, Shan't, Mustn't |
| Implicitness | Implicit sentences, i.e. those that are not 100% explicit due to the use of pronouns, can make the requirement difficult to understand under certain circumstances. Please try to avoid pronouns in order for all stakeholders not to have problems identifying the meaning of those pronouns and enhancing readability. | Examples of pronouns: he, her, him, his, I, it, my, our, she, their, them, they, us, we, you, your, this, that |
| Incompleteness | Some sentences such as "etc.", "not limited to" clearly demonstrate that the requirement has not a clear scope. Try to avoid this kind of expressions, since they make an object non- atomic | Examples of incomplete sentences: among others, and so on, as a minimum, etc., etcetera, further, not defined, not determined, not limited to, shall be included but not limited to, tbc, tbd, tbs, to be determined, but not limited to, e.g., eg, example, such as, (,) |
| In-links | In-links must be used according to the guidelines and policies of your organization. | Number of in-links |
| Negative Sentences | Including more than one negative expression in the same requirement can make the requirement difficult to understand. This metric is not activated when just one negative sentence is used, but when more than one is used at the same time. | Examples of negative terms: Cannot, Does Not, Doesn't, Never, No, Nobody, Non, None, Nor, Not, Nothing, Won't, Shan't, Mustn't, Couldn't, Could Not, Shouldn't, Should Not, Oughtn't, Ought Not, Can't, Cannot, May Be Not |



| Nested levels | The hierarchical nesting structure of your specification includes too many levels. This can lead to complex and difficult-to-read specifications and must be avoided. | Hierarchy of Requirements |
|-----------------------------|---|--|
| Out-links | Out-links must be used according to the guidelines and policies of your organization. | Number of out-links |
| Paragraphs | An object should not be written using too many paragraphs | Criterion used: Number of paragraphs in an object |
| Passive voice | Passive voice could be, in some times, difficult to understand and it is less assertive than active voice since the object which is performing an action is located at the beginning of the sentence. | Number of verbs in passive voice |
| Rationale | Any kind of justification within the requirement makes it difficult to understand. These justifications should be out of the requirement text but must reference it with a link or a trace. | Examples of expressions that imply rationale: in order to, so that, thus allowing |
| Readability | A low readability mark for a requirement means that its structure could be somehow simplified in order to ensure that all the stakeholders understand exactly the same out of the text of the requirement. | Criterion used: Paragraph readability = 0,39 * (words / sentences) + 11.8 * (syllables / words) – 15.59 [Flesch Grade Level Readability Formula] |
| Speculative Sentences | Using speculative sentences suggests that the real necessity of the requirement is not clear for the reader. Please, try to avoid using this kind of sentences. | Examples of speculative expressions: almost always, commonly, frequently, generally, normally, often, optionally, perhaps, probably, rarely, typically, usually, eventually, at last, almost, always |
| Subjectivity | The point of view of the author must not be expressed in the requirement. Instead of this, the author must focus on the objective need of the requirement. | Examples of expressions of subjectivity: I think, imho, imo, in my humble opinion, in my opinion |
| Text Length (chars) | The length of a requirement must be controlled in order to avoid over-specification, several needs into the same requirement or even redundant information. | Number of characters in a requirement. |
| Text Length (paragraphs) | The length of a requirement must be controlled in order to avoid over-specification, several needs into the same requirement or even redundant information. | Number of paragraphs in a requirement. |
| Unclassified concepts | In order to enhance the readability of your requirement, you must use only those terms already managed by the system. In case you consider that the concepts you are using in your requirement should be included into the ontology, please contact your domain architect. | Number of concepts not recognized by the system |
| Unclassified Verbs | In order to enhance the readability of your requirement, you must use only those verbs already managed by the system. In case you consider that the verbs you are using in your requirement should be included into the ontology, please contact your domain architect. | Number of concepts not recognized by the system |
| Volatility | Volatility in a requirement or in a requirements specification is not directly related to the quality of this requirement or specification. Nevertheless, the risk derived from a volatile requirement is higher, and must be controlled carefully. | |



8. User's Roles

SE Expert:

Author Requirements

Quality Assurance:

- Adjusts metrics and quality functions.
- How can metrics and quality functions be adjusted to carry on with the improvement process?

Quality Control:

- Executes assessments for individual requirements and global specifications.
- Is quality evolving as expected?

Project Manager / Quality Manager:

- Do my project requirements have the right quality?
- Do our teams need additional training?

SKB Architect:

• Evolves the requirements knowledge model.

SKR Manager:

• Leader of the Knowledge Repository







9. Creating the improvement cycle

Use DOORS to create several quality folders and modules. These will not contain real requirements, but the Quality Functions. Create one folder for every Maturity Level and create one module for every type of requirements.

| DOORS Database: /DQA LDWS - DOORS | | | | | | | | | |
|---------------------------------------|---|--------|-------------|--|--|--|--|--|--|
| <u>File Edit View Favorites Tools</u> | File Edit View Favorites Tools Change Management Help | | | | | | | | |
| | | | | | | | | | |
| Favorites Location /DQA LDWS | | | | | | | | | |
| DOORS Database | Name | Туре | Description | | | | | | |
| | LDWS NHTSA | Formal | LDWS NHTSA | | | | | | |
| Usemame: Administrator | ✓ User type: Administrator | m | | | | | | | |



Now use the RQA Client to provide quality functions for every Maturity Level and every different type of requirements, following the next steps:

- 1. Log-in into RQA Client
- 2. Move to Configuration/Batch State
- 3. Select a module, right click and click on *No batch process (with metrics)*

| 🟹 Requiremer | nts Quality Analyzer fo | or DOORS [36678@ | W7X86ENG-PC - DQA L | .DWS (Administrator)] | | | - • • |
|----------------------|-------------------------|-------------------|------------------------|--------------------------|-------------|------------|--------|
| Requiren | nents Quality A | By The REUSE (| DORS Company | | | | N |
| Objects Modules | Modules | | | | | | |
| Configuration | Name | ▲ State | Quality | Incompatibilities | Overlapping | Use Filter | Filter |
| Comguration | ISO17361 | Without met | ics No | No | No | No | |
| 2 | LDWS NHTSA | Without | Without metrics | | | No | |
| Patab atata | | | With metrics, quality | assessed manually | | | |
| Datch State | | | With metrics, quality | / assessed automatically | | | |
| | | | Import new special s | entence metrics | _ | | |
| Matrice. | | | import new special s | sentence metrics | _ | | |
| Metrics | | | Import metrics for se | elected modules | | | |
| | | | Import metrics confi | iguration | | | |
| | | | Export metrics to file | · | | | |
| Special sentences | | | Import metrics from | file | | | |
| 14 5 55 | | | Show current config | uration | | | |
| 0 | | | Properties | | | | |
| Magnitudes | | | | | | | |
| 2 | | | | | | | |
| ~ | | | | | | | |
| Ontology | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Help | No. modules : 2 | | | | | | |
| Exit | | | | | | | |

Click now to the *Metrics* icon, on the *Configuration* tab:

- 1. Select the type of requirements from the combo box on the top of the window
- 2. Select which metrics you want to involve in the current ML
 - a. By checking the Used check box
- 3. Select the weight you want to assign to this metric
 - a. By writing a number from 0 to ∞
- 4. Save every Metric configuration, one by one, with the Update button



5. Use the buttons below if you want to add, edit or remove a range for the given Metric

6. Use the *Check* button to look for overlapped intervals in the Quality Function

| 🟹 Requireme | nts Quality Analyze | er for DOORS | [36678@W7X86ENG | -PC - DQA LDW | S (Administrator |)] | | - • • |
|----------------------|--|--|----------------------------------|------------------------------|------------------------------|---|----------------------------|----------------------|
| Requirer | nents Quality | y Analyze By Th | er for DOORS e REUSE Company | | | | | M |
| Objects Modules | Selected module | ISO17361 | | • | | | Set Affect overall quality | true in all ranges 📊 |
| Configuration | Name | | | | | | Used | Weight |
| 8 | Text length (wo | rds) | | | | | | 2 |
| Batch state | Name | | | | Used | Weight | | • |
| Metrics | Text length (w Unclassified co Unclassified vo Volatility (Chan | ords) oncepts erbs iges from last b | paseline) | | True True True True | 1 1 1 1 | | |
| Special sentences | Volatility (Versi No. of metrics: Selected metric r | oning) 30 anges | | | True | 1 | | |
| jii gaa | Lower limit | Upper limit | Affects overall quality | Quality level | Summary | | | |
| Magnitudes | 0 4 36 61 | 4 36 61 += | False False False False | Low High Medium Low | More informati | on must be included i Ients (measured in nui Ients (measured in nui | nt mb | |
| Help Exit | No. of ranges: | 4 | | | | | ٢ | |

For every involved Metric, the Quality Function must be defined. Every range must match on low, medium or high quality. Provide ranges as

- ▶ [lower-limit , upper-limit) or
- [lower,-limit upper-limit [

where

- Lower-limit should include the endpoint
- Upper-limit should exclude the endpoint



Please check *Affect overall quality* if a low quality mark for this Metric involves low quality mark for the whole requirement.

| Modify metric range | | | - |
|---|--|-------------------------|--------|
| Lower limit | Upper li | mit | 4 |
| Affects overall quality | Quality I | evel Low | • |
| C | | | |
| Summary | | | |
| More information must be included | into the requirement | | |
| More information must be included | into the requirement | | |
| More information must be included Description A requirement must have more wo | into the requirement | the proper information. | |
| More information must be included Description A requirement must have more wo | l into the requirement rds in order to convey t | the proper information. | * |
| More information must be included Description A requirement must have more wo | l into the requirement | the proper information. | A |
| More information must be included Description A requirement must have more wo | l into the requirement | the proper information. | * |
| More information must be included Description A requirement must have more wo | l into the requirement | the proper information. | ۵ ۲ |
| More information must be included Description A requirement must have more wo | l into the requirement | the proper information. | Crocel |

9.1 Managing the ontology

The proper way to manage the Ontology for the improvement process is by using the knowledgeMANAGER product. Nevertheless, the RQA Client also allows a shallow management of the ontology, including lists of terms, but not relationships or semantics. Please keep in mind that full ontologies are not mandatory, but help very much in the global metrics.

For basic ontology management, follow the next steps:

- 1. Move to *Configuration/Ontology*. Domain Terms and Domain Verbs can be displayed and managed through this window.
- 2. Use the buttons on the bottom part of the window to Add, Edit or Delete a Term or a verb





3. These lists may be exported/imported to/from *csv* files using the contextual menu.

| Require | ments Quality | y Analyzer for DOORS By The REUSE Company | | N |
|--------------|-----------------|--|---------|--------------------------------------|
| Objects | Domain terms Do | main verbs | | |
| Modules | Tom | Scene Nate | Tom Too | Competio |
| onfiguration | reim | | | Semantic Se |
| | Accentance | Add term | NOUN | «< No semantic >» |
| 2 | Acceptance | Edit term | NOUN | «< No semantic >» |
| | Accident | Delete term(s) | NOUN | «< No semantic >» |
| latch state | Acronyme | | NOUN | «< No semantic >» |
| | Actor | Import terms | NOUN | v< No semantic >v |
| | Actuators | Export terms | NOUN | «< No semantic >» |
| Metrics | Admin | | NOUN | «< No semantic >» |
| | Administrator | Refresh terms | NOUN | « STAKEHOLDER (OK)» |
| <u>a</u> ! | Alam | | NOUN | «< STAREHOEDER (OR)» |
| 0- | Alert | | NOUN | «< No semantic >» |
| Special | Aloha | | NOUN | «< No semantic >» |
| sentences | Apalog | | NOUN | <pre>// No semantic >>//</pre> |
| 14 | Analysis | | NOUN | «< No semantic >» |
| 1.16- | Analysis | | NOUN | «< No semantic >» |
| lagnitudes | Anomaly | | NOUN | «< No semantic >» |
| | Antivinus | | NOUN | «< No semantic >» |
| | Appliance | | NOUN | «< No semantic >» |
| | Application | | NOUN | «< No semantic >» |
| Untology | Approach | | NOUN | «< No semantic >» |
| | Approval | | NOUN | «< No semantic >» |
| | Array | | NOUN | «< No semantic >» |
| | Asp | | NOUN | «< No semantic >» |
| | Assembly | | NOUN | «< No semantic >» |
| | , soundly | | 1001 | ····· |

9.2 Managing special sentences

Special Sentences (Forbidden Sentences) represent a part of the ontology and cannot be managed using the knowledgeMANAGER. In order to manage special sentences, please:

- 1. Move to Configuration/Special Sentences
- 2. Click on one of the lists
- 3. Use the buttons on the bottom part of the window to Add, Edit or Delete a Sentence



4. These lists may be exported/imported to/from csv using the contextual menu



- 5. The lists can be extended with custom lists of sentences.
 - This additional sentences lists can be also edited or deleted
 - But the original sentence lists cannot be edited or deleted, the user is only allowed to manage the sentences that those original sentences lists hold.

| 🟹 Requireme | nts Quality Analyzer for DOORS [36678@W7X86ENG-PC - DQ | A LDWS (Administrator)] | |
|---------------|--|--|-----|
| Requirer | nents Quality Analyzer for DOORS By The REUSE Company | | V |
| Objects | Available special sentence types | | |
| Modules | Special Sentence Type | Incomplete | A 1 |
| Configuration | Ambiguous | (| |
| Batch state | Connectors Design Flow Implicit Incomplete Negative Rationale Speculative Subjective |) among others and so on as a minimum but not limited to e.g. eg etc etcetera example further if possible | |
| Magnitudes | | if required not defined not determined not limited to possibly | |
| Ontology | | shall be included but not limited to such as tbc tbd tbs to be determined various | |
| Help Exit | No. of types: 10 | No. of sentences: 27 | |



10. RQA for Project Managers

10.1 Assigning a set of Quality Functions

The Project Manager should be in charge of assigning a set of Quality Functions to each corresponding projects and then be able to visualize the quality of the project. In order to do so, the Project Manager should:

- 1. Open your project with RQA
- 2. Move to Configuration/Batch state
- 3. Import the Quality Functions from one of the defined by the QA Team
 - Right click and click on Import metric configuration
- 4. Select a Maturity Level (or any other module with metrics)
- 5. Select those module names whose Quality Functions you want to overwrite
- 6. Set *Batch State* if you want the *Synchronizer* to assess the quality of this modules when it is executed





- 7. Other operations you can perform are:
 - Import new special sentence metrics
 - Import metrics for selected modules: you will be prompted to choose a different project and a concrete module
 - i. Select the project



ii. Select the appropriate module

| | Modules selection | 0.1 | and alma | <u> </u> | |
|---|-----------------------------|----------------------|----------|----------|--------|
| ۷ | Select a module to copy its | metric configuration | | | |
| | ISO 17361 LDWS NHTSA | | | | |
| | | | | | |
| | | | | | |
| | | | | ОК | Cancel |

- iii. Click OK
- Import metrics configuration: you will be prompted to choose a different project. All modules in the current project whose module name match with


another module in the target project will be overwritten their set of quality metrics

- Export metrics to file
- Import metrics from file
 - i. Select the xml file



- ii. Click Open
- Show current configuration



Module properties. The Module Properties window is separated in 5 sections, as shown in the following image:

| 🟹 Module | Properties | | | | | × |
|-----------------|-------------------------------|-----------------------------------|----------|--|--------------------------------|---------|
| Module | | | | | | |
| Name | ISO17361 | | | | | |
| Descript | tion | | | | | |
| | | | | | | |
| Process | | | | | | |
| Status | With metrics, quality assess | ed automatically | | | | • |
| | Quality | Process and Manual | | | | |
| | Incompatibilitie | s Process | | | | |
| | Overlapping | Process with task | | | | |
| V Save | e quality assessment in DC | ORS | | | | |
| Re-a | assess quality next time sy | nchronization process is executed | | | | |
| Add | a custom identifier column | to the requirement list | | Authoring | | |
| Filte | er field | | | Boilerplate group restriction | < Select a boilerplate group > | - |
| Cust | tom identifier | | | Notify authors about low quality | | |
| | no a su an an an a | | | Quality report | | |
| Use Ciald Na | condition to identify objects | 3 | | Quality report polification e-ma | ail(c) | |
| Field Na | ame | | | | | |
| Туре | | String | . | Quality report notification shar | ed resource | _ |
| Operato | or | = | - | Resource folder | | <u></u> |
| Value | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | OK Car | ncel |

i. Module.

Display the name and description of the selected module.

ii. Process.

Provides the following options:

- *Status* drop-down menu for defining the quality status for this module, as explained in Batch State.
- Save Quality Assessment in DOORS. Stores the results of the quality assessment for each metric back to DOORS. Quality information is added as new attributes to DOORS objects.
- Re-assess quality next time synchronization process is executed. By default, quality information is recalculated only if the Title, Description or content of an object is changed. By checking this option, quality will be recalculated in the next synchronization process, regardless of any change to the object.



Note: the re-assessment will be executed only once. After the next synchronization process is executed, this option will be automatically un-checked. You must explicitly check it again for the next time you want quality to be recalculated for all unmodified objects.

iii. Add a custom identifier column to the requirement list.

Defines which field of DOORS is used as an identifier for requirements. The user can choose the field defined in the filter (in Use condition to identify objects section) or a custom identifier.

iv. Use condition to identify objects.

Defines a filter according to which you can specify which objects of DOORS are actual requirements. Four fields are required for defining this filter:

- Field Name: The name of the DOORS field that is checked by the filter.
- Type: The data type of the condition to be checked. It can be String, Boolean or Number.
- Operator: A comparison operator for equality (=), non-equality (!=) and ordered comparison (>, >=, <, <=).
- Value: The result of the above comparison, as required to hold for the filter to apply.

In the example shown in the above window, the filter is defined on the PUID field, with a String data type. For the filter to apply correctly, we require that the string comparison is not equal (!=) to an empty Value. In other words, we consider requirements to be all objects that have some value defined in the PUID field.

v. Authoring.

In this section, we can define options related to authoring requirements:

• Select the group of Boilerplates over which the Boilerplates matching metric is calculated.



 Send a notification email to the author of every requirement that scores low quality.

Note: if this check box is left unchecked, no notification email will be sent.

- Specify the quality report notification
 - Specify the email address of the person who will receive the quality report, after each execution of the synchronization process.
 - Specify the shared folder where will store the quality report, after each execution of the synchronization process.

Note: if this field is left empty, no notification will be sent.

10.2 Enabling the inconsistent units global metric

RQA for DOORS can identify projects where two inconsistent units are used at the same time, in two or more different requirements. For example:

- UR001 The altimeter must calculate the altitude
- UR002 The altitude is measured in feet
- UR003 At 100 meters, the landing gear must be released automatically

A set of units is provided, but it must be enabled in the ontology.

- 1. Move to *Configuration/Magnitudes*. Unfold the contextual menu and click on *Load Default Measures and Systems*
- 2. Once the default configuration is loaded, you can add, edit or remove measures and systems
- 3. Double click on a magnitude, to add, edit or remove systems to it
- 4. Double click on a system to add, edit, or remove measures to it. Unit names and abbreviations are handled.



5. Import and export from/to a csv file

| | | | (| | |
|--------------|-----------------------|---------|--|---|-----------------|
| Requirer | ments Quality An | By T | ter for DOORS | | N |
| Objects | Manage the project ma | gnitude | 95 | | |
| Modules | Magnitude | | | | |
| onfiguration | | | | | |
| Batch state | | | | | |
| | | | | ı | |
| Metrics | | 2 | Add magnitude | | |
| | | | Edit magnitude | | |
| <u>o</u> , | | × | Delete magnitude(s) | _ | |
| Special | | | Load Default Measures and Systems | | |
| sentences | | | Import Measures And Systems from project | | |
| 作 | | | Import | | |
| lagnitudes | | | Export | | |
| | | _ | | * | |
| \sim | | | | | |
| Ontology | | | | | |
| | | | | | |
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10.3 Reviewing the quality of a module or project

The Project Manager must be able to review the quality of the corresponding projects or modules. In order to do so, the Project Manager should:

- 1. Select your project or module using the combo box in the upper part of the window
- 2. Once you have assigned a set of Quality Functions, quality can be calculated:
 - a. Manually: Move to *Objects/Objects*, select your requirements, right click and click on *Recalculate* (could be a very time consuming task)
 - b. Automatically: let the Synchronizer to calculate the quality on regular basis

Note: Remember to calculate the quality of the module in RQA and save it back in DOORS, the DOORS module must be closed, not locked and the DOORS user must have writing rights in that DOORS module.



3. A new window appears, containing the quality report for the selected Object. The report window is usually very wide, since it contains all calculated metrics and quality information organized in columns of a table. It is often the case that the BA must scroll horizontally to navigate through the report. The following three screens depict the generated report in its entire width. All calculated metrics are clearly visible in the columns of the report, while their values appear in the corresponding cells, for each object in the module.





4. Once the quality has been calculated, move to *Objects/Metrics* and see:

| Require | ments Quality Analy | zer for DOOI | 25 | | | | | | | | T | 7 |
|----------|---|---|---|---|---|--|--|---|--|--|---|---|
| noquiro | By By | The RELISE Com | nanv | | | | | | | | N | 1 |
| | | | | | | | | | | | LY. | - |
| Objects | 🙍 ISO17361 | | | | | | | | | | | |
| := | Globals statistics | | | | | | | | | | | |
| Objects | High quality: | 3 (2. | 16 %) | Most freque | ent error: | Boilerplates matching | | | | | | |
| 00,000 | Medium quality: | 111 (79 | 86 %) | | | | | | | | | |
| | Low quality | 25 (1) | 99.91 | | | | | | | | | |
| | N/A- | N/A: 0 (0.00 %) | | Least frequ | ent error: | Dependencies, Volatility | (Versioning), Su | bjective senter | ces, In-links, (| Out-links, OLE | objects, | |
| Metrics | N/A: 0 (0.00 %) | | | 1 | Volatility (Changes from | last baseline) | | | | | | |
| 20 | Number of elements: | 139 | | | | | | | | | | |
| Users | Metric | High quality | High (%) | Medium quality | Medium (% | () Low quality | Low (%) | N/A | N/A (%) | Max. | Min. | |
| 000.0 | Acronyms | 111 | 79.86 % | 0 | 0.00 * | % 28 | 20.14 % | 0 | 0.00 % | 7.00 | 0.00 | |
| | Ambiguous sente | 112 | 80.58 % | 0 | 0.00 * | % 27 | 19.42 % | 0 | 0.00 % | 4.00 | 0.00 | |
| \smile | Boilerplates match | 7 | 5.04 % | 0 | 0.00 * | % 132 | 94.96 % | 0 | 0.00 % | 1.00 | 0.00 | |
| Graphics | Conditional mode | 114 | 82.01 % | 0 | 0.00 * | % 25 | 17.99 % | 0 | 0.00 % | 5.00 | 0.00 | |
| | Connector | 111 | 79.86 % | 13 | 9.35 1 | % 15 | 10.79 % | 0 | 0.00 % | 12.00 | 0.00 | |
| | Connectors | | | | | | | | | | | |
| | Dependencies | 139 | 100.00 % | 0 | 0.00 \$ | % Ο | 0.00 % | 0 | 0.00 % | 0.00 | 0.00 | |
| | Dependencies | 139 130 | 100.00 % 93.53 % | 0 8 | 0.00 % 5.76 % | % 0 % 1 | 0.00 % 0.72 % | 0 0 | 0.00 % 0.00 % | 0.00 3.00 | 0.00 | |
| | Dependencies | 139 130 58 | 100.00 % 93.53 % 41.73 % | 0 8 13 | 0.00 5.76 9.35 | %0 %1 %68 | 0.00 % 0.72 % 48.92 % | 0 0 0 | 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 | 0.00 0.00 0.00 | |
| | Dependencies Design sentences | 139 130 58 37 | 100.00 % 93.53 % 41.73 % 26.62 % | 0 8 13 12 | 0.00 5.76 9.35 8.63 | % 0 % 1 % 68 % 90 | 0.00 % 0.72 % 48.92 % 64.75 % | 0 0 0 | 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 | 0.00 0.00 0.00 0.00 | |
| | Dependencies Dependencies Design sentences Domain concepts Domain verbs Flow sentences | 139 130 58 37 119 | 100.00 % 93.53 % 41.73 % 26.62 % 85.61 % | 0 8 13 12 19 | 0.00 5.76 9.35 8.63 13.67 | % 0 % 1 % 68 % 90 % 1 | 0.00 % 0.72 % 48.92 % 64.75 % 0.72 % | 0 0 0 0 | 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 3.00 | 0.00 0.00 0.00 0.00 0.00 | |
| | Domain concepts | 139 130 58 37 119 16 | 100.00 % 93.53 % 41.73 % 26.62 % 85.61 % 11.51 % | 0 8 13 12 19 0 | 0.00 5.76 9.35 8.63 13.67 0.00 | % 0 % 1 % 68 % 90 % 1 % 123 | 0.00 % 0.72 % 48.92 % 64.75 % 0.72 % 88.49 % | 0 0 0 0 0 | 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 3.00 5.00 | 0.00 0.00 0.00 0.00 0.00 0.00 | |
| | Design sentences Domain concepts Domain verbs Row sentences Imperative mode Implicit sentences | 139 130 58 37 119 16 133 | 100.00 % 93.53 % 41.73 % 26.62 % 85.61 % 11.51 % 95.68 % | 0 8 13 12 19 0 4 | 0.00 5.76 9.35 8.63 13.67 0.00 2.88 | % 0 % 1 % 68 % 90 % 1 % 123 % 2 | 0.00 % 0.72 % 48.92 % 64.75 % 0.72 % 88.49 % 1.44 % | 0 0 0 0 0 0 | 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 3.00 5.00 5.00 | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 | |
| | Design sentences Design sentences Domain concepts Row sentences Implicit sentences Implicit sentences | 139 130 58 37 119 16 133 86 | 100.00 % 93.53 % 41.73 % 26.62 % 85.61 % 11.51 % 95.68 % 61.87 % | 0 8 13 12 19 0 4 0 | 0.00 5.76 9.35 8.63 13.67 0.00 2.88 0.00 | x 0 x 1 x 68 x 90 x 1 x 123 x 23 x 53 | 0.00 % 0.72 % 48.92 % 64.75 % 0.72 % 88.49 % 1.44 % 38.13 % | 0 0 0 0 0 0 0 | 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 3.00 5.00 5.00 18.00 | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0 | |
| | Dependencies Design sentences Domain verbs Row sentences Imperative mode Imperative mode Import sentences Incomplete sente | 139 130 58 37 119 16 133 86 139 | 100.00 % 93.53 % 41.73 % 26.62 % 85.61 % 11.51 % 95.68 % 61.87 % 100.00 % | 0 8 13 12 19 0 4 0 0 | 0.00 5.76 9.35 8.63 13.67 2.88 0.00 2.88 0.00 0.00 | % 0 % 1 % 90 % 1 % 123 % 2 % 53 % 0 | 0.00 % 0.72 % 48.92 % 64.75 % 0.72 % 88.49 % 1.44 % 38.13 % 0.00 % | | 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 3.00 5.00 5.00 18.00 0.00 | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0 | |
| Modules | Dependencies Design sertences Domain verbs Row sentences Imperative mode Imperative mode Imperative mode Imperative sentences Incomplete sente Incomplete sentences | 139 130 58 37 119 16 133 86 139 136 | 100.00 % 93.53 % 41.73 % 26.62 % 85.61 % 11.51 % 95.68 % 61.87 % 100.00 % 97.84 % | 0 8 13 12 19 0 4 0 0 0 0 0 | 0.00 5.76 9.35 8.63 13.67 0.00 2.88 0.00 0.00 0.00 | ½ 0 ¼ 1 ¼ 68 ¼ 12 ¼ 123 ¼ 2 ¼ 53 ¼ 3 | 0.00 % 0.72 % 48.92 % 64.75 % 0.72 % 88.49 % 1.44 % 38.13 % 0.00 % 2.16 % | 0 0 0 0 0 0 0 0 0 | 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 3.00 5.00 5.00 18.00 0.00 2.00 | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0 | |
| Modules | Dependencies Design sertences Domain concepts Domain vebs Row sertences Imperative mode Imperative mode Imperative sertences Incomplete sertences Negative sertences | 139 130 58 37 119 16 133 86 139 136 136 | 100.00 % 93.53 % 41.73 % 26.62 % 85.61 % 11.51 % 95.68 % 61.87 % 100.00 % 97.84 % 96.40 % | 0 8 13 12 19 0 4 0 0 0 0 5 | 0.00 5.76 9.35 8.63 13.67 0.00 2.88 0.00 0.00 0.00 3.60 | % 0 % 1 % 68 % 90 % 123 % 22 % 53 % 0 % 33 | 0.00 % 0.72 % 48.92 % 64.75 % 0.72 % 88.49 % 1.44 % 38.13 % 0.00 % 2.16 % 0.00 % | | 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % 0.00 % | 0.00 3.00 10.00 8.00 3.00 5.00 5.00 18.00 0.00 2.00 5.00 | 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 1.00 | |

- a. How many requirements you have in high, medium or low quality
- b. Which are the most or least frequent mistakes
- c. Relevant statistical information for every metric



Project quality report

d. Metric quality information for each module can be presented as a report.

| Req | uirem | en | ts Qı | uality / | Analyz | zer fo | r DOO | RS | _ | | | | | | | 21 |
|------------------------------|-----------|----------|------------|----------|---------------|-------------|---------|---------------|----------|---------------|---------------|----------------------------|-------------------------|----------------------------------|-------------------------|----|
| | | | | | By | The RE | USE Com | pany | | | | | | | | |
| M 4 | 1 | of 1 | 11 🕨 | • | · · · · · · | | | - - | 75% | | - | | F | ind Next | | |
| Requ | ireme | nts ₀ | Qual | ity Ana | alyzer : " | for D | OORS | | | | | | | | | |
| Proje | ect qu | alit | ty re | port | | | | | | | | | | 12/4/2012 4:58:29 PM | Page 1 of 11 | |
| | High: | | | 6 226 | 1.78 % | | | Mostfr | equent e | rror. | Boile rplate: | s matching | 9 | | | |
| | Low: | | | 108 | 31.38 % | | | | | | _ | | | | | |
| | N/A: | | | 0 | 0.00 % | | | Leastfr | equent e | rror. | (Changes 1 | cies, Subje form la stb | ective sent aseline) | en œs , In -links, Out-links, OL | E objects, Vola tili ty | |
| | Total: | | | 338 | | | | | | | | | | | | |
| Metric | ; Hgh | ÷H | igh (%) | Me dium | ; Medi | um 🛫 (%) | Low 🗧 | LOW : (%) | N/A : | N/A :: (%) | Max. 🛫 | Min. 😜 | Avg. 🛫 | std. <u>∶</u> Bestusers Dev. | t Worstusers t | |
| Acronyms | 1 | 210 | 62.13 | | 0 | 0.00 | 128 | 37.87 | | 0.00 |) 16 | 0 | 1.01 | 1.87 Gauthier Fan muy | Gauthier Fanmu y | |
| Ambiguou sentence: | 15 2 5 | 259 | 76.63 | | 0 | 0.00 | 79 | 23.37 | | 0.00 | 6 | 0 | 0.39 | 0.87 Gauthier Fan muy | Gauthier Fanmu y | |
| Boilerplat matching | es | 14 | 4.14 | | 0 | 0.00 | 324 | 95.86 | | 0.00 | 1 | 0 | 0.04 | 0.20 Gauthier Fan muy | Gauthier Fanmu y | |
| Condition mode | al 1 | 232 | 68.64 | | 0 | 0.00 | 106 | 31.38 | | 0.00 |) 6 | 0 | 0.54 | 1.01 Gauthier Fanmuy | Gauthier Fanmu y | |
| Connecto | rs 2 | 256 | 75.74 | | 40 | 11.83 | 42 | 12.43 | | 0.00 | 12 | 0 | 1.02 | 1.68 Gauthier Fan muy | Gauthier Fanmu y | |
| Depende es | nci 3 | 338 | 100.00 | | 0 | 0.00 | 0 | 0.00 | | 0.00 | 0 0 | 0 | 0.00 | 0.00 Gauthier Fan muy | Gauthier Fanmu y | |
| Design sentence | 5 | 316 | 93.49 | | 18 | 5.33 | 4 | 1.18 | | 0.00 | 3 | 0 | 0.08 | 0.33 Gauthier Fan muy | Gauthier Fanmu y | |
| Domain concepts | 1 | 143 | 42.31 | | 38 | 10.85 | 159 | 47.04 | | 0.00 | 32 | 0 | 2.11 | 3.23 Gauthier Fanmuy | Gauthier Fanmu y | |
| Dom ain verb s | | 75 | 22.19 | | 39 | 11.54 | 22.4 | 66.27 | | 0.00 | 13 | 0 | 0.90 | 1.50 Gauthier Fanmuy | Gauthier Fanmu y | _ |
| Flow sentence: | 5 | 279 | 82.54 | | 54 | 15.98 | 5 | 1.48 | | 0.00 C |) 4 | 0 | 0.25 | 0.82 Gauthier Fan muy | Gauthier Fanmu y | |
| Imperativ mode | 2 | 22 | 6.51 | | 0 | 0.00 | 316 | 93.49 | | 0.00 |) 5 | 0 | 0.17 | 0.85 Gauthier Fan muy | Gauthier Fanmu y | |
| Implicit sentence | s | 315 | 93.20 | | 19 | 5.82 | 4 | 1.18 | | 0.00 | 8 | 0 | 0.33 | 0.88 Gauthier Fan muy | Gauthier Fanmu y | |
| Incomple sentence | te 1 s | 237 | 70.12 | | 0 | 0.00 | 101 | 29.88 | | 0.00 |) 18 | 0 | 0.95 | 2.09 Gauthier Fan muy | Gauthier Fanmu y | |
| In-links | 1 | 338 | 100.00 | | 0 | 0.00 | 0 | 0.00 | | 0.00 | 0 0 | 0 | 0.00 | 0.00 Gauthier Fan muy | Gauthier Fanmu y | |
| Negative sentence | s | 328 | 97.04 | | 0 | 0.00 | 10 | 2.96 | | 0.00 |) 5 | 0 | 0.16 | 0.54 Gauthier Fan muy | Gauthier Fanmuy | |
| Nesting levels | | 266 | 78.70 | | 72 | 21.30 | 0 | 0.00 | | 0.00 |) 5 | 1 | 3.41 | 1.11 Gauthier Fan muy | Gauthier Fanmu y | |
| Number o chars between | of 3 | 302 | 89.35 | | 29 | 8.58 | 7 | 2.07 | | 0.00 | 211 | 0 | 39.43 | 32.00 Gauthier Fan muy | Gauthier Fanmu y | |

5. Export this statistical information to a *csv* file using the contextual menu



All of this statistical information can be broken down by users:

- 1. Move to Objects/Users and select a single user
- 2. All of the information should be related to this Business Analyst (BA)

| equiren | nents Quality Ana | alyzer for DOO | RS | | | | | | | | 1 | 1 |
|----------|----------------------|--------------------|-------------|------------------|-----------------|-------------|---------|--------------------|------------|-------------|--------------|-------|
| | | By The REUSE Com | pany | | | | | | | | | / |
| bjects | 🙀 ISO17361 | | | | | | | | | | | |
| = | Lears statistics | | | | | | | | | | | |
| | Lleer | Lieb quality Lie | . (%) Modiu | m quality Madium | (%) Low quality | low (%) | NI/A | N/A (%) Most from | ont orror | Logat from | ont orror | - |
| bjects | Oser | nigri quality nigi | 1 (%) Wediu | m quality Medium | (%) Low quality | LOW (%) | N/A | N/A (%) Most frequ | encenor | Least riequ | ent enor | -1-1 |
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| etrics | | | | | | | | | | | | |
| | • | | | | | | | | | | | |
| 2 | Metric | High quality | High (%) | Medium quality | Medium (%) | Low quality | Low (%) | N/A | N/A (%) | Max. | Min. | ī |
| sers | Acronyms | 111 | 79.86 % | 0 | 0.00 % | 28 | 20 14 % | 0 | 0.00 % | 7.00 | 0.00 | ï |
| | Ambiguous sente | 112 | 80.58 % | 0 | 0.00 % | 27 | 19.42 % | ō | 0.00 % | 4.00 | 0.00 | 1 |
|) | Boilerplates match. | . 7 | 5.04 % | ō | 0.00 % | 132 | 94,96 % | ō | 0.00 % | 1.00 | 0.00 | 1 |
| nhice | Conditional mode | 114 | 82.01 % | 0 | 0.00 % | 25 | 17.99 % | 0 | 0.00 % | 5.00 | 0.00 | |
| ipinos | Connectors | 111 | 79.86 % | 13 | 9.35 % | 15 | 10.79 % | 0 | 0.00 % | 12.00 | 0.00 | |
| | Dependencies | 139 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | 0 | 0.00 % | 0.00 | 0.00 | į. |
| | 💼 Design sentences | 130 | 93.53 % | 8 | 5.76 % | 1 | 0.72 % | 0 | 0.00 % | 3.00 | 0.00 | į. |
| | Domain concepts | 58 | 41.73 % | 13 | 9.35 % | 68 | 48.92 % | 0 | 0.00 % | 10.00 | 0.00 | |
| | 💼 Domain verbs | 37 | 26.62 % | 12 | 8.63 % | 90 | 64.75 % | 0 | 0.00 % | 8.00 | 0.00 | |
| | How sentences | 119 | 85.61 % | 19 | 13.67 % | 1 | 0.72 % | 0 | 0.00 % | 3.00 | 0.00 | J. |
| | 💼 Imperative mode | 16 | 11.51 % | 0 | 0.00 % | 123 | 88.49 % | 0 | 0.00 % | 5.00 | 0.00 | J. |
| | 💼 Implicit sentences | 133 | 95.68 % | 4 | 2.88 % | 2 | 1.44 % | 0 | 0.00 % | 5.00 | 0.00 | J. |
| | Incomplete sente | 86 | 61.87 % | 0 | 0.00 % | 53 | 38.13 % | 0 | 0.00 % | 18.00 | 0.00 | J. |
| | 💼 In-links | 139 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | 0 | 0.00 % | 0.00 | 0.00 | |
| lulae | Negative sentences | s 136 | 97.84 % | 0 | 0.00 % | 3 | 2.16 % | 0 | 0.00 % | 2.00 | 0.00 | |
| 10105 | Nesting levels | 134 | 96.40 % | 5 | 3.60 % | 0 | 0.00 % | 0 | 0.00 % | 5.00 | 1.00 | |
| | Number of chars | 127 | 91.37 % | 11 | 7.91 % | 1 | 0.72 % | 0 | 0.00 % | 144.00 | 0.00 | J. |
| guration | | | | | | | | | | | | |

The statistical information could be also depicted as dynamic graphs:



Move to Objects/Graphics and create your dynamic graph using all of the data provided by RQA





11. RQA for Business Analysts

11.1 Analyzing the quality of a requirement

The Business Analyst (BA) of the project must be able to check the quality of your requirements as they are being written (on-the-fly). The BA must also be able to see the aggregated quality of your requirements in the corresponding project.

11.2 Analyzing the quality of an individual requirement

- 1. Move to Objects/Objects
- 2. Select the module you want to analyze using the combo box in the upper part of the window
- 3. If needed, select your requirements and click on *Recalculate* in order to calculate again (or for the very first time) the quality of the selected requirements
- 4. A couple of columns help you deciding which requirements you should focus on:
 - a. Quality: contains a label corresponding to high, medium or low quality
 - b. Quality value: helps you prioritizing your requirements

| equire | ments Quality Analyzer for | DOORS | | | | 5 | 1 |
|---------|------------------------------------|--|---------------|---------|---------|---------------|-----|
| | By The REI | JSE Company | | | | \mathbb{D} | |
| Objects | ISO17361 | | | | | | |
| := | Madula maximmenta: | | | | | | |
| • | | | | | | | |
| Objects | Quality Assessment by: < All metro | \$> | | | | | |
| 0 | Absol Object heading | Object description | Parent module | Quality | No. met | Quality value | Qua |
| | Scope | | ISO17361 | Medium | 0 | 17.467 | 12/ |
| Users | 🖹 IS | This International Standard specifies the | ISO17361 | Low | 1 | 0.500 | 12/ |
| | IS Normative references | | ISO17361 | Medium | 0 | 15.867 | 12/ |
| | 🖹 IS | The following referenced documents are in | ISO17361 | Medium | 0 | 13.667 | 12/ |
| | IS Terms and definition | - | ISO17361 | Medium | 0 | 16.200 | 12/ |
| | 📑 IS | For the purposes of this document, the follo | ISO17361 | Medium | 0 | 16.833 | 12/ |
| | 🖹 IS | 3.1lanearea of roadway that a vehicle woul | ISO17361 | Low | 1 | 0.500 | 12/ |
| | 🖹 IS | 3.2visible lane markingdelineators intention | ISO17361 | Medium | 0 | 14.900 | 12/ |
| | 🖹 IS | 3.3incidental visible road feature visible pat | ISO17361 | Medium | 0 | 13.600 | 12/ |
| | 🖹 IS | 3.4lane boundaryborderline of the lane, situ | ISO17361 | Medium | 0 | 14.267 | 12/ |
| | 🖹 IS | 3.5default lane width predetermined width | ISO17361 | Medium | 0 | 14.900 | 12/ |
| | 🖹 IS | 3.6departure situation in which the outside | ISO17361 | Medium | 0 | 15.533 | 12/ |
| | 🖹 IS | 3.7ane departure point of departure across | ISO17361 | Medium | 0 | 16.200 | 12/ |
| | E IS | 3.8rate of departure. Vsubject vehicle's ap. | ISO17361 | Medium | 0 | 16.833 | 12/ |
| | IS | 3.9time to line crossing TTLCcalculated tim | ISO17361 | Medium | 0 | 14.600 | 12/ |
| | 🖹 IS | 3.10warning issue point measured location | ISO17361 | Medium | 0 | 16.500 | 12/ |
| | E IS | 3.11warning thresholdlocation where the w | ISO17361 | Medium | Ō | 14.267 | 12/ |
| | 🖹 IS | 3.12waming threshold placement zonezon | ISO17361 | Medium | 0 | 13.300 | 12/ |
| | 🖹 IS | 3.13waming conditioncondition in which de | ISO17361 | Medium | 0 | 15.567 | 12/ |
| | 🖹 IS | 3.14repeatabilityability of a certain percenta | ISO17361 | Medium | Ō | 16.833 | 12/ |
| | I IS | 3.15false alamalam that is issued when th | ISO17361 | Medium | 0 | 14.600 | 12/ |
| | | | | | | | |

5. Now, double click (or use the contextual menu and *View Quality*) in order to get deeper into the quality of an individual requirement

 LEGATEC Technology Park | Margarita Salas 16, 2nd Floor | 28919 Leganés – Madrid - SPAIN Tel.: (+34) 91 146 00 30 | Fax: (+34) 91 680 98 26 | contact@reusecompany.com | www.reusecompany.com



- 6. You can see the result of the quality assessment, but you also see:
 - a. A summary with all the recommendations made by RQA
 - b. The result for every individual Metric
 - c. Which are the terms detected by RQA that appears in your requirement (domain terms, domain verbs, conditional sentences, imperative sentences, forbidden sentences...)

| equirements Quality | Analyzer fo | r DOOF | RS | | | 21 | |
|---|--|--|--|--|--|----------------------------|--|
| | By The RE | USE Comp | bany | | | | |
| equirements Quality Analyzer for | DOORS assessme | nt Manua | al Assesment | | | | |
| Original quality assessment: | Low | | | New quality assessment: | Low 12/11/2012 11:10:56 AM | | |
| Original quality date: | 12/11/2012 10:5 | 9:15 AM | | New quality date: | | | |
| Original quality summary: | Long requirements (measured in number of words) must be avoided incomplete sentences must be avoided.() such as Conditional sentences must be | | | New quality summary: | Long requirements (measured in number of words) must be avoided Incomplete sentences must be avoided:(,), such as Conditional sentences must be avoided:may At least one imperative verb must be involved | | |
| | | | | | ı · | | |
| bject original data Object data | Metrics Textua | I metrics (| Quality forums | Recomendation | · · | Affects overall | |
| bject original data Object data | Metrics Textua | I metrics 0 | Quality forums | Recomendation | | Affects overall quality | |
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| d | Ι. | Read | and | write | a qual | ity f | forum | system | for | every | ' requir | ement |
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| | ĺ | 🟹 Quality post | | | |
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| | | Quality post Author Title Description | Administrator | | |
| | | | | Accept Cancel | |
| Object quality assessment | | | | | - • 💌 |
| Requirements Qualit | y Analyzer f o | DOORS | | | N |
| Requirements Quality Analyzer for | r DOORS assessme | ent Manual Assesment | | | |
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| Original quality assessment: | Low | | New quality assessment: | Low | |
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| Object original data Object data | Metrics Textus | al metrics Quality forums | | | |
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e. Quality information for each object can be presented as a report.

| 🟹 Object quality assessme | nt report | | | | - • • |
|---------------------------|---|--|---|--|-------|
| Requirements Qu | ality Analyzer for DC | ORS | | | 51 |
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| | by The REUSE C | ompany | | | |
| | N 4 🛞 🚱 🖨 💷 🖡 | □ 🔍 - 75% - | Find Next | | |
| Requirements Qual | ity Analyzer for DOOF | RS | | 5/ | · |
| by The RE | USE Company | | | V | |
| Object quality as | sessment report | | 12/4/2012 5:03:41 PM | Page 1 of | 2 |
| Project: | DQA LDWS | | | | |
| Module: | ISO17361 | | | | |
| Code: | | | | | |
| Name: | | | | | |
| De scription: | This In terna fonal Standard spec lane departure warning systems. The subject system, which may markings. The issuance of warni scope of this International Standa take anyautomatic action to preve | Fes the definition of the system, classification, function These are in-which is systems hatcan warn the driver tilize optical, electromagnetic, GPS or other sensor tack gras at toadway sections having temporary or irregula d. This International Standard applies to passenger or ti possible lane departures. Responsibility for the safe | ns, human-machine interface (HM) and te- of a lane departure on high ways and high mologies, issues a warning consistent wir r lane markings (such as roadwork zones) ars, commercial vehicles and buses. The - operation of the vehicle remains with the di | stmethods for way-like roads. In the visible lane) is notwithin the system will not river. | |
| Quality: | low | | | | |
| Quality date: | 12/4/2012 4:53:44 PM | | | | E |
| Recomendation: | Long requirements (measured in nomplete sentences must be a Ambiguous sentences must be a The number of domain concept in The number of domain web must the number of domain web must have the number of domain web must Audi using aconyns which are n Audi using aconyns which are havid using bu manyoegative gen implicit sentences must be a vide Audi using bu manyoegative gen might sentences must be a vide Audi using bu used acording to Oul-links must be used acording The number of sets not recognize | umber of kvords) must be skolded oded (kb), (kb), skoh as olded ann, (kb), uas the reduxed buses, warm, warming break and buses, warm, warming of ded and (hb), end (hb), of ded and (hb), end (hb), of ded and (hb), end (hb), of ded and (hb), end of ded and (hb), end the guidelines and policies of your organization. The guidelines and policies of your organization. | ;e, system (12), systems, warning e, | | |
| Metric s | - Value - Quality | + Descendation | + Conformat | - Affects - | |
| web to | value , quality | , Necomentation | , Jerkennes | overall | |
| Acronyms | 2 Low | Avoid using acronyms which are not declared in to the ontology | GPS, HMI | No | |
| Ambiguous senten œs | 2 Low | Ambiguous sentences must be a wided | any, safe | No | |
| Boilerplates matching | 0 Low | The structure of the requirement must follow of the boilerplates | one | No | |
| Conditional mode | 2 Low | Conditional sentences must be a wided. | cain (x2) | Yes | |
| Connectors | 5 Low | Avoid using too manyconnectors. | and (x3), or (x2) | No | |
| Dependencies | 0 High | | | No | |
| Design sentences | 0 High | | | No | |
| Domain concepts | 9 Low | The number of domain concepts must be reduced | buses, driver, functions, operation, scope, system (x2), systems, warning | No | |



Using all the information provided by these dialogs, try to correct the problems of your requirements. Once a requirement has been re-written, you are able to:

- Calculate the quality of the new text as many times as needed
- Reload the original text from DOORS
- Save your new text to DOORS
- Open the current requirement in DOORS

| equirements Qualit | y Analyzer for DOORS | | | | |
|---|--|---|--|--|--|
| | By The REUSE Company | | LY | | |
| Requirements Quality Analyzer for | DOORS assessment Manual Assesment | | | | |
| Original quality assessment: | Low | New quality assessment: | Low | | |
| Original quality date: | 12/11/2012 10:59:15 AM | New quality date: | 12/11/2012 11:10:56 AM | | |
| Original quality summary: | Long requirements (measured in number of words) must be avoided Incomplete sentences must be avoided:(,), such as Conditional sentences must be | New quality summary: | Long requirements (measured in number of words) must be avoided Incomplete sentences must be avoided:(,), such as Conditional sentences must be avoided may At least one imperative verb must be involved | | |
| Lane lines are broken w 3.0 m line segments with | vhite lines normally with segments and 1 6,0 m gaps. On high-speed roads suc | gaps in a 1:2 ratio. A rec h as freeways, a segmen | ommended pattern is t-to-gap ratio of 1:3 (3,0 😥 🏠 Conditional mode | | |



Every requirement implements a forum system. The Project Manager and Business Analysts can interchange messages regarding quality metrics:

- 1. Go to Quality Forum tab
- 2. Use the contextual menu to add:
 - a. New threads
 - b. New comments to an existing thread

| 🟹 Object quality assessment | | | | | | |
|-----------------------------------|---|------------------------------------|--|--|---|-------|
| Requirements Quality | y Analyzer for DOORS | | | | 5 | 1 |
| | By The REUSE Company | | | | | |
| Requirements Quality Analyzer for | DOORS assessment Manual Assesment | | | | | |
| Original quality assessment: | Low | New quality assessment: | Low | | | |
| Original quality date: | 12/11/2012 10:59:15 AM | New quality date: | 12/11/2012 11:10:56 AM | | | |
| Original quality summary: | Long requirements (measured in number of words) must be avoided Incomplete sentences must be avoided:(), such as Conditional sentences must be | New quality summary: | Long requirements (measur avoided Incomplete sentences mus Conditional sentences mus At least one imperative ver | red in number of t be avoided:(,), t be avoided.:ma b must be involv | words) must be , such as ay ed | • |
| Object original data Object data | Metrics Textual metrics Quality forums | | | | | |
| Title | Description | | | Author | Date | |
| Remember not to add too much | detail to user requirements | | | Administrator | 12/11/2012 11:0 | MA 80 |
| OK | Yes, I have summa | nized the requirement and I will a | add more | JMFuentes | 12/11/2012 11:1 | 2 AM |
| Help Create report | : < <u>P</u> revious <u>N</u> ext > R | calculate qualit | y Open in DOORS | <u>S</u> ave in DOO | DRS <u>C</u> lo | ose |



11.3 Aggregating the quality of all of your requirements

The BA of the project should not have Admin privileges in RQA. Therefore, a BA can only aggregate the quality of the requirements written by them. In order to do so, a BA should:

- 1. Move to *Objects/Users* and find out which are your most/least frequent mistakes, statistical information about every metric...
- 2. Export this statistical information into a .csv file if needed

| equirer | nents Quality Ana | lyzer for DOO | RS | | | | | | 5/ |
|---------|--------------------|-------------------|------------|-------------------|-----------------|-------------|----------|------------------|---------------|
| | I | By The REUSE Com | pany | | | | | | V |
| Objects | KISO17361 | | | | | | | | |
| Ξ | Users statistics | | | | | | | | |
| Objects | User | High quality High | n (%) Medi | um quality Medium | (%) Low quality | Low (%) | N/A | N/A (%) Most fre | quent error |
| 50,0015 | IMEventes | 0 0 | 00 % | 0 0 00 | 1% 1 | 100.00 % | 0 | 0.00 % Boilemi | ates matching |
| Users | | | | | | | | | |
| | • | | | | | | | | |
| | Metric | High quality | High (%) | Medium quality | Medium (%) | Low quality | Low (%) | N/A | N/A (%) |
| | Acronyms | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | Ambiguous sente | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | Boilerplates match | 0 | 0.00 % | 0 | 0.00 % | 1 | 100.00 % | (| 0.00 % |
| | Conditional mode | 0 | 0.00 % | 0 | 0.00 % | 1 | 100.00 % | (| 0.00 % |
| | Connectors | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | Dependencies | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | 💼 Design sentences | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | 💼 Domain concepts | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | 🚹 Domain verbs | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | How sentences | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | imperative mode | 0 | 0.00 % | 0 | 0.00 % | 1 | 100.00 % | (| 0.00 % |
| | inplicit sentences | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | Incomplete sente | 0 | 0.00 % | 0 | 0.00 % | 1 | 100.00 % | (| 0.00 % |
| | 💼 In-links | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | Negative sentences | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| | Nesting levels | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| lodules | Number of chars | 1 | 100.00 % | 0 | 0.00 % | 0 | 0.00 % | (| 0.00 % |
| Help | | | 100.00.0 | • | 0.00.0 | • | 0.00.07 | , | 0.00.0 |

a. Use the contextual menu for this purpose



11.4 Looking for inconsistent units

RQA is able to detect the usage of inconsistent units within the same project. For instance, meters and yards should not be mixed together in a project. This task is not executed in the RQA Client; instead, it is executed by the Batch Process (Synchronizer). This task is executed for every module with metrics and batch state ON. But the results can be reviewed with the Client.

Click on Modules/Measures compatibilities





Compatibility quality information can be presented as a report.

| 🟹 Incompa | tible units report | | | | | | - • • |
|-----------|-------------------------|-------------|--------------|-------------|--|---|--|
| Require | ements Quality / | Analyzer | for DOORS | | | | 5/1 |
| | | By The F | | | | | |
| ∢ ∢ 1 | of 2 🕨 🔰 🐗 | 🛞 🚯 🕯 | • | Find Next | | | |
| Requirer | nents Quality Ana | lyzer for l | DOORS | | | | |
| | by The REUSE Company | y | | | | | |
| Incompa | atible units repo | ort | | | | 12/4/2012 5:30:47 PM | Page 1 c |
| | Batch process date: | : 12/4/201 | 2 5:27:57 PM | | | | |
| Magnitude | Measurement System | Module | Object code | Header | | Description | |
| Length | British imporial system | | | | | | |
| | ontish inpenarsystem | ISO17381 | | | | | |
| | | | 6525 | | | 3.11 warning threshold location where the warnin road, which corresponds t point set in the system NOTE 1 in the case of TT threshold shifts depending departure NOTE 2 The warning three the warning threshold plac Figure 1) The test course shall be s | g is issued on the to a warning trigg LC, the warning g on the rate of shold is placed w sement zone (see set to within i10 9 |
| | | | ee20 | | | the minimum radius of ou Table 1 for the relevant of be of sufficient length in o minimum vehicle speed (' mis for Class II) to allow o at a rate of departure of 0 Other characteristics Pavement marker installa California standard plans Raised pavement markers | Invature specified ass. The course s rider to maintain (17 mls for Class ' trifting out of the I < V G 0.8 mis. tion based on a may be used in |
| • | | | | | | place of existed string in a | mark inn Californir |

11.5 Looking for overlapping requirements

RQA is able to generate a matrix of overlapping requirements for different purposes:

- Overlapping requirements in the same module: redundancies may lead to incompatibilities and rework.
- Overlapping requirements between user and system requirements: it can be a helpful tool to elicit traceability.



You must use the RQA Client to program the overlapping task and later on review the results. However, this process is always executed by the Synchronizer (it is a time consuming task).

| 🛛 Requiremen | nts Quality Ar | nalyzer for DOC |)RS [36678@W | 7X86ENG-PC - | DQA LDWS (| Administr | ator)] | | | |
|-----------------|----------------|-----------------|----------------|--------------|--------------|--------------|---------------|-----------------------------|---------------|------------|
| Requirem | ients Qua | ality Analy | zer for DOC | ORS | | | | | | 5/1 |
| | | By | The REUSE Co | mpany | | | | | | |
| Objects | Overlapping | Tasks | | | | | | | | |
| Modules | Source | Module | Target project | Module | Creation | | Resolved | Release on | User | |
| 14 <u>5</u> 500 | DQA LDWS | ISO17361 | DQA LDWS | LDWS NHTSA | 11/30/2012 | 3:10:07 PM | | 2/28/2013 3:10:02 PM | Administrator | |
| Measure | DQA LDWS | ISO17361 | DQA LDWS | ISO17361 | 11/30/2012 | 3:18:49 PM | | 2/28/2013 3:18:42 PM | Administrator | |
| compatibilities | | | | | | | | | | |
| | | | | | | | | | | |
| Overlapping | | | | | | | | | | |
| Server. | Results | | | | | | | | | |
| Completeness | Source Code | Source Name | Source De | escription | Targ Code | et Tar | get Name | Target Description | Link | Similarity |
| | | | | | | | | | | |
| Configuration | | | | | | | | | | |
| Heln | Similarity | | | 100 | Object de | eletion only | enabled on co | nnected project | | 0 Results |
| Exit | Ginnanty |) | | 100 | Link only | available b | etween object | s on then connected project | | |

Creating an overlapping task:

- 1. Move to *Modules/Overlapping*
- 2. Use the contextual menu or the buttons to create a new overlapping task
- 3. Select the source module you want to analyze
- 4. Target could be the same module, or another module in the same project: click on *Existing connection*
- 5. Target could also be placed in a different project: click on New connection
- 6. Unfold the *Module* combo box to select the target module



7. Overlapping results will be automatically removed from the database in the date selected in this dialog box: *Release on* data field

| 🕅 New Overlapping | g Task | × |
|--|---|-----|
| Select the module f connection or new | from source or leave it blank to process all modules. Then select existing connection to set the target project. | |
| Database: | 36678@W7X86ENG-PC | |
| Project: | DQA LDWS | |
| Module: | ISO17361 | • |
| Target | | |
| Database: | 36678@W7X86ENG-PC | |
| Project: | DQA LDWS | |
| Module: | < Select a module > Select a module > ISO17361 LDWS NHTSA | |
| Release on: | Z8/ February /2013 | cel |



Reviewing overlapping results:

- 1. Move to Modules/Overlapping
- 2. Select the overlapping task you want to review

| 🚺 Requireme | ents Quality Ar | halyzer for DOO |)RS [36678@W7 | X86ENG-PC - I | DQA LDWS (Ad | ministrator)] | | | | |
|-----------------------|--|---|-------------------------------------|---------------|--|--------------------|--|--|-----------------|---|
| Requirer | nents Qua | ality Analy. By | ZER FOR DOO The REUSE Cor | IRS npany | | | | | | |
| Objects | Overlapping | Tasks | | | | | | | | |
| Modules | Source | Module | Target project | Module | Creation | Resolve | d | Release on | User | |
| | DQA LDWS | ISO17361 | DQA LDWS | LDWS NHTSA | 11/30/2012 3:10 | D:07 PM 11/30/2 |)12 3:14:21 PM | 2/28/2013 3:10:02 Pf | M Administrator | |
| [1] | | | | | | | | | | |
| leasure | | | | | | | | | | |
| Inpaubinues | | | | | | | | | | |
| | | | | | | | | | | |
|)verlapping | | | | | | | | | | |
| rendpping | | | | | | | | | | |
| Serena Serena | Results | | | | | | | | | |
| ompleteness | Source Code | Source Name | Source Des | cription | Target Code | Target Name | Target Des | cription | Link | Similarity |
| | ISO1736 | General | | | 13 | | Circular conducted | e roadway departur | | 100 |
| | 1901726 | | | | | | Single vehic | e loauway uepaitui | | |
| | 1301730 | General | | | 23 | | The commer | cial vehicle populati | | 100 |
| | ISO1736 | General General | | | 23 285 | | The commer General Esti | cial vehicle populati nates System | | 100 100 |
| | ISO1736 ISO1736 | General General General | | | 23 285 13 | | The commer General Estin Single vehic | cial vehicle populati nates System e roadway departur | | 100 100 100 |
| | ISO1736 ISO1736 ISO1736 | General General General General | | | 23 285 13 23 | | The commer General Estir Single vehic The commer | cial vehicle populati nates System e roadway departur cial vehicle populati | | 100 100 100 100 |
| | ISO1736 ISO1736 ISO1736 ISO1736 | General General General General General | | | 23 285 13 23 285 | | The commer General Esti Single vehic The commer General Esti | cial vehicle populati nates System e roadway departur cial vehicle populati nates System | | 100 100 100 100 100 |
| | ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 | General General General General General | | | 23 285 13 23 285 13 | | The commer General Estin Single vehic The commer General Estin Single vehic | cial vehicle populati nates System e roadway departur cial vehicle populati nates System e roadway departur | | 100 100 100 100 100 100 |
| | ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 | General General General General General General | | | 23 285 13 23 285 13 23 | | Single venic The commer General Esti Single vehic The commer General Esti Single vehic The commer | cial vehicle populati nates System e roadway departur cial vehicle populati nates System e roadway departur cial vehicle populati | | 100 100 100 100 100 100 |
| | ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 | General General General General General General General | | | 23 285 13 285 285 13 23 285 | | Single Venic The commer General Esti Single vehic General Esti Single vehic The commer General Esti | cial vehicle populati nates System e roadway departur cial vehicle populati nates System e roadway departur cial vehicle populati nates System | | 100 100 100 100 100 100 100 |
| onfiguration | ISO 1736 ISO 1736 ISO 1736 ISO 1736 ISO 1736 ISO 1736 ISO 1736 ISO 1736 | General General General General General General General | | | 23 285 13 285 13 285 13 23 285 | | Single Venic The commer General Esti Single vehic The commer General Esti Single vehic The commer General Esti | cial vehicle populati nates System e roadway departur cial vehicle populati nates System e roadway departur cial vehicle populati nates System | | 100 100 100 100 100 100 100 20. Besult |
| Configuration Help | ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 ISO1736 Similarity | General General General General General General General | | 100 | 23 285 13 285 13 285 23 23 285 Object delet | ion only enabled o | The commer General Esti Single vehic The commer General Esti Single vehic The commer General Esti n connected pr | cial vehicle populati nates System e roadway departur cial vehicle populati nates System e roadway departur cial vehicle populati nates System oject | | 100 100 100 100 100 100 100 20 Result |

- 3. Identical requirements will arise with a similarity value of 100%
- 4. Other overlapped (not identical) requirements will be shown with a lower similarity value: move the *Similarity* slider to show more or less pairs
- 5. Use the contextual menu and Show overlapped objects



- 6. With this dialog, you'll be able to:
 - a. Check the text of both requirements (one from the source module and another one from the target module)
 - b. Open one of the requirement (source or target) in DOORS
 - c. Open one of the requirements in the RQA edit dialog
 - d. Move to the next or previous couple of requirements

| Source objec Date: | t state(at the last batch process execution) 30/11/2012 15:14:21 | | Destination of Date: | object state (at the last batch process execution) 30/11/2012 15:14:21 | |
|-----------------------|---|---|----------------------|--|-------|
| Code: | ISO17361-161 | | Code: | 23 | |
| Name: | General | * | Name: | | * |
| | | - | | | Ŧ |
| Description: | | • | Description: | The commercial vehicle population is comprised of a wide variety of vehicle types and uses. At a high level, two types of vehicles are predominant, combination vehicles (tractors-trailers) and straight trucks. These two types of vehicles have very different operating characteristics. In general, straight trucks tend to be used in a more local setting and provide deliveries of goods and services to customers generally within a 50 to 100 mile radius of their base of operations. Combination vehicles are more often utilized in regional and long distance applications, and account for about | * III |
| | Edit source object Open in DOORS | | | Edit destination object Open in DOORS | |



7. Overlapping quality information can be presented as a report

| Overlapping task results report | | | | | |
|--|--------------------------------|---------------------------|--|---------------|---|
| Requirements Quality Analyzer for DOORS | | | | 5 | 1 |
| By The REUSE Company | | | | | |
| I | 75% | • | Find Next | | |
| Requirements Quality Analyzer for DOORS | | | | | Â |
| Overlapping task results report | | | 12/4/2012 5:35:26 PM | Page 1 of 5 | |
| Source project: DQALDWS Source module: ISO17381 | Target projec Target module | : DQALDWS : LDWS NHTSA | | | |
| Source object | Target object | | | | |
| Code Header Description | Code ‡ | Header | Description | Sim ilarity 🌻 | |
| ISO17361-36 Test course conditions | 385 | | LDWS should issue lane departure warnings on straight roadways as described in R1-8. LDWS should also issue warnings when at least one of the roadwaycurwature last conditions listed in Table 1 is encountered [8] <htp: facts-<br="" www.fm.csa.dot.gov="">researd/ivesard/hume/fane-departure- tworning-systems.htm> Table 1 - LDWS Warning Curved Roadway? testConditions Condition Road Curve ture Radius Condition Operasting Speed 1 (MetrioUnits) > 250 m <72 kph, > 01 kph 1 (English Units) > 1640 feet > 2 (MetrioUnits) > 1640 feet > 3 (Small States) feet > 3 (Small Sta</htp:> | 100 | |
| ISO17381-45 Procedure | 152 | | The SAE has de veloped a comprehensive standard that describes various a spects of the heavytruck environment in its J1455 standard, which includes procedures to verifysystem compliance. | 100 | |
| ISO17381-148 General | 13 | | Single vehicle roadwaydeparture : LOWS is sue a warning as the truck crosses the shoulder lane marking. Without the system, the truck maybe driven off the shoulder and crash in to off road | 100 | Ŧ |

Acting with the overlapping results: the actions allowed by RQA Client, for every couple of overlapped requirements, are the following:

- Delete source: deletes the overlapped requirements in the source module
- Delete target: deletes the overlapped requirements in the target module



- Link: use this dialog box to easily create a link between source and target requirements
 - RQA links are stored in the DOORS database
 - RQA links are based on the link modules already existing in the DOORS database

| to add the link. | |
|------------------|---|
| Source | |
| Code: ISO173 | 61-36 |
| Name: Test co | urse conditions |
| Target | |
| Code: 385 | |
| Name: | |
| | |
| Link | |
| Link module: | < Select link module > |
| Description | < Select link module > DOORS Links (DOORS Links) |
| | |
| | |
| | |
| | |
| | |



11.6 Assessing completeness for your requirements

RQA is able to group each requirement in each group and boilerplate which it belongs to. This task is not executed in the RQA Client; instead, it is executed by the Batch Process (Synchronizer). This task is executed for every module with metrics and batch state ON. But the results can be reviewed with the Client.

Click on *Modules/Completeness*





Completeness quality information can be presented as a report.

| 🟹 Completeness repo | rt | | | |
|-------------------------|----------------|----------------------|--|-----|
| Requirements | Quality | Analyzer for DOORS | | 5/1 |
| - | - | By The REUSE Company | | |
| l≰ ≰ 1 of 1 | ▶ N I 4 | 🔊 🚱 📇 🗐 🖬 属 🗸 75% | Find Next | |
| Dequiremente O | | eluzer for DOODS | | |
| Requirements Q | | alyzer for DOORS | | |
| | ie REUSE Compa | sny | 12/4/2012 5:01:09 PM | |
| Completeness | report | | rzerzorz 3.01.001 m Page 1.011 | |
| Boilerplate Boilerplate | Module | Object code Header | Description | |
| Grupo 1 | name | | | |
| Requirement | t | | | = |
| | LDWS NHTSA | | | |
| | | 10 | Some of these LUWS may be installed directly by the fleets as an altermarket accessory, while dher LDWS are installed by truck. Original Equipment Manufactures (OEMs) when the vehicles are manufactured. As technology advances, new features and components may be added to the set systems. | |
| | | 115 | The data may be obtained via the On-Board Diagnos tic (OBD) connector from one of the in-vehicle data networks, J1708 or J1939, as defined by their respective Society of Automotive Engineers (SAE) standards. | |
| | | 415 | LDWS should include a visual indicator to indicate when the system is not tracking the vehicle's position in the lane. This status may be indicated by an ins turnent panel warning light or an indicator that is integral to LDWS. | |
| | | 418 | LDWSs hould use a visual indicator to indicate that the system is operational and ready to function. This status may be indicated by an instrument panel warning light or an indicator that is integral to LDWS. | |
| | | 417 | LDWS should use a visual or audible indicator to indicate a system failure or malfunction. This status may be indicated by an instrument panel warning light or an indicator that is integral to LDWS. | |
| | | 428 | Users should be provided with a manual and training for LDWS. All application software programs should include installation instructions and user manuals. | |
| | | 430 | OPTIONAL : Video, audio, or computer-based training material may be provided for fleet management and/or drivers | |
| | ISO17381 | | | |
| | | ISO17361-18 | a) Warning presentation An easily perceivable haptic and/or audible warning shall be provided. | |
| | | 1SO17381-20 | c) Indication of the system status. The system status shall be indicated to the driver. The system status indication shall be easy to understand for the driver. If a failure is detected during system start-up or operation, or a system incapable is detected during operation, the driver shall be informed. Any symbol used to notify the driver shall be a standard symbol. For example, if a system bit used to notify the driver shall be a standard exotifs. | |
| | | ISO17381-24 | symbol s hall be the standard symbol for that mess age. a) The system may be fitted with a system on/off control that can be operated | - |
| | | | , | |



12. Exiting the RQA Client

If you wish to exit the RQA Client at whichever time, please select the *Exit* tab on the left. The following dialog will appear:



- Click Exit Project if you wish to stay in the RQA Client and later open a new project.
- Click Exit RQA if you wish to exit the RQA Client.



13. Accessing the RAT Client

The RAT Client can be launched using the Windows Start Menu



13.1 Providing a valid client license

Floating (server based) license:



| 🕅 RAT Client: Licer | se Configuration | | |
|--------------------------------------|--------------------------------------|--------------------|------------------------------|
| Requirements Au RQA Server. | thoring Tool client I | icensing needs a | connection to a |
| Please set up the port RQA Server | RQA Server machi is listening to. | ine name or its II | ^p address and the |
| - Requirements Quali | ty Analyzer Server | | |
| Server: | | | W7X86ENG-PC |
| Port: | | [| 16555 |
| | | <u>о</u> к | Cancel |

- 1. Click on Configure server
- 2. Type the server name and the service port in the server
- 3. Default port value: 16555
- 4. Start the server and click on *Licensing* to see this values
- 5. Click OK in the License Configuration dialog

13.2 DOORS Log in

Login in DOORS

| 🕕 Login - I | DOORS 💌 |
|-------------|-------------------|
| IBM Ra | tional DOORS |
| Database: | 36678@W7X86ENG-PC |
| Usemame: | |
| Password: | |
| | OK Cancel |



- 1. Insert username and password.
- 2. Click OK.
- Authoring option
 - 1. The user must navigate through your folders/subfolders and project structure to reach the module. Ensure that you have writing access to open that module with writing wrights.

| DOORS Database: /DOA LDWS - D | OORS | | | |
|--------------------------------|--------------------------|------------------|-------------|---|
| File Edit View Favorites Tools | Change Management Help | | | |
| 📑 📬 💑 🏘 🌋 📑 😅 | ล ฏ ิ X | | | |
| Favorites | Location /DQA LDWS | | | • |
| DOORS Database | Name | Туре | Description | |
| | ISO17361 | Formal Formal | LDWS NHTSA | |
| Liemane: Advisitater | < | | | • |
| Username: Administrator | User type: Administrator | | | |



2. Press Authoring option on the top menu

| ſ | | | | | 10 | |
|----------------|---|------------------|--|--|--|---|
| | ISO17361' current 0.0 in /DQA LDV | VS (Formal m | odule) - DOORS | | | |
| | File Edit View Insert Link An | alysis Table | e Tools Discussions | Authoring user (| Change Management He | ٤lp |
| | | 1° 3° dF | ° P [×] t-2 B₁ © | Insert 🕨 | Object | |
| | View Standard view 👻 | All levels | 💌 🛛 🚠 🗍 | Edit | Object below | |
| | E- ISO17361 | ID | | | | |
| | - I Scope - 2 Nomative references - 3 Tems and definition | ISO1736 1-77 | 1 Scope | | | |
| | 4 Specifications and requirement 5 Test method 6 Annex A (informative): Nationa 7 Bibliography | ISO1736 1-78 | This International S functions, human-m systems. These are highways and highy electromagnetic, GPS visible lane markings or irregular lane m International Standa vehicles and buses. departures. Respons | itandard specifies achine interface (HI in-vehicle systems way-like roads. Th 5 or other sensor t s. The issuance of arkings (such as ru ard. This Internatio The system will n sibility for the safe | the definition of the sy MI) and test methods fi : that can warn the drix is that can warn the drix is chologies, issues a wi f warnings at roadway padwork zones) is not v inal Standard applies to to take any automatic a operation of the vehicle | rstem, classification, or lane departure warning ver of a lane departure on ch may utilize optical, varning consistent with the sections having temporary within the scope of this o passenger cars, commercial action to prevent possible lane remains with the driver. |
| | | ISO1736 1-79 | 2 Normative | e references | | |
| 10 10 10 | | ISO1736 1-80 | The following referen dated references, on referenced documeni ISO 15037-1, Road w passenger cars ISO 15037-2, Road w heavy vehicles and b | nced documents are ly the edition cited a t (including any ame ehicles - Vehicle dyr ehicles - Vehicle dyr uses | indispensable for the ap applies. For undated refe endments) applies. namics test methods - Pa namics test methods - Pa | plication of this document. For rences, the latest edition of the irt 1: General conditions for irt 2: General conditions for |
| | | ISO1736 1-118 | 3 Terms and | definition | | |
| | | ISO1736 | For the purposes of t | this document, the fo | ollowing terms and defin | itions apply. |
| | 4 III + | 4 | | | | 4 |
| | Usemame: Administrator Excl | lusive edit mode | 8 | | | |



3. Another way to open the RAT tool is pressing the right mouse button on the requirement.

| View Standard view | All levels | ╸┊╬╔┷┊ | i ≪i ⊈i 7 √ Ai Ai | | | |
|--|---|---|-------------------------|--|---|---|
| - ISO17361 - 1 Scope This International Standard | ID IS01736 | 1 Scope | | | | |
| 2 Normative references 3 Terms and definition 4 Specifications and requirement | ISO1736 1-78 | This International Standar functions, human-mac | Authoring | E tha | Insert + | Object |
| | | highways and highwa electromagnetic, GPS o visible lane markings. | Insert Link | + | warning consistent of varcing consistent of varcing to | with the emporary |
| | or irregular lar International S vehicles and bu departures. Res | or irregular lane mar International Standard vehicles and buses. Tl departures. Responsibi | Cut Copy Copy URL | • | within the scope of to passenger cars, action to prevent po remains with the o | this commercial ossible lane driver. |
| | ISO1736 1-79 | 2 Normative | Paste Undelete | | | |
| | ISO1736 1-80 1-80 Iso15037-1, Road vehi passenger cars Iso15037-2, Road vehi heavy vehicles and bus | Delete Purge New Object Discussion Submit Change Proposal | | application of this doc erences, the latest e 'art 1: General condit | cument. For dition of the tions for | |
| | | Properties | | | | |
| | 1-118 ISO1736 | For the purposes of this | Lock | | nitions apply. | |

13.3 Adding a new requirement in DOORS

RAT allows the insertion of a new requirement either at the same hierarchical level with the selected one or one level below.

| Authoring | • | Insert + | Object |
|-----------|---|----------|--------------|
| nsert | • | Edit | Object below |
| nk | • | Help | |
| ut | | | |
| onv | | | |



1. Click Authoring > Insert > Object



2. Type you quality database credentials: Username and Password. (Only necessary if the RQA Server has not stored the Quality database credentials before)

| V Quality database credentials | - • • |
|---|--------|
| Quality database crendentials Username | |
| Password | |
| Remember credentials | |
| | Accept |

LEGATEC Technology Park | Margarita Salas 16, 2nd Floor | 28919 Leganés – Madrid - SPAIN Tel.: (+34) 91 146 00 30 | Fax: (+34) 91 680 98 26 | contact@reusecompany.com | www.reusecompany.com



3. A confirmation window will appear if there is no quality information calculated yet, for the selected module



4. Type the text for your requirement. In the box on the right, you can see the quality summary

| Z RAT - Requirements Authoring Tool | |
|--|--|
| Type your requirement here: | Quality Assessment Summary |
| RAT - Requirements Authoring Tool Type your requirement here: The system may be fitted with a system on/off control that can be operated by the Metric Conditional sentences must be avoid Speculative sentences must be avoided You must involve more punctuation m The number of verbs not reconnized Save and close Save and close | Metric Value 🔦 |
| | Conditional sentences must be avoid 2 |
| | At least one imperative verb must be i 0 |
| | Speculative sentences must be avoided 2 |
| | You must involve more punctuation m 81 |
| | The number of verbs not recognized 1 |
| | |
| | Save and close I |

5. Icons show the quality level. Red icons show low quality and yellow icons show medium quality.

| -1it - A | | | |
|--|-------|---|--|
| Metric | Value | • | |
| Ambiguous sentences must be avoided | 1 | | |
| Conditional sentences must be avoid | 2 | Ξ | |
| At least one imperative verb must be i | 0 | | |
| The number of domain concepts must | 4 | 1 | |
| Speculative sentences must be avoided | 2 | | |
| Very much involve many num duration m | 100 | _ | |

6. The Quality Frame is part of the right side of the RAT User Interface window that is showing the quality of the written requirement. The Quality Frame shows the requirement qualitative value as a coloured frame using the following colours:


• **Green:** the quality of the requirement written in its text box has been assessed as high.

| ype your requirement here: | Quality Assessment Summary | |
|--|----------------------------|-----|
| The user shall be able to save changes | Metric Vi | lue |

• Yellow: the quality of the requirement written in its text box has been assessed as medium

| ype your requirement here: | Quality Assessment Summary |
|--|---|
| The user shall be able to visualize all metrics in the system while he or she is filing the form | Metric Value |
| ······································ | Ambiguous sentences must be avoided 1 |
| | At least one domain verb must be used 0 |
| | Flow sentences must be avoided 1 |
| | Implicit sentences must be avoided 2 |
| | You must involve more punctuation m 96 |

• **Red:** the quality of the requirement written in its text box has been assessed as low

| pe your requirement here: | Quality Assessment Summary |
|---|--|
| The system may be fitted with a system on/off control that can be operated by the | Metric Value |
| | Conditional sentences must be avoid 2 |
| | At least one imperative verb must be i 0 |
| | Speculative sentences must be avoided 2 |
| | You must involve more punctuation m 81 |
| | The number of verbs not recoanized 1 |

7. Based on the quality assessment, the text box shows in red color the words or terms that should be considered for re-authoring.

| AT - | Requirements Authoring | Tool | | | |
|--------|------------------------|----------------------------------|--------------------------------|----------------------|--------------------|
| Type y | our requirement here: | | | | |
| The | system may be fitted | with a <mark>system</mark> on/of | f <mark>control</mark> that ca | n be operated by the | driver at all time |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



8. Based on a standard dictionary, the text box shows possible spelling errors, offering a solution similar to the one provided by Microsoft Word.

| pe your requin | ement here: | | Quality Assessment Summary |
|----------------|-------------------|---|---|
| The system | · | n/off control that can be operated by the driver at all | Metric Value |
| times. | systems | | Mabiguous sentences must be avoided |
| | stems | | Conditional sentences must be avoid |
| | systems' | | At least one imperative verb must be i |
| | | | Avoid passive voice in your requireme |
| | Add to dictionary | | B word passive voice in your requirement. |
| | - | | |
| | Comu | | Save and close |

9. Saving your changes



13.4 Editing a requirement in DOORS

- 1. Click Authoring > Edit > Object
- 2. Edit your requirement



3. Icons show the quality level. Red icons show low quality and yellow icons show medium quality.

| ality Assessment Summary | | |
|--|-------|---|
| Metric | Value | - |
| Ambiguous sentences must be avoided | 1 | |
| Conditional sentences must be avoid | 2 | Ξ |
| 🕺 At least one imperative verb must be i | 0 | |
| The number of domain concepts must | 4 | - |
| Speculative sentences must be avoided | 2 | |
| You must involve more punctuation m | 100 | ÷ |



4. Based on the quality assessment, the text box shows in red color the words or terms that should be considered for re-authoring.

| liting requirement: ID: ISO17361-30 - | g) While driving in a curve, the system may move the warning threshold fart | Quality Assessment Summary | | |
|--|---|---|-------------|-----|
| g) While driving in a curve, the system may move the warning threshold farther out, allowing for curve | Metric | Value | 1 | |
| cutting behaviour; but the warning | threshold shall never be moved beyond the latest warning line. | Incomplete sentences must be avoided | | 1 . |
| | | Conditional sentences must be avoid | | 1 |
| | | At least one domain verb must be used | | D |
| | | Flow sentences must be avoided | | 2 |
| | Using speculative sentences may suggest that the real necessity of | f the requirement is not clear for the reader. Plea | ase, try to | avo |

5. Based on a standard dictionary, the text box shows possible spelling errors, offering a solution similar to the one provided by Microsoft Word.

| 🗹 RAT - F | Requirements Authoring Tool - F | Requirement ID: ISO17361-30 | | - 0 | × |
|------------------------|--|---|---|--------------------------------|---------|
| Editing g) Wi ام | requirement: ID: ISO17361-30 - hile driving in a curve, the system inters but the unamine threshold behavior Add to dictionary | q) While driving in a curve, the system may move the warning threshold fart m may move the warning threshold farther out, allowing for curve cutting I shall never be moved beyond the latest warning line. | Quality Assessment Summary Metric Conditional sentences must be avoid At least one domain verb must be used Flow sentences must be avoided Incomplete sentences must be avoided Avoid bassive voice in your requireme | Value 1 0 2 1 1 | * III + |
| | Copy Cut Paste | | Save and clos | ;e∣▼ C | ancel |

6. Buttons de *Previous* and *Next* allowed to move between the different requirements

7. Saving your changes

