

Gestion de la complexité dans les processus d'Ingénierie avec l'IA

Doors Next Generation avec l'IA Watson et Requirement Quality Assistant

Watson IoT™

Pierre Milcent

IBM

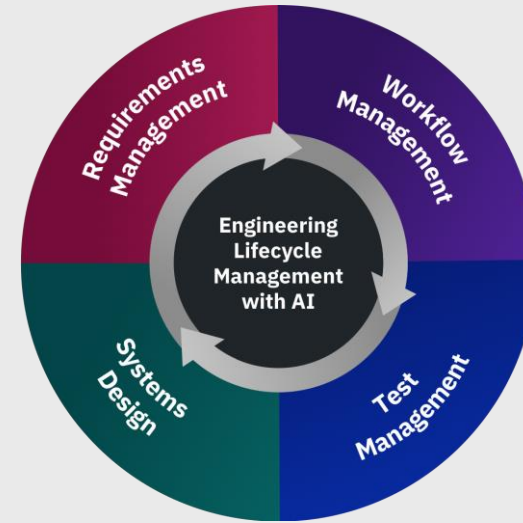
IBM Engineering

Offering naming aligned with GTM strategy

- IBM Engineering Lifecycle Management
 - Core engineering capabilities
- IBM Engineering Lifecycle Optimization
 - Engineering insights, industry specific offerings

Customer imperatives:

- Innovate with speed and quality while delivering safety critical systems
- Meet regulatory, compliance, reporting & audit requirements
- Drive constant improvement while dealing with increasing complexity



End to end engineering lifecycle management optimized with AI



Three things to know about renaming

Why rename? What's changing?

- [IBM Rational](#) to [IBM Engineering](#)
- [Team Concert](#) to [Workflow Management](#)
- [CLM](#) to [ELM](#) and [CE](#) to [ELM](#)

For example:

- [Continuous Engineering](#) to
- **[Engineering Lifecycle Management](#)**

Phased approach to renaming

CE → ELM
CLM → ELM

Software is driving innovation in regulated markets. We want our customers in engineering and IT appdev teams to easily identify our products' purpose by their names as part of an ELM solution

Marketing materials first, followed by the products, product documentation and jazz.net site when new products we intend to release in 2H 2019:
ELM.Next



Offering Name Updates

Old Offering Name	New Offering Name
IBM Continuous Engineering	IBM Engineering Lifecycle Management
IBM Rational DOORS	IBM Engineering Requirements Management DOORS Family
IBM Rational DOORS Next Generation	IBM Engineering Requirements Management DOORS Next
IBM Rational Team Concert	IBM Engineering Workflow Management
IBM Rational Quality Manager	IBM Engineering Test Management
IBM Rational Rhapsody	IBM Engineering Systems Design Rhapsody
IBM Rational Engineering Lifecycle Manager	IBM Engineering Lifecycle Optimization - Engineering Insights
IBM Collaborative Lifecycle Management	IBM Engineering Lifecycle Management Base
IBM IoT Collaborative Lifecycle Management on Cloud	IBM Engineering Lifecycle Management Base SaaS
IBM IoT Continuous Engineering on Cloud	IBM Engineering Lifecycle Management Extended SaaS
Rational Publishing Engine	IBM Engineering Lifecycle Optimization - Publishing
Method Composer	IBM Engineering Lifecycle Optimization - Method Composer



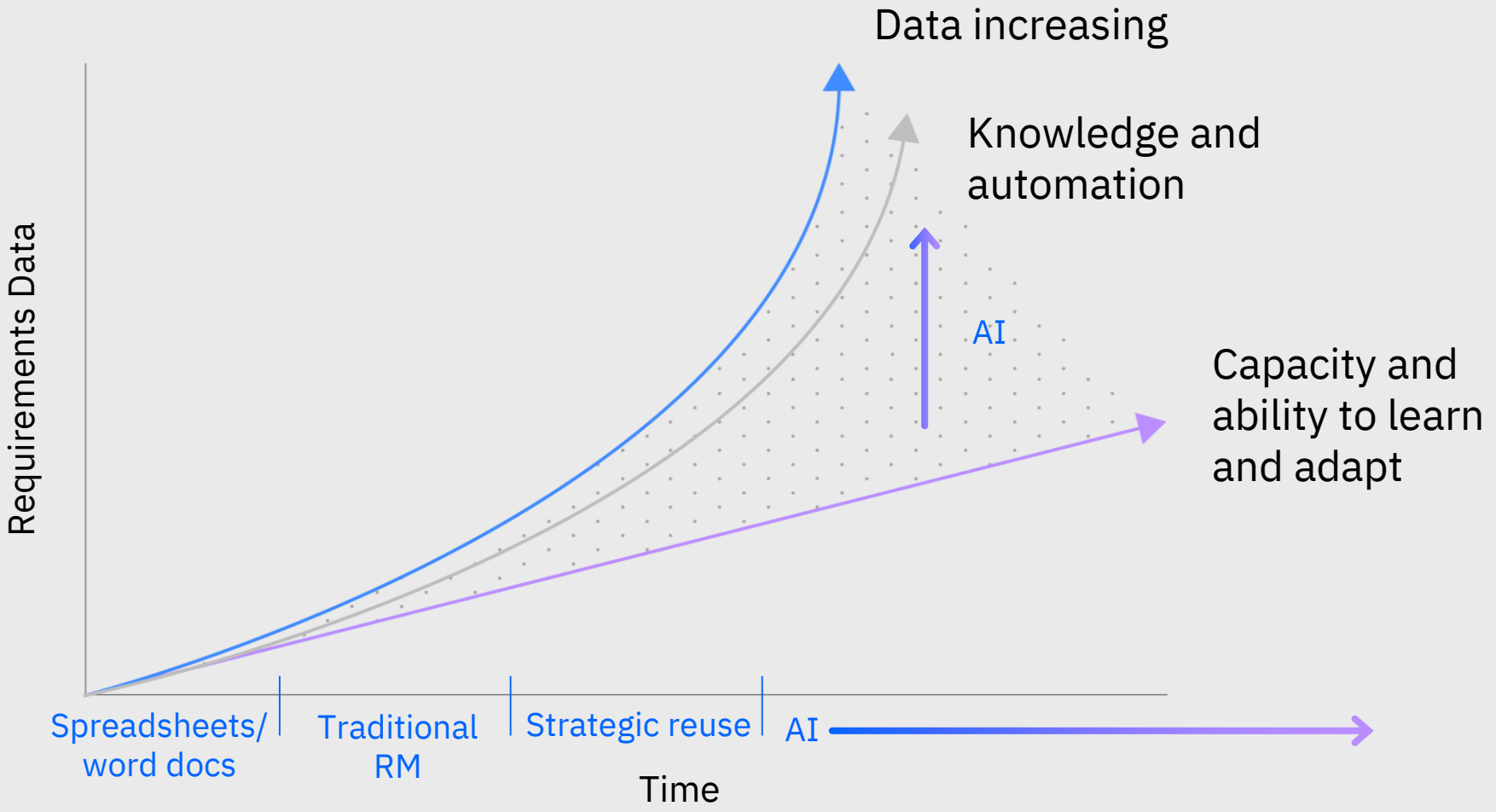
Nouveaux enjeux industriels:

Plus de Challenges et de complexités

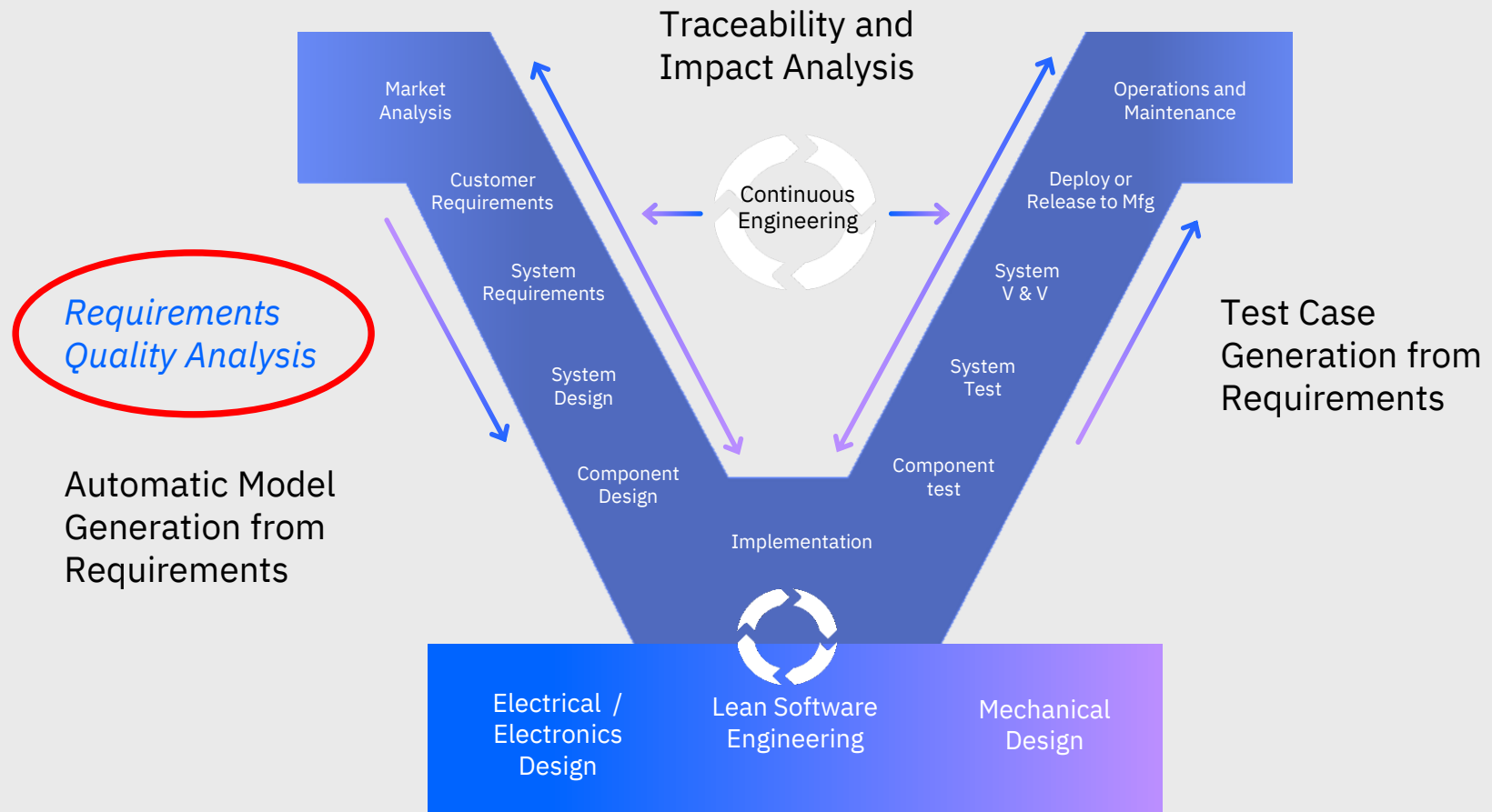
- Généralisation des logiciels dans les produits et une augmentation exponentielle du volume des données à gérer.*
- Plus de règlements et de standards à respecter*
- Diminuer les risques d'erreurs et les coûts de correction*
- Exploiter, utiliser les connaissances et le savoir-faire de l'entreprise.*



L'évolution de la gestion des exigences impose de *mieux utiliser les connaissances et le savoir-faire*



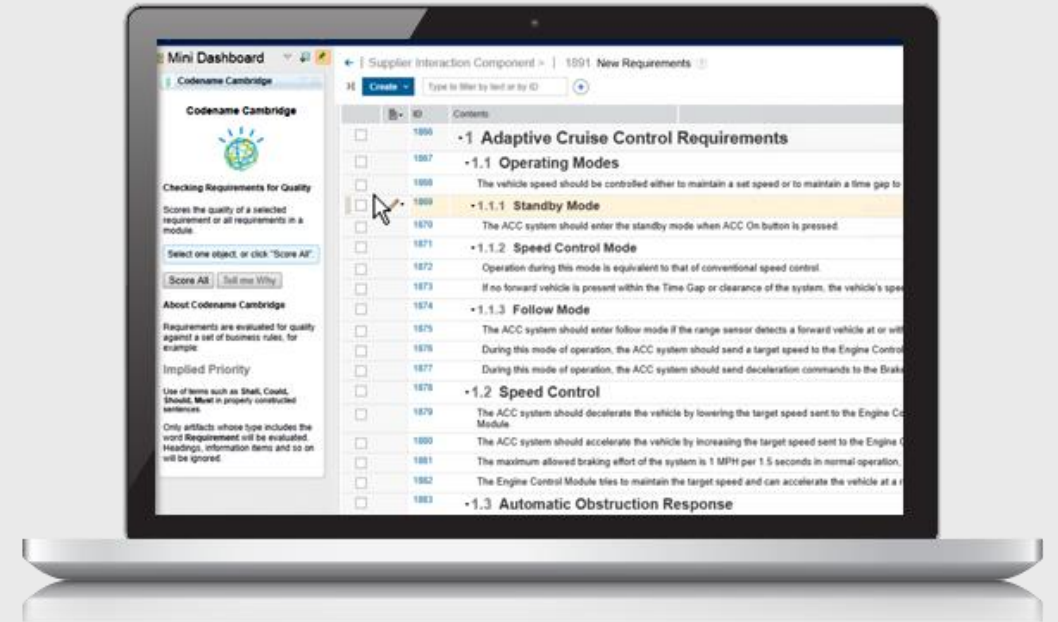
Aider les ingénieurs dans leurs activités avec de l'automatisation et de l'intelligence dans le cycle d'ingénierie



Requirements Quality Assistant (RQA) + Watson

Nouvelles capacités Watson intégrées dans DNG ...

- *Elimine les risques et les ambiguïtés lors de la phase de création des Exigences en utilisant IA (Watson Natural Language Understanding)*
- *Prédéfinies pour détecter les principaux indicateurs de Qualité en accord avec l'**INCOSE** Guidelines for Writing Good Requirements*
- *Watson guide et conseille les auteurs lors de la rédaction des Exigences pour en améliorer la qualité*



Gains avec la solution IBM dans le processus de revue des Exigences

Requirements Quality Assistant + IA Watson interfacés à Doors Next Generation:

- Accélération du processus de revue et validation des exigences.*
- Réduction importante des erreurs et de leur coût.*
- Le savoir-faire et l'expertise de l'entreprise sont préservés et peuvent être partagés efficacement.*
- Amélioration de la qualité produit et de la satisfaction client.*
- Réduction des temps et coûts de développement.*

Démonstration



IBM Requirements Quality Assistant

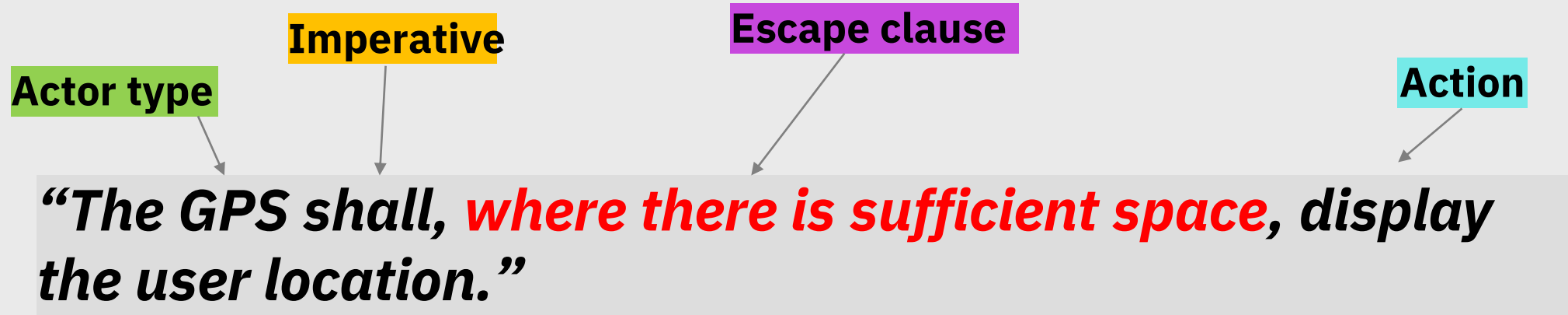
Grades requirements against a criteria that was designed to be consistent with the INCOSE Guidelines for Writing Good Requirements

Pre-trained to detect 10 quality issues

- Unclear actor or user
- Compound requirement
- Negative requirements
- Escape clause
- Missing units
- Missing tolerances
- Ambiguity
- Passive
- Incomplete requirements
- Unspecific quantities

The screenshot displays the IBM Requirements Quality Assistant interface. On the left, a 'Mini Dashboard' for 'Project Cambridge' shows a 'Welcome Watson to your Requirements Team' message and a 'Quality Scores: 0-100' section. Two artifacts are listed: '415: The GPS System shall show...' with a score of 70 and '418: The GPS System shall use...' also with a score of 70. Both scores are circled in blue. The dashboard also includes a 'Start over' button and a 'Recheck these artifacts' link. On the right, a table lists requirements with their IDs and contents. Requirements 415 and 418 are highlighted in orange, indicating a quality score of 70. The table has columns for 'ID' and 'Contents'. Below the table, there is a detailed view of requirement 418, which states: 'The GPS system shall use minimum power'. The interface also includes a navigation bar at the top with 'Project Dashboard', 'Artifacts', 'Reviews', and 'Reports'.

Escape clause is present



WHAT: Escape clause

GUIDANCE: It appears that there is an escape clause in this requirement. Escape clauses can lead to ambiguous, unverifiable requirements that are open to interpretation and that do not reflect accurately the stakeholder expectations. Requirements with these phrases could be interpreted as being optional, even when they are not. The escape clauses should be removed from the requirement in order to make it clearer.

IBM Requirements Quality Assistant

- Identifies exactly what's wrong with the requirement
- Displays the issue to the requirements engineer

The screenshot shows the IBM Requirements Quality Assistant interface. On the left is a 'Mini Dashboard' for 'Project Cambridge' with a 'Welcome Watson to your Requirements Team' message and a 'Start over' button. Below this, it shows 'Quality Scores: 0-100' and '2 artifacts checked'. Two requirements are listed with quality issues circled in blue:

- Requirement 415: 'The GPS System shall show a clear perspective of the upcoming junction'. Issue: 'Ambiguous Term. Look for: clear perspective'.
- Requirement 418: 'The GPS System shall use minimum power'. Issue: 'Unspecific quantity. Look for: minimum power'.

On the right, a table lists requirements with their IDs and contents. Requirements 415 and 418 are highlighted in orange, indicating quality issues.

ID	Contents
413	The GPS System shall clear the display and reduce current draw to less than 2 mA on transition to power off mode.
414	The GPS System shall show a clear perspective of the upcoming junction.
415	The GPS system shall show a clear perspective of the upcoming junction
416	The GPS System shall maintain the displayed user location for at least 500 milliseconds.
417	The GPS System shall update the user location at least every 100 milliseconds.
418	The GPS system shall use minimum power

Below the table, there is a list of detailed requirements for an ACC system, including: 'The vehicle speed shall be controlled in order to maintain a set speed or to maintain a time gap to a forward vehicle, whichever speed is lower.', 'The ACC system shall enter the standby mode when ACC On button is pressed.', 'Operation during this mode is equivalent to that of conventional speed control.', 'If no forward vehicle is present within the Time Gap or clearance of the system, the vehicle speed is maintained at the target speed.', 'The ACC system shall enter to low mode if the range sensor detects a forward vehicle at or within the clearance distance.', 'During this mode of operation, the ACC system shall send a target speed to the Engine Control Module to maintain the set time gap between the vehicles.', 'During this mode of operation, the ACC system shall send deceleration commands to the Brake Control module to maintain the set time gap between the vehicles.', 'The ACC system shall decelerate the vehicle by lowering the target speed sent to the Engine Control Module and sending a brake deceleration command to the Brake Control Module.', 'The ACC system shall accelerate the vehicle by increasing the target speed sent to the Engine Control Module.', 'The maximum allowed braking effort of the system is 1 MPH per 1.6 seconds in normal operation, or up to maximum available braking effort in emergency operation.', 'The Engine Control Module tries to maintain the target speed and can accelerate the vehicle at a rate of up to 1 mph per 1.5 seconds.', 'After the clearance between the ACC vehicle and the forward vehicle only increases,

Questions





Merci

Video: Requirements Quality Assistant Brings Watson AI to Requirements Management

[Video de présentation RQA sur Youtube](#)