



# **Novedades IBM Rational DOORS e integración con sistemas PLM**

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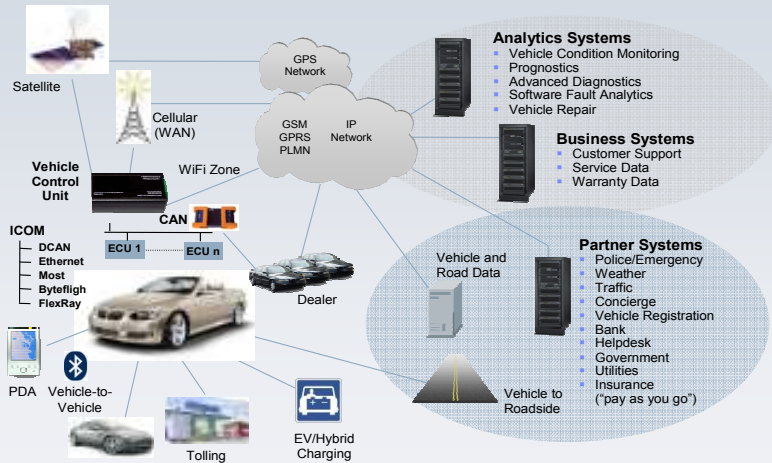
# Agenda

- IBM Rational DOORS y los **sistemas PLM**
- What's **new** in IBM Rational DOORS?
- What's **next** in IBM Rational DOORS?



# Tendencias en la industria

## Sistemas cada vez más complejos: sistemas de sistemas



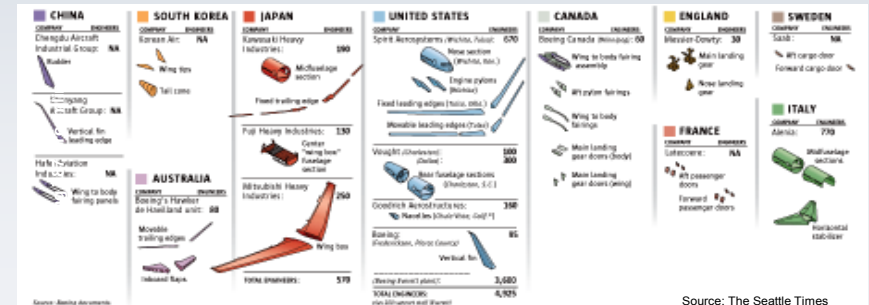
## Desarrollo y construcción distribuida

### Boeing Commercial Aircraft: 787 Development Program

Number of parts: 6 million  
Peak number of suppliers: 2,600

### Who makes the parts and where the engineering jobs are:

Boeing 787: # of engineers are 2005 projections and may not include all engineering specialties. Production workers are not included.



## Cada vez más software, y cada vez más importante...

1968

e.g. VW Squareback



- Fuel injection
- Manifold pressure control
- Digital clock

1983

e.g. Chrysler Imperial



- Ignition
- Engine controls
- Instrumentation

1995

e.g. Honda CRX Si



- Engine management
- ABS
- Digital dashboard
- Electronic seats / doors
- Automated climate control
- Safety sensors

2008

e.g. BMW 7 Series Sedan

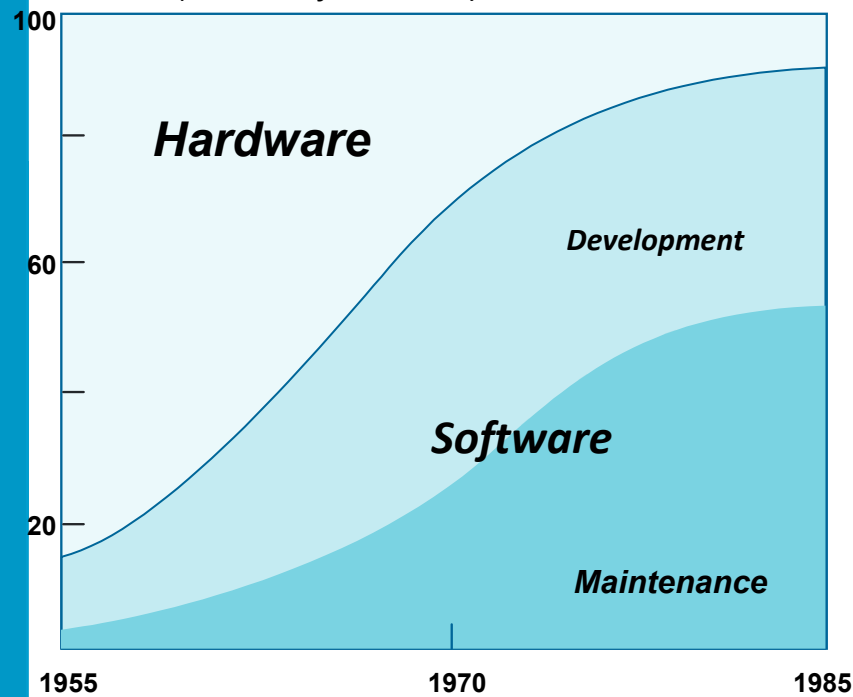


- Dynamic Damping Control
- Brake Energy Regeneration
- Integral Active Steering
- Electrically controlled air vents
- Night Vision
- Lane Departure Warning
- Lane Change Warning
- Adaptive Headlights
- Head-Up Display
- Active Cruise Control
- Camera systems
- Driver assistant systems

Platform	Year	% of Specification Requirements requiring SW Control
F-4	1960	8%
A-7	1964	10%
F-111	1970	20%
F-15	1975	35%
F-16	1982	45%
B-2	1990	65%
F-22	2000	80%

# El software ha incrementado su presencia e importancia hasta diez veces en los últimos años

Relative Distribution  
of Software/Hardware Costs  
(Percent of total cost)



Source: Software Engineering, IEEE Transactions on Computers December 1976

Platform	Year	Percent of Specification Requirements Requiring Software Control
F-4	1960	8%
A-7	1964	10%
F-111	1970	20%
F-15	1975	35%
F-16	1982	45%
B-2	1990	65%
F-22	2000	80%

Source: The Australian Software Acquisition Management Course, Defense Systems Management College, March 2000



# Fallos en el software pueden ser dramáticos en sistemas complejos

## Agencia Aeroespacial

*Prototipo de cohete de \$1B se autodestruyó 40 segundos después de despegar por un error en el software del sistema de teledirección*



## F-22, línea de cambio de fecha

*Todos los sistemas de software dejaron de funcionar cuando el F22 pasó sobre la línea del cambio de fecha en un vuelo de prueba*



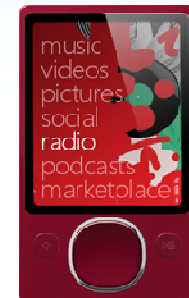
## Constructor de automóviles

*Sensores de lluvia no funcionales por incompatibilidad entre el sensor y el grosor del limpiaparabrisas*



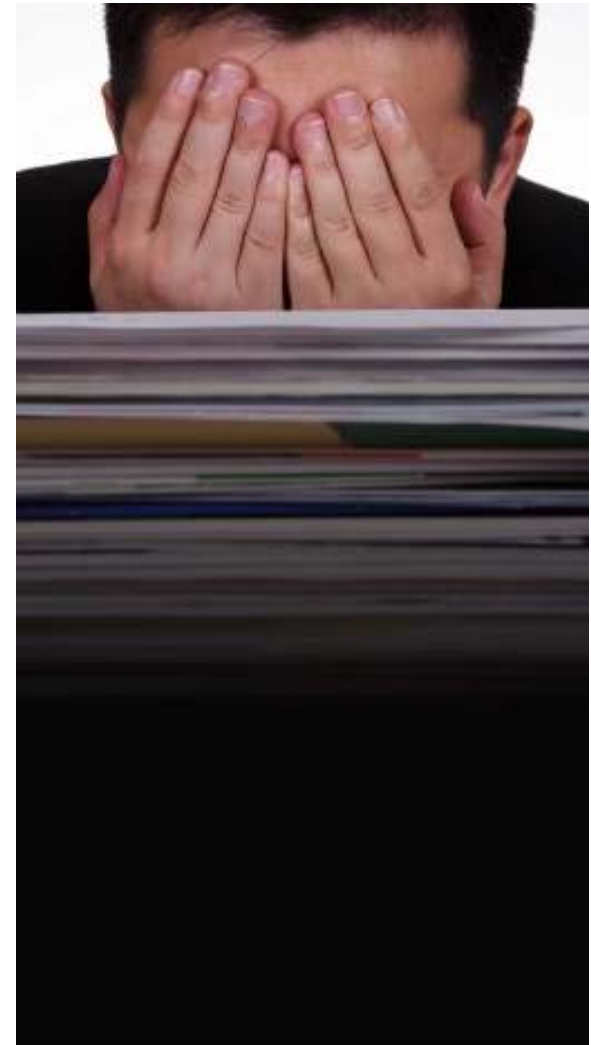
## Microsoft Zune

*1 millón de usuarios se levantaron una mañana y su dispositivo mp3 no funcionaba. El software no era capaz de manejar el día extra del nuevo año bisiesto*



# Retos en el desarrollo de sistemas en la actualidad

- La **complejidad** de los productos es cada vez mayor: sistemas de sistemas
- La **construcción** de los productos cada vez se encuentra más **distribuida**
- Cada vez **más software** y desempeñando un papel **más importante**
- Tradicionalmente **falta de comunicación entre disciplinas**: ingenieros de sistemas, ingenieros mecánicos, ingenieros eléctricos, ingenieros de software, ...
- Gestión de **cambios** globales
- Se requieren productos cada vez de **mayor calidad** y **libres de fallos** (integridad de las personas)
- El desarrollo de productos está cada vez **más regulado**. Cumplimiento de normativas y estándares, demostración de evidencias





# El equipo piensa como mejorar ...

"Si tuviera una única vista de los requisitos del producto, su evolución en desarrollo sw y construcción del hw correspondiente y como se validan, tendría un control total sobre el desarrollo del producto "



Jefe de proyecto/programa

Ingeniero de sistemas



"El producto es cada vez más complejo, necesitaría diseñar su arquitectura de una manera entendible por todos los ingenieros de forma que se represente claramente todos los componentes sw y hw del sistema, su interconexión y cómo satisfacen los requisitos del sistema"  
"Si detectase errores en el diseño de la arquitectura del sistema durante su elaboración, evitaría el alto coste de arreglarlo si se detecta cuando el sistema esté construido"

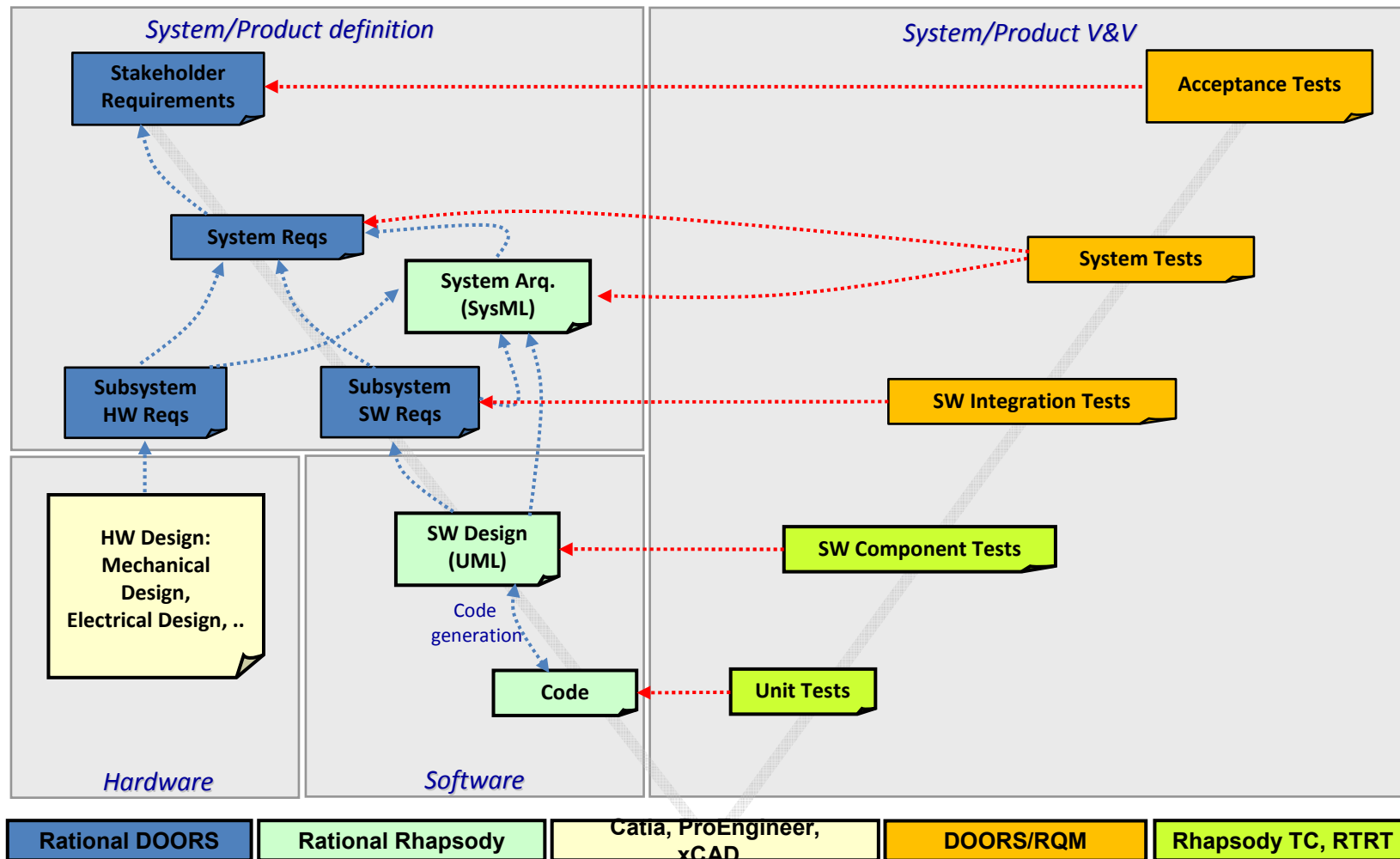
"Los cambios en un componente eléctrico puede requerir cambios en el software o en un componente mecánico. Necesito coordinar los cambios a nivel de producto, no sólo a nivel aislado por disciplina"



Responsable del control de cambios,  
miembro del CCB

# Plataforma para desarrollo de sistemas

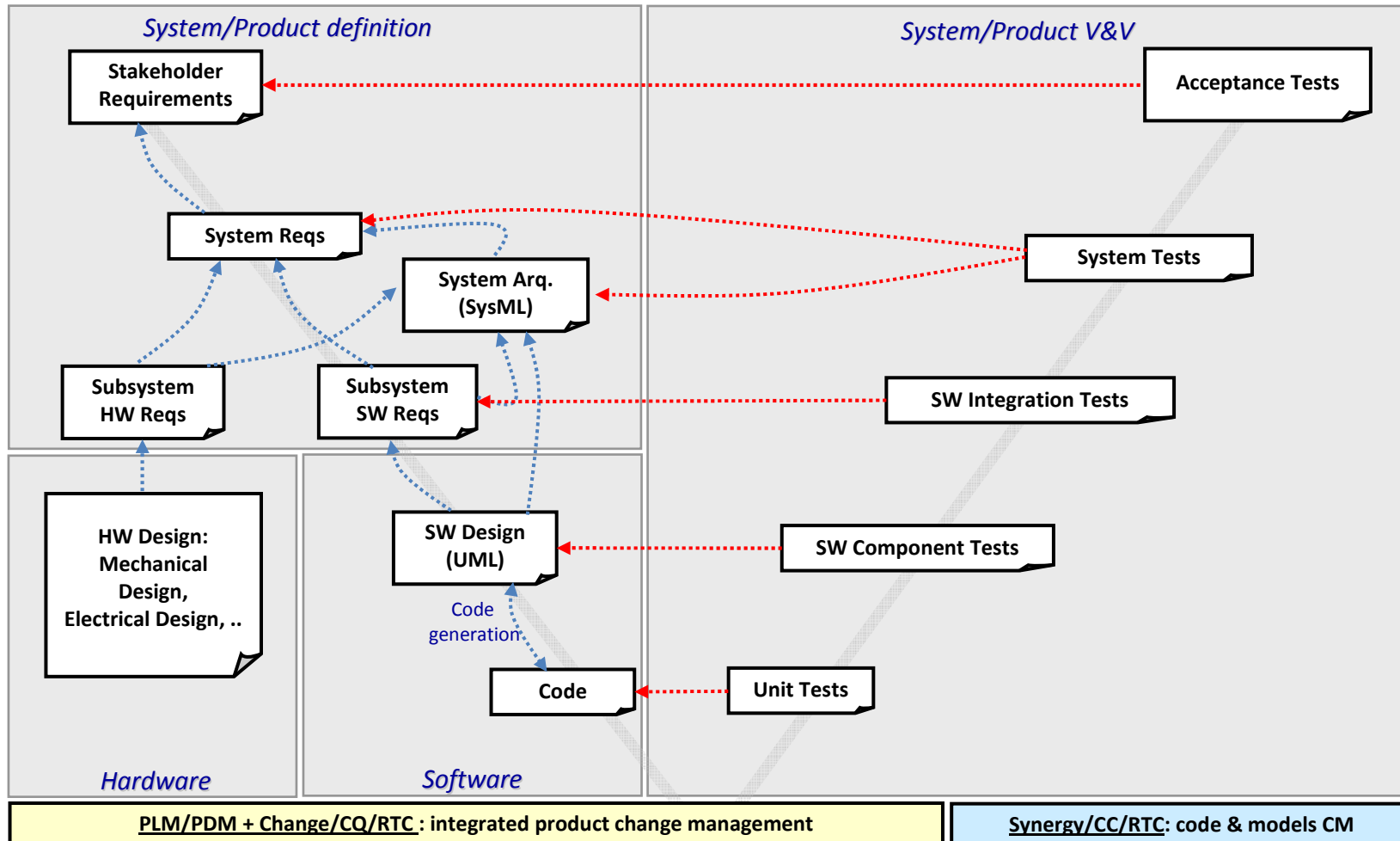
*Definición, Desarrollo, Construcción y Verificación & Validación*





# Plataforma para desarrollo de sistemas

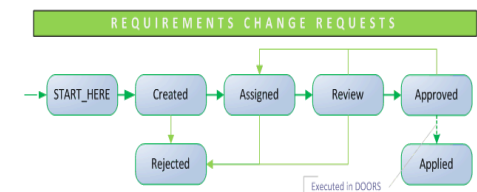
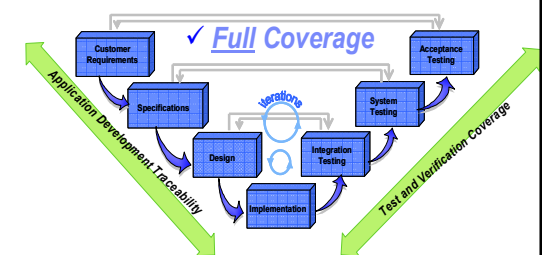
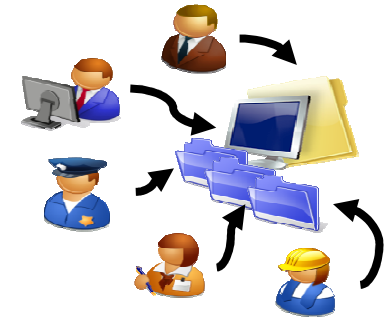
## Gestión de Cambios y de la Configuración



# IBM Rational DOORS



- **Plataforma de colaboración**
  - Centralizar, organizar, estructurar, trazar y gestionar los requisitos del producto
  - Información actualizada **accesible** para todos los miembros del equipo. Facilita la **colaboración** y **comunicación** entre ellos.
  - **Acceso controlado**, permisos de acceso
- **Trazabilidad**
  - **Establecer relaciones** entre requisitos, entre requisitos y pruebas, entre requisitos y diseño software, entre requisitos y diseño hardware (diseño mecánico, eléctrico, etc)
  - Demostrar que el sistema final **cumple los requisitos** de cliente
  - Demostrar que el sistema final **está probado**
  - **Control** de los procesos de desarrollo/construcción y verificación&validación desde los requisitos
- **Gestión del cambio**
  - Análisis de **impacto de cambios**, **seguimiento** del estado de los cambios
- **Flexibilidad**
  - Fácil implementación de cualquier **proceso de desarrollo**



# IBM Rational DOORS

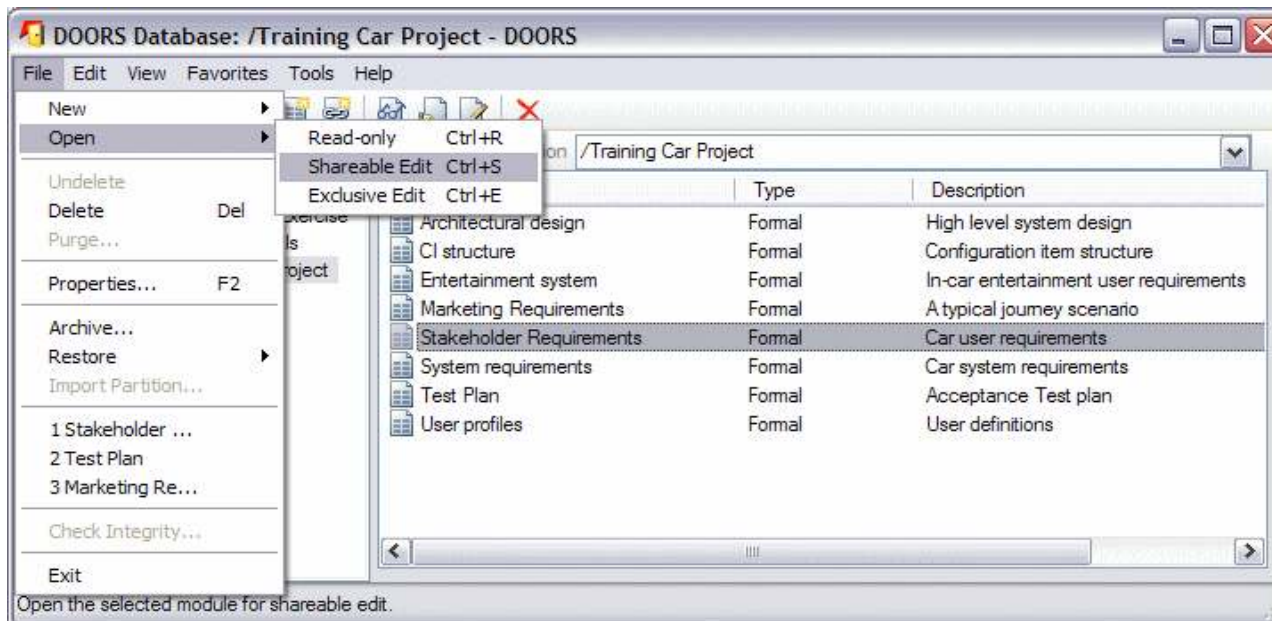
*Acceso controlado y organización de la información*

The screenshot displays the IBM Rational DOORS software interface. It consists of several overlapping windows:




- Login - DOORS:** A small dialog box with fields for Database (39977@ES222042) and Username (Bill Young).
- DOORS Database: /Example Data/Company Programs/Vehicle projects/Light Trucks - DOORS:** A window showing a tree view of the database structure. The tree includes folders like 'EasyStart Tutorial', 'Example Data', 'Company Programs', 'Concept cars', 'e-business', 'Vehicle projects', 'Cars', 'Commercial vehicles', 'Light Trucks', 'Common components', 'Flat bed trucks', 'Over sized truck', 'Prototypes', 'Sports utility vehicle 4x2', 'Sports utility vehicle 4x4', 'Company Standards', and 'General information'. The status bar shows 'Username: Administrator' and 'User type: A'.
- 'Stakeholder Requirements' current 1.0 (2004 Model) in /Training Car Project (Formal module) - DOORS:** A window showing a hierarchical tree of requirements on the left and a list of requirements on the right. The tree includes 'Introduction', '2 User types', '2.1 Nationalities', '2.2 User sizes', '3 Requirements', '3.1 Capability Requirements', '3.1.1 Carrying Capacity', '3.1.1.1 Number of people', '3.1.1.2 Amount of luggage', and '3.1.2 Movement'. The list on the right shows requirements with IDs and descriptions, such as '1 Introduction', '2 User types', '2.1 Nationalities', '2.2 User sizes', '3 Requirements', and '3.1 Capability Requirements'. The status bar shows 'Username: Administrator' and 'Exclusive edit mode'.

# IBM Rational DOORS

*Colaboración*



## Modo de apertura:

- Sólo lectura**  acceso sólo lectura, permite editar a otros usuarios
- Edición compartida**  permite editar a varios usuarios simultáneamente
- Edición exclusiva**  edición exclusiva del documento

# IBM Rational DOORS

Creación de relaciones de trazabilidad

The screenshot displays two overlapping windows from the IBM Rational DOORS application. The top window, titled "Stakeholder Requirements Specification", shows a table of requirements for the Coyote UAV. The bottom window, titled "System Requirements Specification", shows a table of system requirements for the Unmanned Air Vehicle System. A context menu is open over a requirement in the top window, with options like "Make Link From Start" and "Make Link To Start". A mouse cursor is pointing at a requirement in the bottom window. A red box labeled "Nuevo Link" is next to a requirement in the bottom window.

ID	Object Type	Stakeholder Requirements Specification for the Coyote UAV
UAV-5	*	<b>2 Requirements</b>
UAV-6	Requirement	The UAV is shall be a multipurpose and reusable U multimission capability.
UAV-74	Requirement	The UAV shall...
UAV-75	Requirement	This is a new stakeholder requirement
UAV-7	Requirement	It shall operate at altitudes of un to 30,000 feet.
UAV-8	Requirement	It shall operate at altitudes of up to 30,000 feet.
UAV-9	Requirement	It shall operate at altitudes of up to 30,000 feet.
UAV-10	Requirement	It shall operate at altitudes of up to 30,000 feet.
UAV-11	Requirement	The UAV shall be capable of of flying complex flight with the operational goal of systematic area search.
UAV-12	Requirement	The UAV shall be capable of of flying complex flight with the operational goal of ground route or road based (synonym) search.
UAV-13	Requirement	The UAV shall be capable of of flying complex flight with the operational goal of orbit surveillance of ground targets.
UAV-14	Requirement	The UAV shall be capable of of flying complex flight with the operational goal of ground route or road based (synonym) search.
UAV-15	Requirement	The UAV shall be capable of of flying complex flight with the operational goal of orbit surveillance of ground targets.
UAV-16	Requirement	The UAV and manned control capability from the ground station shall provide sustained 24 hour flight with reconnaissance, infra-red or radar telemetry with target recognition capability.

ID	Object Type	System Requirements Specification	Priority
SRSUAV-1	*	<b>1 Overview</b>	
SRSUAV-2	*	The Unmanned Air Vehicle System is a system solution to a medium-range reconnaissance in hostile environments with limited attack capability.	
SRSUAV-3	*	It is a medium-range long endurance UAV system that can carry a variety of payloads to assist in ground, air and sea operations.	
SRSUAV-4	*	A full UAVS consist of four UAVs and a ground Mission Planning and Control System.	
SRSUAV-5	*	<b>2 System Requirements</b>	
SRSUAV-74	*	<b>2.1 UAV Vehicle</b>	
SRSUAV-6	Requirement	The UAV is shall be a multipurpose and reusable UAV with multimission capability.	High
SRSUAV-78	Requirement	This is a new system requirement.	Medium
SRSUAV-7	Requirement	It shall operate at altitudes of up to 30,000 feet.	High
SRSUAV-8	Requirement	It shall operate at altitudes of up to 30,000 feet.	High
SRSUAV-9	Requirement	It shall operate at altitudes of up to 30,000 feet.	Medium
SRSUAV-10	Requirement	It shall operate at altitudes of up to 30,000 feet.	
SRSUAV-11	Requirement	The UAV shall be capable of of flying complex flight with the operational goal of systematic area search.	Medium
SRSUAV-12	Requirement	The UAV shall be controllable from the ground station CMPCS.	High
SRSUAV-13	Requirement	The UAV shall be capable of of flying complex flight plans with the operational goal of systematic area search.	High
SRSUAV-14	Requirement	The UAV shall be capable of of flying complex flight plans with the operational goal of ground route or road based (synonym) search.	High

Creación con drag & drop





# IBM Rational DOORS

*Trazabilidad a varios niveles*

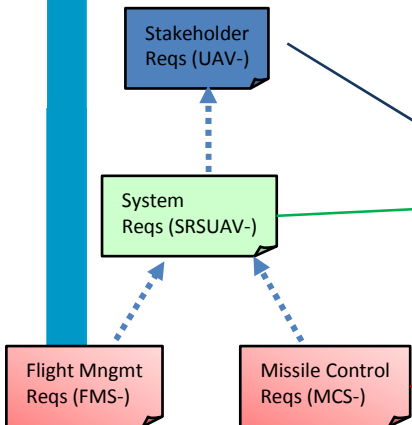
'Stakeholder Requirements Specification' current 0.1 in /1. Stakeholder Requirements Specification (Formal module) - DOORS

File Edit View Insert Link Analysis Table Tools Discussions User Publish WEXP Rhapsody 7.4 RG Analyst Change Management Harmony/ESW Harmony/ITSW  
Harmony/SE TAU Help

View U2 - Impact Analysis SS All levels

ID	Object Type	Stakeholder Requirements Specification for the Coyote UAV	System <- Missile Control Subsystem	System <- Flight Management Subsystem
UAV-5	*	<b>2 Requirements</b>		
UAV-6	Requirement	The UAV is shall be a multipurpose and reusable UAV with multimission capability.	SRSUAV-6	SRSUAV-6
UAV-74	Requirement	The UAV shall...	SRSUAV-78	SRSUAV-78
UAV-75	Requirement	This is a new stakeholder requirement	SRSUAV-78	SRSUAV-78
UAV-7	Requirement	It shall operate at altitudes of up to 30,000 feet.	SRSUAV-7	SRSUAV-7
			MCS-11	FMS-11
			MCS-13	SRSUAV-14
			MCS-20	FMS-14
			SRSUAV-14	
			MCS-13	
			MCS-14	
UAV-8	Requirement	It shall reach ground speeds of up to 100 knots in cruise mode.	SRSUAV-8	SRSUAV-8
UAV-9	Requirement	It shall reach ground speeds of 150 knots in dash mode.	SRSUAV-9	SRSUAV-9
UAV-10	Requirement	It shall carry payloads up to 450 lbs for durations exceeding 24 hours.	SRSUAV-10	SRSUAV-10
UAV-11	Requirement	The UAV shall fly unimpeded in low visibility environments while carrying reconnaissance or attack payloads.		
UAV-12	Requirement	The UAV shall be controllable from the ground station CMPCS.	SRSUAV-12	SRSUAV-12
UAV-13	Requirement	The UAV shall be capable of of flying complex flight plans with the operational goal of systematic area search.	SRSUAV-13	SRSUAV-13
			MCS-13	FMS-13
UAV-14	Requirement	The UAV shall be capable of of flying complex flight plans with the operational goal of ground route or road based (synonym) search.	SRSUAV-14	SRSUAV-14
			MCS-13	FMS-14
			MCS-14	
UAV-15	Requirement	The UAV shall be capable of of flying complex flight plans	SRSUAV-15	SRSUAV-15

Username: Administrator Exclusive edit mode



# IBM Rational DOORS

*Trazabilidad a diseño software*

The screenshot shows the IBM Rational DOORS interface with a table of System Requirements Specifications. The table has the following columns: ID, Object Type, System Requirements Specification, and Allocated to (System Architecture). The 'Allocated to' column for requirement SRSUAV-6 is highlighted with a red box, showing 'Package: UAV\_Vehicle'. The table also shows a hierarchy of requirements, including '2 System Requirements' and '2.1 UAV Vehicle'.

ID	Object Type	System Requirements Specification	Allocated to (System Architecture)
SRSUAV-3	*	It is a medium-range long endurance UAV system that can carry a variety of payloads to assist in ground, air and sea operations.	
SRSUAV-4	*	A full UAVS consist of four UAVs and a ground Mission Planning and Control System.	
SRSUAV-5	*	<b>2 System Requirements</b>	
SRSUAV-74	*	<b>2.1 UAV Vehicle</b>	
SRSUAV-6	Requirement	The CUAV is shall be a multipurpose and reusable UAV with multimission capability.	Package: UAV_Vehicle
SRSUAV-78	Requirement	This is a new system requirement..	Package: UAV_Vehicle
SRSUAV-7	Requirement	It shall operate at altitudes of up to 30,000 feet.	Package: UAV_Vehicle
SRSUAV-8	Requirement	It shall reach ground speeds of up to 100 knots in cruise mode.	Package: UAV_Vehicle
SRSUAV-9	Requirement	It shall reach ground speeds of 150 knots in dash mode.	Package: UAV_Vehicle
SRSUAV-10	Requirement	It shall carry payloads up to 450 lbs for durations exceeding 24 hours.	Package: UAV_Vehicle
SRSUAV-11	Requirement	The UAV shall fly unimpeded in low visibility environments while carrying reconnaissance or attack payloads.	Package: UAV_Vehicle block: Flight_Management
SRSUAV-12	Requirement	The UAV shall be controllable from the ground station CMPCS.	Package: UAV_Vehicle
SRSUAV-13	Requirement	The UAV shall be capable of of flying complex flight plans with the operational goal of systematic area search.	Package: UAV_Vehicle
SRSUAV-14	Requirement	The UAV shall be capable of of flying complex flight plans with the operational goal of ground route or road based (synonym)	Package: UAV_Vehicle





# IBM Rational DOORS

*Trazabilidad a diseño hardware*

The screenshot shows the IBM Rational DOORS application window. The title bar reads "'PSS 000' current 0.0 in /2. PSS (Formal module) - DOORS". The menu bar includes File, Edit, View, Insert, Link, Analysis, Table, Tools, User, NAVANTIA, WEXP, Analyst, and Help. The toolbar contains various icons for file operations and analysis. The main workspace displays a table with the following data:

DOORS UID	Platform System Specifications	CATO	Technical Documentation Associated	Remarks
PS000 - 4	This Specification defines details of Contractual technical aspects, i.e., ship's features, components, equipment, structure and materials, to be fulfilled during the ship's.	Inspection	<b>0736350020R</b> NOISE REPORT INF.LR 20080527  <b>1111000010S</b> SHELL EXPANSION APR.LR 20080508	
PS000 - 10	A margin provided in the ship design so that future systems can be added after the Ship is commissioned to the Commonwealth. FOR INFORMATION: XXX	Analysis		
PS000 - 12	This margin covers potential modifications in relation to GFE throughout design and construction with regard to GFE identified in the Contract.			
PS000 - 14	With the purpose of defining a later installation / integration of systems not installed in the ship			

At the bottom of the window, the status bar shows "Username: flopez" and "Exclusive edit mode".

Diseños mecánicos,  
eléctricos, informes  
técnicos asociados con el  
requisito



# IBM Rational DOORS

*Análisis de impacto de cambios a todos los niveles y disciplinas*

ID	User Requirements	Functional Requirements	Design	Test Plan
TRN-CSR-55	<b>3.1.6.1.3 Clutch</b>			
TRN-CSR-56	Users shall be able to operate the clutch, if fitted, in standard footwear.	FR-167 There shall be a standard lightweight clutch.	TRN-AD-45 Clutch	TRN-TP-36 Lightweight footwear control test
TRN-CSR-57	<b>3.1.6.1.4 Gears</b>			
TRN-CSR-58	Users shall be able to operate gears, if fitted, with minimal effort.	FR-169 The car shall be fitted with a lightweight 5 speed manually operated gearbox.	TRN-AD-44 Gearbox	TRN-TP-36 Lightweight footwear control test
TRN-CSR-59	<b>3.1.7 Visibility</b>			
TRN-CSR-60	<b>3.1.7.1 Day light</b>			
TRN-CSR-61	Users shall have maximum daylight visibility from within the vehicle.			
TRN-	<b>3.1.7.2 Night time</b>			

Evaluación del impacto de cambios de forma rápida y fiable a través de links

Un cambio en

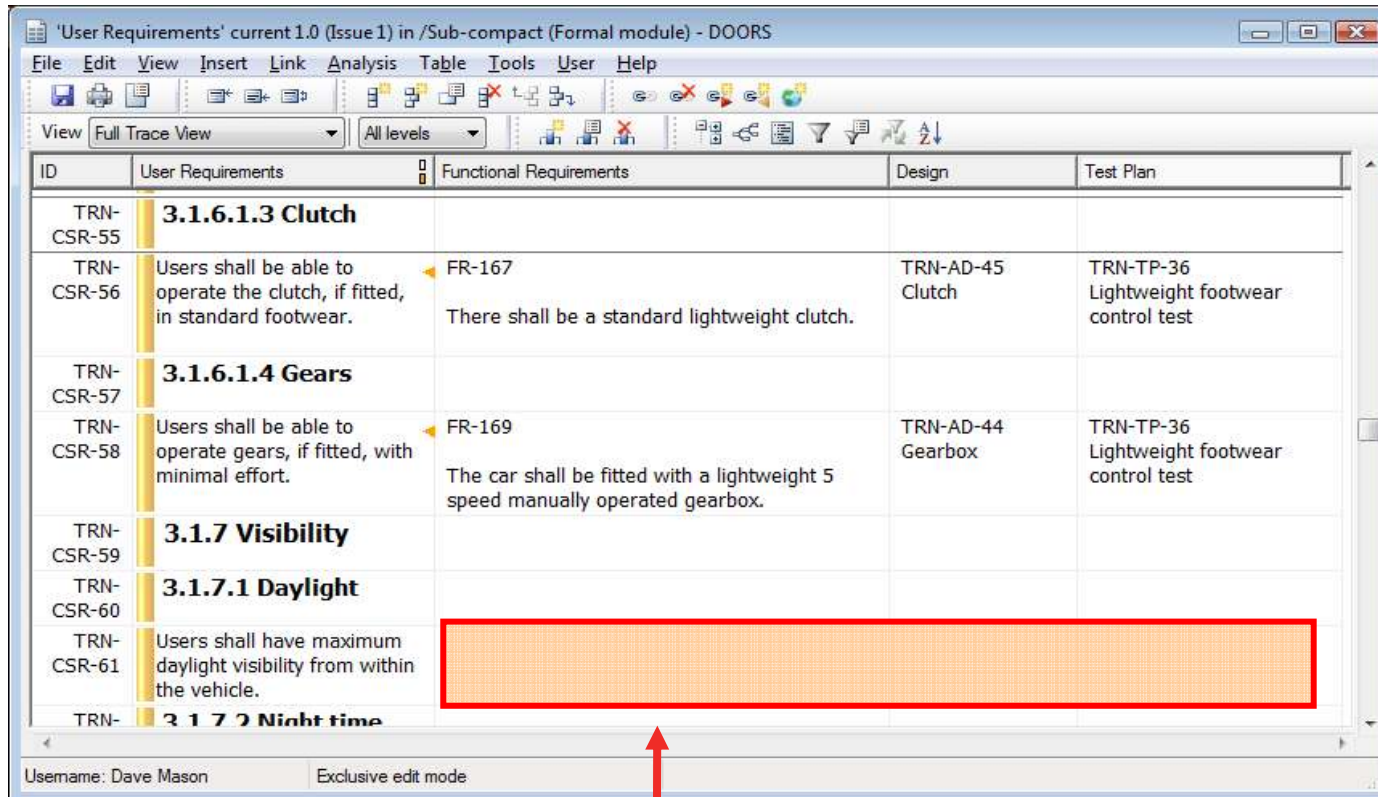
impacta en

y en



# IBM Rational DOORS

*Progreso del proyecto*



ID	User Requirements	Functional Requirements	Design	Test Plan
TRN-CSR-55	<b>3.1.6.1.3 Clutch</b>			
TRN-CSR-56	Users shall be able to operate the clutch, if fitted, in standard footwear.	FR-167 There shall be a standard lightweight clutch.	TRN-AD-45 Clutch	TRN-TP-36 Lightweight footwear control test
TRN-CSR-57	<b>3.1.6.1.4 Gears</b>			
TRN-CSR-58	Users shall be able to operate gears, if fitted, with minimal effort.	FR-169 The car shall be fitted with a lightweight 5 speed manually operated gearbox.	TRN-AD-44 Gearbox	TRN-TP-36 Lightweight footwear control test
TRN-CSR-59	<b>3.1.7 Visibility</b>			
TRN-CSR-60	<b>3.1.7.1 Daylight</b>			
TRN-CSR-61	Users shall have maximum daylight visibility from within the vehicle.			
TRN-	<b>3.1.7.2 Night time</b>			

Fácil detección de requisitos no satisfechos, sin prueba asociada, etc...

Los huecos muestran los requisitos no satisfechos, trabajo que falta por hacer



# IBM Rational DOORS

*Progreso del proyecto con respecto a las pruebas*

The screenshot shows the IBM Rational DOORS interface. On the left is a tree view of system requirements. The main area is a table with columns for ID, Car system requirements, Requirement Status, and Associated Tests & Status. The table lists several requirements, with some marked as passed (green checkmarks) and others as failed (red X marks). The 'Test Status' for several tests is highlighted with blue circles.

ID	Car system requirements	Requirement Status	Associated Tests & Status
SR1635	<b>1.1.2.1 Without Winds</b>	✓	
SR1009	The car shall be able to accelerate from 0 to 100 Kilometers per hour in 10 seconds on standard flat roads with winds of 0 kilometers per hour.	✓	<b>TP-26.1</b> <b>Action:</b> In a flat road without winds, accelerate the car from 0 to 100 Km/h and observe the time taken <b>Expected Result:</b> The time taken must be less or equal than 10 seconds. <b>Test Status:</b> Pass
SR1010	The car shall be able to accelerate from 100 to 150 kilometers per hour at a rate of 5 kilometers per second on standard flat roads with winds of 0 kilometers per hour.	✓	<b>TP-26.1</b> <b>Action:</b> In a flat road without winds, accelerate the car from 0 to 100 Km/h and observe the time taken <b>Expected Result:</b> The time taken must be less or equal than 10 seconds. <b>Test Status:</b> Pass
SR1011	The car shall be able to accelerate from 150 to 200 kilometers per hour at a rate of 3 kilometers per second on standard flat roads with winds of 0 kilometers per hour.	✓	<b>TP-26.2</b> <b>Action:</b> Continue accelerating from 100 to 150 Km/h and observe the total time taken (from 0 km/h) <b>Expected Result:</b> The time taken from the beginning must be less or equal than 20 seconds. <b>Test Status:</b> Pass
SR1636	<b>1.1.2.2 With winds from 10 to 20 km/h</b>	✗	
SR1632	The car shall be able to accelerate from 0 to 100 Kilometers per hour in 12 seconds on standard flat roads with winds from 10 to 20 kilometers per hour.	✗	<b>TP-26.3</b> <b>Action:</b> Continue accelerating from 150 to 200 Km/h and observe the total time taken (from 0 km/h) <b>Expected Result:</b> The time taken from the beginning must be less or equal than 38 seconds. <b>Test Status:</b> Pass
			<b>TP-36.1</b> <b>Action:</b> In a flat road without winds, accelerate the car from 0 to 100 Km/h and observe the time taken <b>Expected Result:</b> The time taken must be less or equal than 12 seconds. <b>Test Status:</b> Undetermined





# **Novedades IBM Rational DOORS 9.4**





# IBM Rational DOORS 9.4 y DWA 1.5

2011

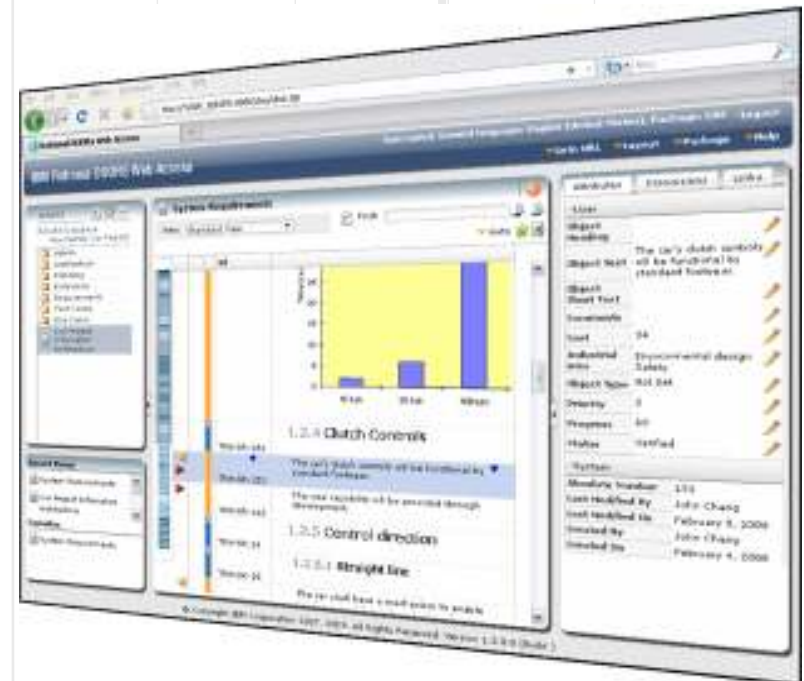
2012

2013

2014

2015...

- DOORS – HP Quality Center
  - Soporte a la última versión de HPQC
- Actualización de RIF a la última versión de ReqIF
  - Soporte mejorado para el trabajo con proveedores
- Mejoras en seguridad
  - La autenticación se mueve del cliente al servidor
- Integraciones, de la sincronización de datos al *linked lifecycle data* vía OSLC
  - Mejora de la visibilidad de los atributos y de la trazabilidad durante todo el ciclo de vida.
  - Nuevas integraciones con RQM y con Design Manager (beta)
  - Generación de documentación. Uso de plantillas definidas por el usuario sin necesidad de licencia de RPE.
  - Mejoras de usabilidad



# Extensión del soporte OSLC

- Mejoras generales en OSLC. Beneficios en todas las integraciones.
- Nueva integración con RQM (ver siguientes slides)
- Nueva integración con Design Manager
  - Design Manager – RSA
  - Design Manager – Rhapsody

▼ **Summary**

Object Identifier: 8  
Created On: 2012-03-30  
Created By: Administrator  
Last Modified On: 2012-04-18  
Last Modified By: Administrator  
Module Name: DOORSinsight  
Module  
Description:

▼ **Attributes**

User	
Object Heading	Document overview
Object Text	
Object Short Text	

System	
Absolute Number	8
Created By	Administrator
Created On	March 30, 2012
Last Modified By	Administrator
Last Modified On	April 18, 2012

▼ **Links**

There are 0 DOORS In-links  
There are 0 DOORS Out-links

▼ **External Links**

Elaborates (1)  
<doors://mehulpat2.46677/?version=2&prodID=0&um=um.telelogic.:1-4f8e4d1f45763832-O-3-00000020>

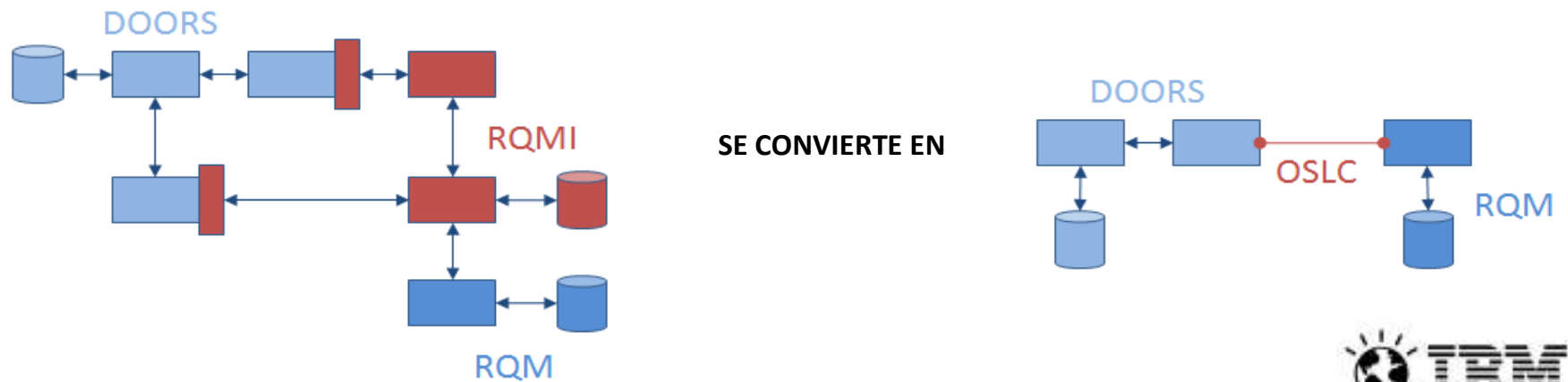
Open... Details >>





# Integración con Rational Quality Manager

- **Los requisitos DOORS asociados/linkados a pruebas RQM a través de OSLC**
  - Sin copias ni sincronización de información
- **Se elimina la antigua integración punto a punto por OSLC**
  - Proporciona una arquitectura estable y escalable para la inclusión de futuras funcionalidades y mejoras.
- **Instalación y configuración mucho más sencilla**
  - La integración no requiere un servidor ni un cliente java



# Integración DOORS – RQM

## Casos de uso para usuarios DOORS

### Trazabilidad a pruebas RQM en tiempo real

- El usuario DOORS:
  - Especifica los requisitos a probar
  - Monitoriza/controla la trazabilidad requisitos pruebas
  - Revisa información de las pruebas RQM desde DOORS
  - Evalúa el estado de los requisitos según el estado de ejecución de las pruebas

The screenshot displays the DOORS software interface. The main window shows a table with columns for ID, Car user requirements, Test Cases, Test Status, and Verdict. The table lists various requirements (CSR103 to CSR115) and their associated test cases, including their status (e.g., Approved, Not Approved) and verdict (e.g., Failed, Passed). A detailed view of a test case is shown on the right, including its state (Draft), description, type (Test Case), owner (Maria), calculated risk (5 circles), community risk (5 circles), project area (Meter Reader Testing), and team area.

ID	Car user requirements	Test Cases	Test Status	Verdict
CSR103	<b>3.2 Constraint Requirements.</b>		Meted Status	Failed
CSR104	<b>3.2.1 Availability</b>		Meted Status	Failed
CSR105	Users shall be able to travel 10000 kilometers with a 99.9 percent chance of experiencing no breakdowns.	(1) 10K Reliability: Failed	Approved	Failed
CSR106	Users shall be able to travel 10000 kilometers with a 99.99 percent chance of experiencing no faults that do not result in breakdowns.	(1) 10K Reliability: Failed	Approved	Failed
CSR107	Loss of use of car due to equipment failure shall not exceed 1 day in every 2 years.	(2) Stress Test: Error	Not Approved	En
CSR108	<b>3.2.2 Lifetime</b>		Not Approved	En
CSR109	Users shall be able to use the car to its designed standard for 200000 kilometers.	(2) Stress Test: Error (3) Security Check: Passed	Not Approved	En
CSR110	<b>3.2.3 Security</b>			
CSR111	Only the authorized user shall be able to start and drive away the vehicle.			
CSR112	<b>3.2.4 Accessories</b>		Approved	Pa
CSR113	A warning triangle shall be supplied with the vehicle	(4) Accessory Audit: Passed	Approved	Pa
CSR114	A first aid kit shall be supplied with the vehicle	(4) Accessory Audit: Passed	Approved	Pa
CSR115	<b>3.2.5 Fuel input</b>		Approved	Incomplete

**Overview**  
State: Draft  
Description:  
**Details**  
Type: Test Case  
Owner: Maria  
Calculated Risk: 5 circles  
Community Risk: 5 circles  
Project Area: Meter Reader Testing  
Modified: May 10, 2012 7:44 PM  
Trigger:  
Activity:  
Weight: 100  
Team Area:  
Open...



# Integración DOORS – RQM

## Casos de uso para usuarios RQM

- El usuario RQM:

***Requisitos que se están probando en tiempo real***

- Crea automáticamente los casos de prueba a partir de los requisitos
- Revisa información de requisitos desde RQM

**Test Cases**

View As: **Traceability** Group By: **Ungrouped**

10 items per page

ID	Name	Validates Requirement	Tests Development Item	Priority
19	Allocate Dividends to a Single Cause	(1), (2), (3), (4), (5)	Allocate Dividends by Percentage	
22	Dispute Credit Card Charge	-		
3	Allocate Dividends by Percentage	Allocate dividend		
7	Allocate dividends by amount and frequency	Allocate dividend		
18	Dividend Allocation by Percentage	Dividend allocati		
9	Donors Can Choose to Support an Organization	Donors can cho		
11	Donors Choose an Organization	Donor Chooses		
17	JKE Charity Coordinator responds to online request	JKE Charity Coo		
25	(QM Tutorial) Allocate Dividends to Multiple Causes			
16	Donor dividend allocation conforms to stated criteria	Donor Dividend		

**Summary**

Object Identifier: 164  
Created On: 2011-05-24  
Created By: mark  
Last Modified On: 2012-05-10  
Last Modified By: mike  
Module Name: J Handheld Unit Software Requirements  
Module Description: Software requirements for the Handheld Water Meter Receiver

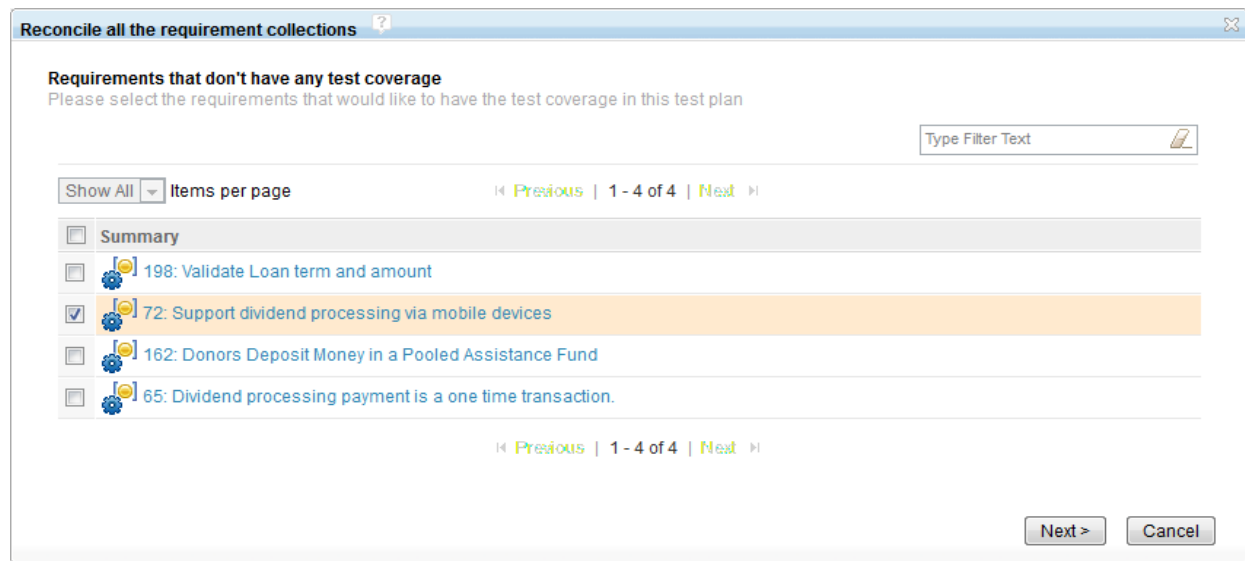
**Attributes**

User	Object Heading	Object Text
		The Handheld Unit shall have the ability to request and receive Leak diagnostic data from the MIU.

# Asistente reconciliación de requisitos

*Aseguramiento cobertura, incluso si los requisitos cambian*

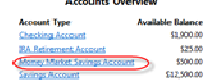
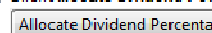

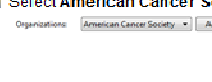
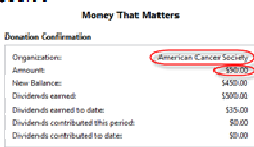
- Muestra requisitos no asociados a casos de prueba en un plan de pruebas
- Permite crear automáticamente un nuevo caso de prueba para cada uno de esos requisitos
- Permite añadir al plan de pruebas casos de prueba existentes asociados a esos requisitos
- Muestra requisitos modificados y borrados
- Permite actualizar links a casos de prueba y mostrar relaciones sospechosas




# Trazabilidad a pasos de casos de prueba

## Cumplimiento de requisitos regulatorios


- Cada paso de un script de prueba manual puede trazarse a uno o varios requisitos
- Puede restringirse a los requisitos asociados con el caso de prueba
- Links are shown during test execution and in test case result details

Step	Description:	Expected Results	Validates
1	<b>Select Money Market Savings Account</b> <i>Accounts Overview</i> 	Account Details screen appears	
2	<b>Click Allocate Dividend Percentage button</b> 	Money That Matters screen appears	 <a href="#">Allocate dividends by Percentage</a>
3	<b>Select American Cancer Society and click Add</b> 	American Cancer Society is added to the organizations list	
4	<b>Enter 10 for the Percentage and click Next</b>	Verify <b>Donation Organization</b> is American Cancer Society and <b>Donation Amount</b> is \$50.00 	











 [Click to add step](#)

include built-in variables  

Name	Value
No items found.	

Requirement View 

  
[Previous](#) | 1 - 5 of 5 | [Next](#)

Requirement	Test
 Donor Chooses a...	 A...
 Allocate dividends...	 A...
 Donors can choos...	 A...
 Dividend allocatio...	 A...
 Allocate dividends...	 A...

[Previous](#) | 1 - 5 of 5 | [Next](#)

# Reporting

## *Generación de documentación y dashboards*

- Generación de informes desde DOORS utilizando plantillas definidas por el usuario sin necesidad de licencia de RPE
- Licencia necesaria para la creación de la plantilla, pero no para la generación

	DOORS 9.3	DOORS 9.x
Use Standard Templates	Built in	Built in
Use Custom Templates	License needed	Built in
Create Custom Templates	License needed	License needed

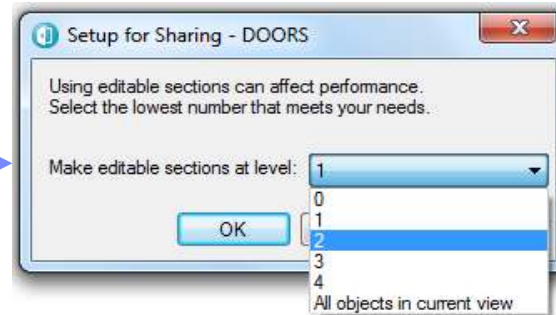
- DOORS proporcionará un ETL para Data Warehousing (Insight) – Se espera para finales de 2012
  - Obtención de dashboards de proyecto
  - Informes de tendencias



# Otras mejoras de usabilidad

## Mejoras de la edición compartida

- Definición y gestión de cómo múltiples usuarios pueden trabajar simultáneamente con el mismo documento.
- Resetear secciones de edición a un estado anterior
- Establecer secciones compartidas a los objetos de una vista



## Vistas

- Color del background en función del valor de un atributo
- Vistas de hasta 128 columnas (antes 32)
- Borrado múltiple de vistas

## Microsoft Excel

- Exportación de rich text a Excel

## Usabilidad

- Importación de múltiples atributos de un módulo a otro en una acción





# Temas candidatos para futuras mejoras.. 9.X

2011

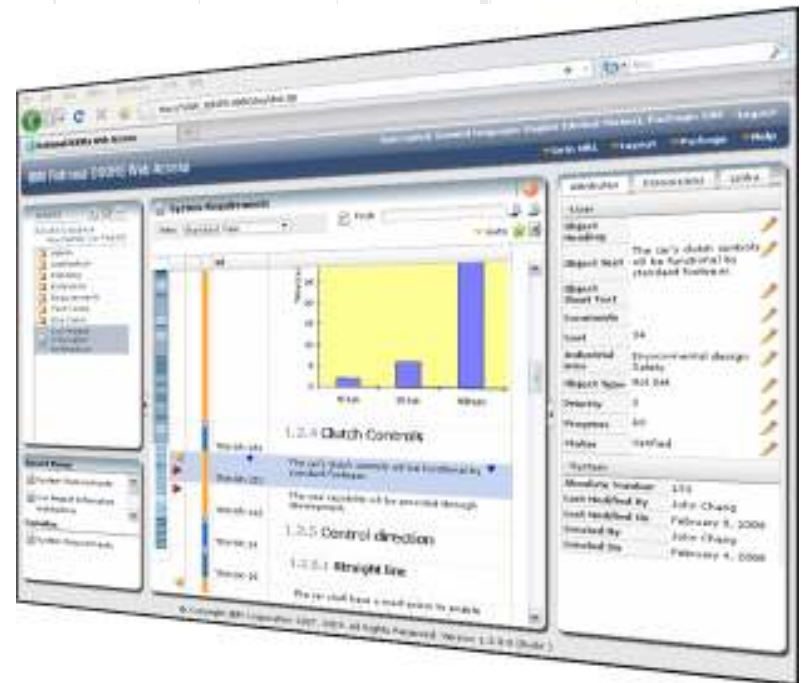
2012

2013

2014

2015...

- DOORS
  - Usability Enhancements
  - Reporting over system engineering metrics
  - Database-wide query
  - Richer OSLC Integrations
  - Additional Integrations
- DOORS Web Access
  - Persistent user preferences
  - Document generation





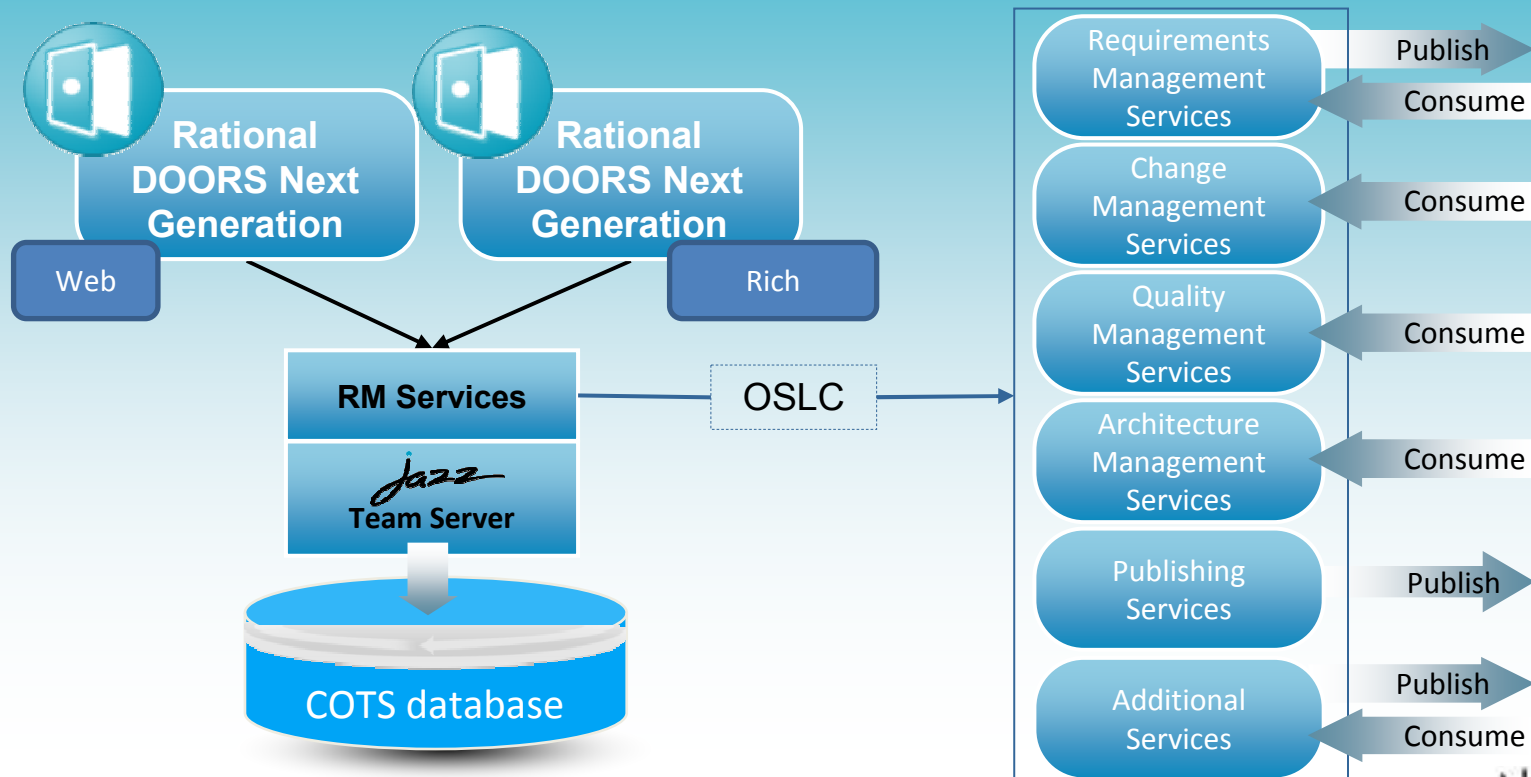
**What's Next?**

**DOORS Next Generation (beta)**



# IBM Rational DOORS Next Generation

- Visibilidad y trazabilidad de requisitos a través de todo el ciclo de vida
- Arquitectura Jazz
- Integraciones mediante OSLC



# DOORS Next Generation rich client

*Módulo formal en el rich client*

ID	Content								
277	<b>1.1 Purpose of the Document</b>								
278	The Stakeholder requirements describe the user needs for a water meter reading system (AMR) including the meter, the method of collecting data from the device, and the means by which the customers will be billed for usage.								
279	The AMR product is intended to allow water providers to lower their cost of operation by more accurately measuring consumption and more quickly gather data.								
280	<b>1.2 Intended Use</b>								
281	The AMR is intended for gathering and reporting of water consumption data to facilitate measurement of residential and business customers.								
282	<b>1.3 Definitions Acronyms, and Abbreviations</b>								
283	<table border="1"><thead><tr><th>Term</th><th>Definition</th></tr></thead><tbody><tr><td>AMR</td><td>Automatic Meter Reading</td></tr><tr><td>MMIU</td><td>Multi-channel Meter Interface Unit</td></tr><tr><td>CTRL</td><td>Central Control Center</td></tr></tbody></table>	Term	Definition	AMR	Automatic Meter Reading	MMIU	Multi-channel Meter Interface Unit	CTRL	Central Control Center
Term	Definition								
AMR	Automatic Meter Reading								
MMIU	Multi-channel Meter Interface Unit								
CTRL	Central Control Center								



# DOORS Next Generation web client

*Módulo formal en el cliente web*

Filter Pane

Module

Properties

The screenshot displays the DOORS Next Generation web client interface. The main content area shows a requirement document titled "149: Automated Meter Reader System Requirements". The document is structured as follows:

- 1 Introduction
  - 1.1 Purpose of the Document
- 2 General Description
  - 2.1 Functions and Purpose

The document content includes the following text:

This document describes the specific functionality of the Automated Meter Reader system. The system is currently available with a handheld collection device. The mobile and fixed network methods of data collection are outside the scope of this system.

The AMR system is used to determine water service / consumption for the more than 75,000 meter connections to residential, commercial and industrial customers inside a 72 square mile area.

In handheld AMR, a meter reader carries a handheld computer with a built-in or attached receiver/transceiver (radio frequency or touch) to collect meter readings from an AMR capable meter. This is sometimes referred to as "walk-by" meter reading since the meter reader walks by the locations where meters are installed as they go through their meter reading route. Handheld computers may also be used to manually enter readings without the use of AMR technology as an alternate but this will not support comprehensive data which can be accurately read using the meter reading electronically.

<AMR Artist Revision>

Showing 66 Artifacts

The interface also features a "Filter Pane" on the left side, a "Module" section in the middle, and a "Properties" pane on the right side. The "Properties" pane shows the following information:

- Project: DOORS Next Generation Beta 1 (Requirements)
- Team Ownership: DOORS Next Generation Beta 1 (Requirements)
- Created On: Dec 20, 2011 1:40:05 PM
- Created By: Morgan Brown
- Modified On: Dec 20, 2011 1:40:05 PM
- Modified By: Morgan Brown
- Type: Automated Meter Reader System Requirements
- Format: Module



# Importante...

- Actualmente es una versión **beta**
- Toda la información en: <https://jazz.net/products/rational-doors/>

Rational DOORS Next Generation (Beta) - Products - Jazz Community Site

https://jazz.net/products/rational-doors/

Search jazz.net | Register | Log In

Products Downloads Our Story MY STUFF GET HELP EXTEND LIBRARY FORUM BLOGS JAZZ616

## Rational DOORS Next Generation (Beta)

Requirements engineering for complex systems

Download 4.0.1 Beta 4  
August 18, 2012

Overview Downloads What's happening

587: AMR System Requirements Specificati...

ID	Contents
2	General Description
2.1	Functions and Purpose
761	The AMR system is used to determine water ser connections to residential, commercial and indu
768	In handheld AMR, a meter reader carries a hand receiver/transceiver (radio frequency or touch) to

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Features >

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# Muchas gracias

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