

RBT / BDTM / RCA

Méthodes d'optimisation des tests





- Sogeti et le Testing
- Objectifs
- Principes méthodologiques
 - BDTM : Business Driven Test Management
 - RBT : Risk Based Testing
- Mise en œuvre avec Rational

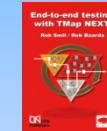


1. Stratégie

Savoir faire > 20 ans
 14 pays
 470 professionnels en France
 Leader 2009 sur trois critères (PAC)
 Activité dédiée
 Industrialisation
 Innovation
 5 axes de développements
 Amélioration des processus de tests
 Services Managés de tests
 Tests à la demande
 Automatisation des tests
 Packaging

2. Testing Sogeti

- Méthodologies
 TMAP Test Management Approach
 TPI Test Process Improvement
- Nombreux ouvrages publiés
 End to End Testing
 TPI Next
- Tous types de tests
- Toutes méthodes de développement
- Tous types d'application
- Tous types de projets (programmes, projets neufs, maintenance, infrastructures)



3. Références / secteurs

- 3000 clients dans le monde
- 200 clients en France
- Secteurs
 Banque; Finance; Assurance
 Téléco; Média
 Energie; Utilities
 Industrie; Transports
 Service Public et Collectivités
 Services
- Double compétence métier
- Solutions verticales
 SEPA, SAP, Accessibilité Web

4. Services industriels

- Tous les besoins de tests
 Conseil et méthodologie, Expertise
 Renforts de ressources
 Centres de compétences,
 Centres de services
 Automatisation,
 Cellule de qualifications
 Usines (packaging et testing)
- Services externalisés et ou offshorisés
- Deux modèles de relation
 MTS : Managed Testing Services pour les services pilotés de tests
 STaaS : pour les activités à la demande

5. Profession

- Filière professionnelle dédiée
 Métiers du test
 Carrière, rôles, Compétences
- Institut de formations
 Cours internes et externes
 Certifications
 Action collective Fafiec
- Communautés
 Bases de connaissances
 Bases d'expériences
 Plate-forme d'échange
 Réseaux de référents



6. Innovation

- Centre de R&D
- En cours de déploiement
 Intégration TMap / Rational
 Extensions de TMap / Agile
 Systèmes complexes
- Expérimentation
 Cloud testing
 Intégration TMap / VSTS 2010
 Certification « accessibilité Web »
- Incubations
 Test Modeling
 Windows 7 impact Testing
 Intégration de TMap / HP Mercury



Mumbai



Casablanca



Bordeaux



Pau

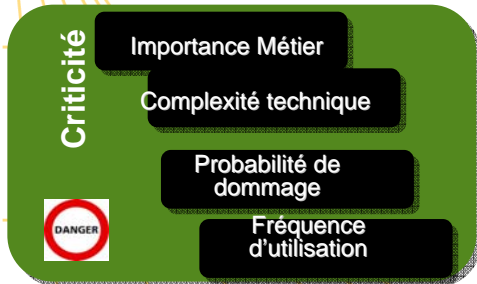


- Les techniques présentées permettent :
 - De vérifier qu'un patrimoine de tests est proportionné aux priorités de tests et à l'importance relative des critères qualité attendus
 - De dimensionner l'effort de test en fonction des moyens disponibles en budget et délais
 - D'organiser les campagnes pour tester d'abord ce qui est le plus risqué et/ou le plus important
 - De maîtriser les efforts de non régression

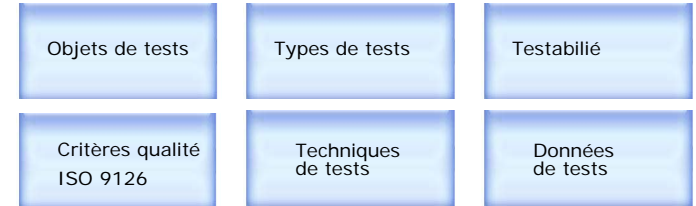


SOGETI

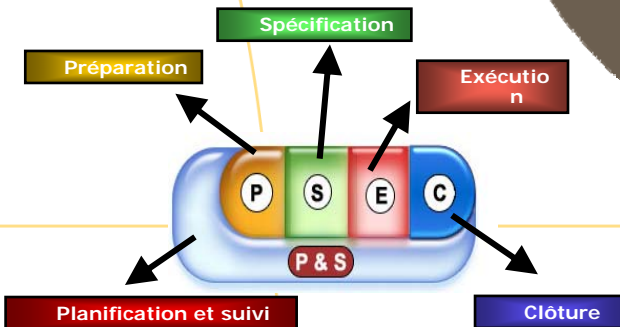
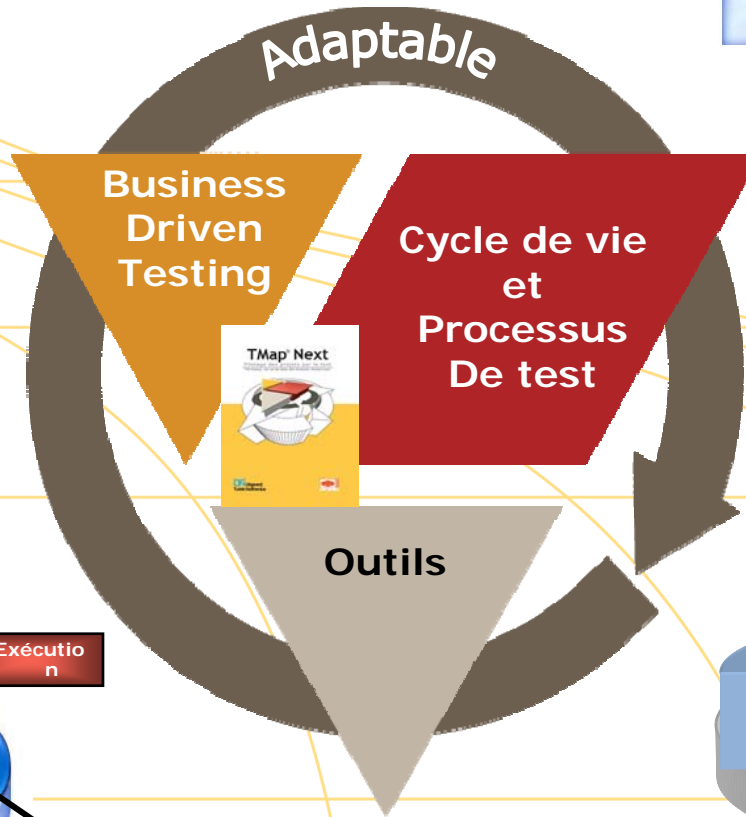
4 bonnes pratiques



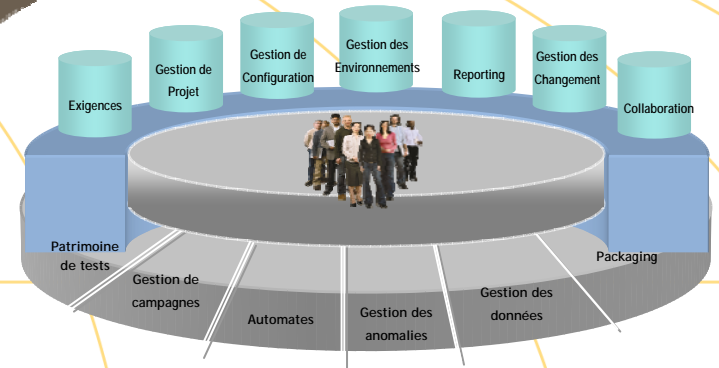
Tester ni trop ni trop peu



Savoir quoi vérifier !



Un processus de test efficace



Des outils support de productivité



- Objet de test
- Type de scénario
- Critère qualité (ISO 9126)
- RBT et/ou BDTM
- *Technique de Test*



- Règles de gestion
 - Test qui vérifie les cas normaux et les cas aux limites d'une règle de gestion, d'un calcul ou d'un algorithme en s'attachant à couvrir les cas possibles et les cas qui peuvent se produire
 - Exemple : contrôles de champs, règles de sécurité, calculs, obligations légales
- Processus (et sous-processus)
 - Vérifie qu'un enchaînement d'événements déclenche les activités prévues (Transformation de données d'entrées en données de sortie, déclenchement d'un autre événement, ...)
 - Exemple : interfaces / échanges; synchronisations tp/batch; intégration technique type bus applicatif; processus métier : prise de paris; gestion du parieur; clôture comptable, ...
- Cycle de vie
 - Vérifie les différents états possibles d'un objet de test
 - Exemple : création, modification, destruction, archivage, persistance de données; Cycle de vie d'un état : demandé, préparé, imprimé, détruit,...
- Procédures
 - Vérifie le système par ses modes opératoires (fonctionnels ou techniques) des utilisateurs et/ou clients
 - Exemple : procédure de surveillance; procédure de support au parieur; procédures de paramétrages; ...
- Cas d'usage
 - Vérifie le système vis-à-vis des situations dans laquelle il peut se trouver
 - Exemple : modes transitoires de lancement ou arrêt comportements sur pannes; comportements types d'un parieur; vérifications de portabilité; journée applicative type;
- Performances
 - Vérifie les temps de réponses, les capacités du SI en terme de charge (nb de stimulation simultanées); volume (de données); et points de rupture (saturations, et comportements de reprise)



Criticité

Importance Métier

Complexité

- Deux critères sont pondérés pour calculer une criticité aux fonctionnalités attendues du système
 - L'importance métier qui caractérise l'intérêt business et/ou le risque de dommages direct ou indirect
 - La complexité technique qui caractérise le risque de mise en œuvre
- Les échelles de valeur doivent être simples pour limiter la combinatoire
- Deux règles de calcul sont nécessaires :
 - L'une pour pondérer les critères entre eux
 - L'autre pour agréger des fonctions en sous-ensembles
- Elles sont choisies pour permettre une différenciation nette de classes de risque entre toutes les fonctionnalités
- Cette approche est bien adaptée aux projets à forte composante fonctionnelle
- Elle se met en œuvre au fur et à mesure des projets

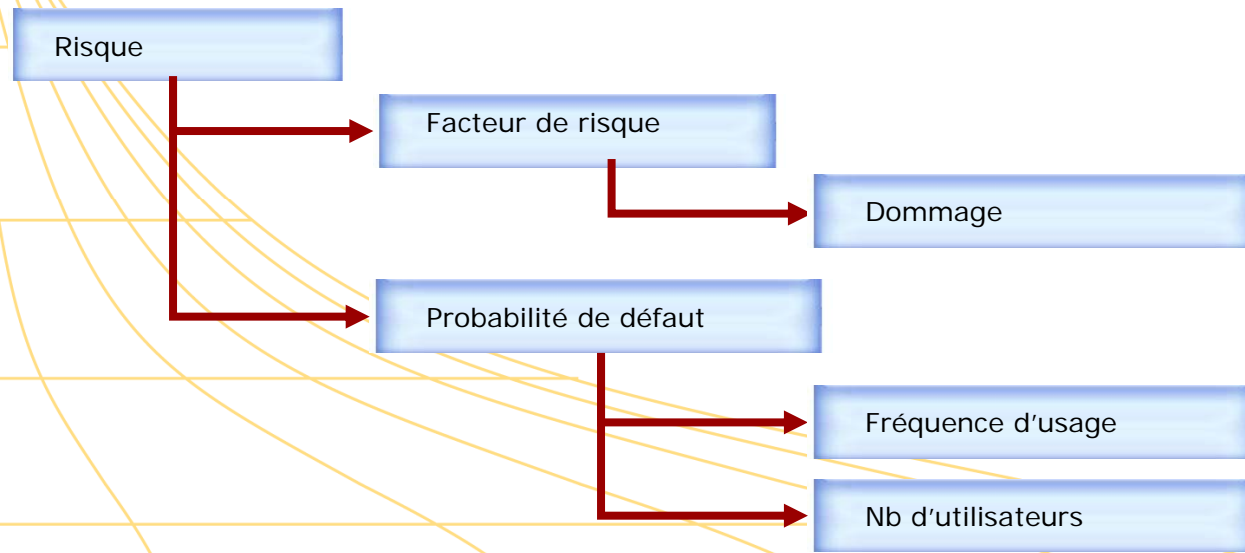


- Exemple d'échelle de mesure
 - **Importance métier**
 - Stratégique : apport direct de CA (et/ou différentiateur en parts de marché)
 - Moyenne : optimisation du travail (productivité)
 - Faible : confort
 - **Complexité technique**
 - Forte : Technos variées; synchronisations complexes, fortes convention de niveau de service, compétences faibles
 - Moyenne : mono techno; compétences dispos
 - Faible : sous-système indépendant
- Exemple de table de pondération

		Importance Métier		
		Stratégique	Moyenne	Faible
		3	2	1
Complexité technique				
Forte	3	3	2	2
Moyenne	2	3	2	1
Faible	1	2	2	1

- Exemple de règle de calcul d'agrégat
 - Moyenne des criticités





- Les facteurs de risques sont toutes les causes qui pourraient créer un dommage. L'échelle de dommage est à trois valeurs : direct (surcoûts, baisse de productivité), indirect (image, pertes de CA, pénalités, obligations légale), clients (dommages directs pour le client). Les facteurs de risques sont toutes les causes potentielles pouvant conduire au dommage : pannes, interruption de service ou des facteurs aggravants : complexité fonctionnelle, technique ou organisationnelle, délais, manque de compétences, ...
- Si les probabilités de défauts sont simples à calculer (multiplication), la quantification des dommages, des facteurs de risques et leur pondération entre eux peuvent rapidement devenir complexe et peu signifiante
- Le plan de gestion des risques indique quelles dispositions sont prises par le SI pour éviter leur survenance, ce qui se traduit par des exigences qui doivent être testées avec soin
- Cette approche est bien adaptée aux projets à forte composante technologique

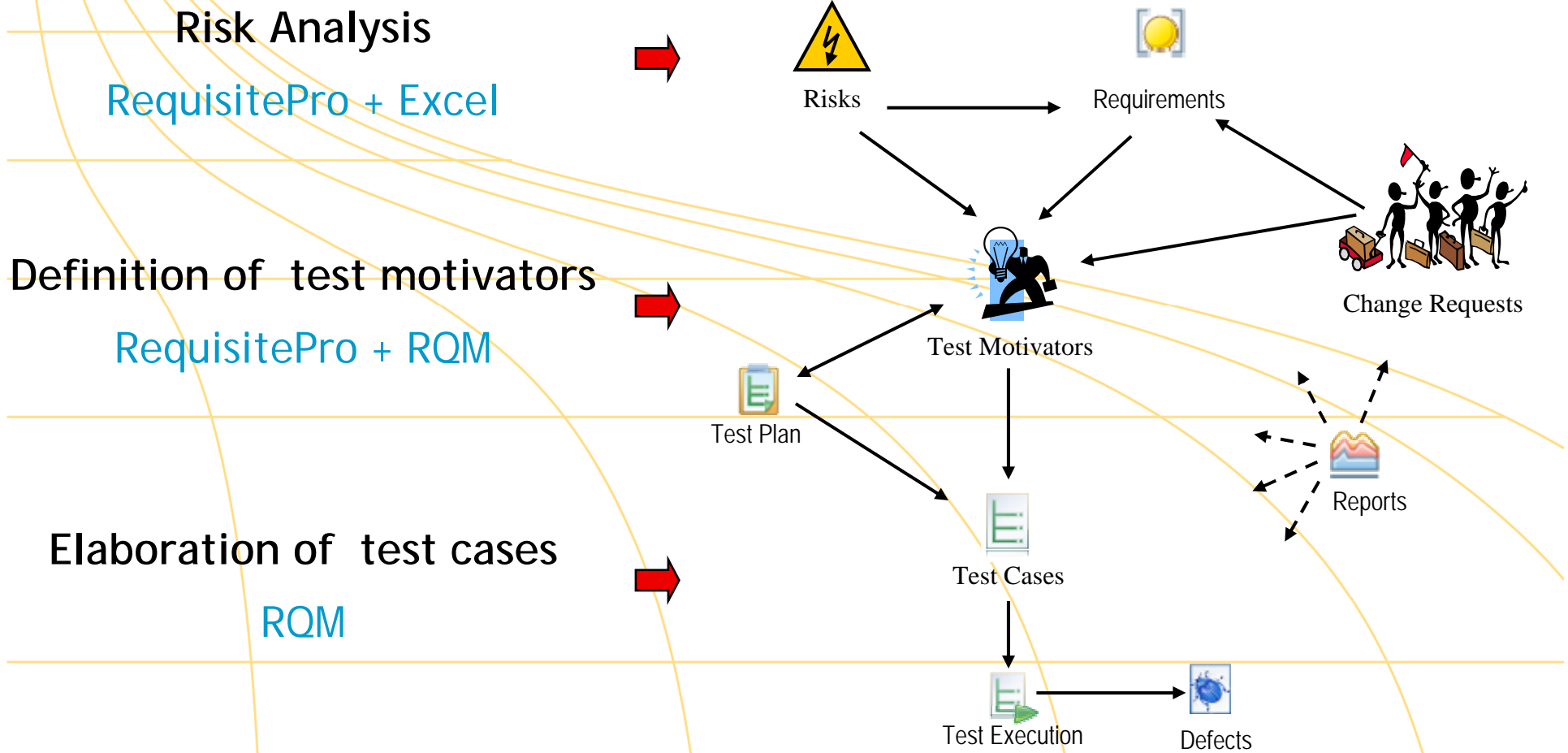
Risk Based Testing (2/2) : exemple



- Exemple d'analyse de risque

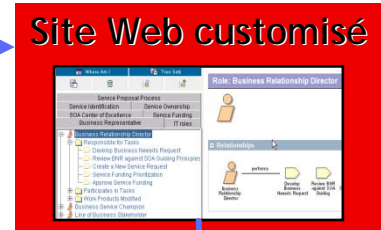
Facteur de risque	Sévérité Dommage		
	Direct	Indirect	Client
Panne matérielle	Oui	Oui	Non
Malveillance	Oui	Oui	Oui
Durée Batch / TP	Oui	Non	Non
Fonction de calcul xxx	Non	Non	Oui
Retards projet	Oui	Non	Non

- Il faut ensuite : quantifier les couleurs (verte, orange, rouge) et reporter ses valeurs sur les fonctionnalités impactées
- Pour le calcul de la probabilité de défaut, il faut se fixer une échelle de temps comparable entre les différentes parties du système et se fixer une règle de niveau de qualité de service : utilisation moyenne, pointe d'utilisation journalière, seconde pointe mensuelle, ...





- [-] [+] Testing Lifecycle
 - [+] [+] Master Test Plan Lifecycle Model
 - [-] [+] System Tests
 - [-] [+] Planning Phase
 - [+] [+] Establishing the assignment
 - [+] [+] Understanding the assignment
 - [+] [+] Determining the test basis
 - [+] [+] Analysing the product risks
 - [+] [+] Determining the test strategy

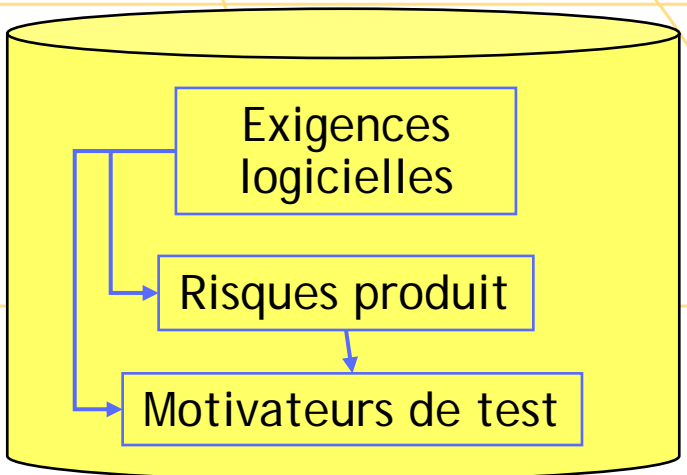


Spécification de la tâche avec des outils

Modèle de projet RequisitePro

Création du référentiel

Référentiel RequisitePro + Excel → stratégie de test basée sur les risques



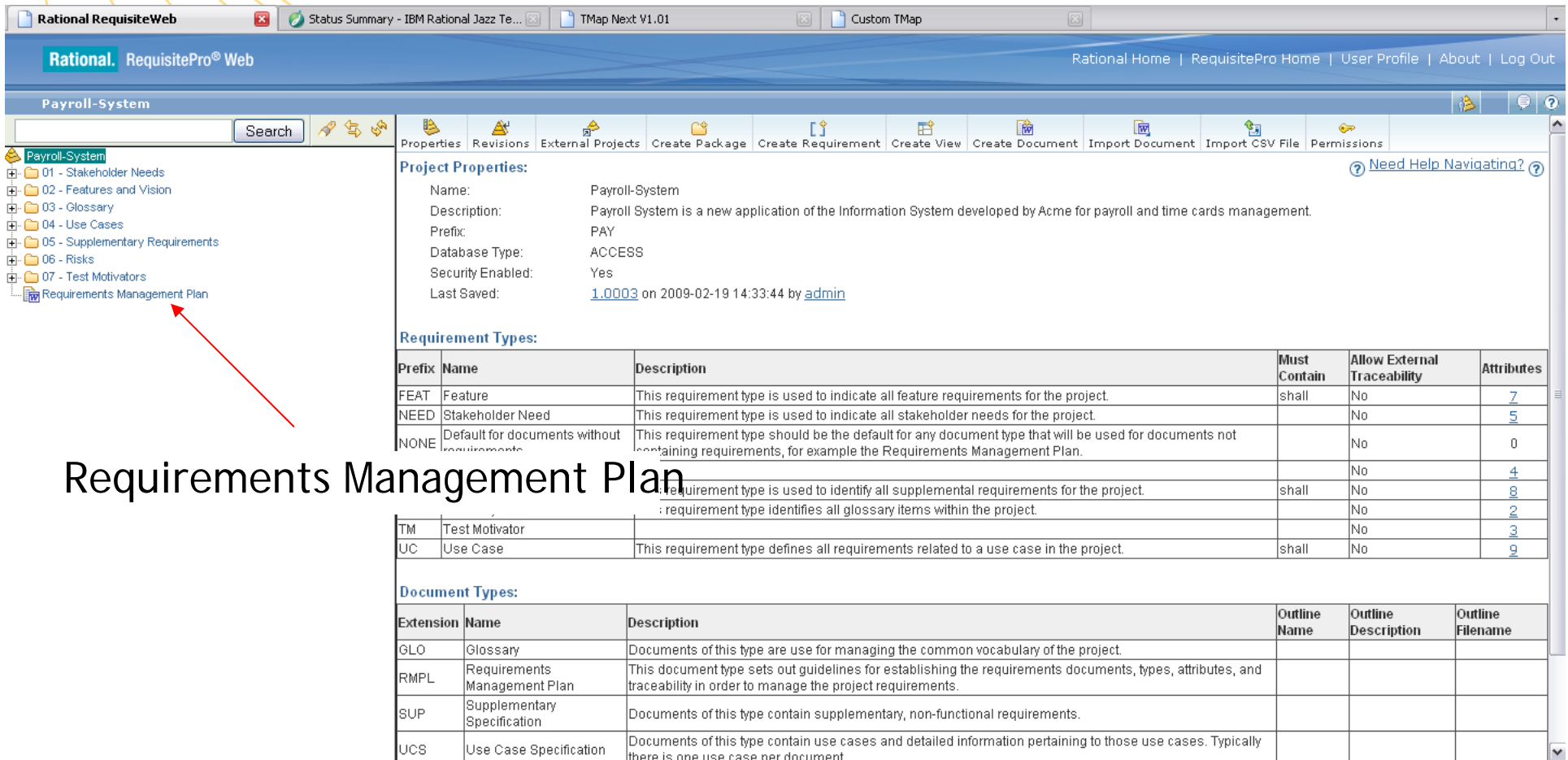
	Exigence 1	Exigence 2
Risque1	↖	
Risque2	↖	↖

	Test1	Test2
Risque1	↖	
Risque2		↖

	Impact	Probabilité	Classe
Risque1	Élevé	Élevé	A
Risque2	Moyen	Moyen	B



The project "Payroll System" is managed by RequisitePro and the process management, the requirements structure has been build from the TMap and IBM Practices (downloaded from the Custom site).



Project Properties:

Name: Payroll-System
 Description: Payroll System is a new application of the Information System developed by Acme for payroll and time cards management.
 Prefix: PAY
 Database Type: ACCESS
 Security Enabled: Yes
 Last Saved: 1.0003 on 2009-02-19 14:33:44 by admin

Requirement Types:

Prefix	Name	Description	Must Contain	Allow External Traceability	Attributes
FEAT	Feature	This requirement type is used to indicate all feature requirements for the project.	shall	No	7
NEED	Stakeholder Need	This requirement type is used to indicate all stakeholder needs for the project.		No	5
NONE	Default for documents without requirements	This requirement type should be the default for any document type that will be used for documents not containing requirements, for example the Requirements Management Plan.		No	0
				No	4
		This requirement type is used to identify all supplemental requirements for the project.	shall	No	8
		This requirement type identifies all glossary items within the project.		No	2
TM	Test Motivator			No	3
UC	Use Case	This requirement type defines all requirements related to a use case in the project.	shall	No	9

Document Types:

Extension	Name	Description	Outline Name	Outline Description	Outline Filename
GLO	Glossary	Documents of this type are use for managing the common vocabulary of the project.			
RMPL	Requirements Management Plan	This document type sets out guidelines for establishing the requirements documents, types, attributes, and traceability in order to manage the project requirements.			
SUP	Supplementary Specification	Documents of this type contain supplementary, non-functional requirements.			
UCS	Use Case Specification	Documents of this type contain use cases and detailed information pertaining to those use cases. Typically there is one use case per document.			

Requirements Management Plan



The criticality of the risk is represented by a class (A= high → C= Low). The calculation of this criticality is done by the combination of "the Damage" and "the chance of Failure".

Rational. RequisitePro® Web

Payroll-System

Search

Filter, Sort, or Save View | Create Requirement | Export View to XML | Export View to CSV | Delete View | Generate Bookmark

Requirements	Quality Characterist	Damage	Chance of Failure	Class
RISK1 Payroll System Intrusion Lack of experience of the developers with the Web technologies	Security	Medium	Medium	B
RISK2 Payroll Service Reliability Robustness of the mainframe technology compare to the new technologies	Reliability	Medium	Medium	B
RISK3 Time card submission Service Scalability All the employee (around 5000) submit their time cards on Friday	Reliability	Low	Medium	C
RISK4 Adaptative compliance to local payroll regulation Capability to configure easily the system for local payroll regulation	Other	Low	High	B
RISK6 Transition to the new system Migration of the existing payroll data	Other	High	High	A
RISK7 Security and user identification Moving from a manual to a Web-based self service process with less human control	Security	High	Medium	B
RISK8 Payroll Fraud Payroll staff fraud	Security	Medium	Medium	B
RISK9 Payroll calculation error Error in the development of the calculation and configurable parameters definition	Reliability	Low	Medium	C
RISK10 Capacity to deliver advanced features Capacity to deliver new advanced features	Functionality	Medium	Medium	B
RISK11 Capacity to integrate with others systems Capacity to deliver expected value through system integration	Functionality	High	Medium	B

Discussion Indicator: On
Hierarchical Format: On

The risk 7 has the class "B" + the attributes "Damage" and "Chance of Failure"



SOGETI

The risk analysis is done for the Risk 7



The traceability matrix for the risk 7

Rational RequisiteWeb

Rational. RequisitePro® Web

Payroll-System

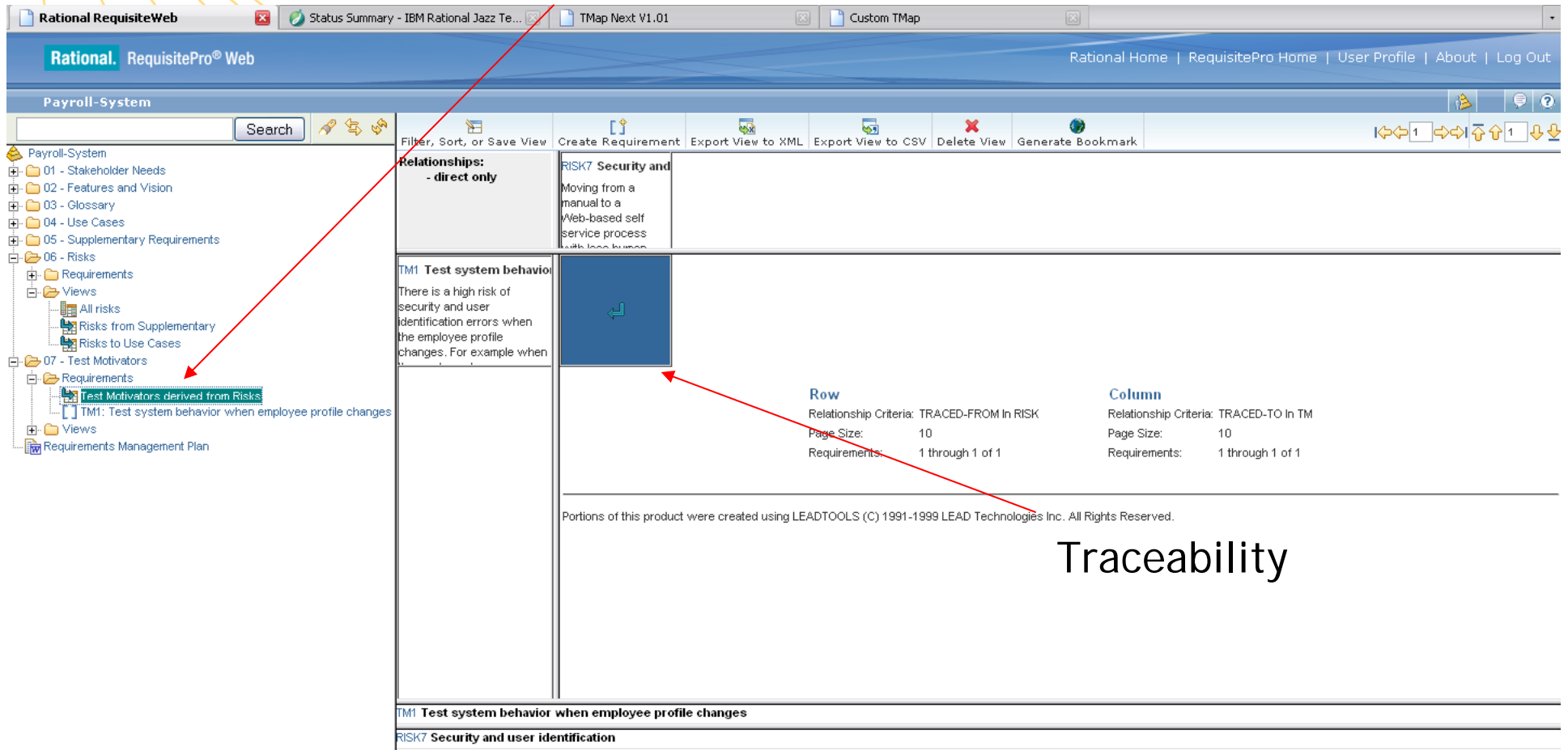
Search

Filter, Sort, or Save View | Create Requirement | Export View to XML | Export View to CSV | Delete View | Generate Bookmark

Relationships: - direct only	PayUC6 Configure Pay	UC7 Create Emplo	UC8 Generate Tax	UC9 Get Help	UC10 Login	UC11 Maintain Emp	UC13 Maintain Tim
RISK4 Adaptive compliance to local payroll regulation Capability to configure easily the system for local payroll regulation	↑					↑	
RISK6 Transition to the new system Migration of the existing payroll data			↑			↑	
RISK7 Security and user identification Moving from a manual to a Web-based self service process with less human control					↑	↑	
RISK8 Payroll Fraud Payroll staff fraud	↑				↑	↑	
RISK1 Payroll System Intrusion							
UC1 Configure Audit							



The "Test Motivators are derived from Risks". The test motivator TM1 contains the test objectives to mitigate the Risk 7.



The screenshot shows the Rational RequisitePro Web interface. On the left, a tree view shows the project structure under 'Payroll-System', with '07 - Test Motivators' and 'Test Motivators derived from Risks' highlighted. The main area displays a traceability matrix. The top row is labeled 'Relationships: - direct only' and shows a link from 'RISK7 Security and user identification' to 'TM1 Test system behavior when employee profile changes'. The matrix shows a single relationship with the following details:

Row	Column
Relationship Criteria: TRACED-FROM In RISK Page Size: 10 Requirements: 1 through 1 of 1	Relationship Criteria: TRACED-TO In TM Page Size: 10 Requirements: 1 through 1 of 1

At the bottom of the interface, the following text is visible:

Portions of this product were created using LEADTOOLS (C) 1991-1999 LEAD Technologies Inc. All Rights Reserved.

TM1 Test system behavior when employee profile changes
RISK7 Security and user identification

Traceability



SOGETI

Rick calculation



The Risk Calculation is made by using the Excel file downloaded from the customer web site.

The screenshot shows an Excel spreadsheet titled "Microsoft Excel - Risk-Analysis-Template.xls". The spreadsheet is divided into columns A through E. The content is as follows:

	A	B	C	D	E
1	Requirements View				
2	Project File:	C:\TMAP\Demo\Requirements\Requirements.rqs			
3	User:	admin	Password:	admin	
4	1 - Catalog	2 - Open			Close COM Server
5					
6					
7	Project Name:	Payroll-System			
8					Reset Worksheet
9	3 - List Requirements				
10					Reset Requirements
11	4 - Show Traceability				
12					
13					
14	To list requirements enter a requirement Type:				
15					
16	FEAT	Feature			
17	NEED	Stakeholder Need			
18	NONE	Default for documents without requirements			
19	RISK	Risk			
20	SUP	Supplementary			
21	TERM	Glossary Term			
22	TM	Test Motivator			
23	UC	Use Case			
24					

The Excel tool has an communication interface with the project RequisitePro,



The calculation can be adapted on the project context.

Microsoft Excel - Risk-Analysis-Template.xls

File Edit View Insert Format Tools Data Window Help

Type a question for help

Button 28

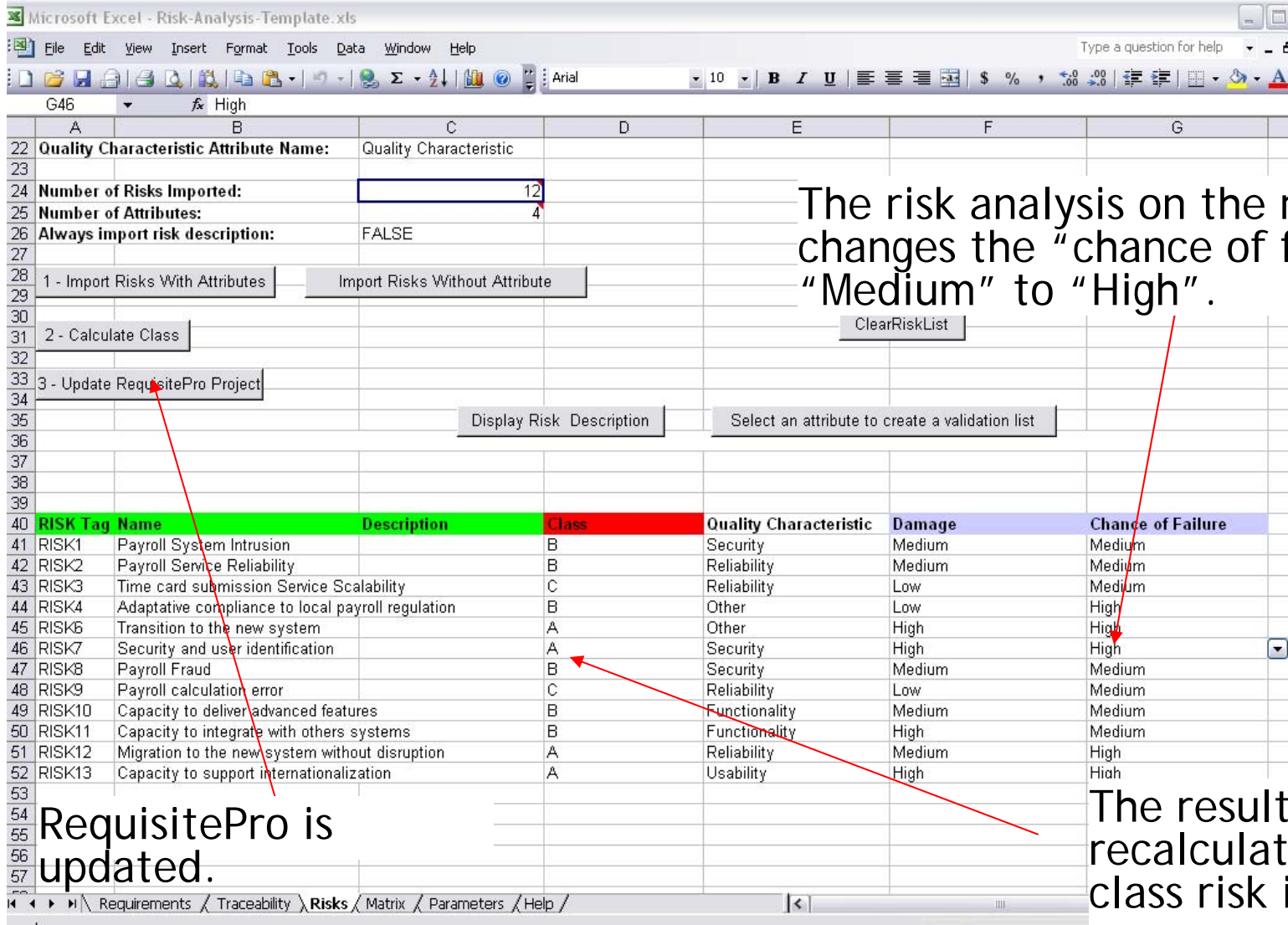
1	A	B	C	D	E	F	G	H	I	J	K	L	M
2	Class = Function (Chance of Failure, Damage)												
3													
4													
5		Chance of Failure		High	Medium	Low							
6	Damage												
7	High			A	A	B							
8	Medium			B	B	C							
9	Low			C	C	D							
10													
11													
12													
13	The "Damage" and the "Chance of Failure" can be the result of a calculation												
14													
15	Damage	LowerBound	UpperBound	Chance of Failure	LowerBound	UpperBound							
16	High			High									
17	Medium			Medium									
18	Low			Low									
19													
20													
21	Implement your calculation												
22													
23													
24	Import Risks												
25													
26	Risk Tag	Risk Name				Chance of Failure	F1	F2	F3	Damage	F1	F2	F3
27													
28													
29													
30													
31													
32													
33													
34													
35													

Requirements Traceability Risks Matrix Parameters Help

Ready



The risk calculation is made and the RequisitePro is updated.



The screenshot shows an Excel spreadsheet with the following data:

RISK Tag Name	Description	Class	Quality Characteristic	Damage	Chance of Failure
RISK1	Payroll System Intrusion	B	Security	Medium	Medium
RISK2	Payroll Service Reliability	B	Reliability	Medium	Medium
RISK3	Time card submission Service Scalability	C	Reliability	Low	Medium
RISK4	Adaptative compliance to local payroll regulation	B	Other	Low	High
RISK6	Transition to the new system	A	Other	High	High
RISK7	Security and user identification	A	Security	High	High
RISK8	Payroll Fraud	B	Security	Medium	Medium
RISK9	Payroll calculation error	C	Reliability	Low	Medium
RISK10	Capacity to deliver advanced features	B	Functionality	Medium	Medium
RISK11	Capacity to integrate with others systems	B	Functionality	High	Medium
RISK12	Migration to the new system without disruption	A	Reliability	Medium	High
RISK13	Capacity to support internationalization	A	Usability	High	High

Control buttons visible in the interface include: "1 - Import Risks With Attributes", "Import Risks Without Attribute", "2 - Calculate Class", "ClearRiskList", "3 - Update RequisitePro Project", "Display Risk Description", and "Select an attribute to create a validation list".

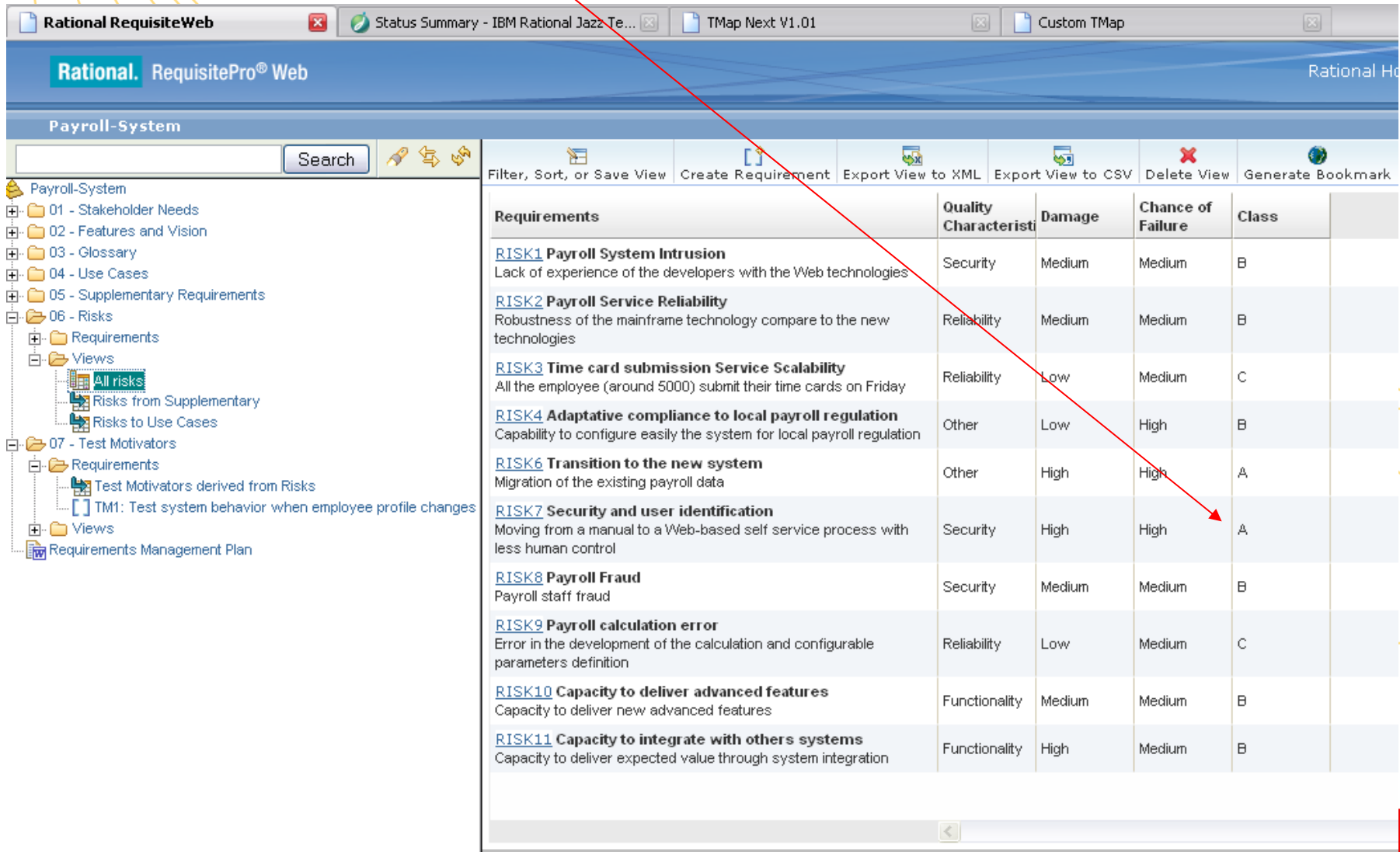
The risk analysis on the risk 7 changes the "chance of failure" from "Medium" to "High".

RequisitePro is updated.

The result of the recalculation of the class risk is "A".



The class risk is changed in RequisitePro.



Rational RequisitePro® Web

Payroll-System

Search

Filter, Sort, or Save View | Create Requirement | Export View to XML | Export View to CSV | Delete View | Generate Bookmark

Requirements	Quality Characterist	Damage	Chance of Failure	Class
RISK1 Payroll System Intrusion Lack of experience of the developers with the Web technologies	Security	Medium	Medium	B
RISK2 Payroll Service Reliability Robustness of the mainframe technology compare to the new technologies	Reliability	Medium	Medium	B
RISK3 Time card submission Service Scalability All the employee (around 5000) submit their time cards on Friday	Reliability	Low	Medium	C
RISK4 Adaptative compliance to local payroll regulation Capability to configure easily the system for local payroll regulation	Other	Low	High	B
RISK6 Transition to the new system Migration of the existing payroll data	Other	High	High	A
RISK7 Security and user identification Moving from a manual to a Web-based self service process with less human control	Security	High	High	A
RISK8 Payroll Fraud Payroll staff fraud	Security	Medium	Medium	B
RISK9 Payroll calculation error Error in the development of the calculation and configurable parameters definition	Reliability	Low	Medium	C
RISK10 Capacity to deliver advanced features Capacity to deliver new advanced features	Functionality	Medium	Medium	B
RISK11 Capacity to integrate with others systems Capacity to deliver expected value through system integration	Functionality	High	Medium	B



SOGETI

Risk calculation



RequisitePro can be used for an analysis of impact

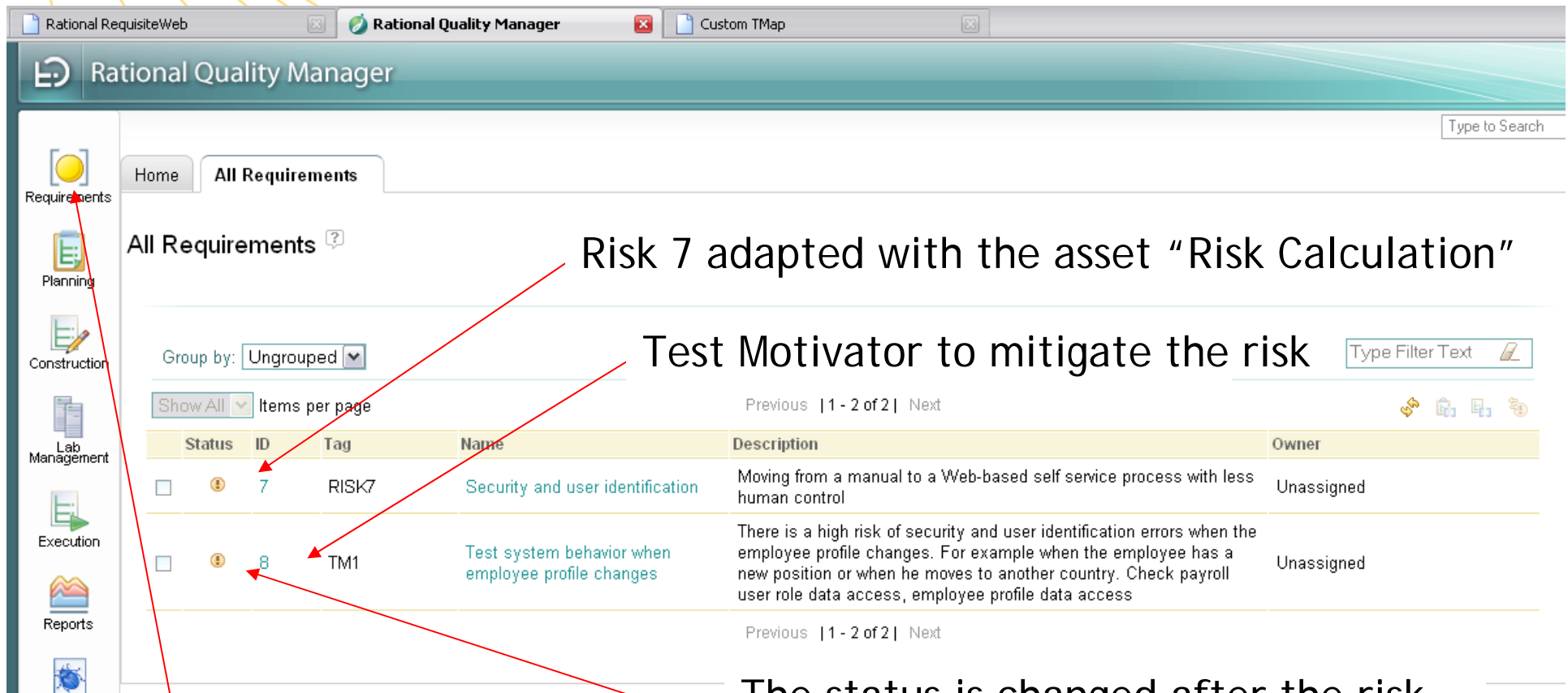
The screenshot shows the Rational RequisitePro Web interface. On the left is a tree view for a project named 'Payroll-System'. The tree includes folders for '01 - Stakeholder Needs', '02 - Features and Vision', '03 - Glossary', '04 - Use Cases', '05 - Supplementary Requirements', '06 - Risks', and '07 - Test Motivators'. Under '06 - Risks', there are sub-folders for 'Requirements' and 'Views', with 'All risks', 'Risks from Supplementary', and 'Risks to Use Cases' listed. Under '07 - Test Motivators', there are 'Requirements' and 'Views' folders, with 'Test Motivators derived from Risks' and 'TM1: Test system behavior when employee profile changes' listed. The main content area on the right has a search bar and buttons for 'Filter, Sort, or Save View', 'Create Requirement', and 'Export'. Below these are two rows in a table. The first row is titled 'Relationships: - direct only' and contains a cell with the text 'RISK7 Security and Moving from a manual to a Web-based self service process with less bu...'. The second row is titled 'TM1 Test system behavior' and contains a cell with the text 'There is a high risk of security and user identification errors when the employee profile changes. For example when...'. A blue box with a red 'X' is overlaid on the second row's cell, and a red arrow points to it from the text 'Suspect link' on the right.

"Suspect" link

The traceability is also done between the tests and the requirements.



The requirement and the result of the risk analysis are imported from RequisitePro like the test motivators. Now we have the right entry to elaborate the test cases.



The screenshot shows the Rational Quality Manager interface with the following elements:

- Browser tabs: Rational RequisiteWeb, Rational Quality Manager, Custom TMap
- Navigation menu: Home, All Requirements
- Left sidebar: Requirements, Planning, Construction, Lab Management, Execution, Reports
- Search bar: Type to Search
- Table of requirements and test motivators:

Status	ID	Tag	Name	Description	Owner
<input type="checkbox"/>	7	RISK7	Security and user identification	Moving from a manual to a Web-based self service process with less human control	Unassigned
<input type="checkbox"/>	8	TM1	Test system behavior when employee profile changes	There is a high risk of security and user identification errors when the employee profile changes. For example when the employee has a new position or when he moves to another country. Check payroll user role data access, employee profile data access	Unassigned

Risk 7 adapted with the asset "Risk Calculation"

Test Motivator to mitigate the risk

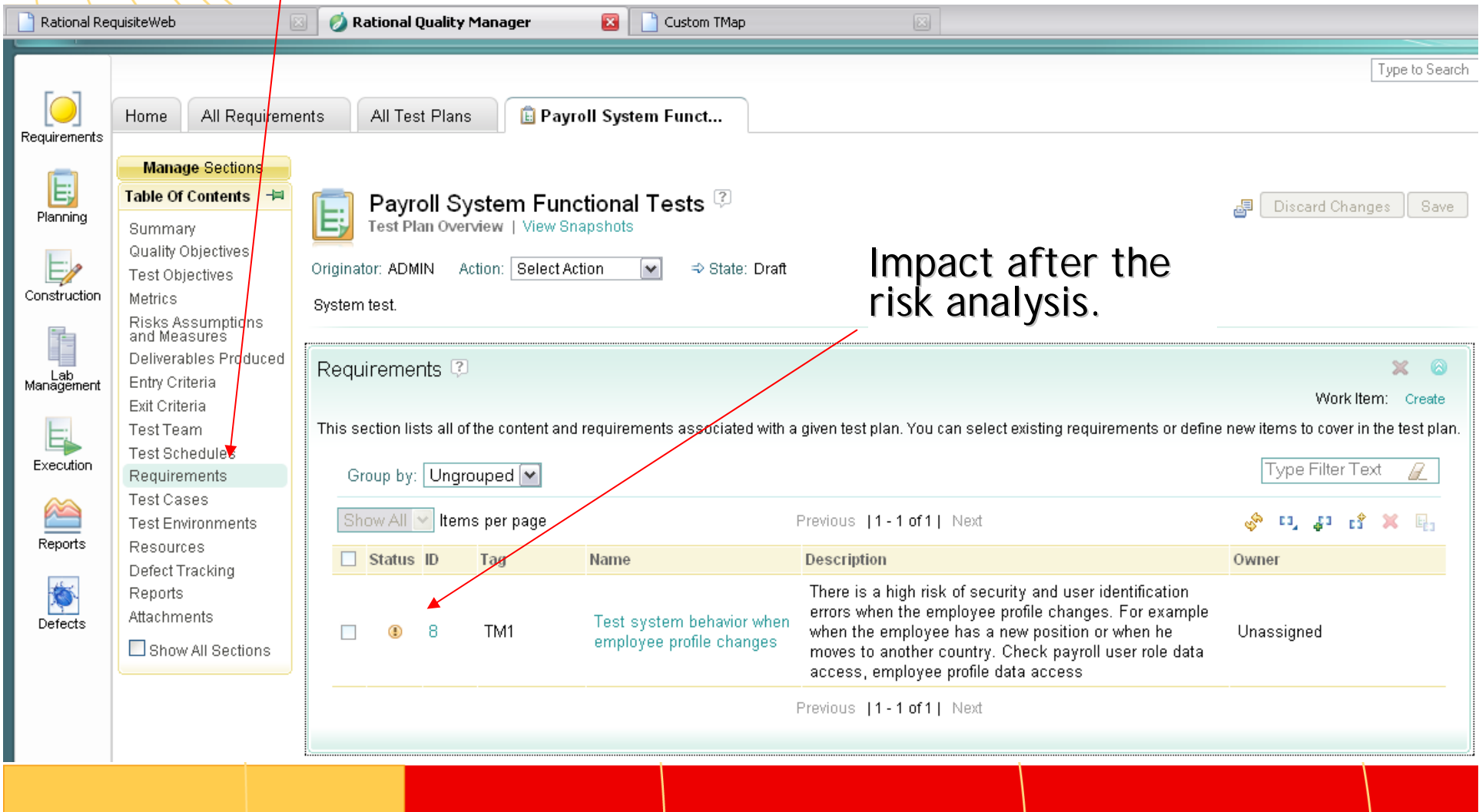
Importation of the requirements

The status is changed after the risk analysis.

Test Plan and Requirement (Test Motivator)



The Test Motivator is imported from RequisitePro and linked with the test Plan.



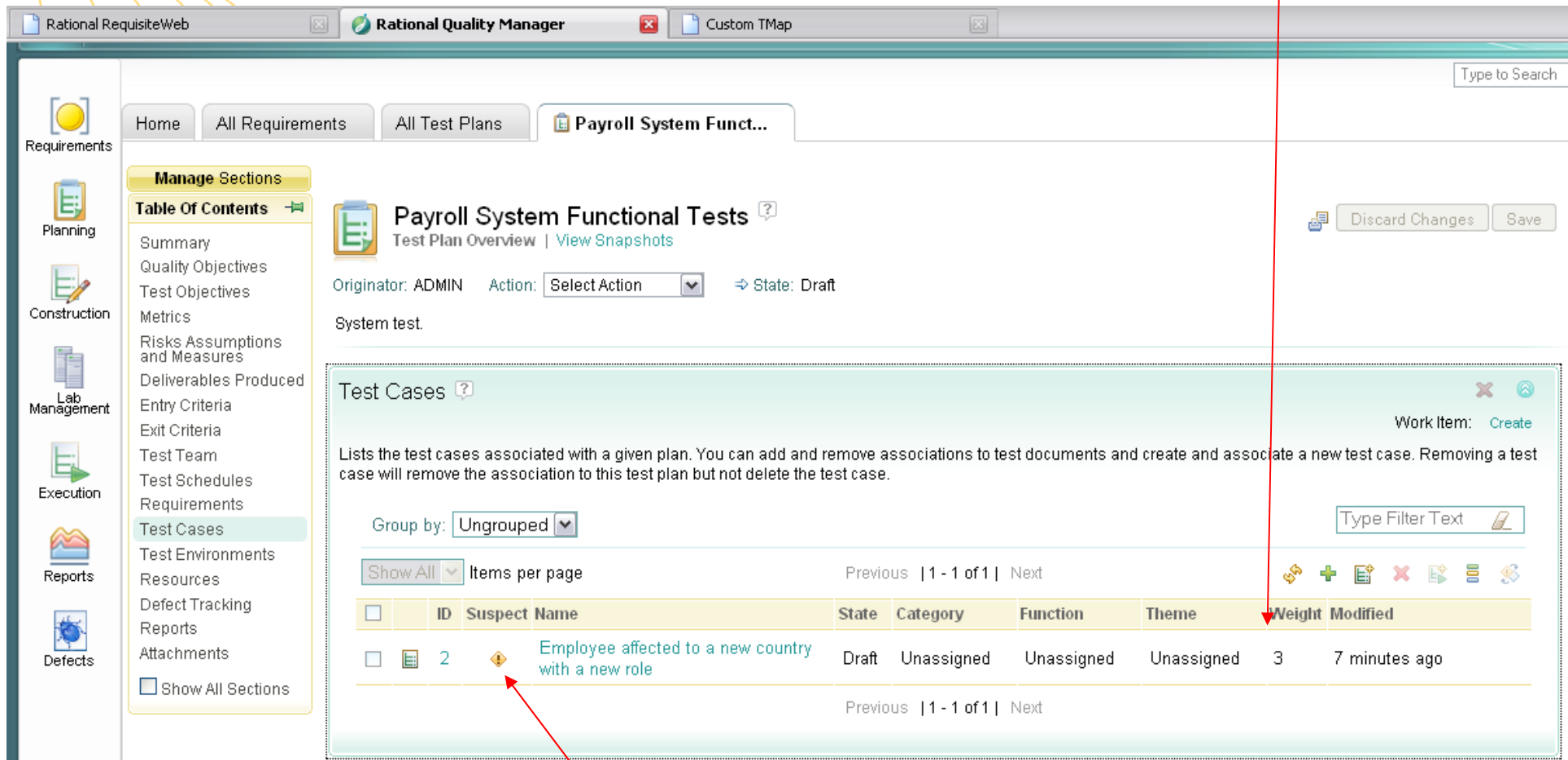
The screenshot shows the Rational Quality Manager interface. The main window displays the 'Payroll System Functional Tests' test plan overview. A sidebar on the left contains a 'Table Of Contents' menu with 'Requirements' selected. The main content area shows a 'Requirements' section with a table of items. A red arrow points from the text 'Impact after the risk analysis.' to the first row of the table, which has a yellow warning icon in the status column.

Impact after the risk analysis.

Status	ID	Tag	Name	Description	Owner
!	8	TM1	Test system behavior when employee profile changes	There is a high risk of security and user identification errors when the employee profile changes. For example when the employee has a new position or when he moves to another country. Check payroll user role data access, employee profile data access	Unassigned



The weight of the test case is adapted according to the class risk of the test motivator.



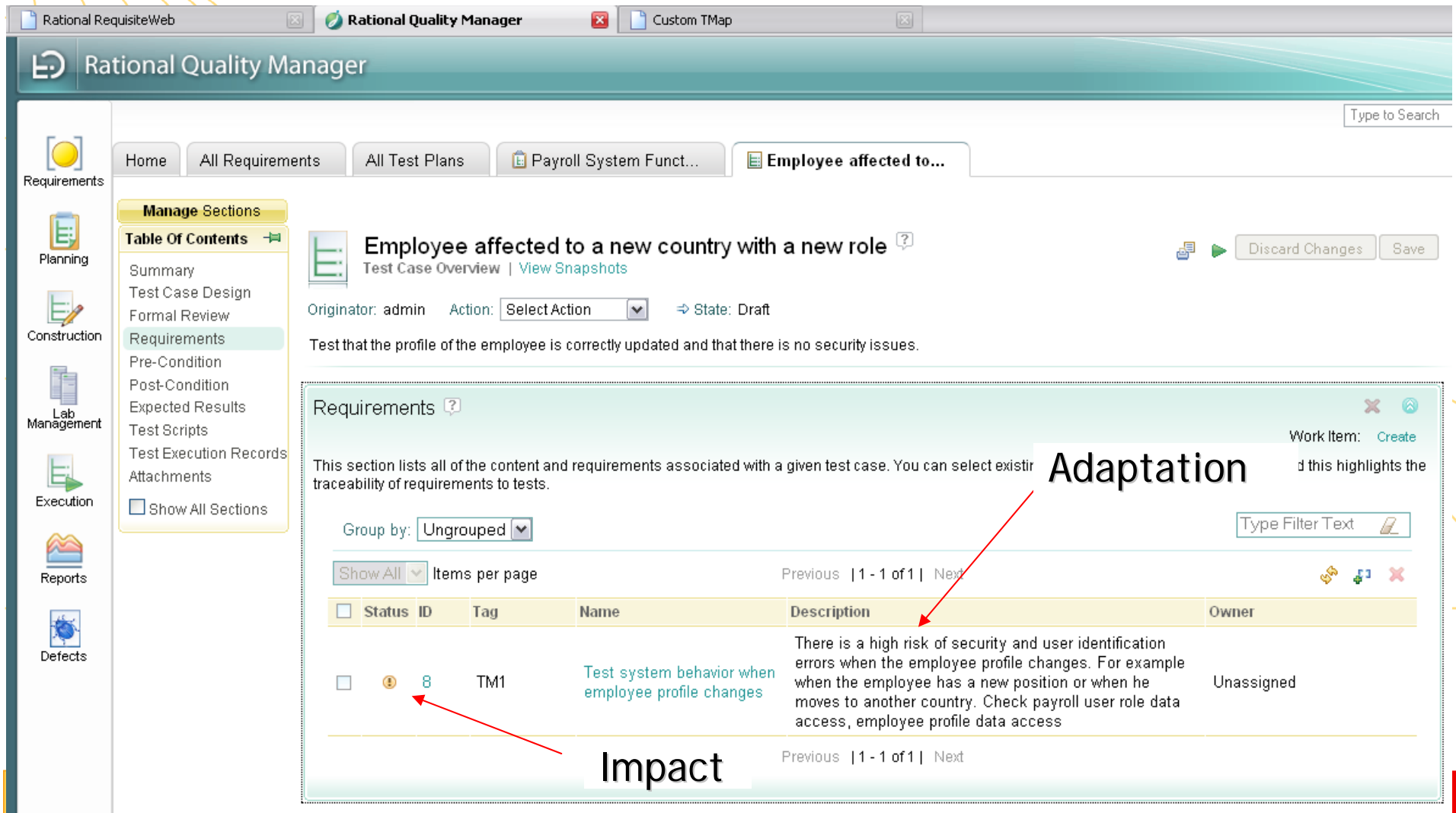
The screenshot shows the Rational Quality Manager interface. The main content area displays the 'Payroll System Functional Tests' test plan overview. Below this, a 'Test Cases' section is visible, containing a table of test cases. A red arrow points from the text above to the 'Weight' column in the table.

ID	Suspect Name	State	Category	Function	Theme	Weight	Modified
2	Employee affected to a new country with a new role	Draft	Unassigned	Unassigned	Unassigned	3	7 minutes ago

Impact



The test case is designed and adapted according to the test motivator and the class risk



The screenshot shows the Rational Quality Manager interface. The main content area displays a test case titled "Employee affected to a new country with a new role". The test case is in a "Draft" state and was created by "admin". The test description is: "Test that the profile of the employee is correctly updated and that there is no security issues."

The "Requirements" section is expanded, showing a table of requirements. A red arrow points to the "Adaptation" column, and another red arrow points to the "Impact" column. The table contains one requirement with ID 8 and tag TM1.

Status	ID	Tag	Name	Description	Owner
<input type="checkbox"/>	8	TM1	Test system behavior when employee profile changes	There is a high risk of security and user identification errors when the employee profile changes. For example when the employee has a new position or when he moves to another country. Check payroll user role data access, employee profile data access	Unassigned