ENGINEERING

Risk-based Testing with Jira and Jubula

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Agenda

- The Theory
  - What is it ?
  - Why should I care ?
- The Practice
  - The ingredients and the recipe
- The Use Case
  - How can you use it (with a special guest…)

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The Theory

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What to test?

How many tests for each requirement ?

One ! Of course ! We need to see if it works !

Mmmmhh… we can prove that it works well with good data (how many good data ?)…What about bad data ?

Uh oh… combination for good data are a lot ! And bad data…. Uncountable !

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What to test?

We have 1342 new requirements. What should we test ?

Everything! Of course ! We need to be confident that it works !

Mmmmhh… OK, I need 42^{10} good testers and 10^{42} years to test all

Mmmmmhhh… I'm wondering if our budget… we need to make a choice about what to test

Once upon a time someone told me something about risk based testing…

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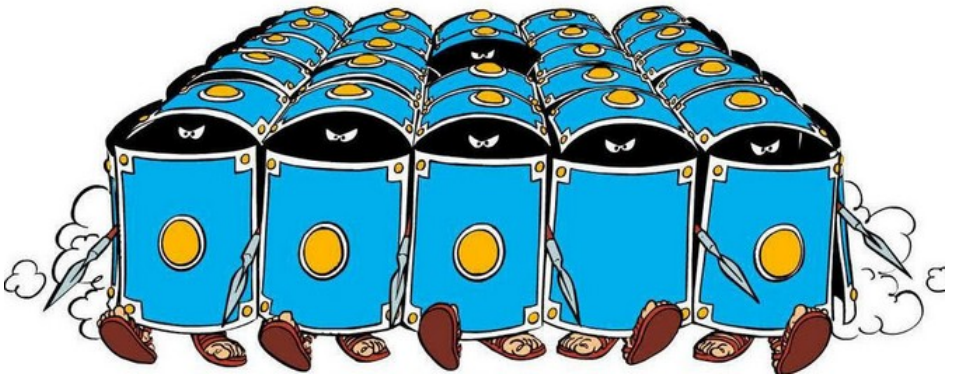
Traditional Testing vs RBT

Traditional Testing

Risk Based Testing



Effectiveness

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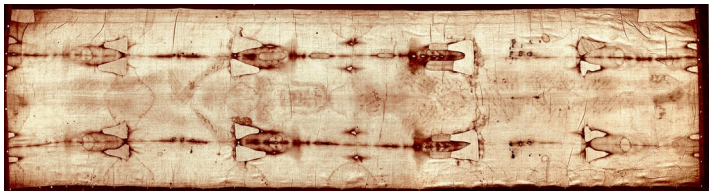
Guarini : chapel of the Holy Shroud

- Baroque-style Roman Catholic chapel
- Designed by architect Guarino Guarini and built in Turin at the end of 17th century, during the reign of Charles Emmanuel II, Duke of Savoy
- Constructed to house the Shroud of Turin, a religious relic believed by many to be the burial shroud of Jesus Christ
- 1997 : a fire, due to a short circuit, seriously damages the chapel
- Restoration in progress, **supported by a software project**



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The chapel and the software

- Applications to manage all the phases of the restoration project
- Every single piece subject to restauration is geo-referenced within a 3D model
- Database with all the relevant information and documents collected during the investigation phase (world-wide relevance)
- Web site to publish news on the restoration progress, and to offer search functions on the single elements subject to restoration
- Cam video system management
- Technologies : open source !

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The chapel, the software and the risks

(A non exahustive list…)

- World-wide relevance of the data → Usability, Accessibility and performance tests

  And also backup/recovery test !!!

- High level of innovation and required technologies not so well known to the project team (**project risk**)
- Heterogenuous technologies and components → integration tests
- Search functions on web site → functional tests

(Mitigate risks with proper testing…)

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Five Phases in a Tester's Mental Life

- Phase 0 : There's no difference between testing and debugging. Other than in support of debugging, testing has no purpose.
- Phase 1 : The purpose of testing is to show that the software works.
- Phase 2 : The purpose of testing is to show that the software doesn't work.
- Phase 3 : The purpose of testing is not too prove anything, but to reduce the perceived risk of not working to an acceptable value.
- Phase 4 : Testing is not an act. It is a mental discipline that results in low-risk software without much testing effort.

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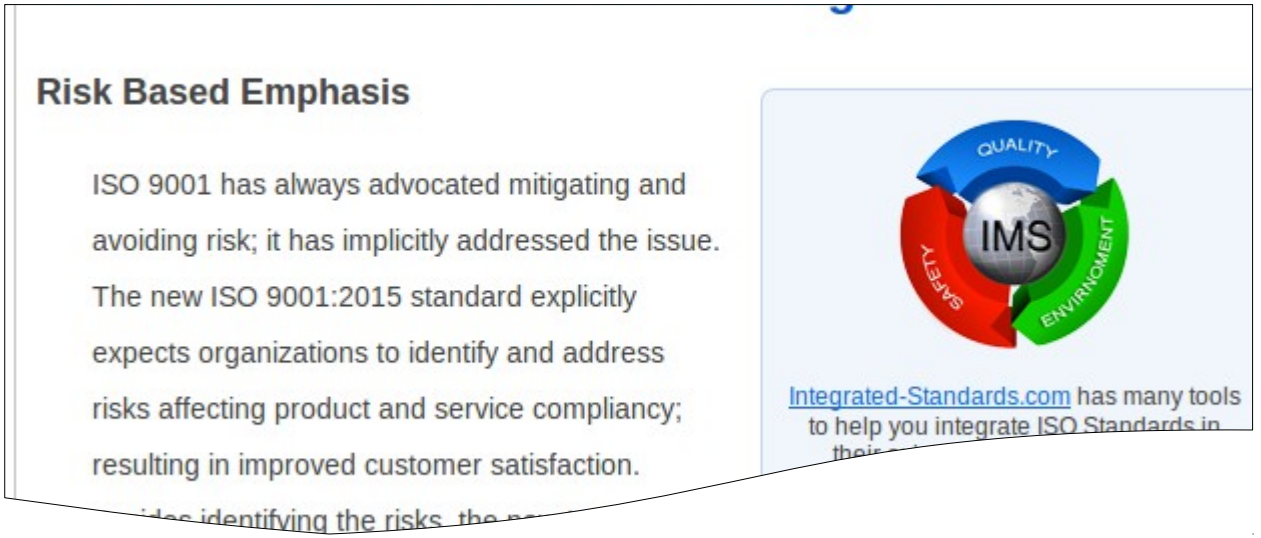
Phase 4 and new ISO 9001:2015

- ISO 9001:2015 – systematic approach to risk
- Risk based thinking
- Become proactive rather than purely reactive



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What is Risk ?

- Risk: the **possibility** of a negative or undesirable event or outcome
- Quality risk: the possibility that the product or system might fail to deliver one or more of the key quality attributes
- **Project Risks**
- **Software Risks (Risky features)**

- **Analyse** the risks – to prioritise them.

Risk Management

Managing risks is something we all do every day, mostly without even thinking about it. When the complexity increases beyond our everyday experiences, such as risks faced by a business or a big project, a more formal approach is needed. However, it really isn't difficult.

A generic risk management process has been set out in ISO standard 31000 and can be applied to any kind of risk by any kind of organisation. PMBOK and PMI both describe a similar process for managing project risk.

Different kinds of risks need different assessments in terms of the questions to ask or the exact technique you use, but the overall risk management process is the same. Essentially, the steps are as follows:

- **Establish the context** – what activities are we talking about? What are you trying to do?
  - e.g., using a piece of machinery, making/building something, collecting measurements, importing or exporting goods, staff, data analysis and reporting.
- **Identify risks** – what *might* affect the outcome?
  - e.g., a weather event, change to regulations, injury, staffing shortages, lack
    supplier, chemical exposure, theft, fraud, computer failure, human
- **Analyse** the risks – to prioritise them.

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What is Risk ?

- **Probability : trivial**
- **Note :**
  - **0 % event : not a risk !**
  - **100 %: not a risk ! Rather issue !**
- **Impact : an evaluation of the hypothetical damage (on costs, times, …)**
- **Exposure : $f(P,I)$**
  - $E = f(P)*f(I)$

- **Analyse** the risks – to prioritise them.

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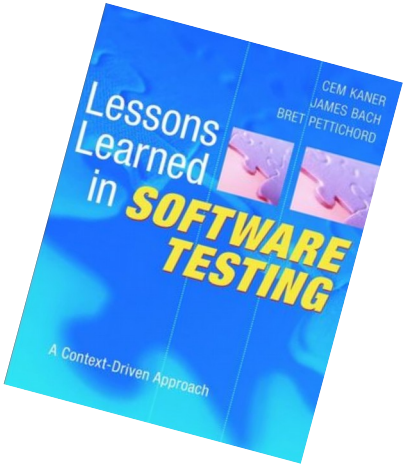
Risk-based Testing

What is Risk Based Testing ?

1. Make a prioritized list of risks
2. Perform testing that explores each risk
3. As risks evaporate and new ones emerge, adjust your test effort to stay focused on the current crop

(James Bach, Heuristic Risk-Based Testing)



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Risk-based Testing

1. Rigorous risk analysis, applying statistical models or...
2. Heuristic Risk Analysis :
    1. Inside-Out : study (you tester with a developer) your product and ask yourself repeatedly: « What can go wrong here ? »
    2. Outside-In : start with a potential set of risks and match them to the current product – Need for a risk catalogue/lists

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Risk-based Testing – Outside-In

1. Three possible kind of risks :
    1. Quality risks (performance, usability, …)
    2. Generic risk list (complex, new, critical, third party, strategic,…
    3. Risk catalogue (risk lists, related to specific domains)
2. Use them
    1. Choose a component/function
    2. Determine scale of concern
    3. Match risks

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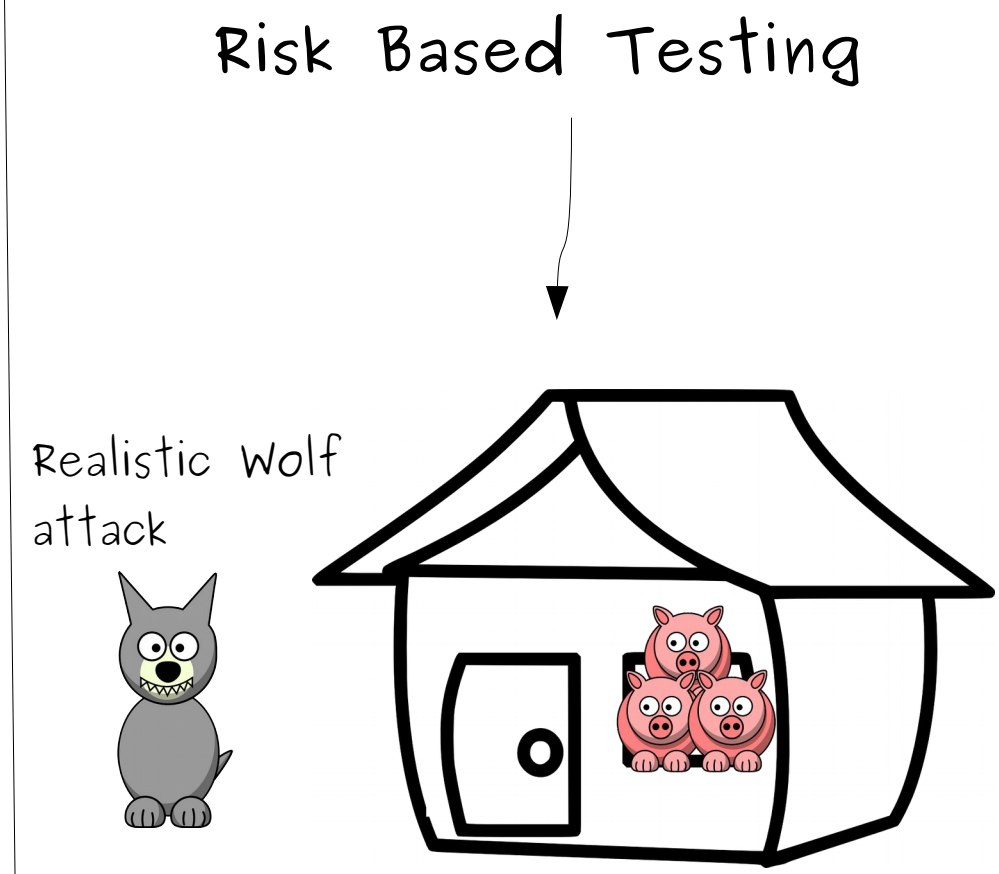
Traditional Testing vs RBT



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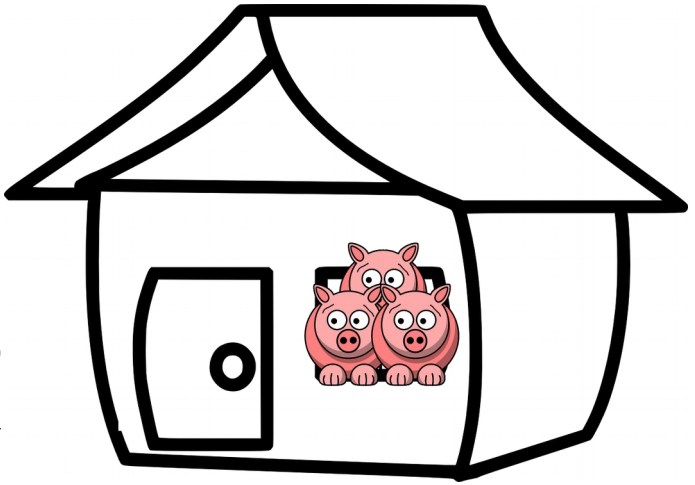
Catalogue and prioritize

Smaug attack

0,00002%

Wolf attack

87%



T-Rex attack

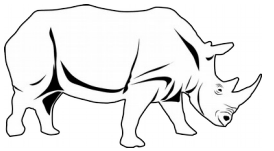
0,00001%

0,1%

Shark attack

0,002%

Rhino attack



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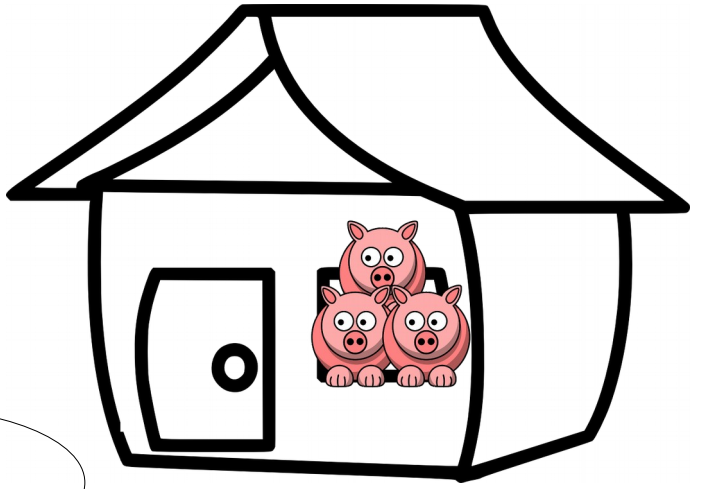
Refine your risk analysis

Wolf attack

1%



Realistic Wolf attack

87%

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Risk-based Testing – Considerations

- Your risk analysis incomplete and inaccurate to some degree ;
- At the beginning of a project rumors of risks ;
- As the project progresses, and you gain information about the product, you should adjust your test effort to match your best estimation of risk ;
- to deal with the risk of poor risk analysis, use other weapons : exploratory testing (**remember the talk of Alex last year ?**), static testing, code coverage testing, or functional coverage testing (principle of diverse half-measures: use a diversity of methods, because no single heuristic always works)
- two vital factors needed to make risk-based testing work : **experience** and **teamwork**;
  - over a period of time, any product line or technology will reveal its pattern of characteristic problems : learn from that ;
  - do whatever you can to invite different people with different points of view into the risk analysis process.

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The Practice

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The Ingredients and the Recipe

- Use Jira to catalogue and prioritize risks
- Use Jubula to mitigate them
- Use Mylyn to mix everything (Risk Based Interface)

The Recipe

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Jira to manage risks

Would you really pay 36000$ for a bug tracking system ?

- Very flexible tool to manage almost everything
- Define objects, attributes, lifecycle, actions, validators, conditions,...
- If you're missing something, develope it with Atlassian SDK! (but it isn't necessary to manage risks…)

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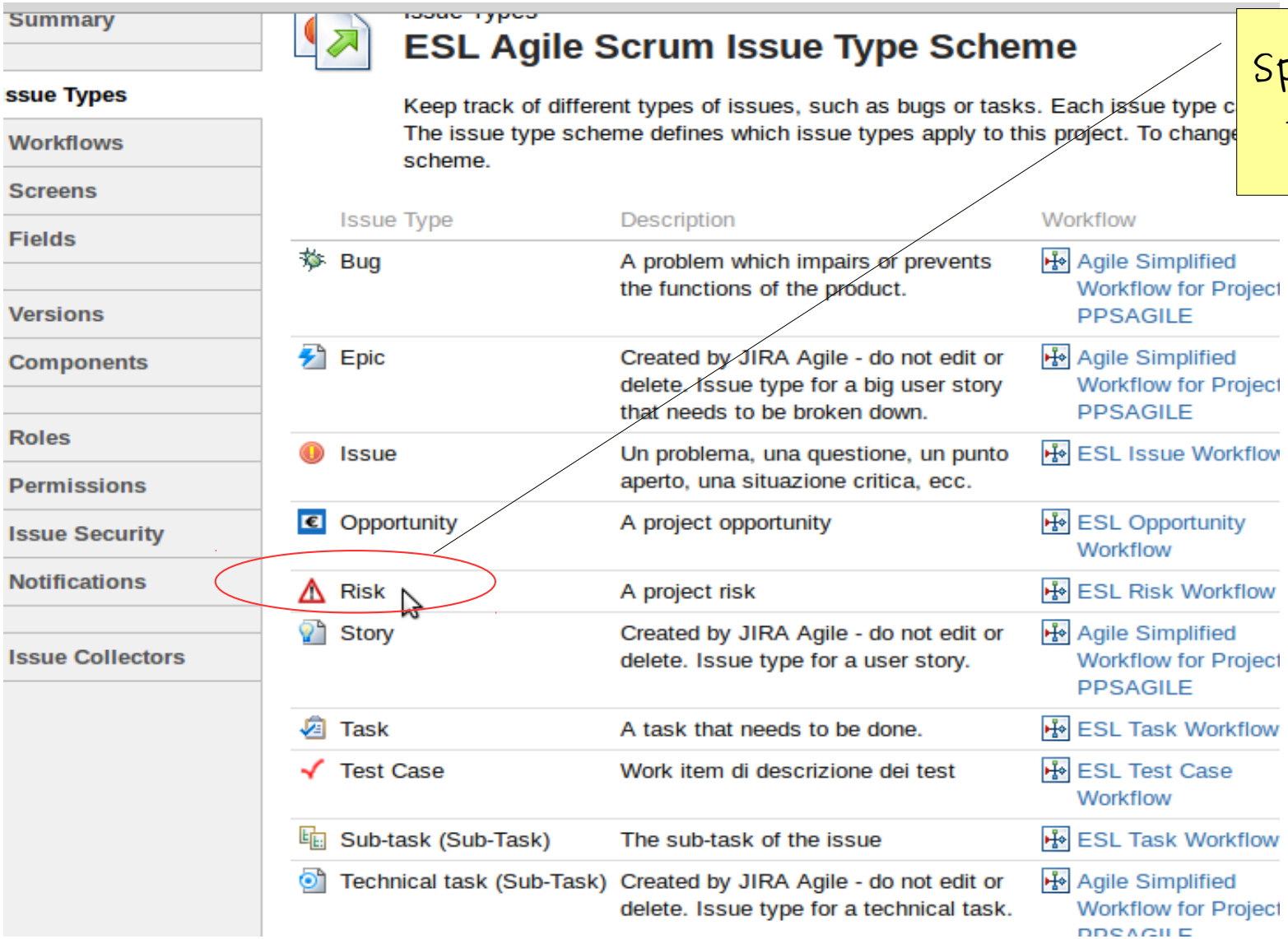
Jira to manage risks - types



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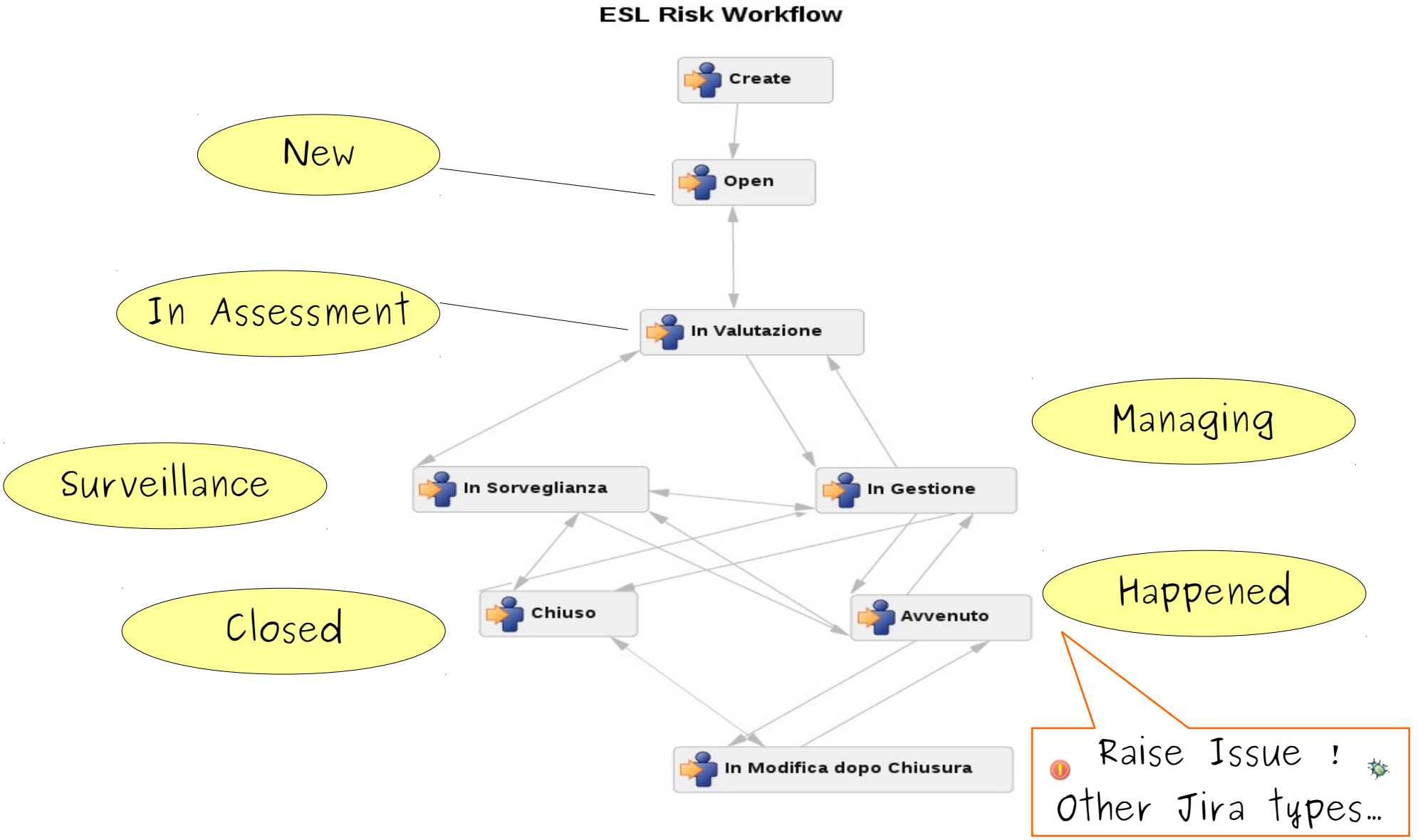
Jira to manage risks - workflow



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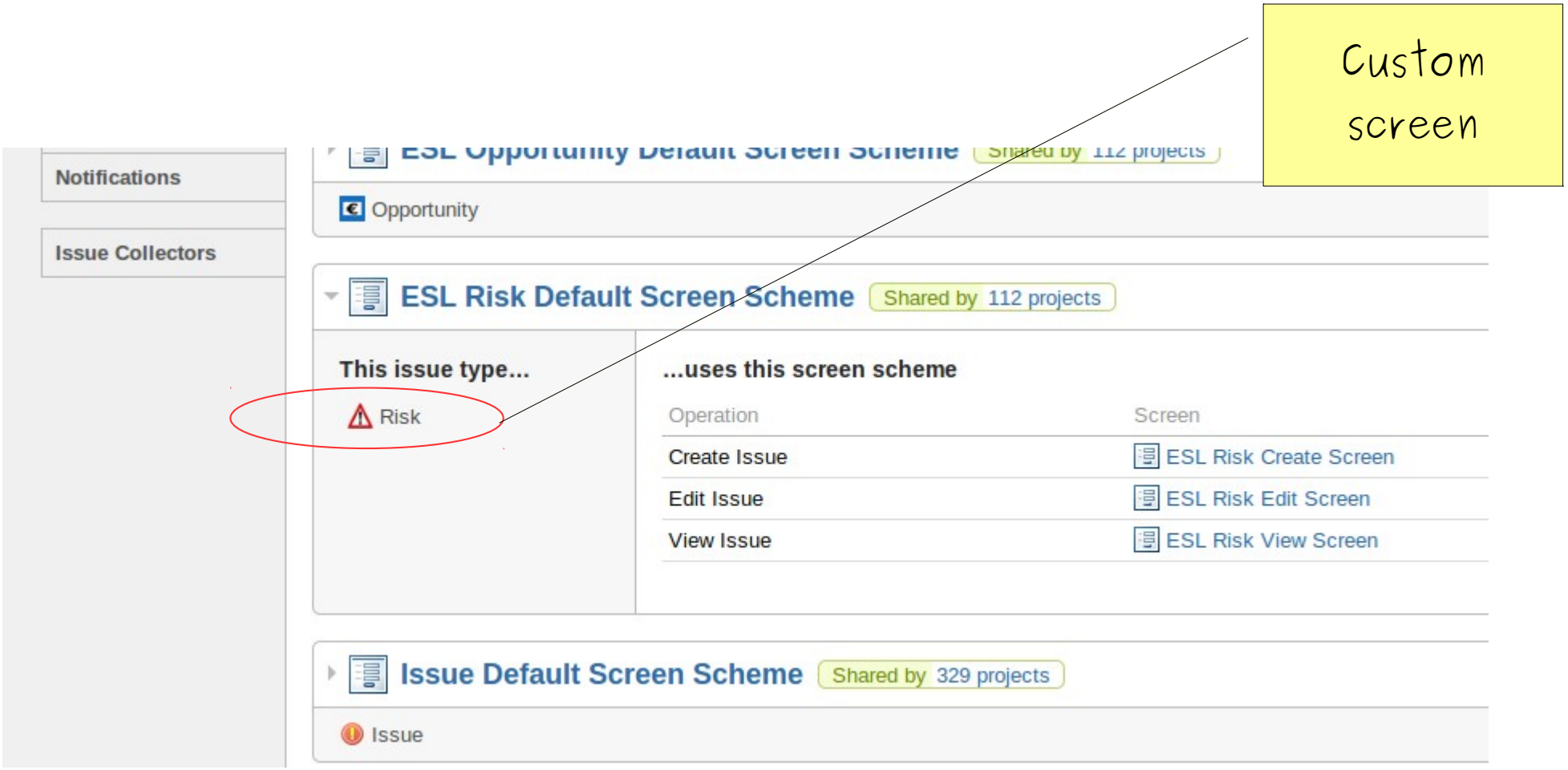
Jira to manage risks – screens...



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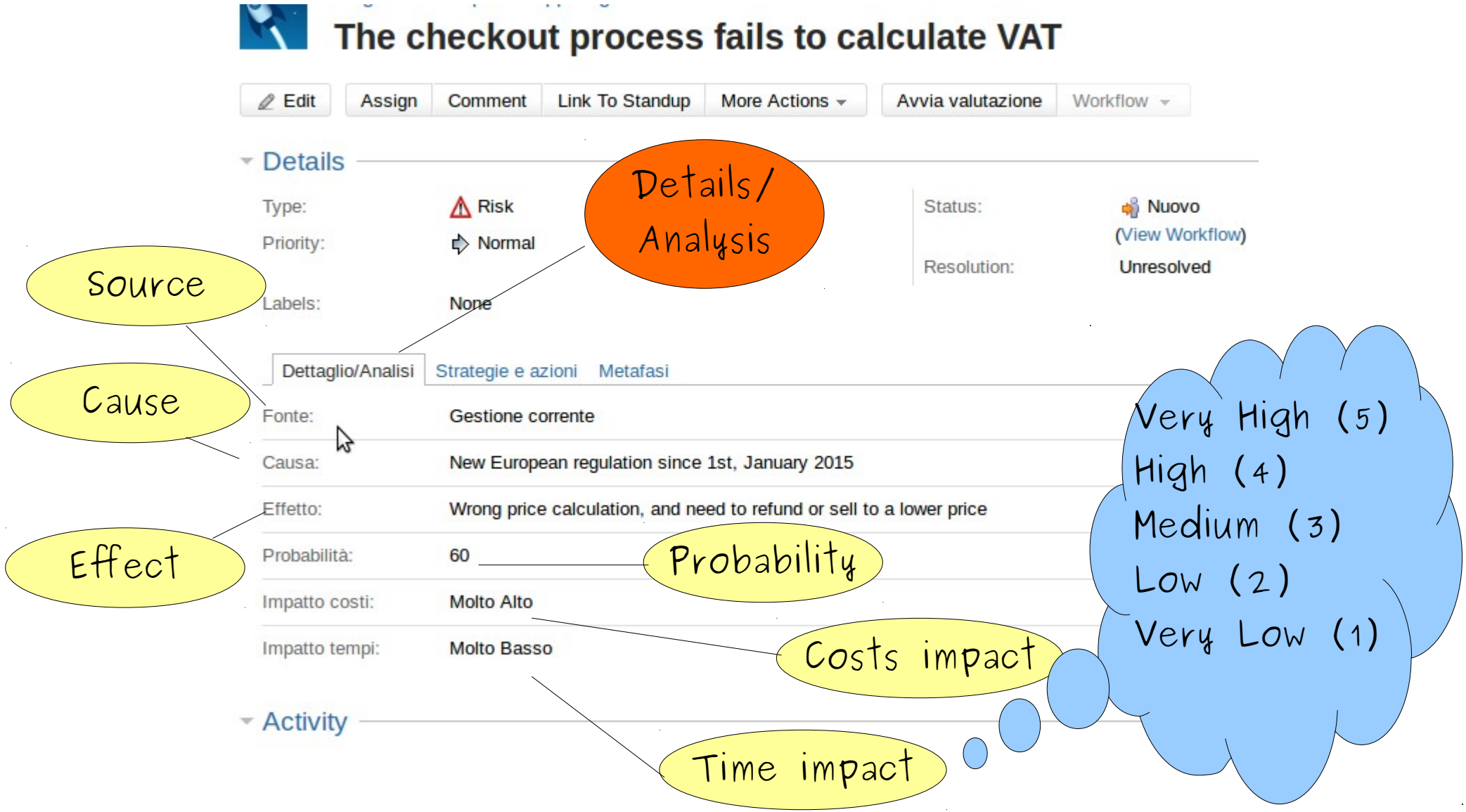
Jira to manage risks – ...custom fields (1)



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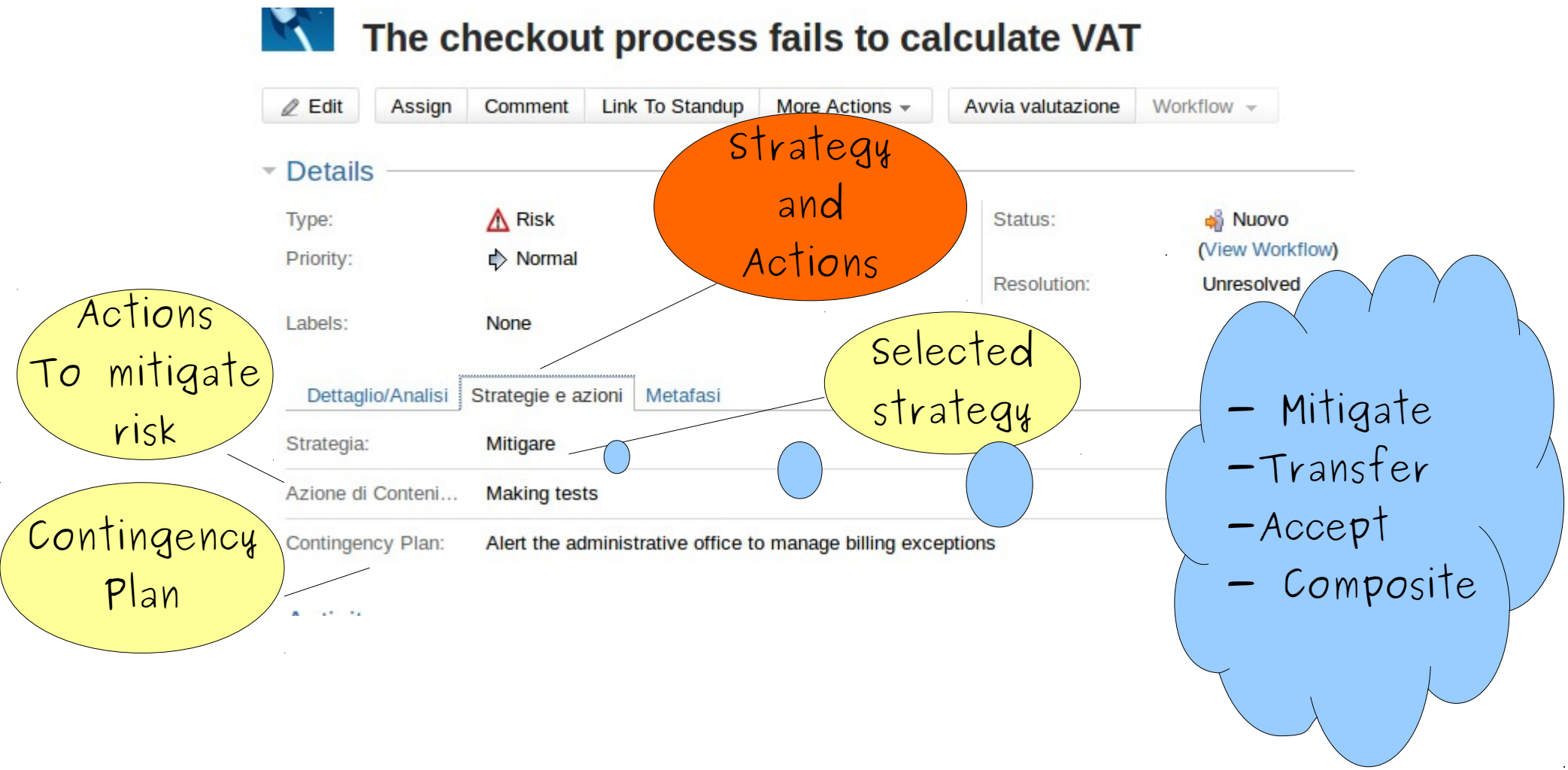
Jira to manage risks – ...custom fields (2)



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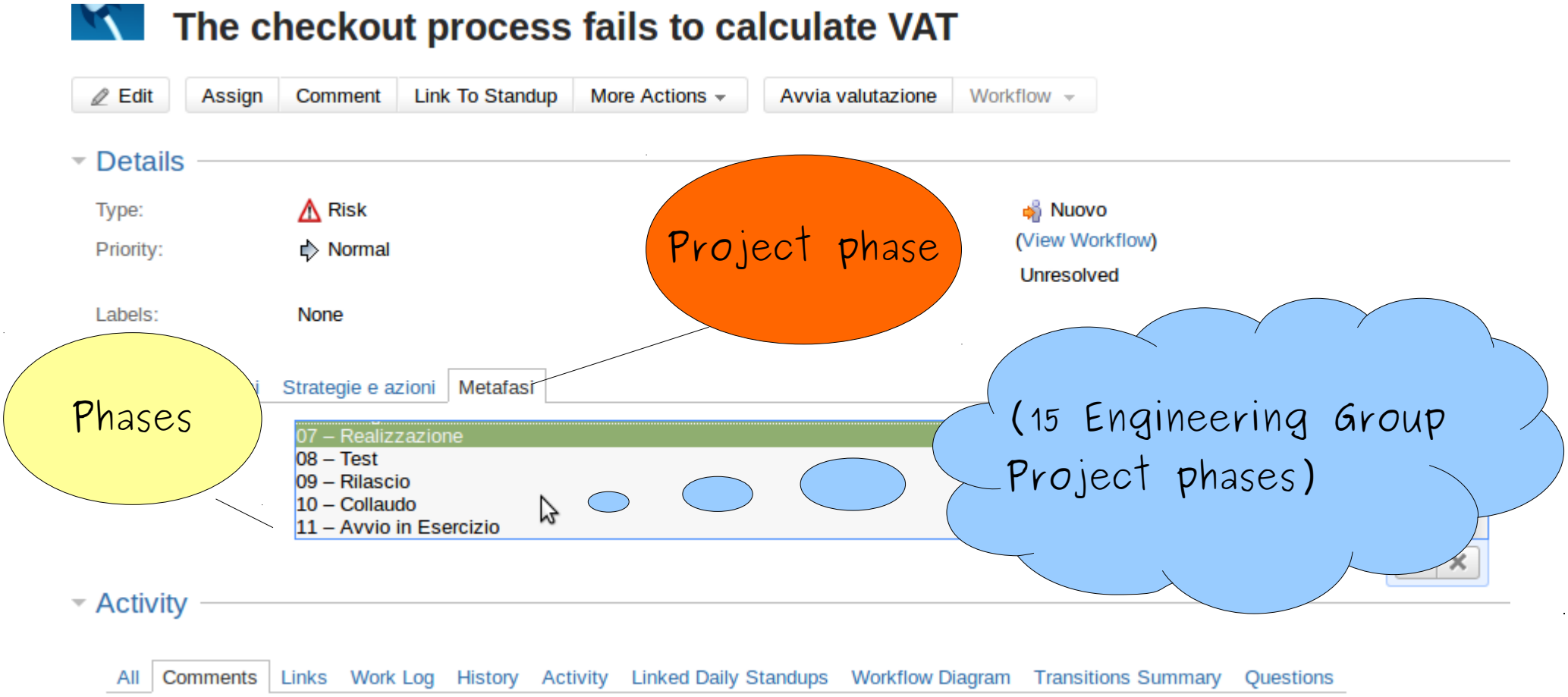
Jira to manage risks – ...custom fields (3)



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1° ingredient

Congratulations!
You've just finished to build your Risk Management Tool !
Risk catalogue, prioritization, and whatever you need to manage them
(incidentally you've just ended to be compliant with RSKM Process Area for CMMi)

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Jubula to test – a recipe for RBT

- Configure PostgreSQL
  - Centralized DB to feed a DWH, for instance...
- Configure Mylyn to build your Risk Focused Interface in your Integrated Test Environment
- Define and execute your Test cases (of course…) - bind them to each risk !
- Analyse results with reports and dashboards

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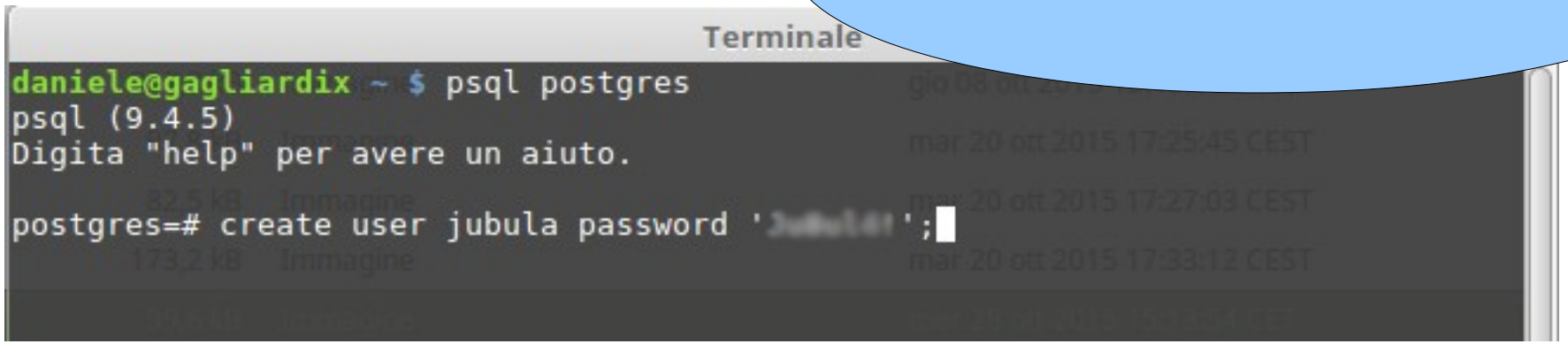
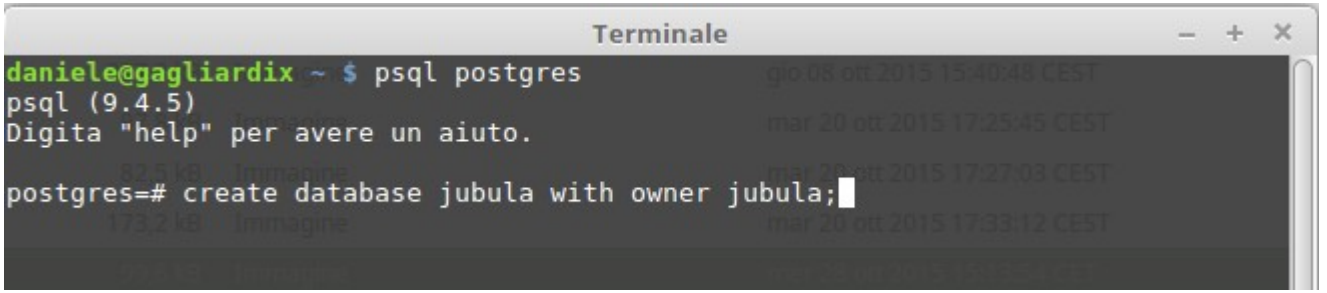
Jubula – Configure PostgreSQL

1. Create a user and a database





Trivial...

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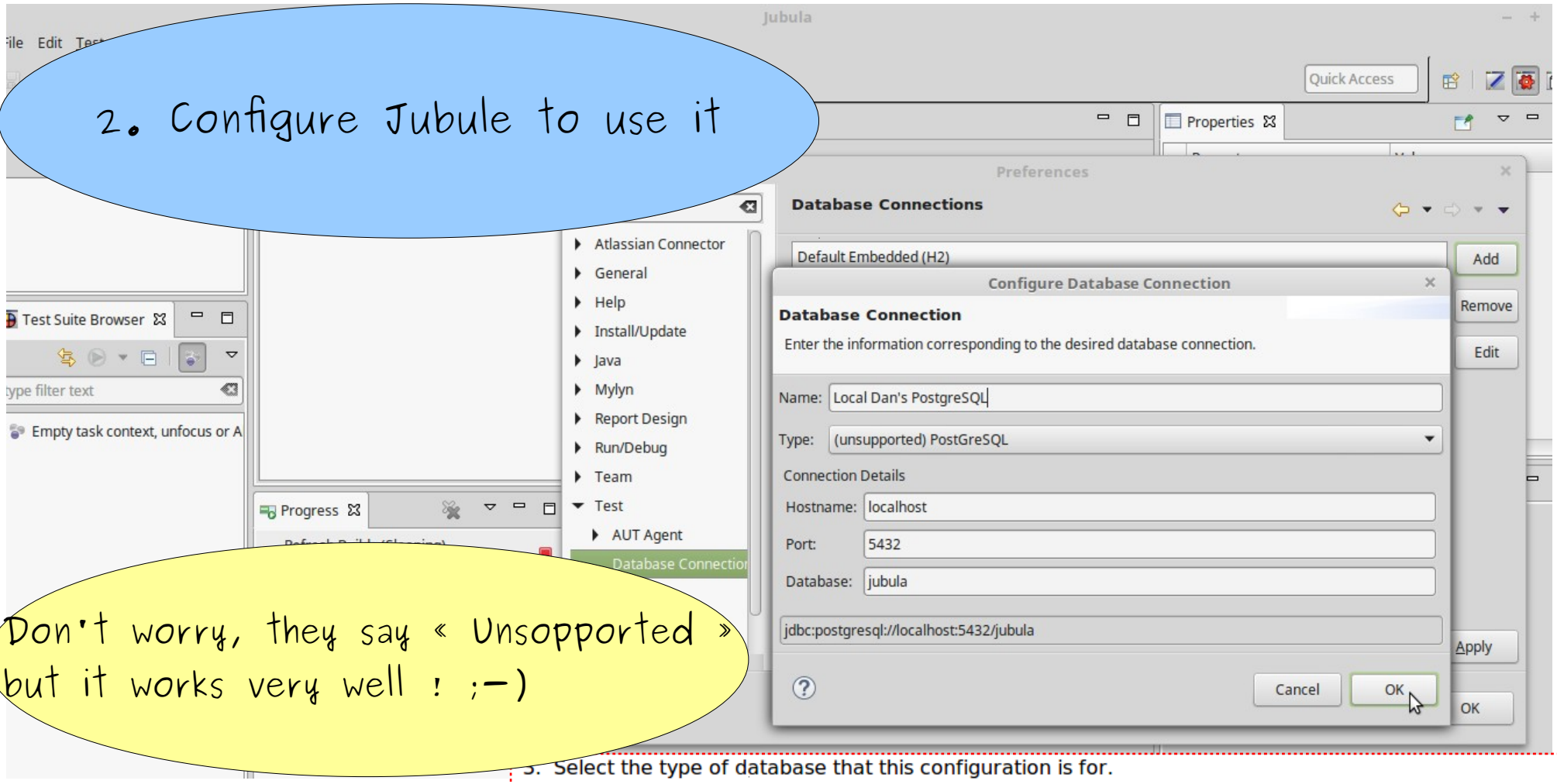
Jubula – Configure database



3. Select the type of database that this configuration is for.

The ITE is thoroughly tested with Oracle. PostGreSQL and MySQL have been successfully tried out, but we cannot guarantee their usage in productive environments.

From the online help of Jubula

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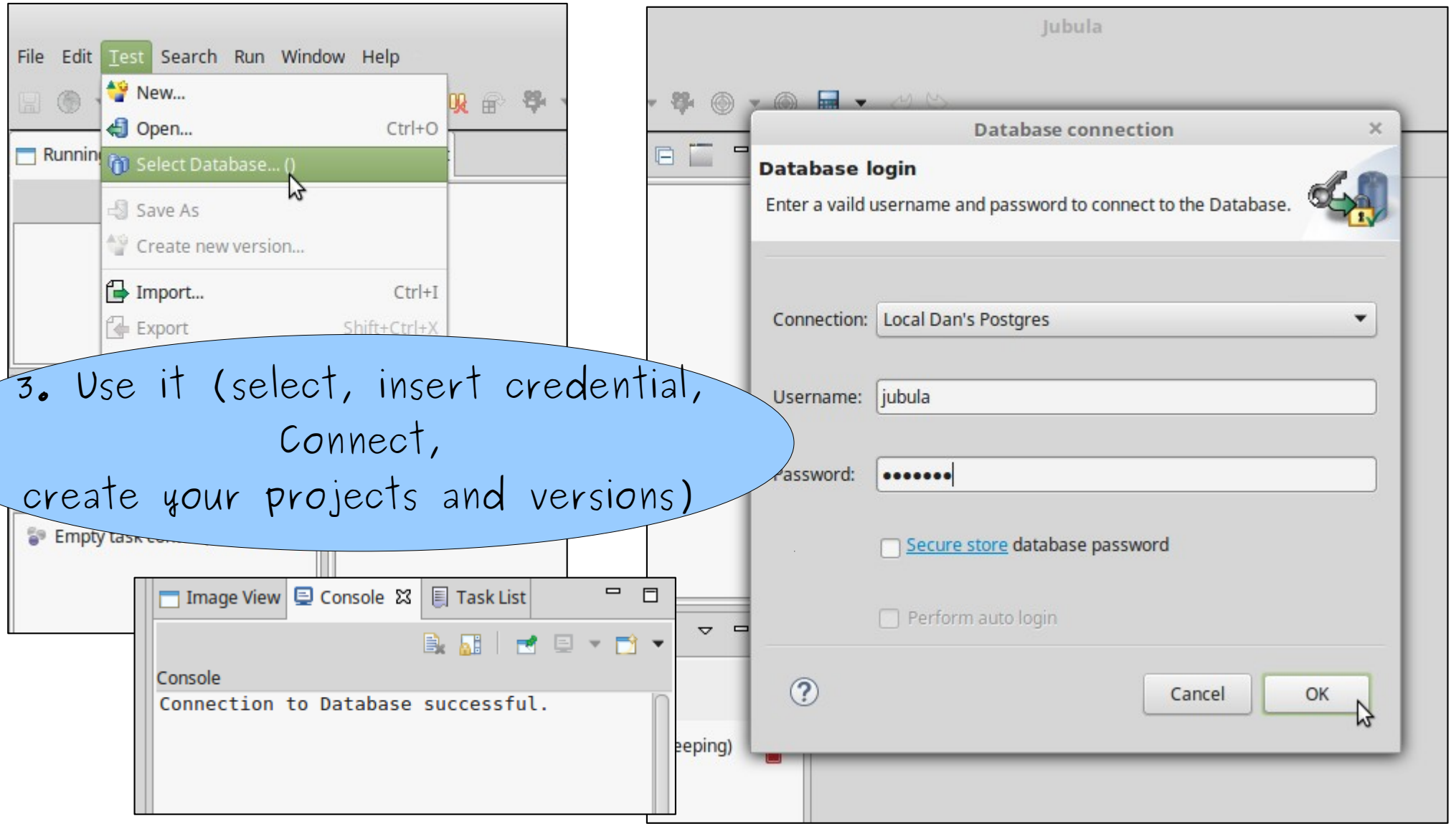
Jubula – Use external database



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Jubula – Configure risks repository

Mylyn
From the Task Focused Interface
To the
Risk Focused Interface

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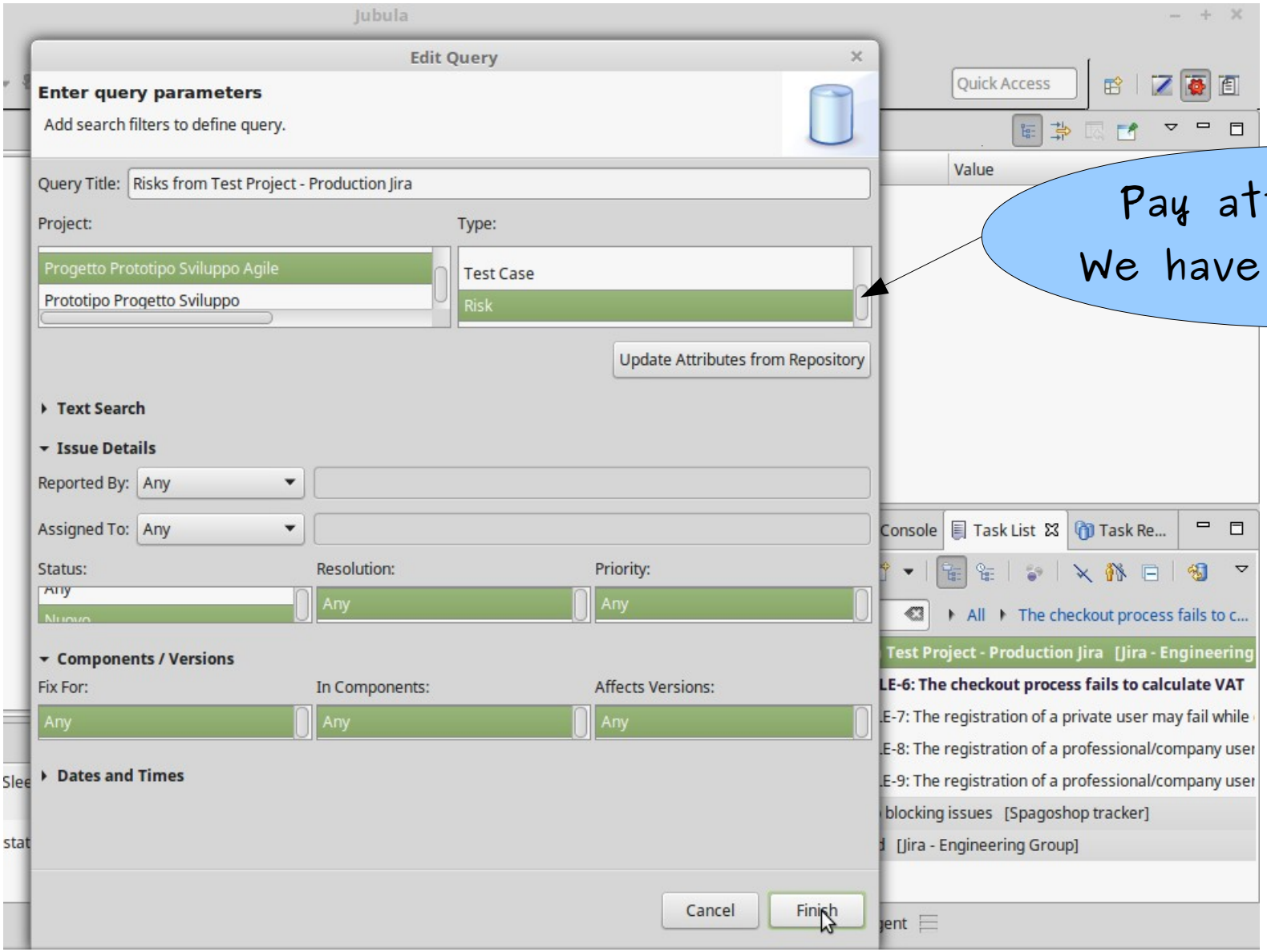
Jubula – Configure risks query



Pay attention !!!
We have risks here !

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2nd and 3rd ingredient

Congratulations!
You've just finished to setup your Risk Mitigation Tool !

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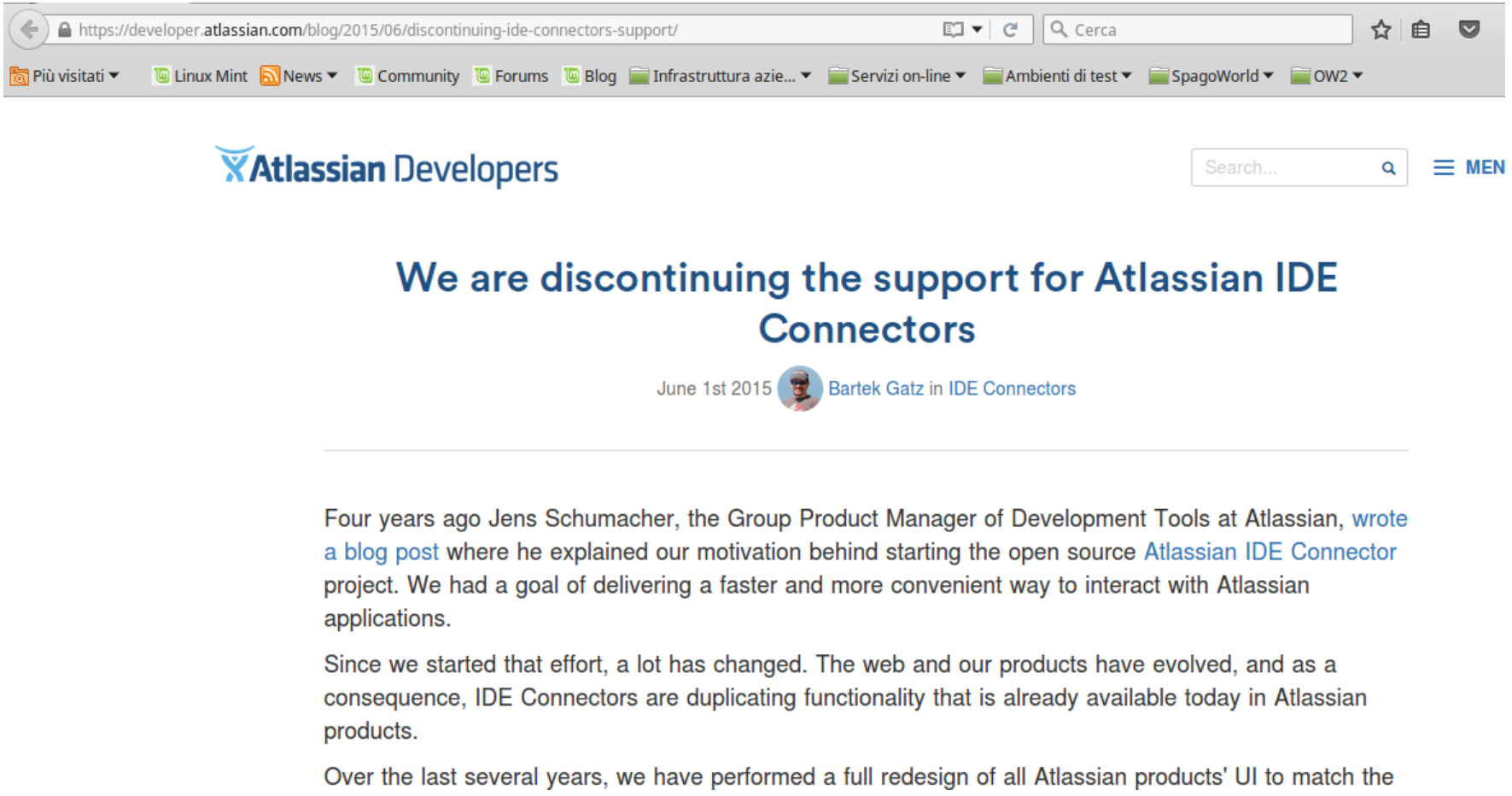
Jira connector: bad news...

https://developer.atlassian.com/blog/2015/06/discontinuing-ide-connectors-support/



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Jira connector: bad news...

What exactly is changing?

Atlassian will not release any new versions of IDE connectors, the current release is the last. We have also discontinued the customer support and Atlassian Answers effort related to IDE Connectors.

Specifically:

- **IDE Connector for Eclipse**, the last version released from Atlassian on **27 April 2015** is 3.2.5. Its support project on SAC and the development backlog project on EAN are now closed.
- **IDE Connector for IntelliJ**, the last version released from Atlassian on **20 April 2015** is 3.0.16. Its support project on SAC and the development backlog project on EAN are now closed.
- **IDE Connector for Visual Studio**, the last version released from Atlassian on **10 April 2015** is1.3.12. Its support project on SAC and the development backlog project on EAN are now closed.
- We have updated product listings on www.atlassian.com and marketplace.atlassian.com.

These changes are effective immediately.

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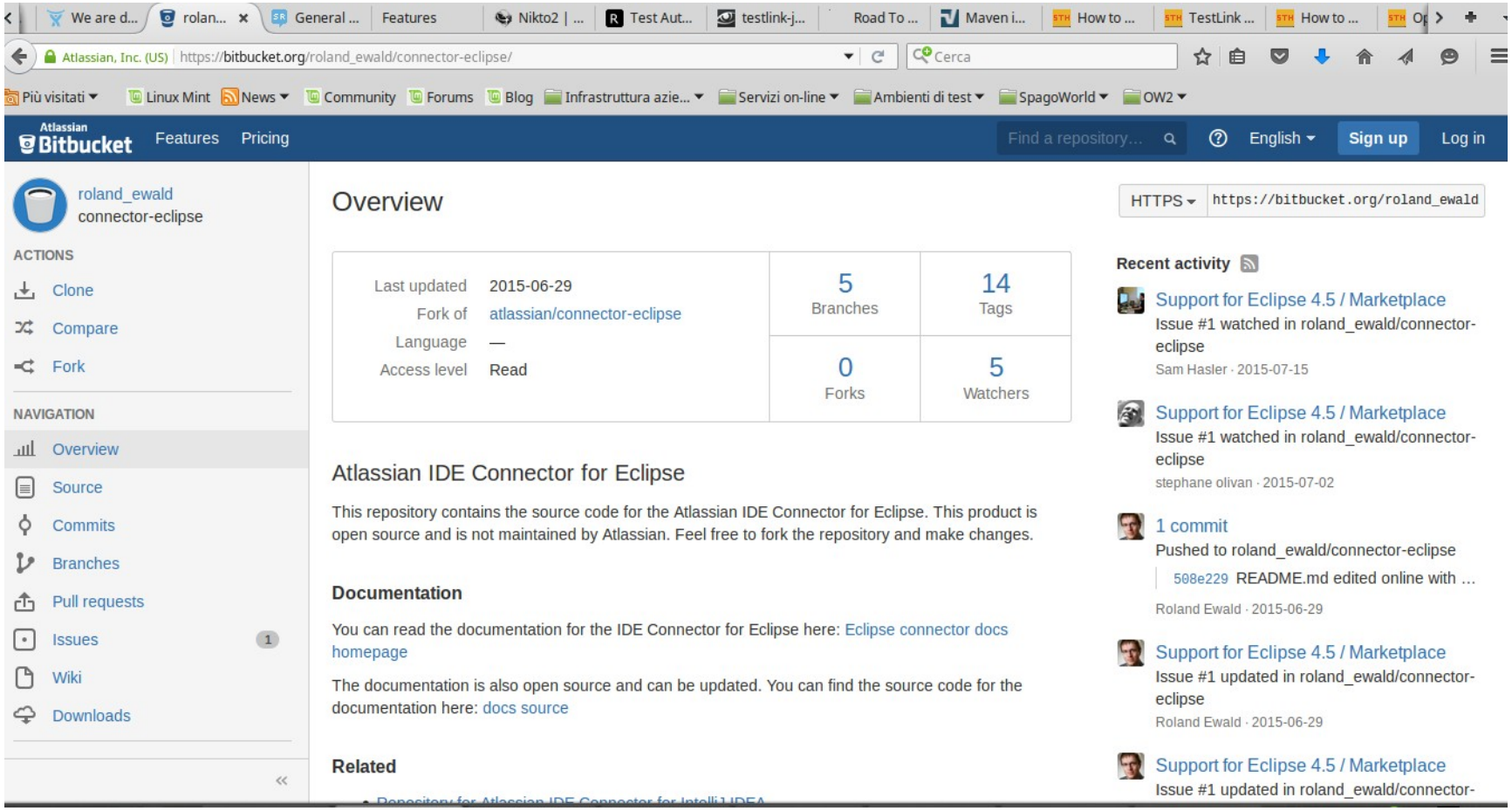
Jira connector: a new hope ?

https://bitbucket.org/roland_ewald/connector-eclipse/



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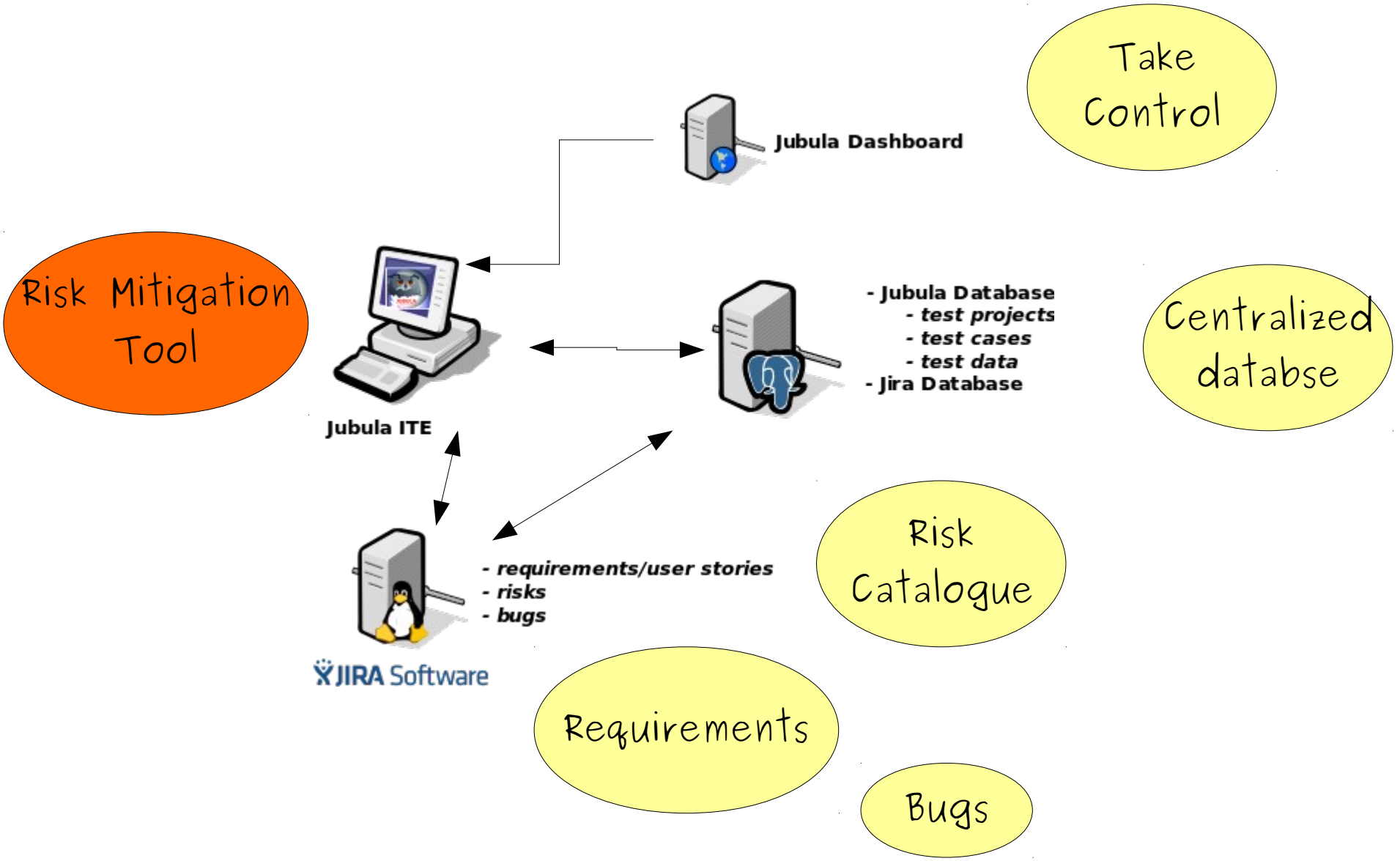
The Risk Based Testing architecture



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The Use Case

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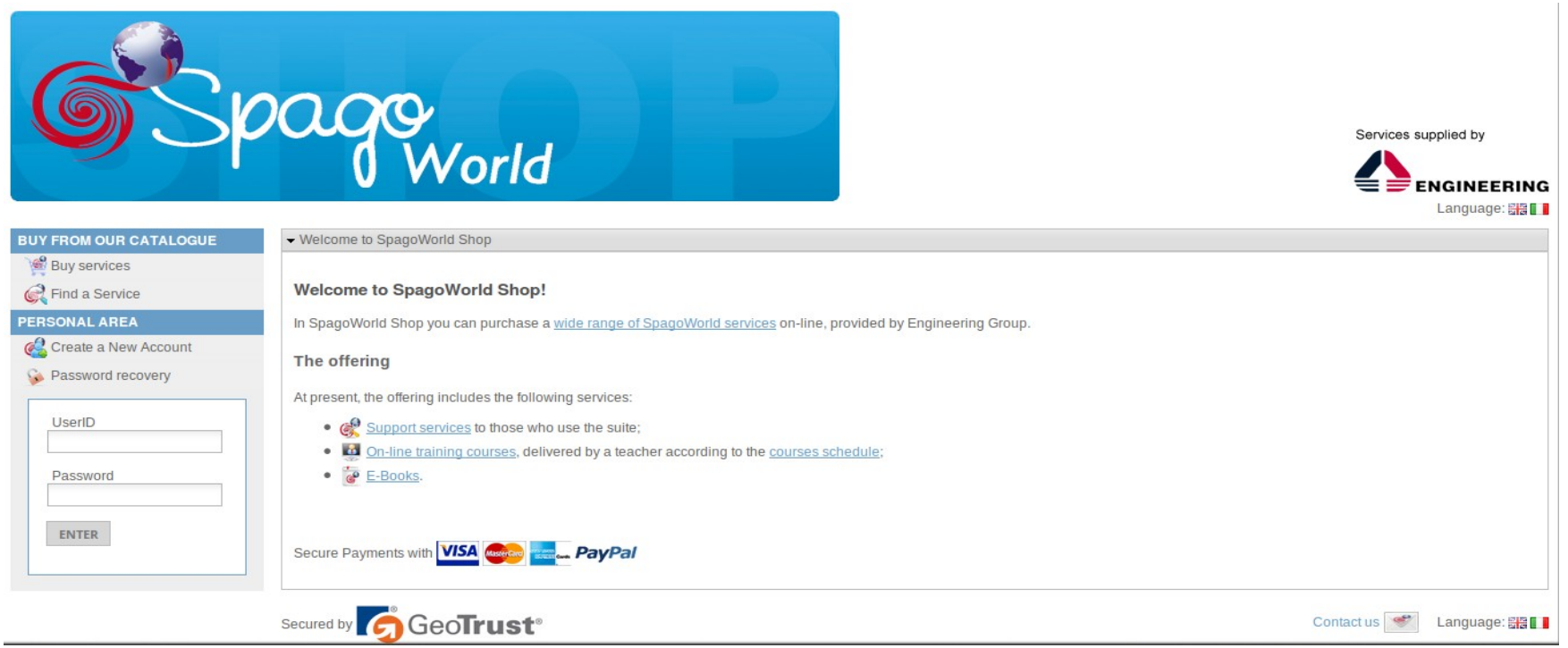
Spagoshop – The Use Case

- https://spagoshop.spagoworld.org/spagoshop
- E-commerce site to sell professional services on SpagoWorld open source products (SpagoBI, Spago4Q, Spagic, Spago framework)



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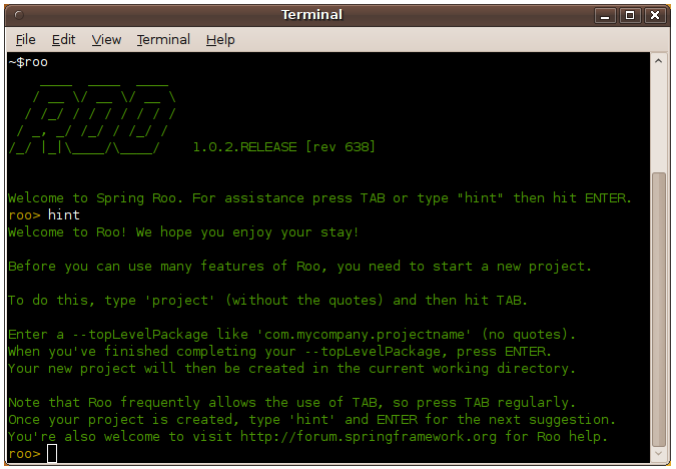
Spagoshop – Internals

- JEE, Tomcat 6/7, JDK 7
- Set-up with Spring Roo (best practices – i.e. web page elements have unique identifiers)

- MySQL rDBMS
- Built with Eclipse (of course)

- It doesn't manage credit cards, it leverages an italian bank payment gateway



An example of Risk Transfer !

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Spagoshop – The Use Case

As a customer
I want to
register myself
as a private user

As a end-user
I want to
Access to the shop
Using a userid
And a password
chosen by me

As a SpagoBI
Consultant
I want to sell
My professional
Services on the web

As a customer
I want to buy
Using my
credit card

As a customer
I want to buy
Using my
PayPal Account

As a customer
I want to
register myself
as a company/
professional user
In order to
Deduct VAT

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Spagoshop – Where are the risks here ?

As a customer
I want to
register myself
as a private user

As a SpagoBI
Consultant
want to sell
rofessional
es on the web

VAT calculation rules
(since 1st January 2015 you
Have to apply the customer's
EU country VAT)

chosen by me

Engineering Group needs
Customer info for billing purposes :
NIN or VAT
(different patterns
from country to country)

omer
buy
my
Account

As a customer
I want to
register myself
as a company/
professional user
In order to
Deduct VAT

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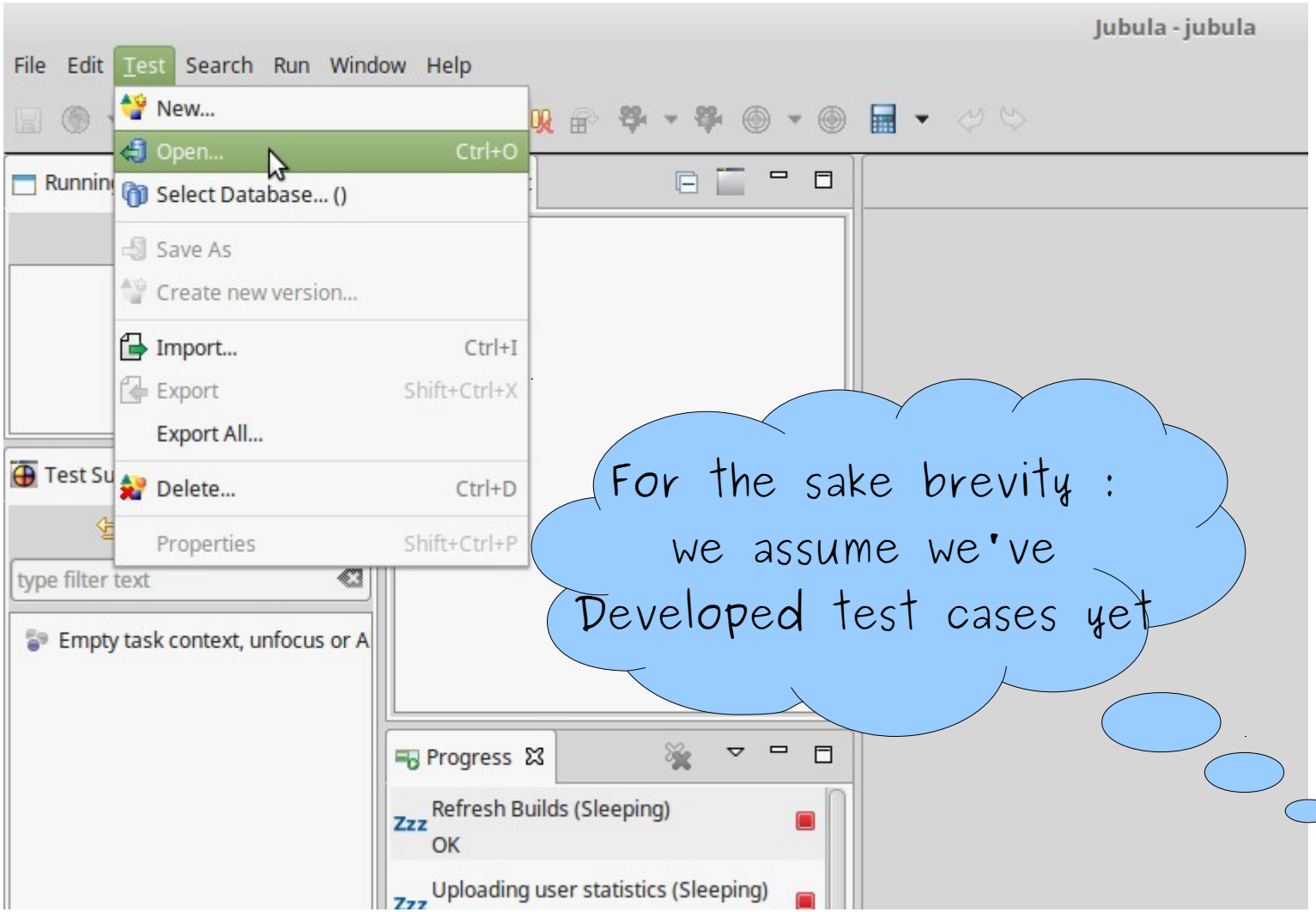
Let's start !

Connect To your test cases



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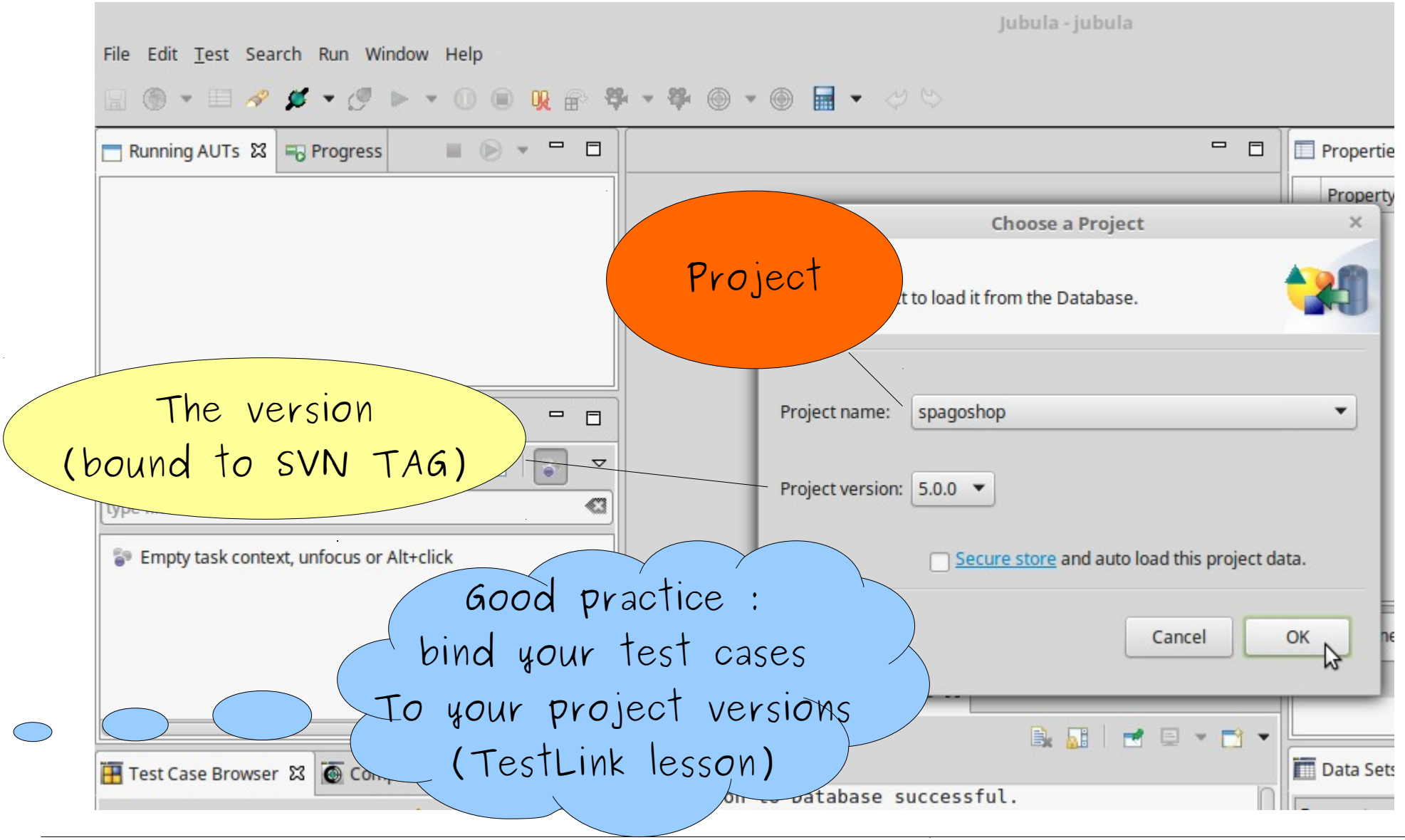
Choose project and project version



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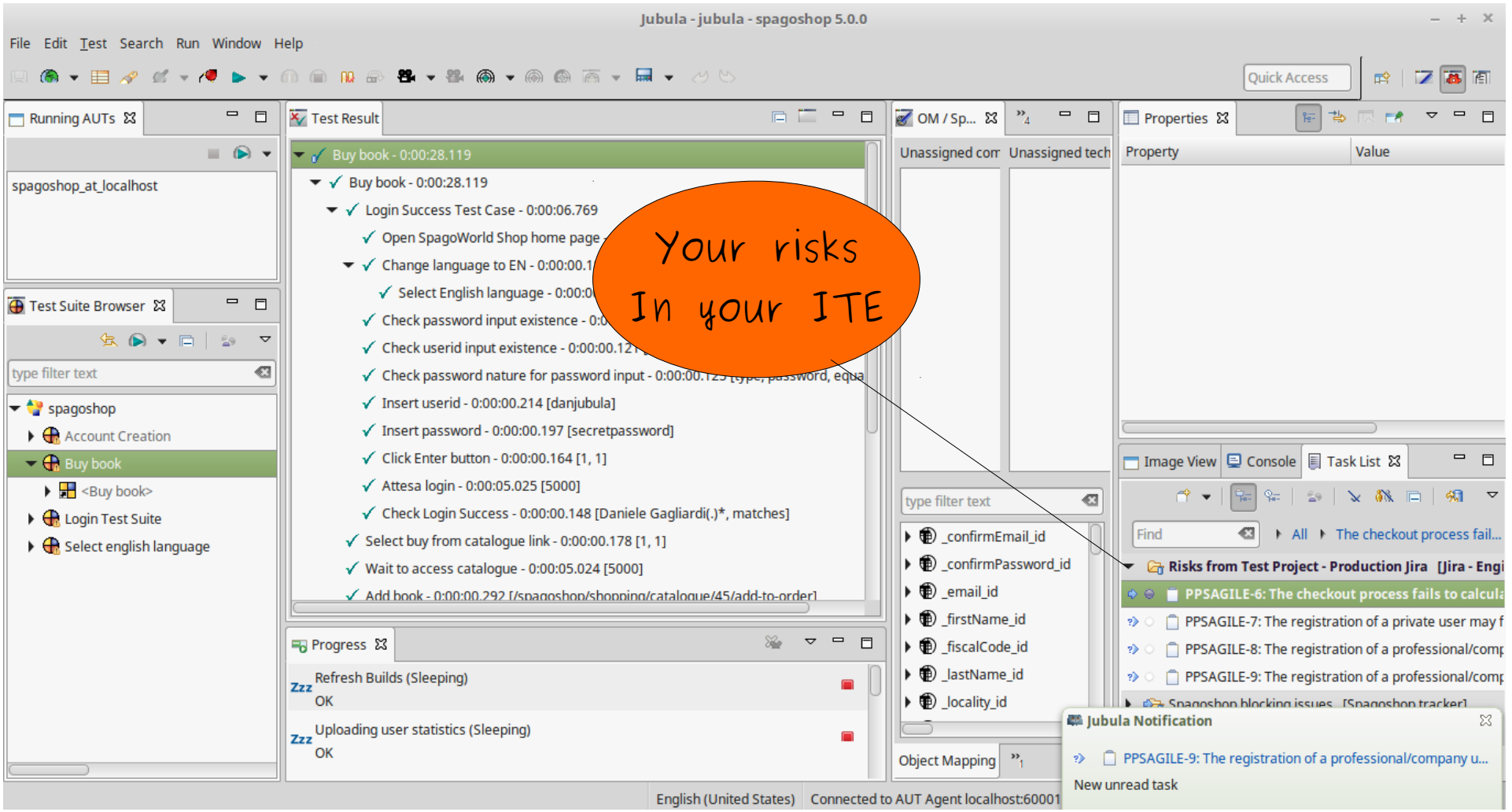
Synch with Risk Repository



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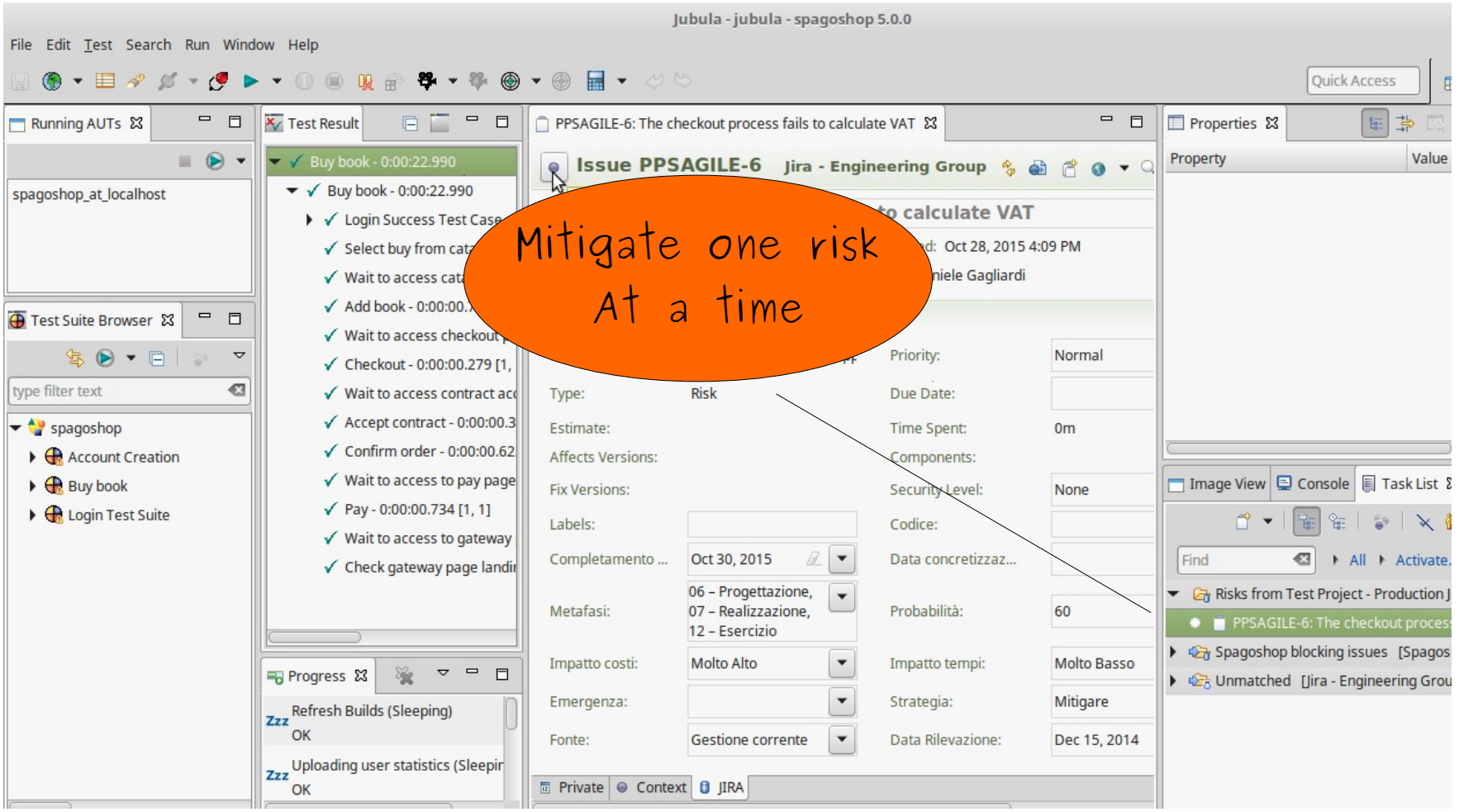
Activate task (focus on one risk at a time)



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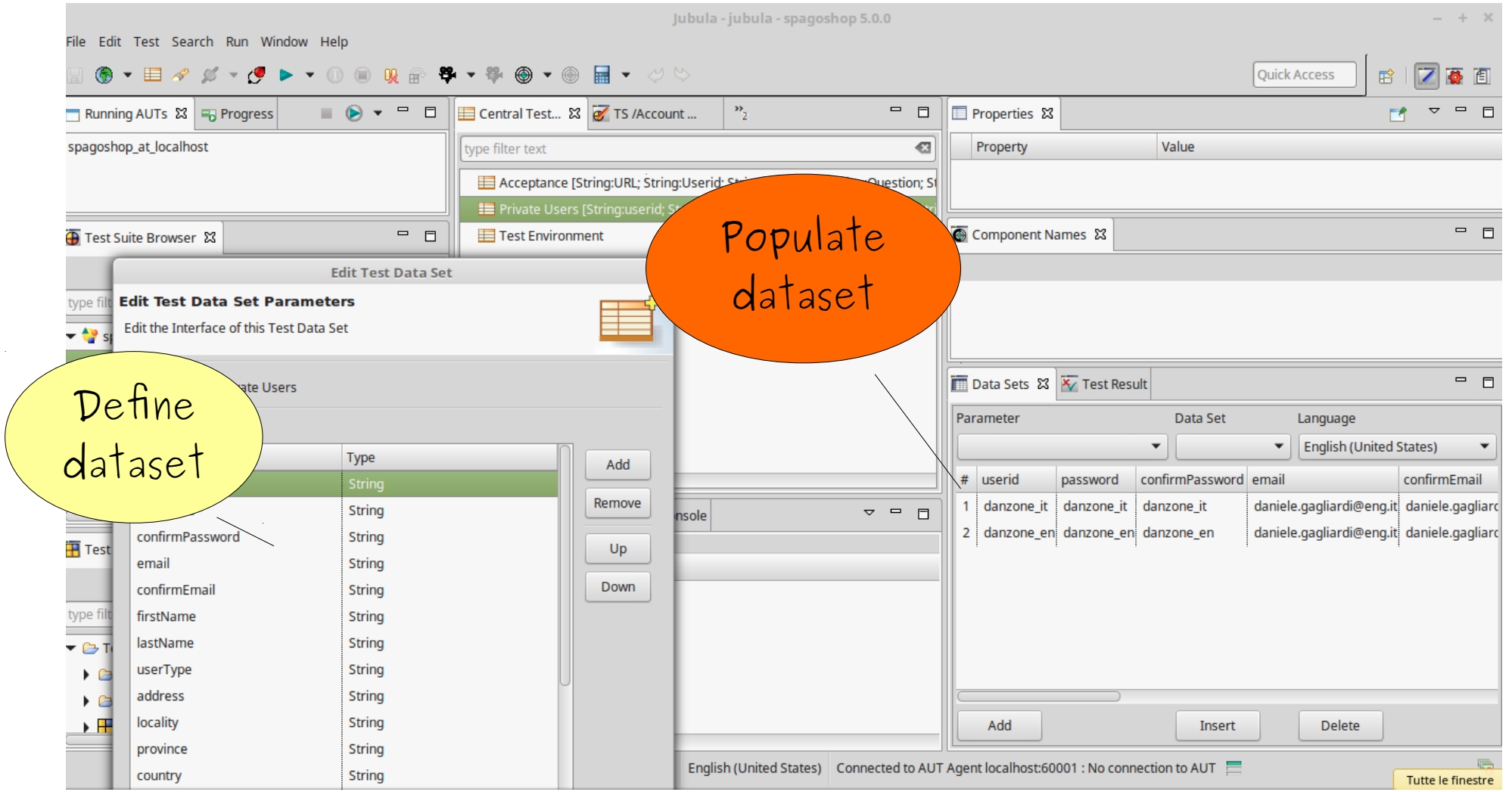
Define datasets (VAT & NIN Risk!!!)



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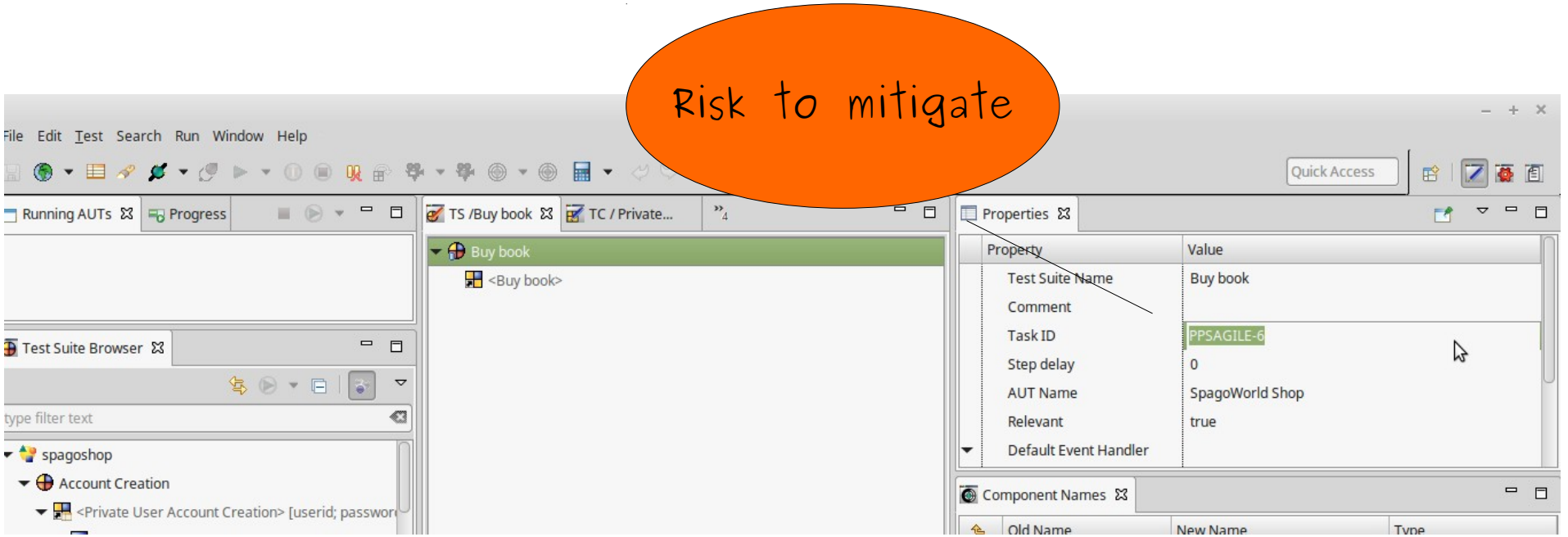
Traceability



Traceability What is it ? Why should I care ?

Traceability is a keyword to take things under control : from the requirements to the risk to the test cases to mitigate them

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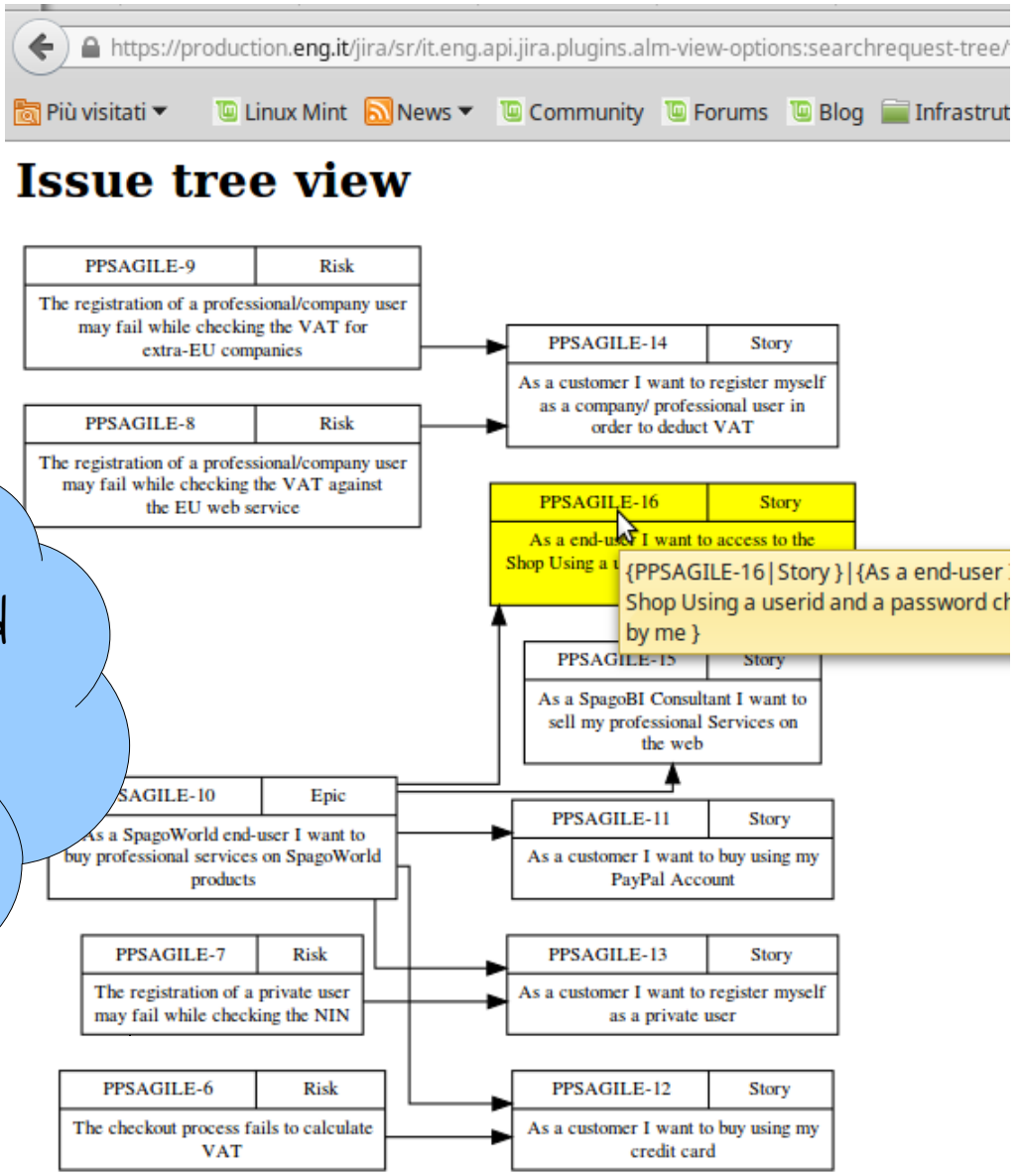
Traceability - example

A Jira search result view

A plugin we developed At Engineering Group Using Atlassian SDK



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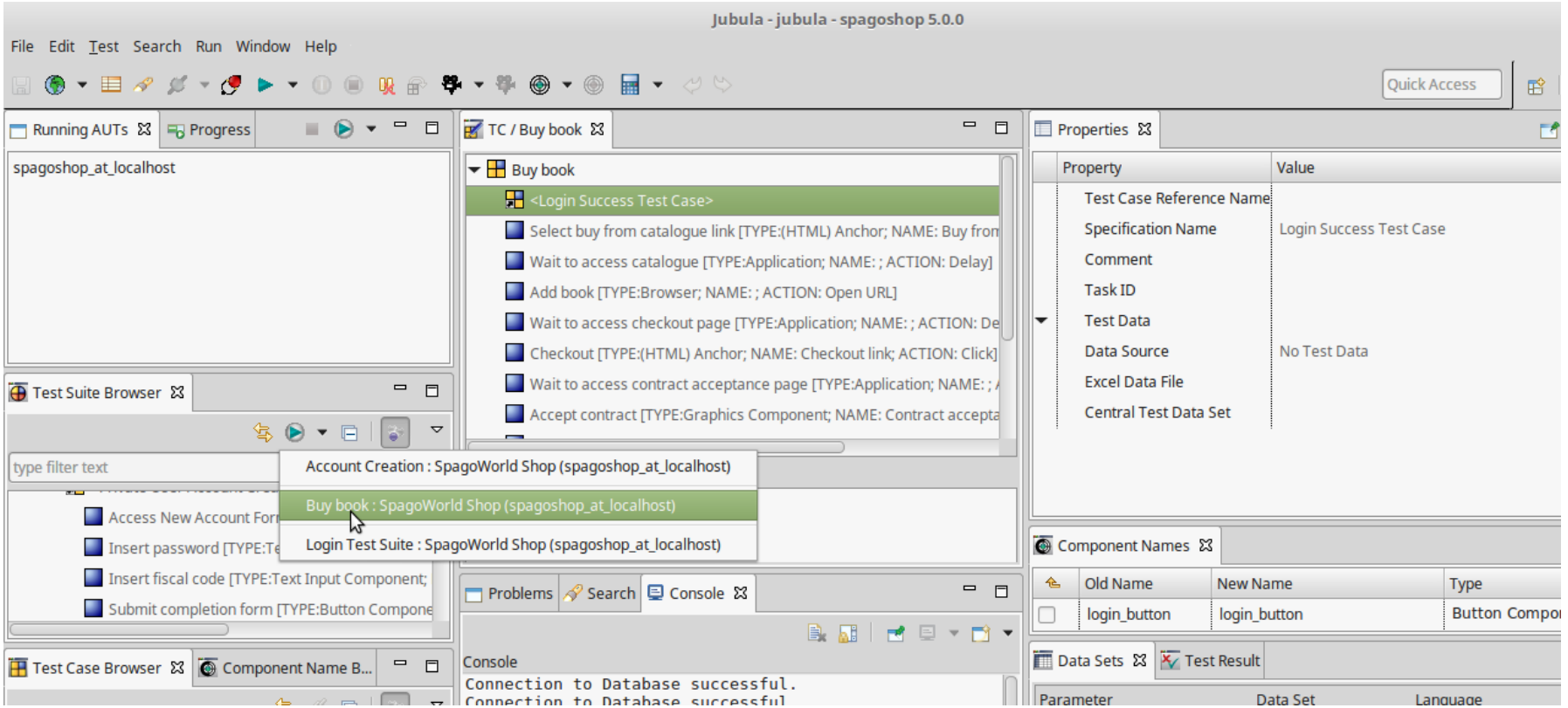
Select test case to execute



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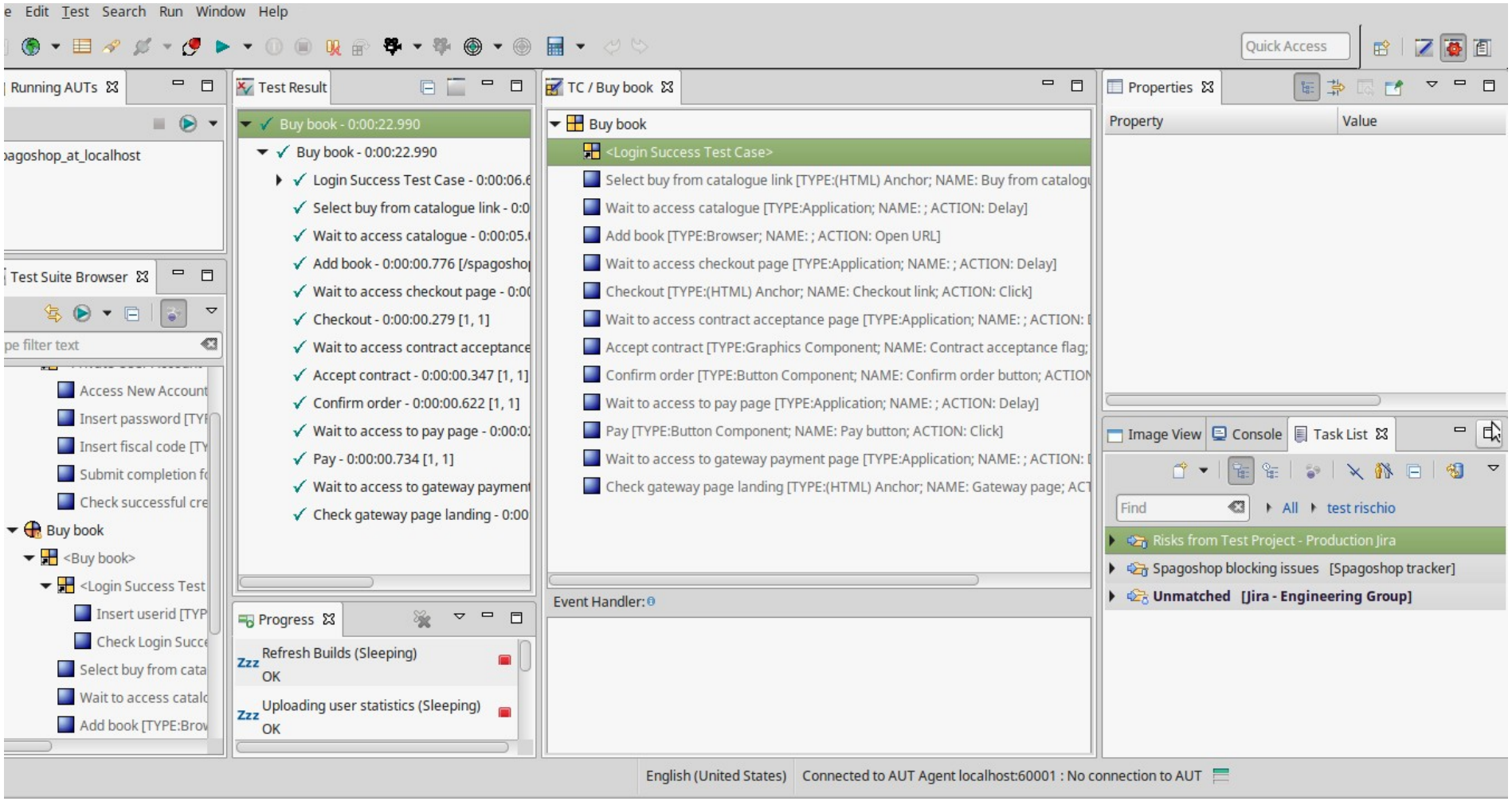
ENGINEERING

Execute



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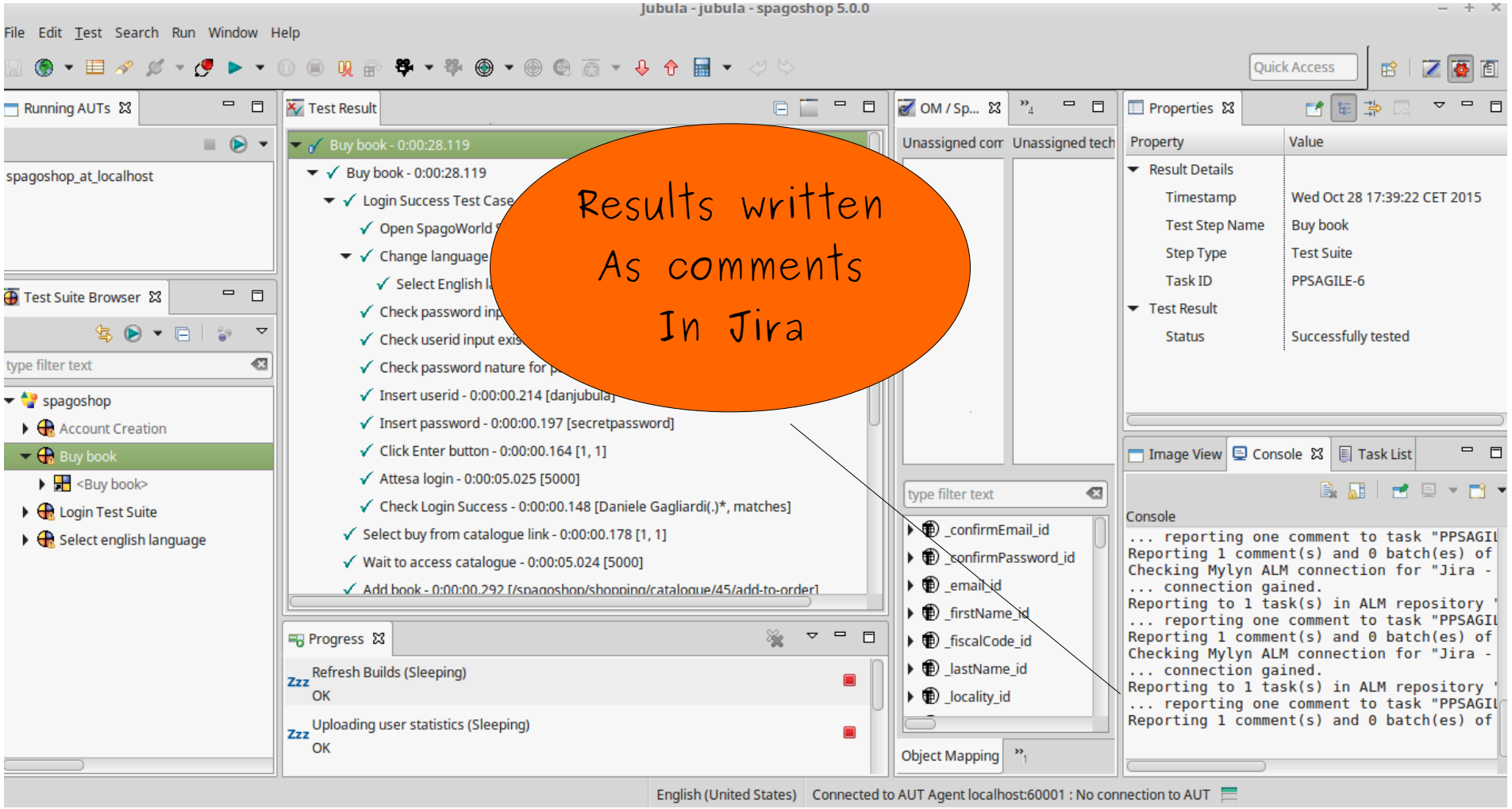
Write comments/results



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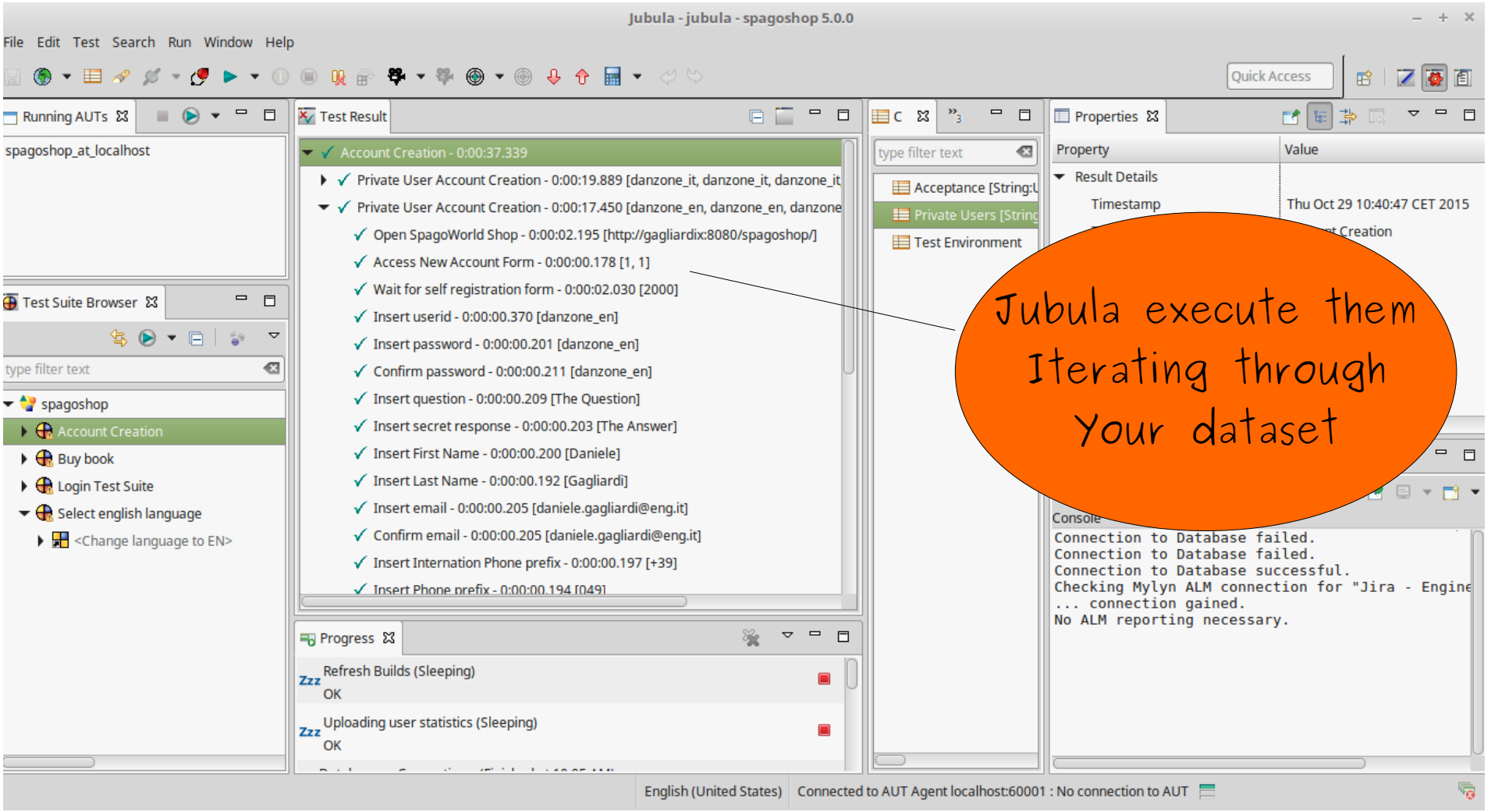
Execute (2)



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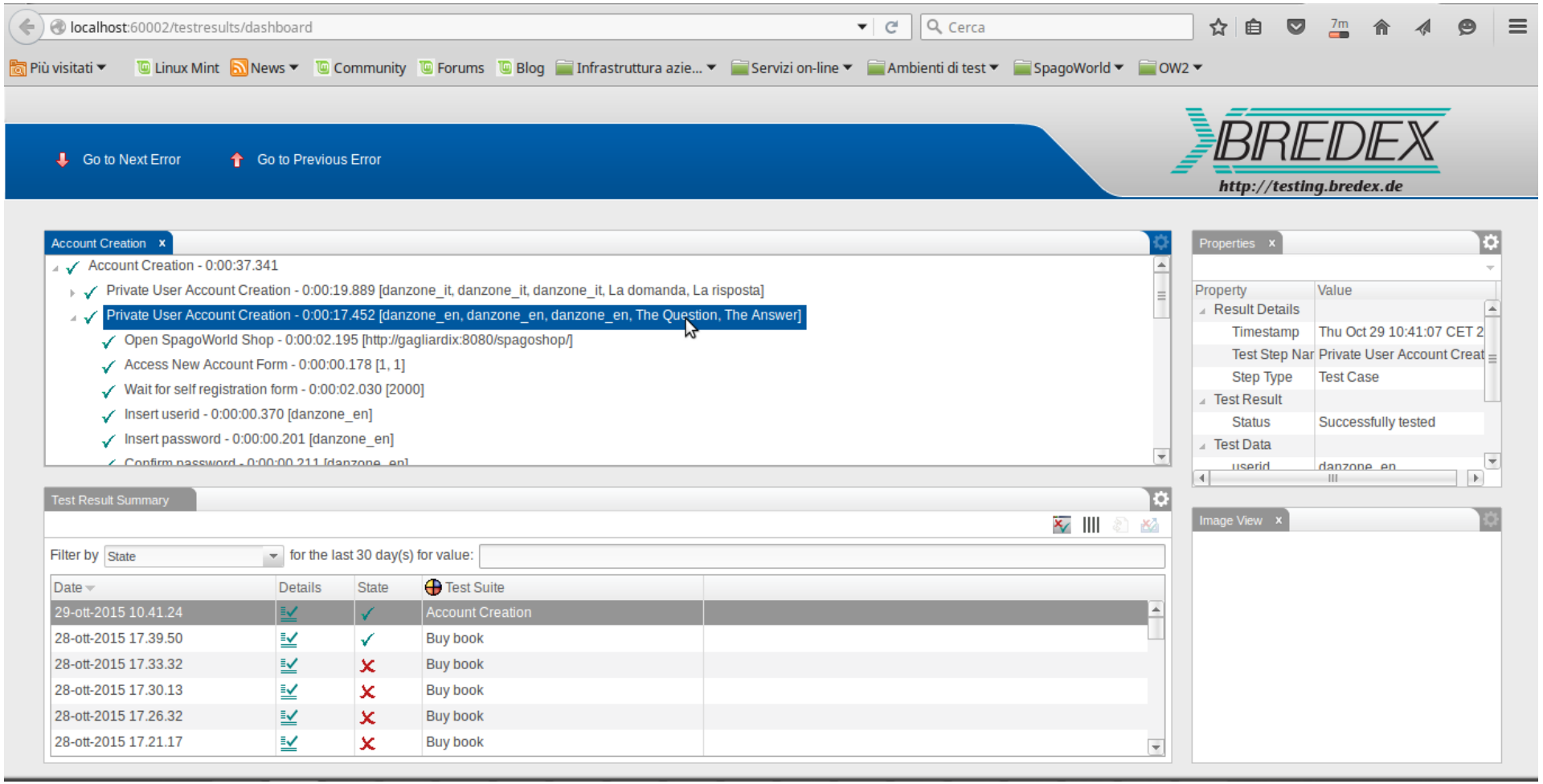
Analyse results



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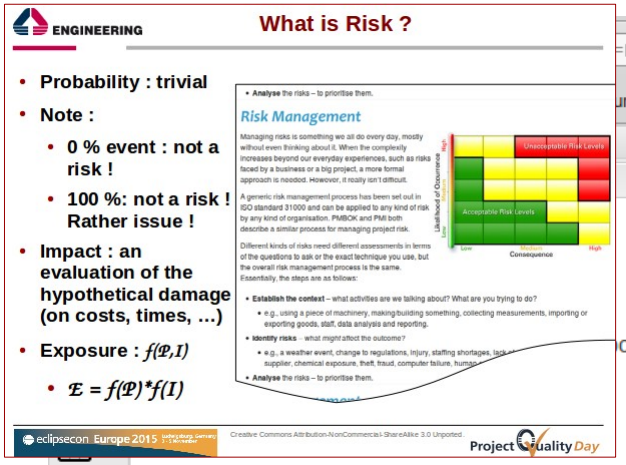
A special guest (to gain control)



Do you remember the beginning ?
slide number 12

Execute

Progetto Jira: Progetto P

o Agile

Data Inizio: October 14, 2015

Jira Project lead: GAGLIARDI DANIELE

> RISCHI

RISCHIO	STATO	ESP. COSTI	ESP. TEMPI
The checkout process fails to calculate VAT	Nuovo	300	60
The registration of a professional/company user may fail while checking the VAT against the EU web service	Nuovo	280	70
The registration of a professional/company user may fail while checking the VAT for extra-EU companies	Nuovo	120	40
The registration of a private user may fail while checking the NIN	Nuovo	200	80

	PROBABILITA'							
IMPATTO COSTI	0-20	21-40	41-60	61-80	81-99	100	CHIUSO	TOTALE
MOLTO BASSO	0	0	0	0	0	0	0	0
BASSO	0	0	0	0	0	0	0	0
MODERATO	0	1	0	0	0	0	0	1
ALTO	0	0	0	1	0	0	0	1
MOLTO ALTO	0	1	1	0	0	0	0	2
TOTALE	0	2	1	1	0	0	0	4

	PROBABILITA'							
IMPATTO TEMPI	0-20	21-40	41-60	61-80	81-99	100	CHIUSO	TOTALE
MOLTO BASSO	0	1	1	1	0	0	0	3
BASSO	0	1	0	0	0	0	0	1
MODERATO	0	0	0	0	0	0	0	0
ALTO	0	0	0	0	0	0	0	0
MOLTO ALTO	0	0	0	0	0	0	0	0
TOTALE	0	2	1	1	0	0	0	4

https://production.eng.it/jira/browse/PPSAGILE-7

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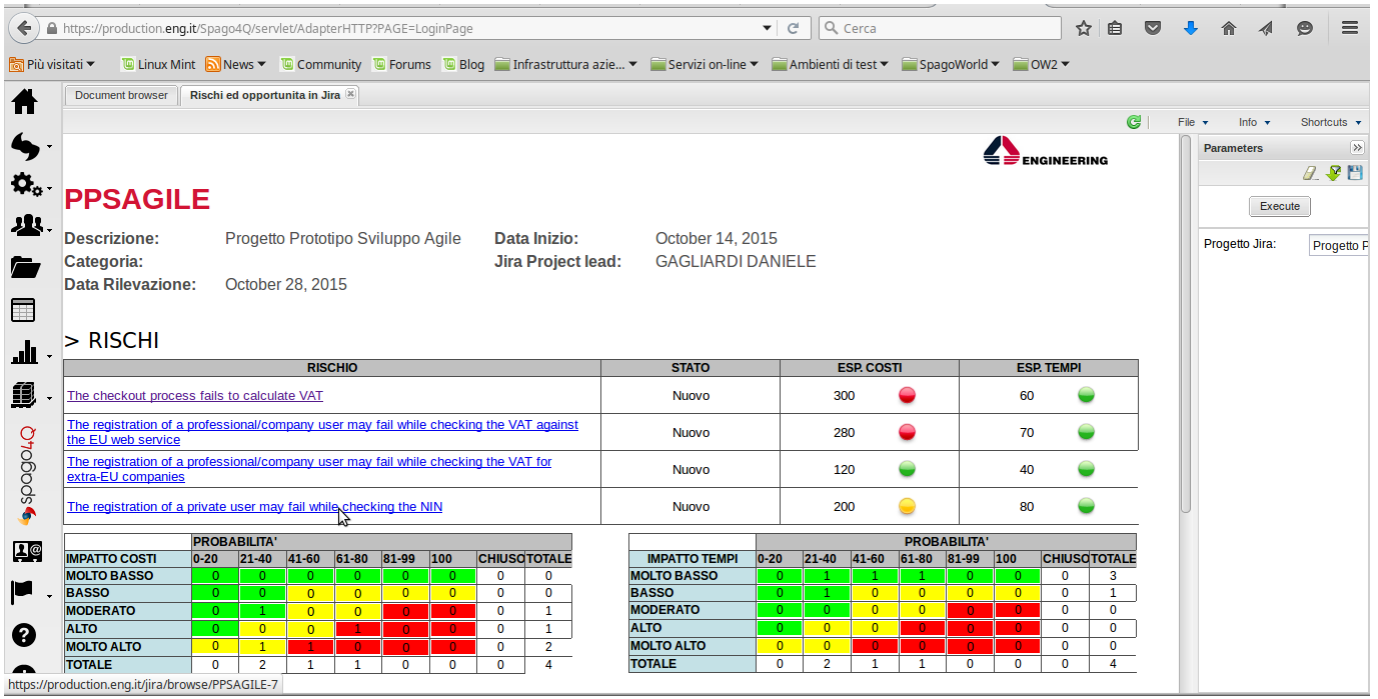
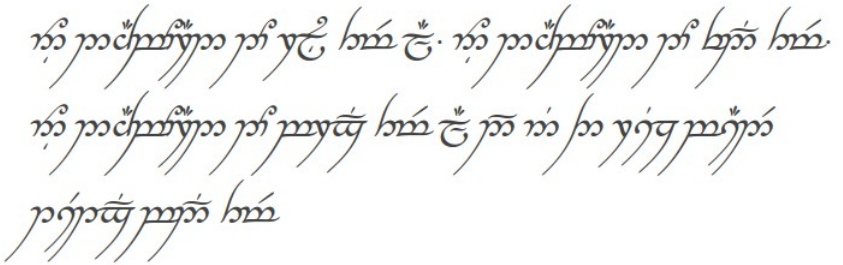
Spago4Q

- Risk dashboard
- Top ten & red zone
- Test report from Jubula (thanks to centralized db)





One Dashboard to rule them all, One Dashboard to find them, One Dashboard to bring them all and in the risk based testing bind them (trans. from the ancient Elvish)

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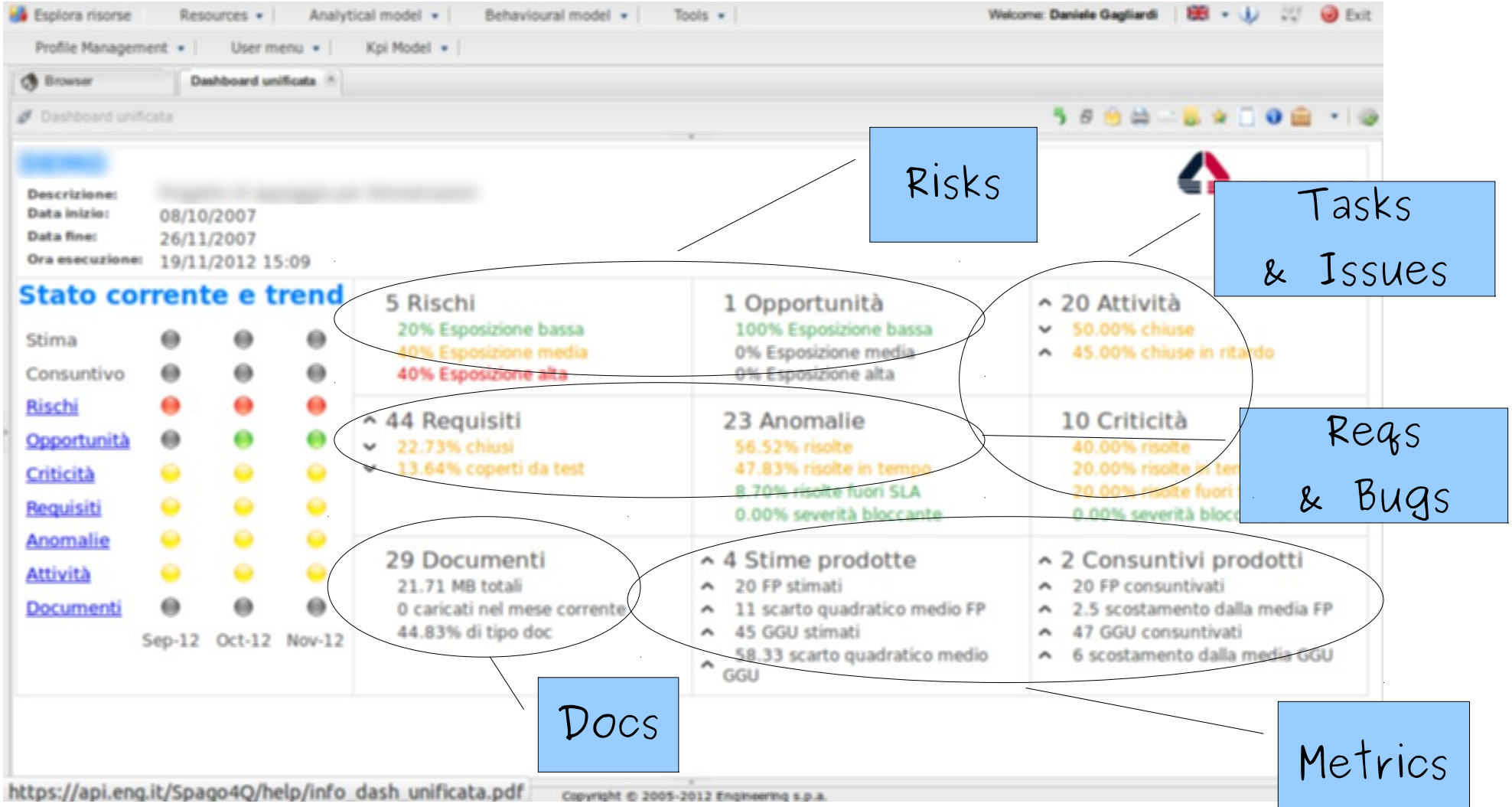
Another example – A Unified Dashboard



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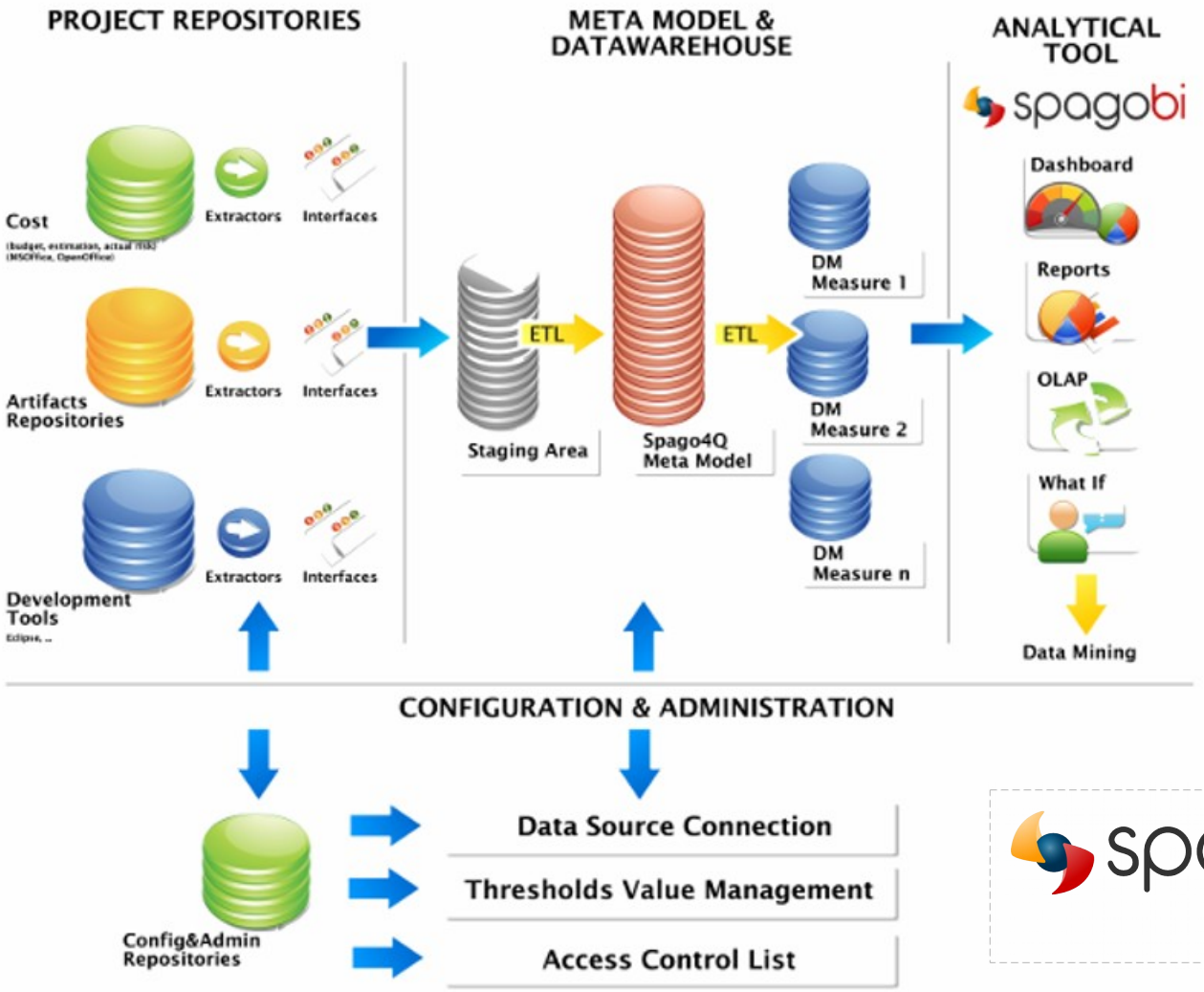
Spago4Q Internals



spagobi for quality

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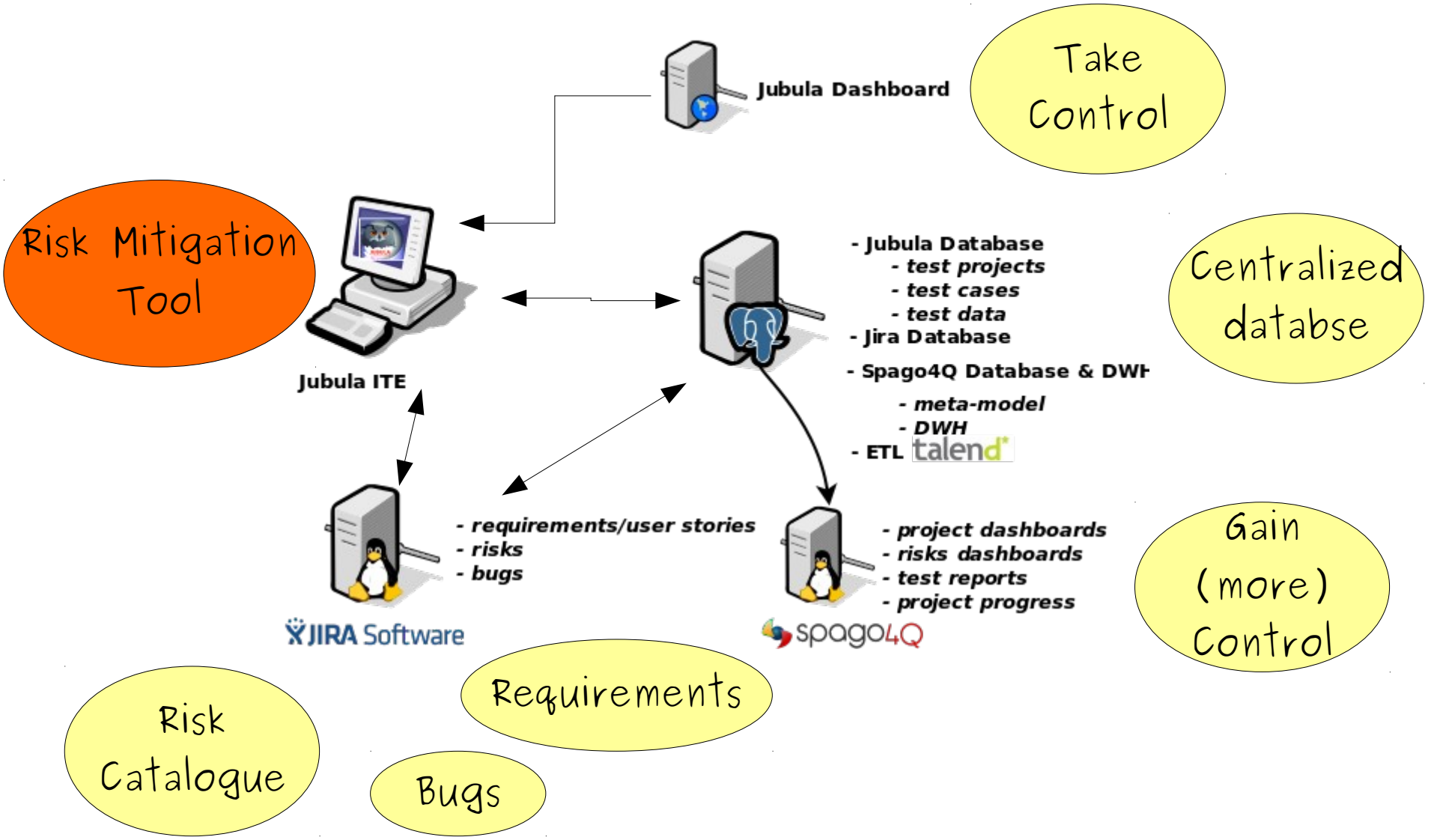
Full architecture



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Last thoughts

- On the theoretical side : Risk based analysis can boost the effectiveness of your test effort (concentrate on what really matters) Your test cases are your treasssssure...
- On the practical side : Effective risk based testing **without coding**

  Take care of your test cases

  They live within your application… and your risks
- Jira the only solution for the risk catalogue ? Maybe Bugzilla and oth. work equally well (this presentation showed you how to configure your favourite issue tracker) and Mylyn connector is supported yet...
- Jubula can greatly lower the burden of testing (remember VAT/NiN issues and Jubula datasets?)

  OSS helped you to build quality. Once again.

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References

- Practical Risk Based Testing – tutorial at STF Italian Software Testing Forum, Milan, June 15th, by Alon Linetzki - http://www.swtestingforum.org/en/27-eng/tutorial/programs/58-practical-risk-based-testing
- Pragmatic Software Testing – Rex Black – Wiley – 2007
- Heuristic Risk-Based Testing, James Marcus Bach (http://www.satisfice.com/articles/hrbt.pdf)
- « RISK » IN ISO 9001:2015 (http://www.orion4value.com/wp-content/uploads/ISO-TC176-SC2_N1222_N1222_-_Risk_in_ISO_9001_2014-07.pdf)
- Eclipse Jubula Project (http://www.eclipse.org/jubula)
- Atlassian Jira (https://www.atlassian.com/software/jira)
- Spago4Q (http://www.spago4q.org)

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That's all folk!

Grazie per la vostra attenzione !

Dankon pro via atento!

Merci de votre attention!

Vielen Dank für Ihre Aufmerksamkeit !

Thanks for Your attention !

Any question ?

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