Automating the Automation -
Harnessing the power of model based testing

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Agenda

1. TRADITIONAL TESTING
2. THE SECRETS OF SUCCESSFUL AUTOMATION
3. MODEL BASED TESTING FOR AUTOMATING THE AUTOMATION
4. DEMO - HOW CA USE AGILE REQUIREMENTS DESIGNER
5. WRAP UP AND QUESTIONS

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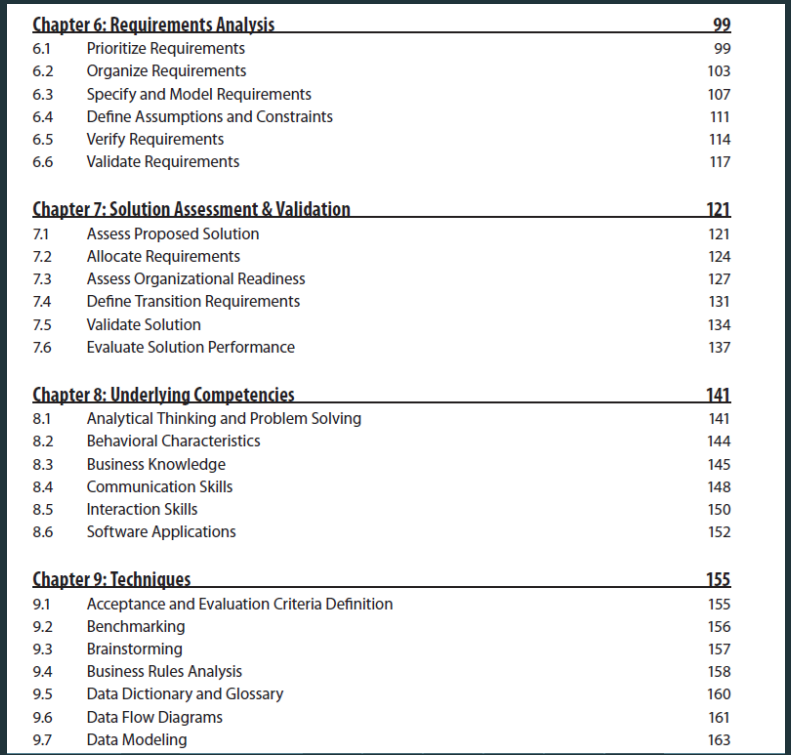
Traditional Software Development

Poor Requirements

- A plethora of techniques exist, most are written in ambiguous natural language
- The requirements are “static” - they offer no way to derive tests directly from them…
- … no way to update tests when the requirements change
  – this has to be done manually



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The results are often poor

Summary

Ambiguity Category	Number of occurrences
Contradiction	7
Ambiguity of reference	10
Dangling Else (including improper use of conditionals)	9
I.E. versus E.G.	1
Omissions (Missing Clauses)	5
Omissions (Missing Definitions)	3
Completely Ambiguous	1
Ambiguous Logical Operators	2
Ambiguous Precedence Relationships	5
Incomplete Definition Completed Elsewhere	3

Total ambiguities found: 46

Over 50% of defects are introduced in the design phase

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Manual Test Case Design

- Currently manual – a **time consuming, error-prone** process
- Is unsystematic, ad hoc, and has no real notion of "**coverage**"
- **Over-testing** and **under-testing** – 10-20% coverage with 4 times over-testing
- Poor requirements lead to **poor overall testing**, with testers having to fill in the gaps
- No linkage to **test data** – process is manual, painstaking and very time-consuming
- No flexibility for **change requests**: a critical weakness in an agile or continuous delivery environment. Changes take longer than the original requirement.

	Step Name	Description	Expected Result
	Step 1	Enter valid username	Username is shown on login panel input
	Step 2	Enter valid password	Password is entered but masked on the display
	Step 3	Click login	The user is forwarded to the welcome page

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Poor Testing -> Automated testing

Automated testing: Manual script generation

- Automated testing frameworks are heavily scripted
- Script generation is usually done manually
- As well as the maintenance of scripts

- Alternative solutions use:
- Record playback
- Script-less automation frameworks (keyword)

But you're still doing manual test case design!

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Fundamentals of Successful Automation

Fundamentals of Successful Test Automation

1) Modular – Test cases are reused to mitigate reinventing the wheel every time a test is written.

2) Maintainable – Traceability between requirements and tests – when the requirements changes there is a low cost to identify and update the associated tests

3) Notion of coverage – Tests are relevant to support the test requirements, minimising the number of tests, while ensuring the maximum amount of functionality is covered

4) The right data at the right time – The right test data is utilized and deployed for each test at the right location at the right time during execution.

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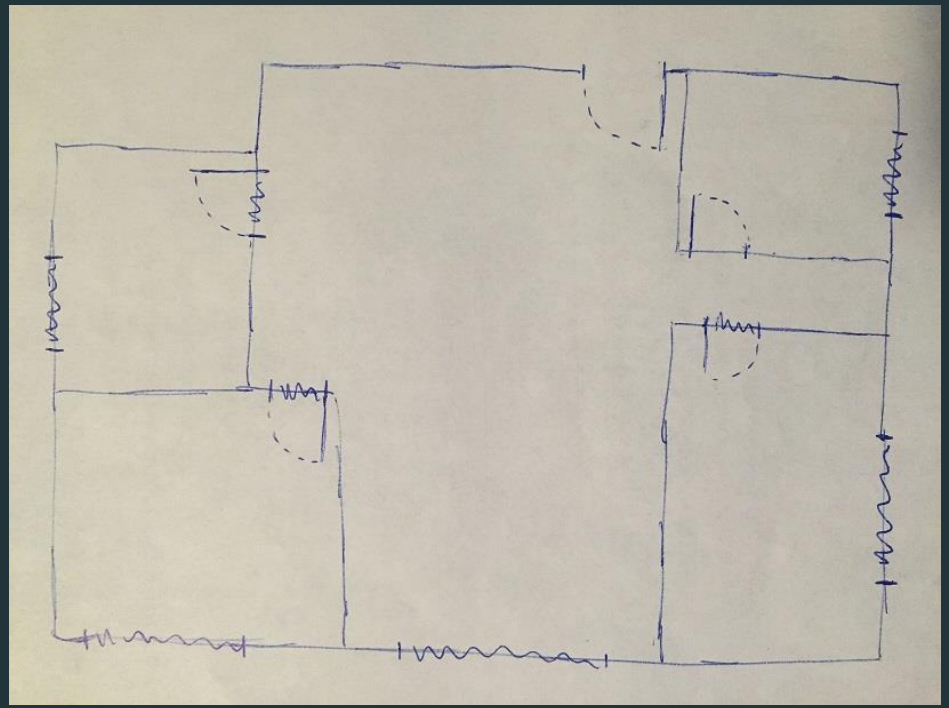
Model based Testing for Test Automation

Persona 1 – The Home Owner



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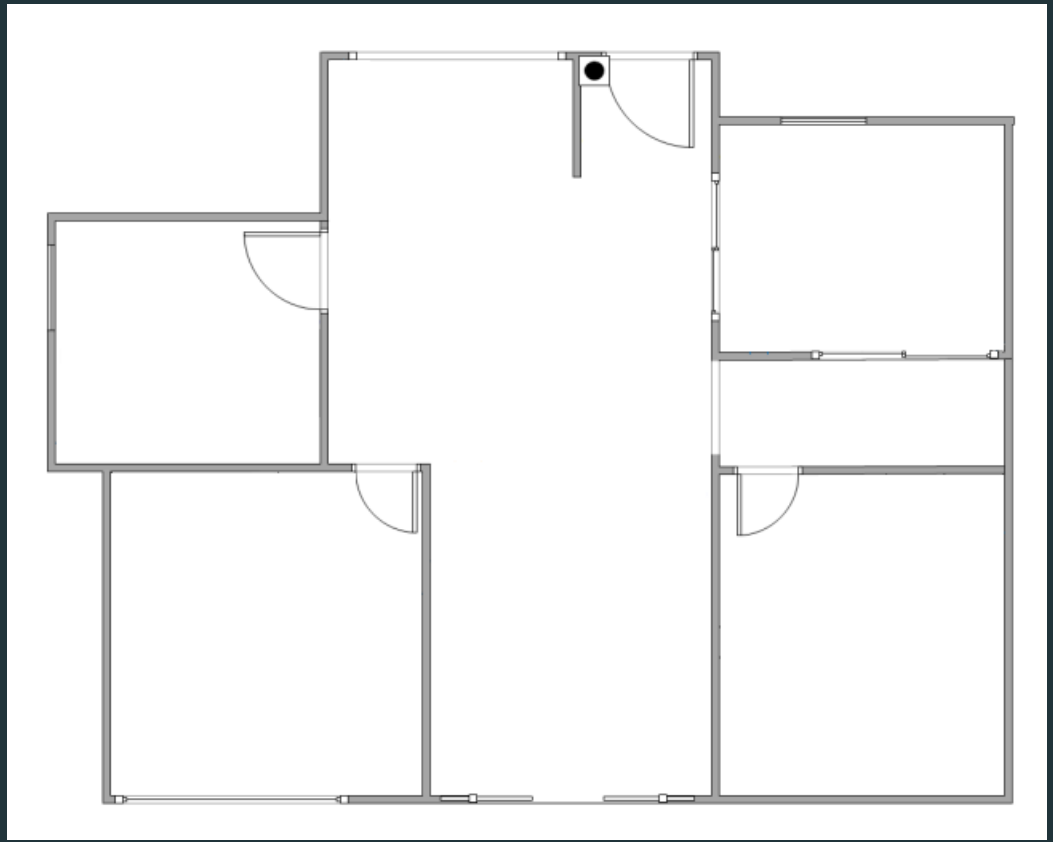
Persona 2 – The Architect



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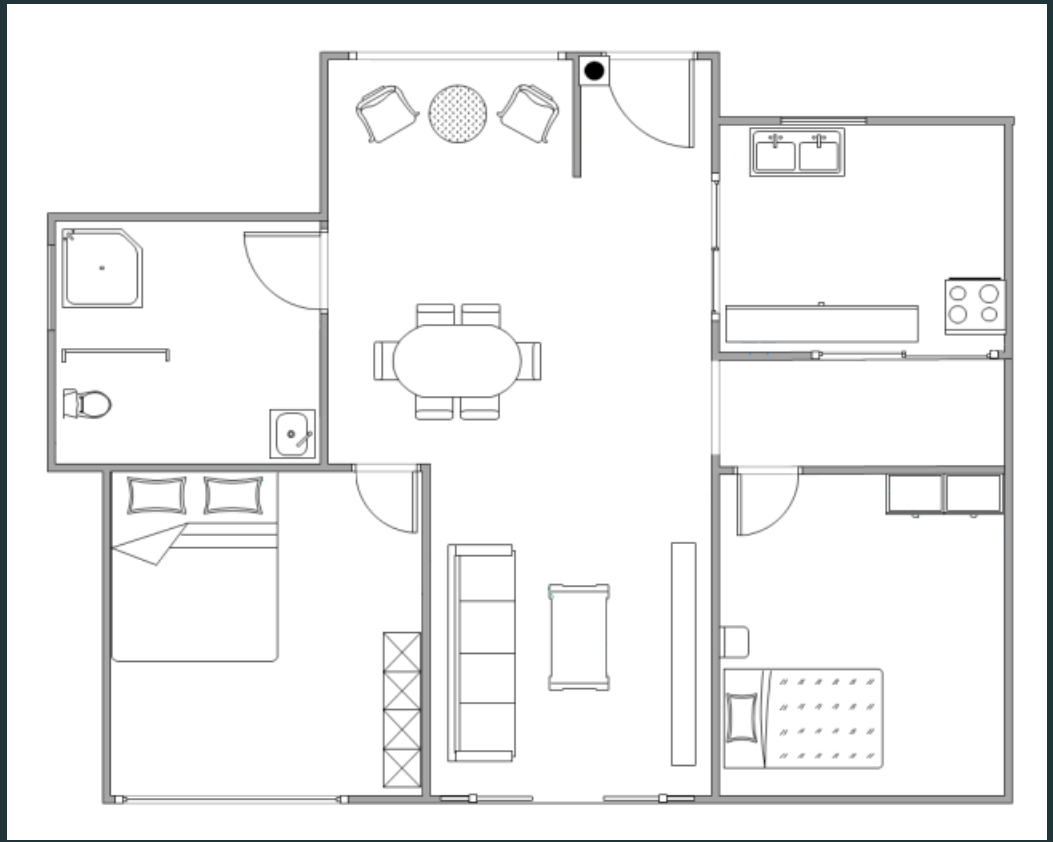
Persona 3 – The Interior Designer



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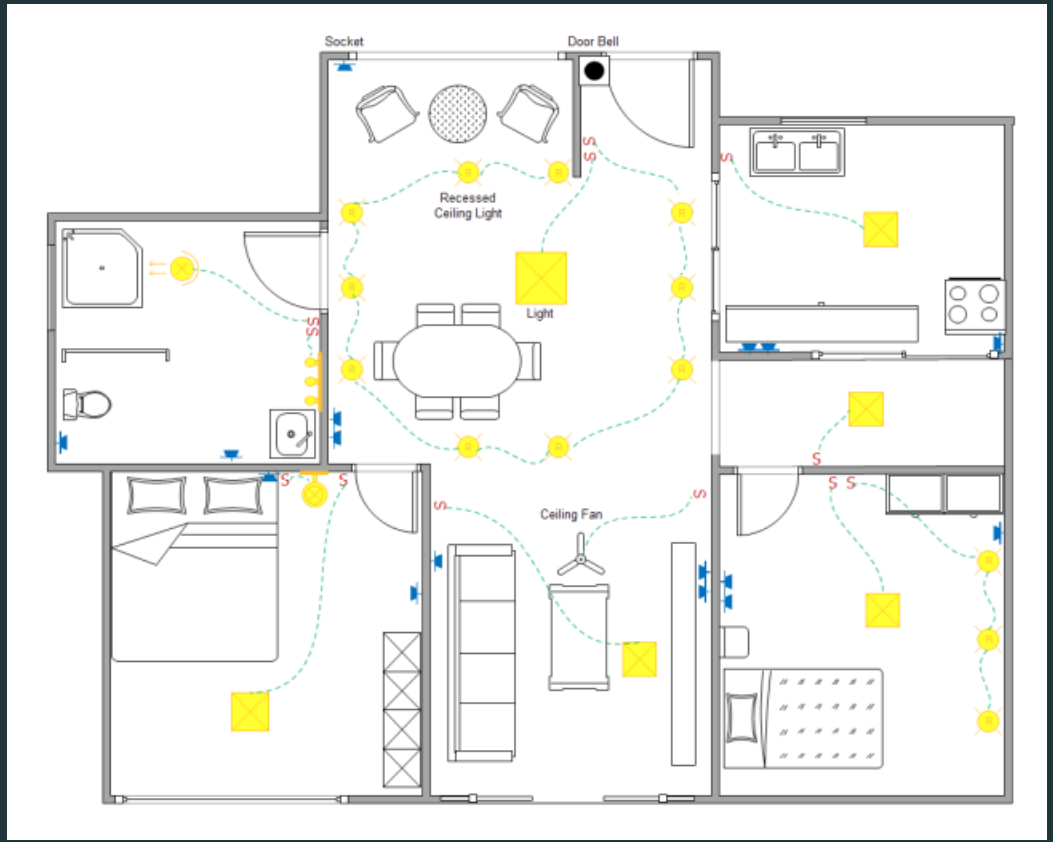
Persona 4 – The Electrical Engineer



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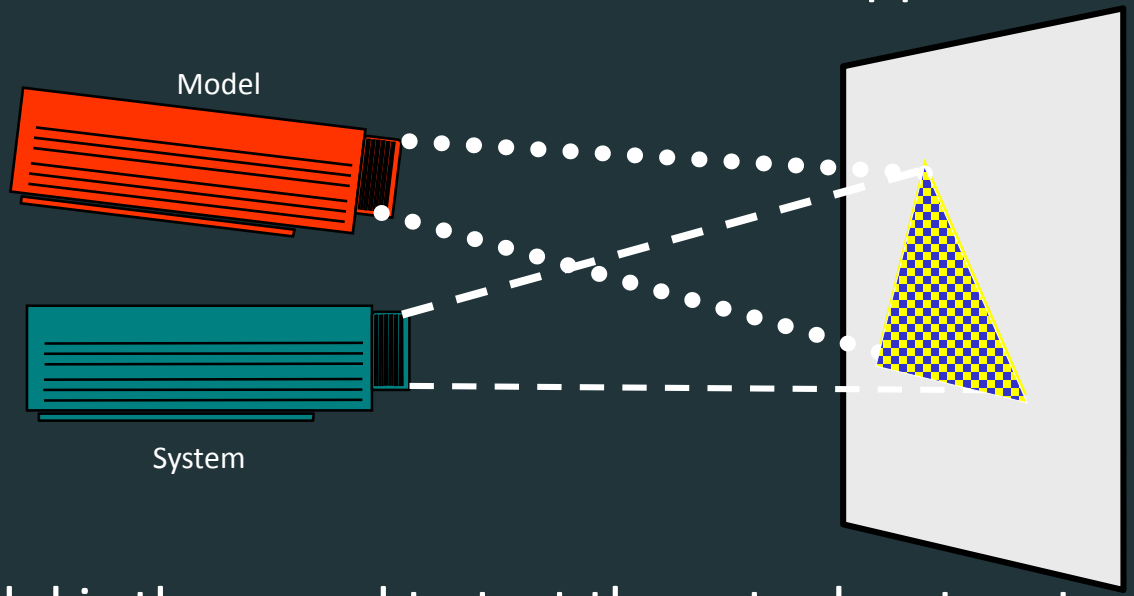
What is Model Based Testing?

Model based testing lets you define the behavior of a system under test – in other words what is supposed to happen.



The model is then used to test the actual system to see if it does what it is meant to.

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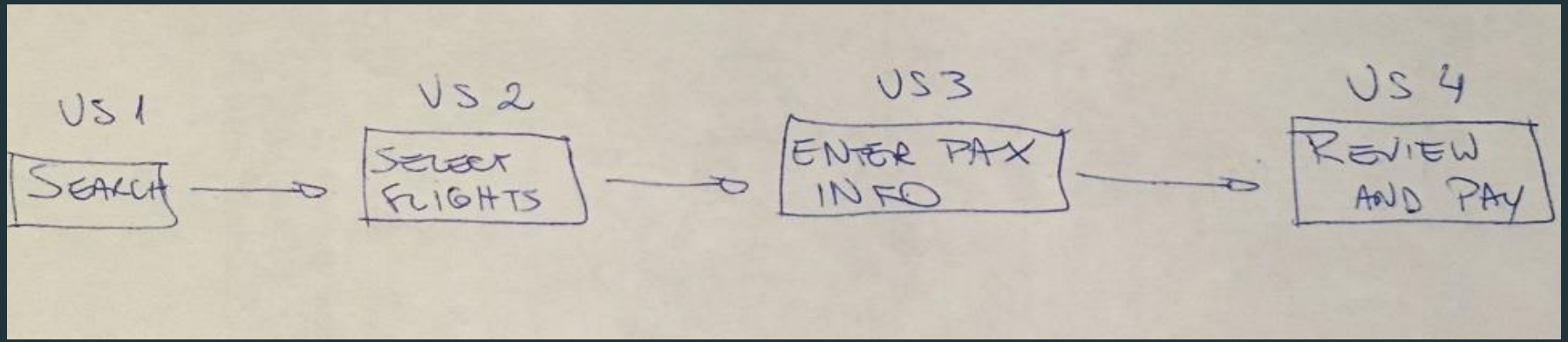
Persona 1 – The Product Owner



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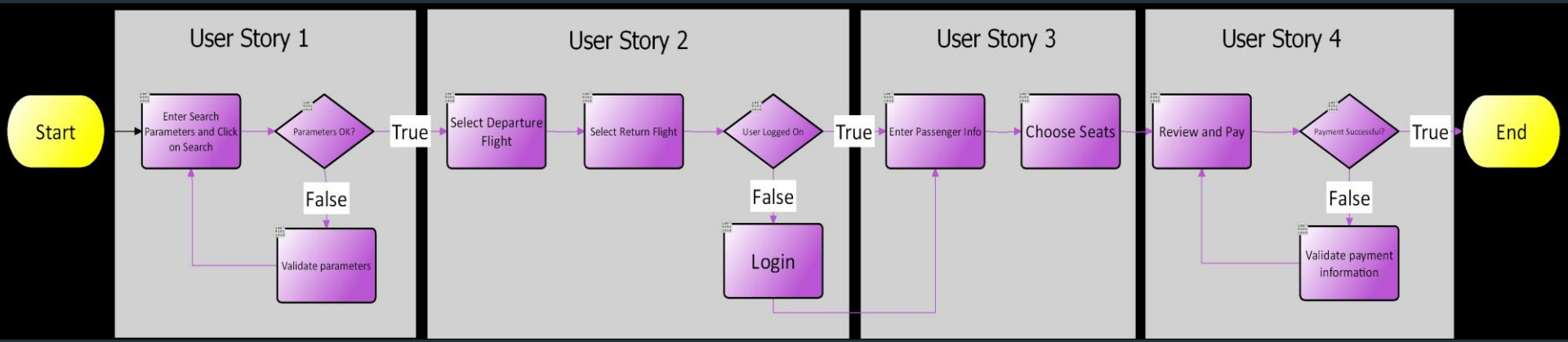
Persona 2 – The Modeler



- Streamlines understanding across all teams in the value stream by removing all ambiguity from the scope
- Foundational layer others will build on top of (single source of truth)

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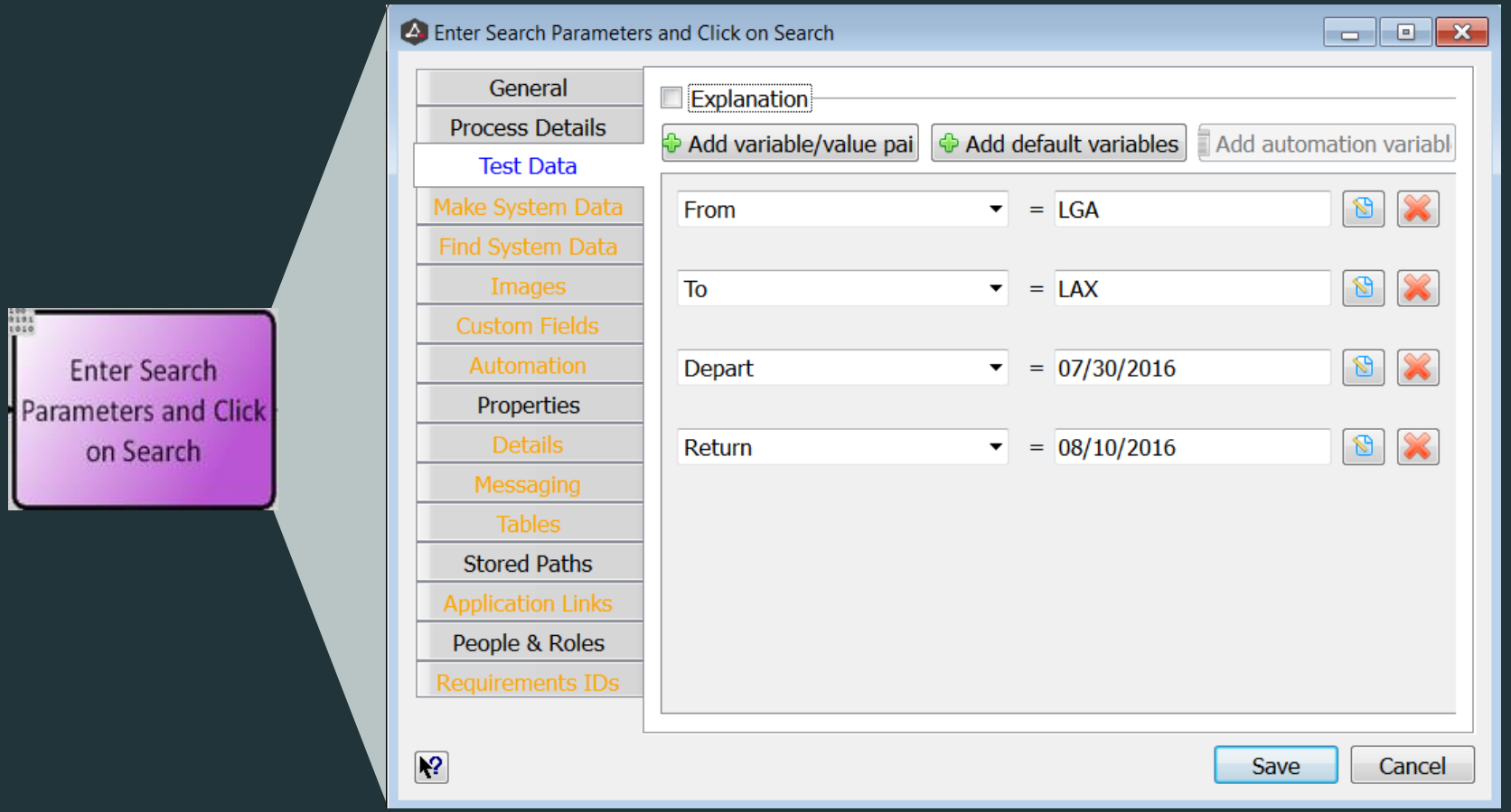
Persona 3 – The Data Engineer



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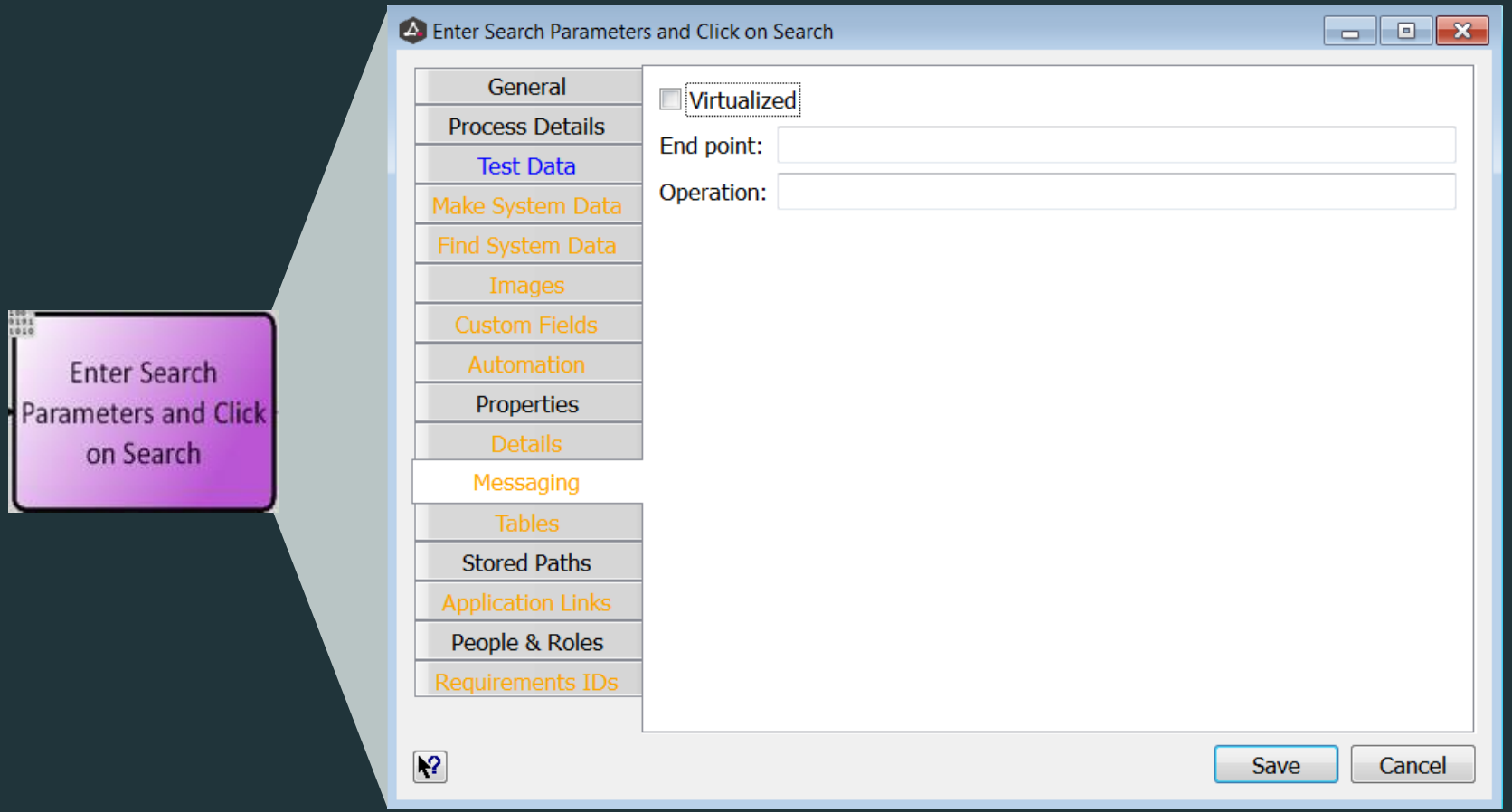
Persona 4 – The SOA Engineer



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Persona 4 – The Test Automation Engineer

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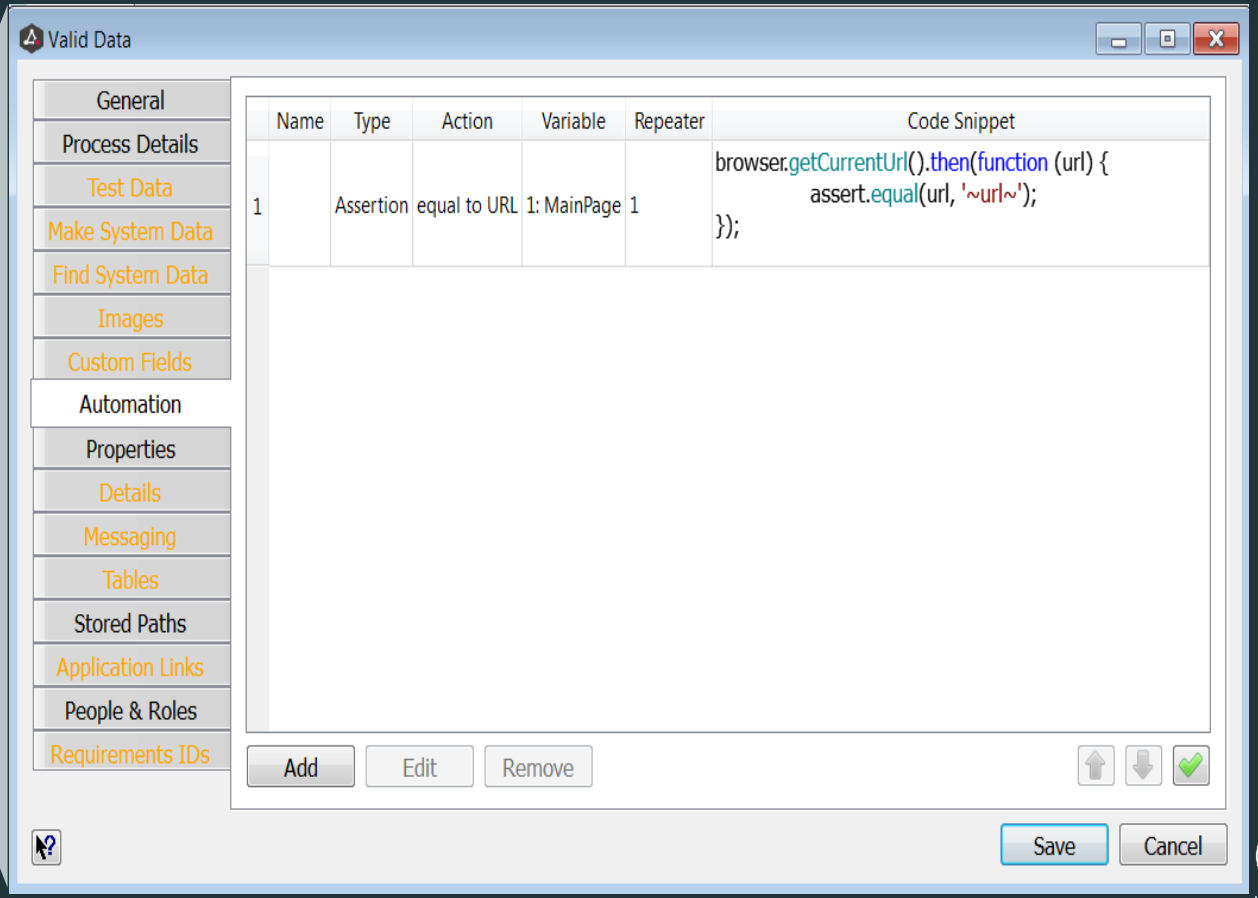

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Active Automation

Active Automation

- Test cases and scripts are created automatically from “Active” requirements
- Testing is Model Based for maximum coverage
- Use a modular component library of common and optimized tests to promote reusability
- Test Data and Virtual End Points are created or found as part of the Automation
- If the requirements change the tests are updated.

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How CA Use Agile Requirements Designer

Drinking our own champagne

- We use CA Agile Requirements Designer in our own software development
- Model requirements in ARD
- Overlay the Ranorex automation framework
- Automatically generate automated functional tests

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Conclusion

Conclusion

- Have ARD create a perfect test suite for my coverage requirements.
- For each test case automatically generate me an automation script.
- How we can edit the ARD model to reflect a change in the requirements.
- How that change instantly updates our automation scripts.
- Providing automatic automation with MBT.

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