TRICENTIS

Agile vs Fragile

- The need for Automation in Agile

Susmit Bhattacharya, Solution Architect, Asia Pacific

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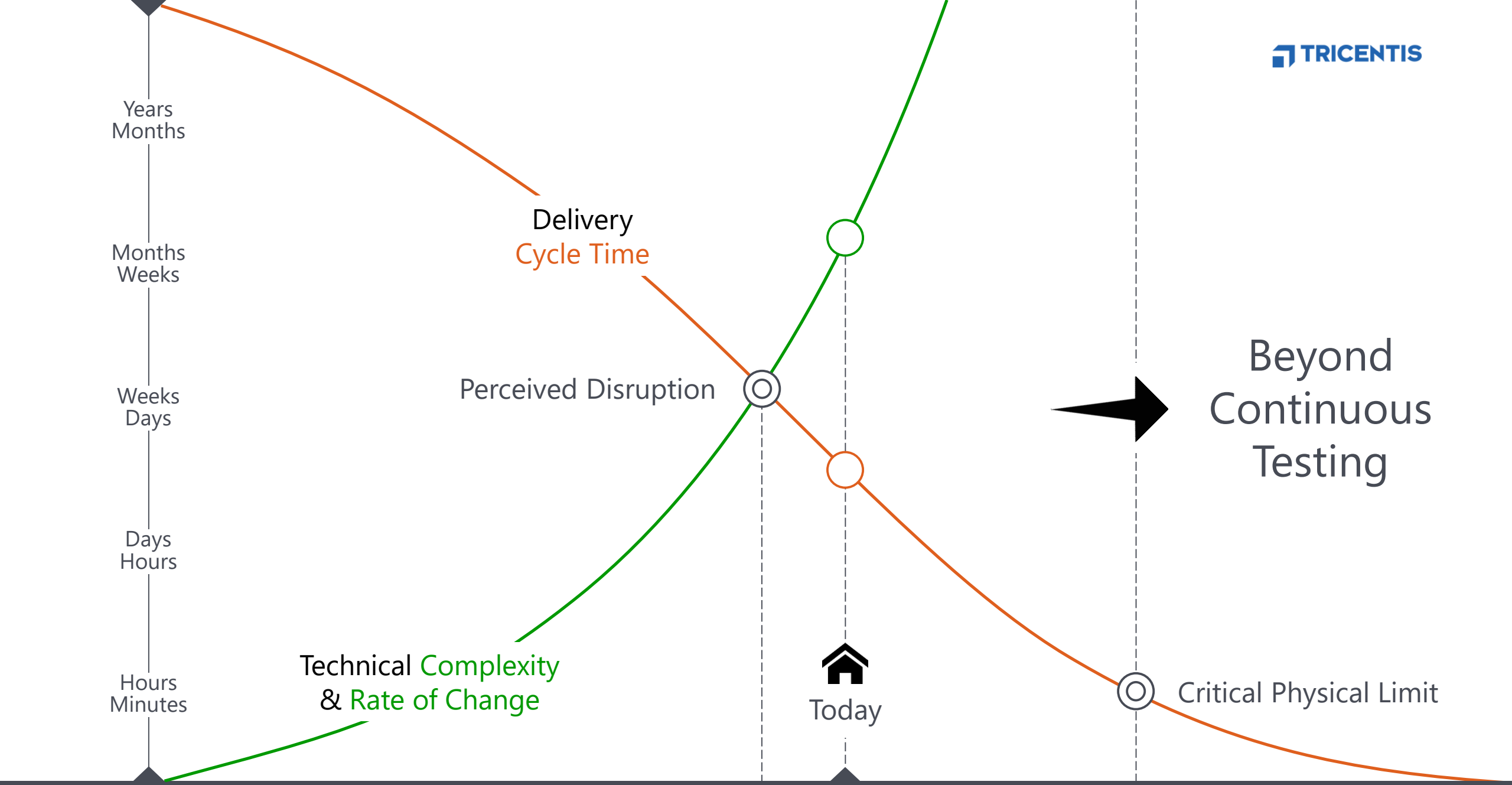
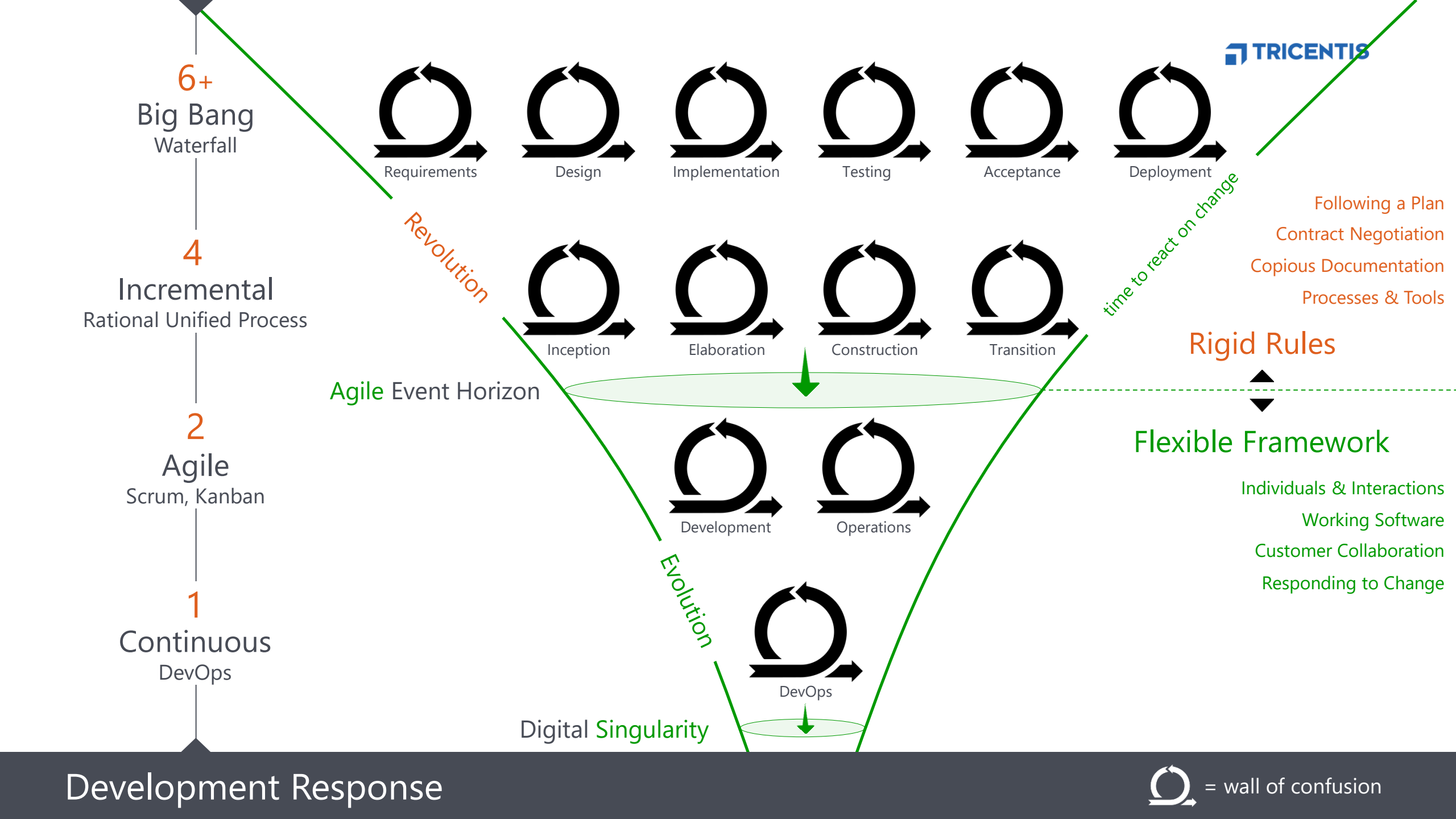


Ever-Growing Challenge


TRICENTIS
6+
Big Bang
Waterfall
4
Incremental
Rational Unified Process
2
Agile
Scrum, Kanban
1
Continuous
DevOps
Requirements
Design
Implementation
Testing
Acceptance
Deployment
Revolution
Inception
Elaboration
Construction
Transition
time to react on change
Following a Plan
Contract Negotiation
Copious Documentation
Processes & Tools
Rigid Rules
Agile Event Horizon
Development
Operations
Flexible Framework
Individuals & Interactions
Working Software
Customer Collaboration
Responding to Change
Evolution
DevOps
Digital Singularity
Development Response
= wall of confusion

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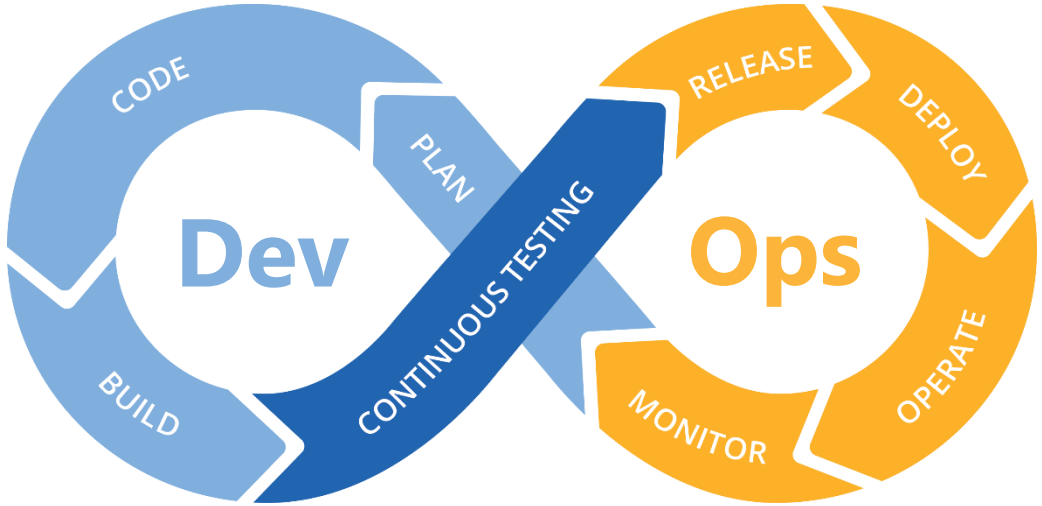
Collaborative Development

Continuous Release & Deployment



Continuous Integration

Continuous Feedback

Continuous Testing

Continuous Monitoring

Dev ← Shift Left **Test** → Shift Right **Ops**

DevOps is no longer a unicorn's discipline.

81%

of enterprises have adopted or plan to adopt DevOps.

DevOps Movement

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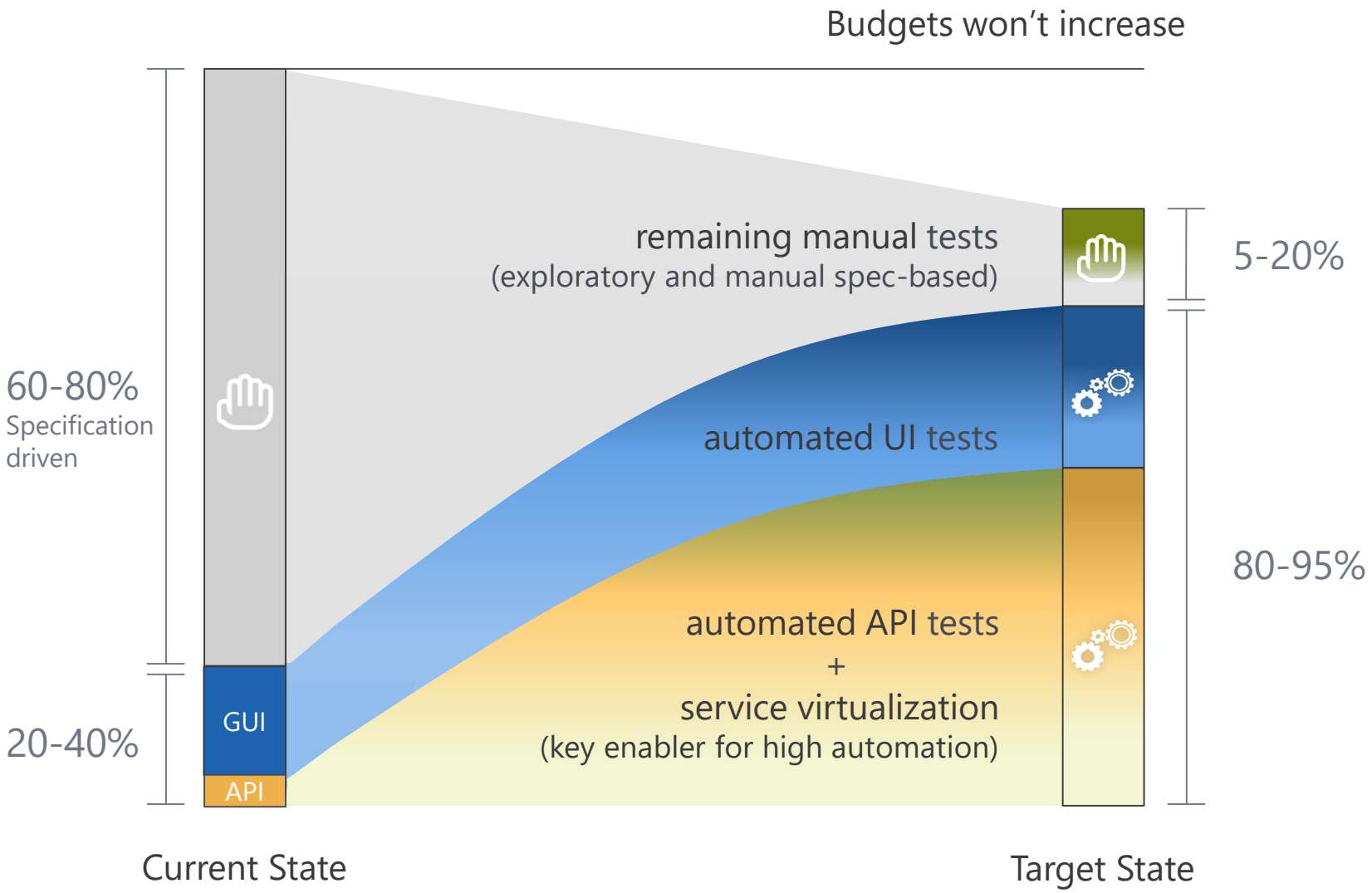
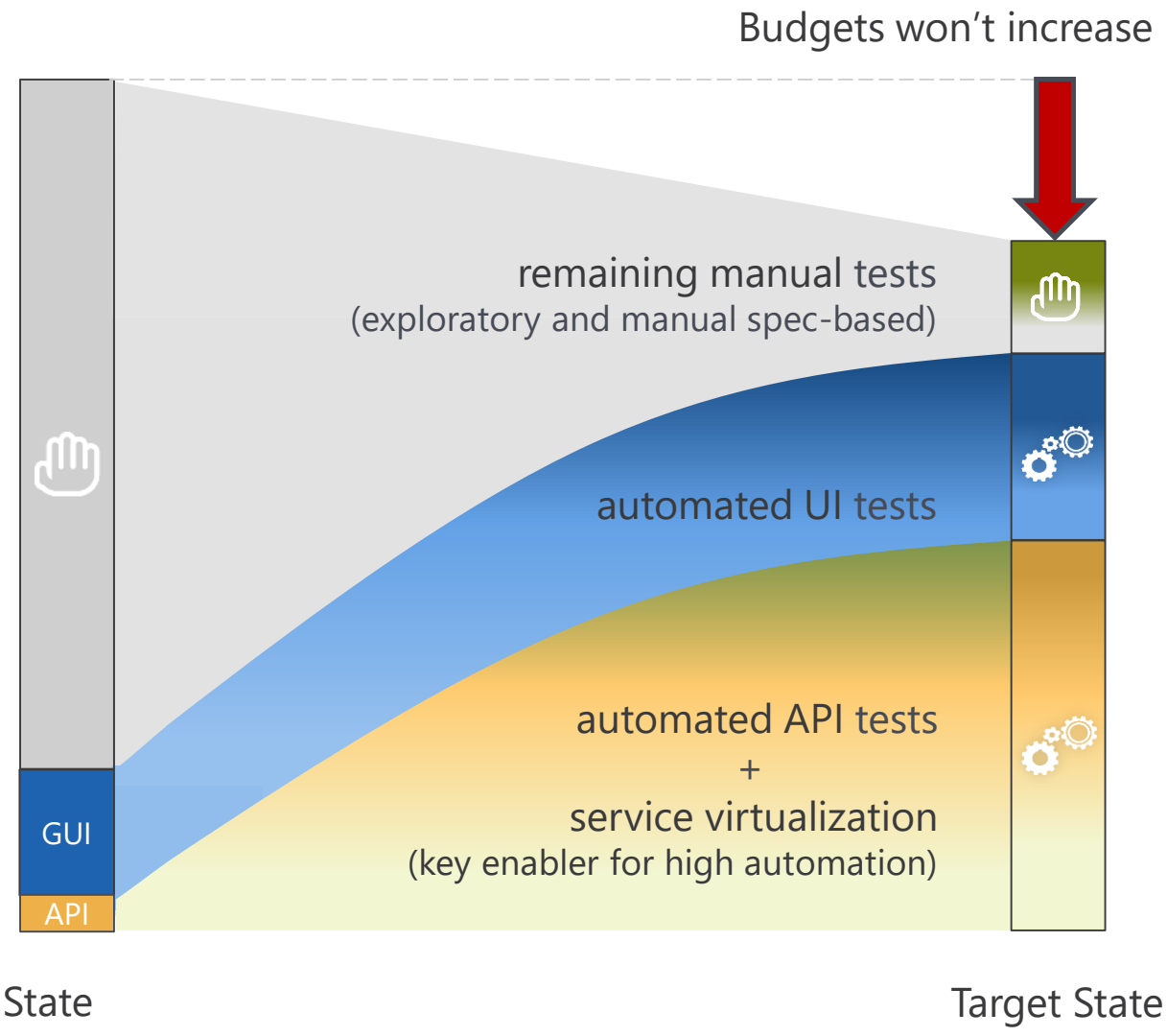


Testing Future



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Optimize

Computer-Aided Test Portfolio Design

Redundancy-free test case portfolio with maximum risk coverage and fewer tests.

Explore

Session-Based Exploratory Testing

Make your testing intellectually rich.

Automate

Model-Based Test Automation (MBTA) for UI and API

Automating the automation framework.

Manage

Orchestrated Service Virtualization

Make testing independent.

Stateful Test Data Management

Integrate

CT Integration (CI, CD)

Distributed Execution

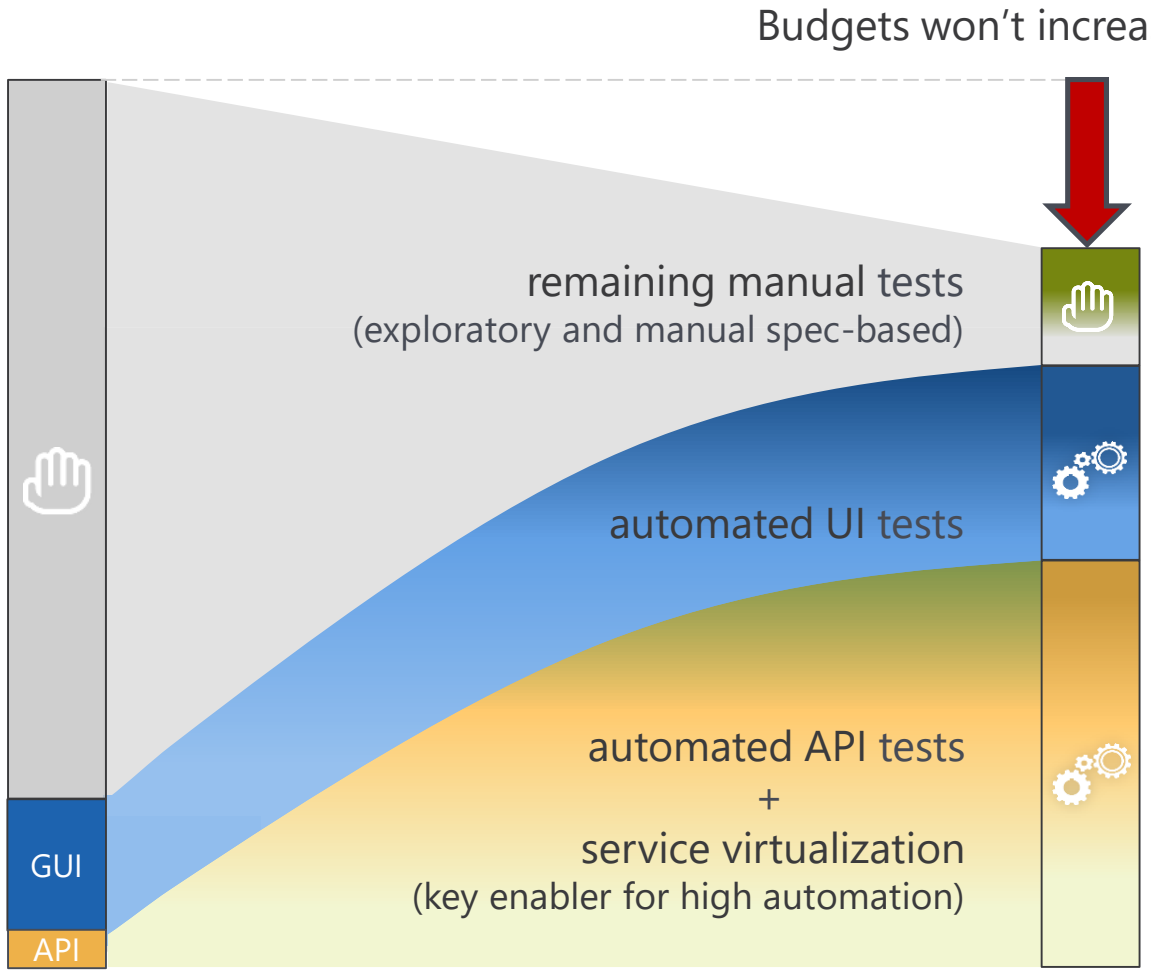
Testing Future

Optimize

TRICENTIS

Computer-Aided Test Portfolio Design

Redundancy-free test case portfolio with maximum risk coverage and fewer tests.



Testing Future

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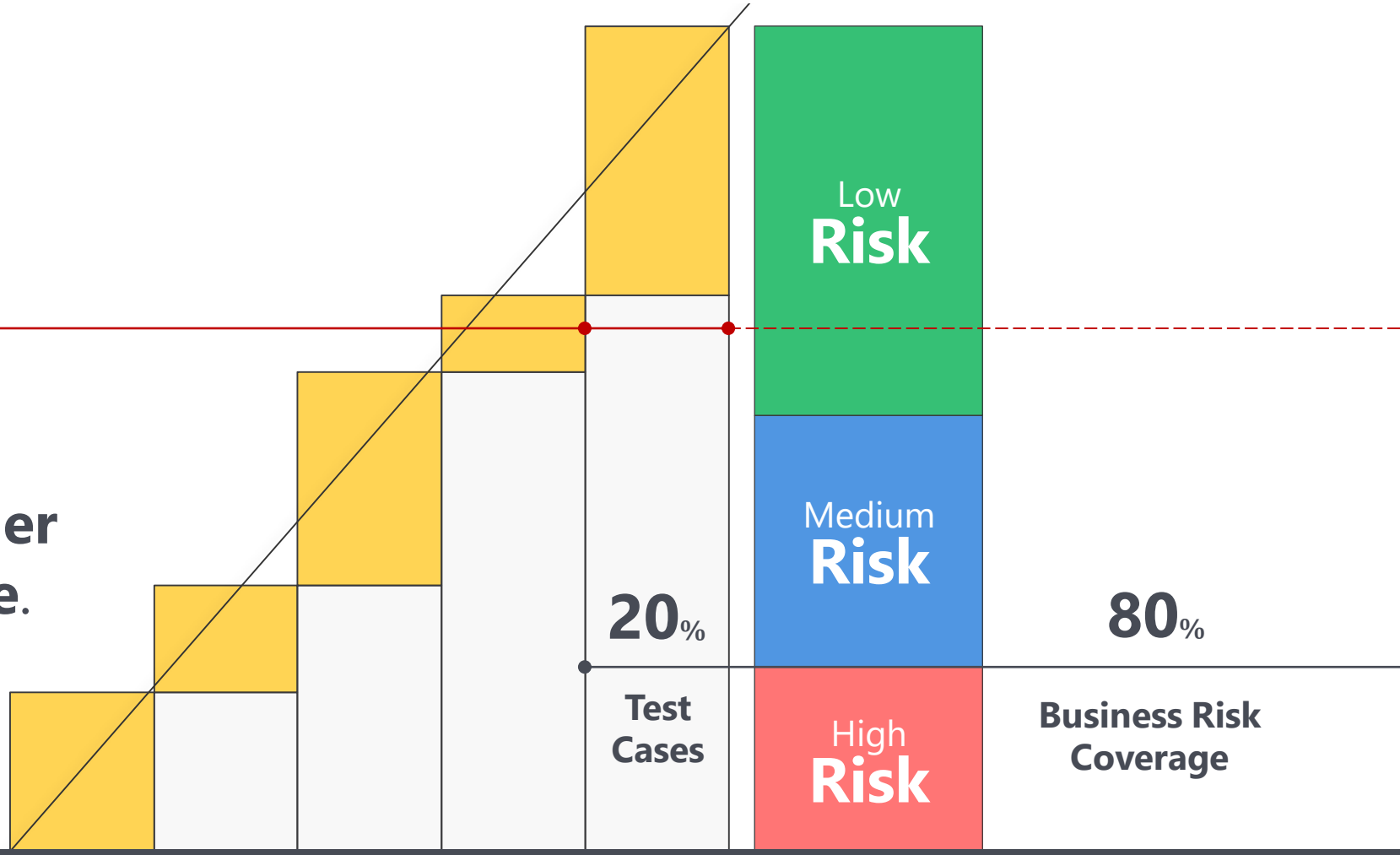
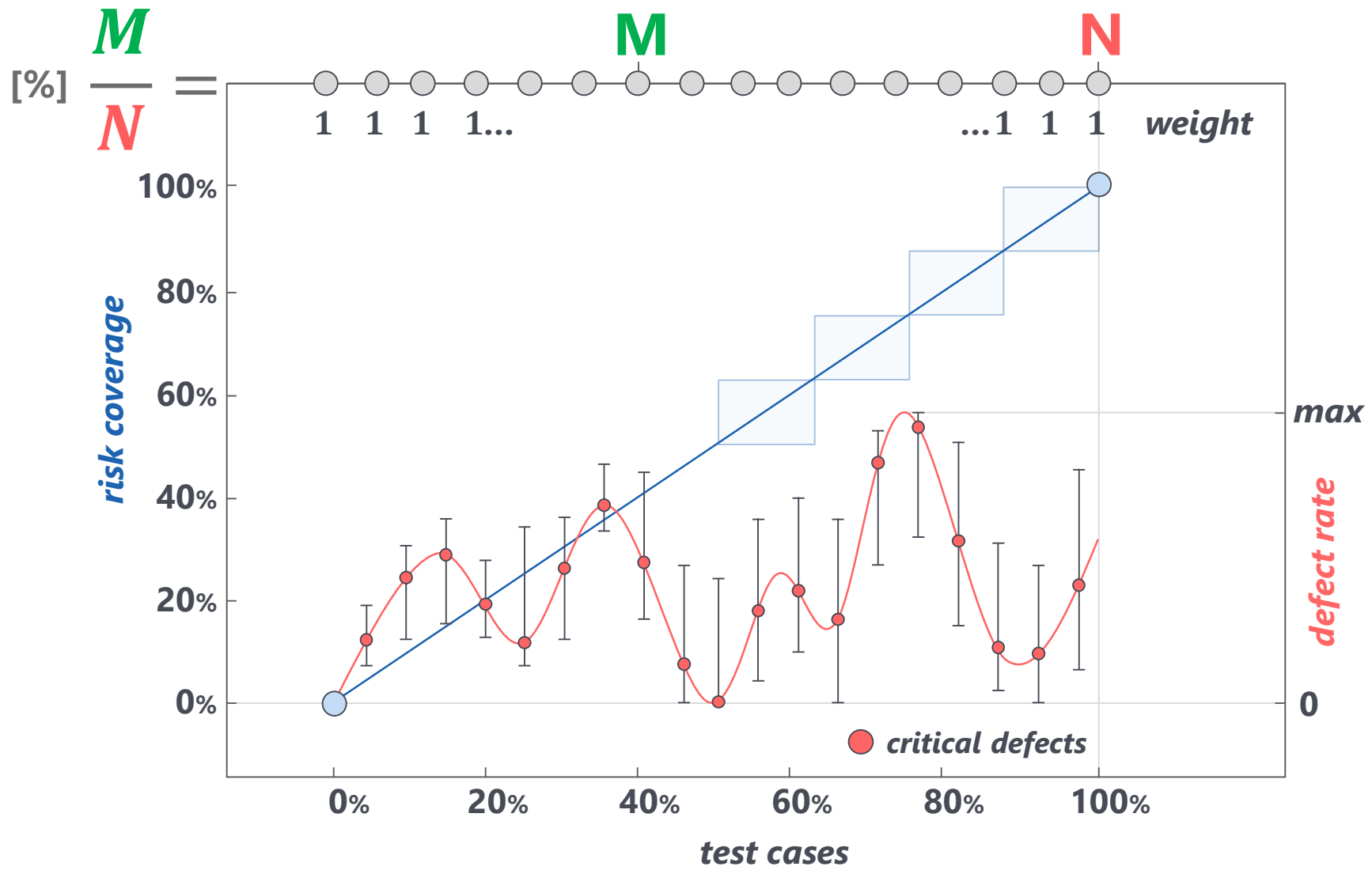
Have the right test cases.
Do the right things.

Critical Limit

The time **needed** for testing is **infinitely larger** than the time **available**.



TRICENTIS



Computer-Aided Test Portfolio Optimisation

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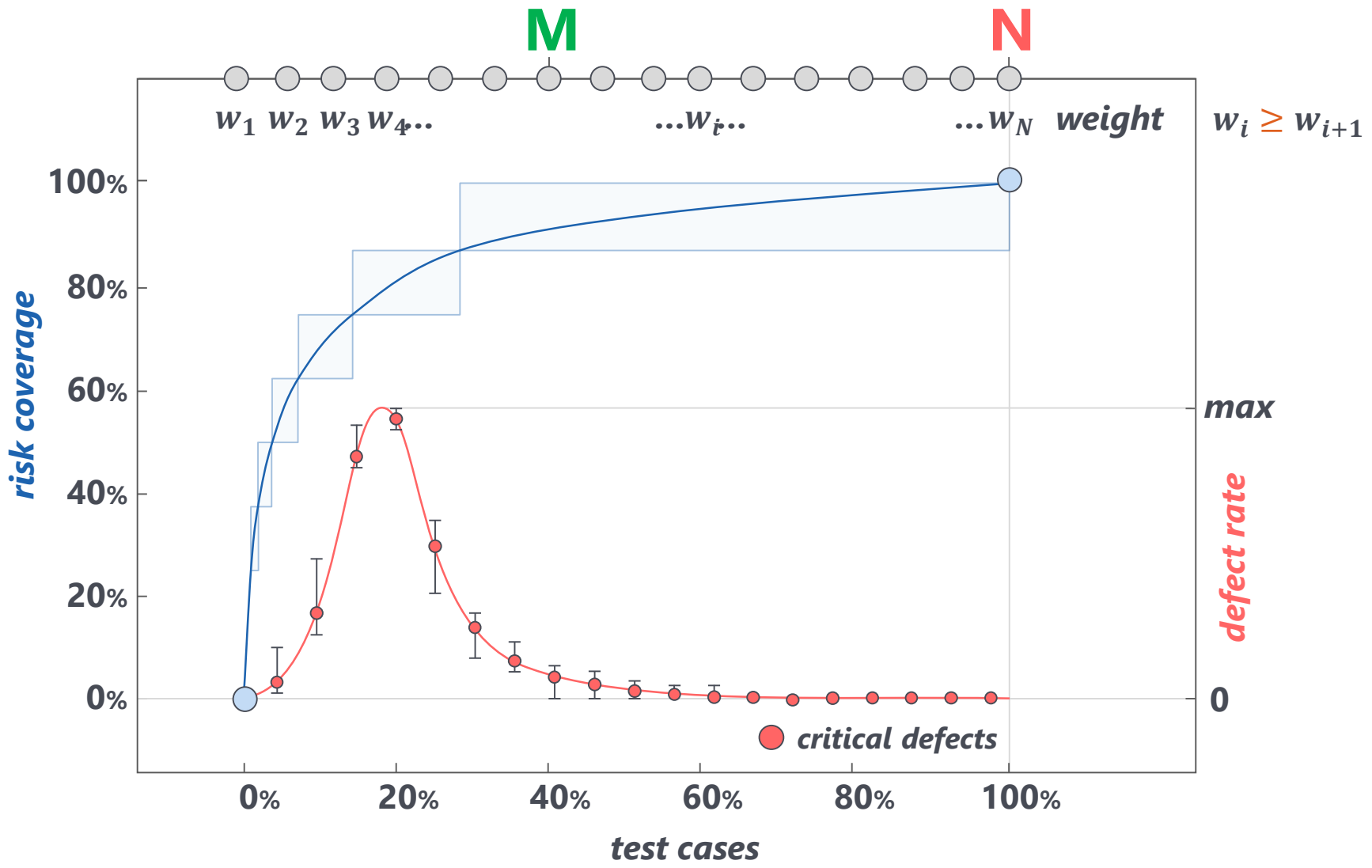
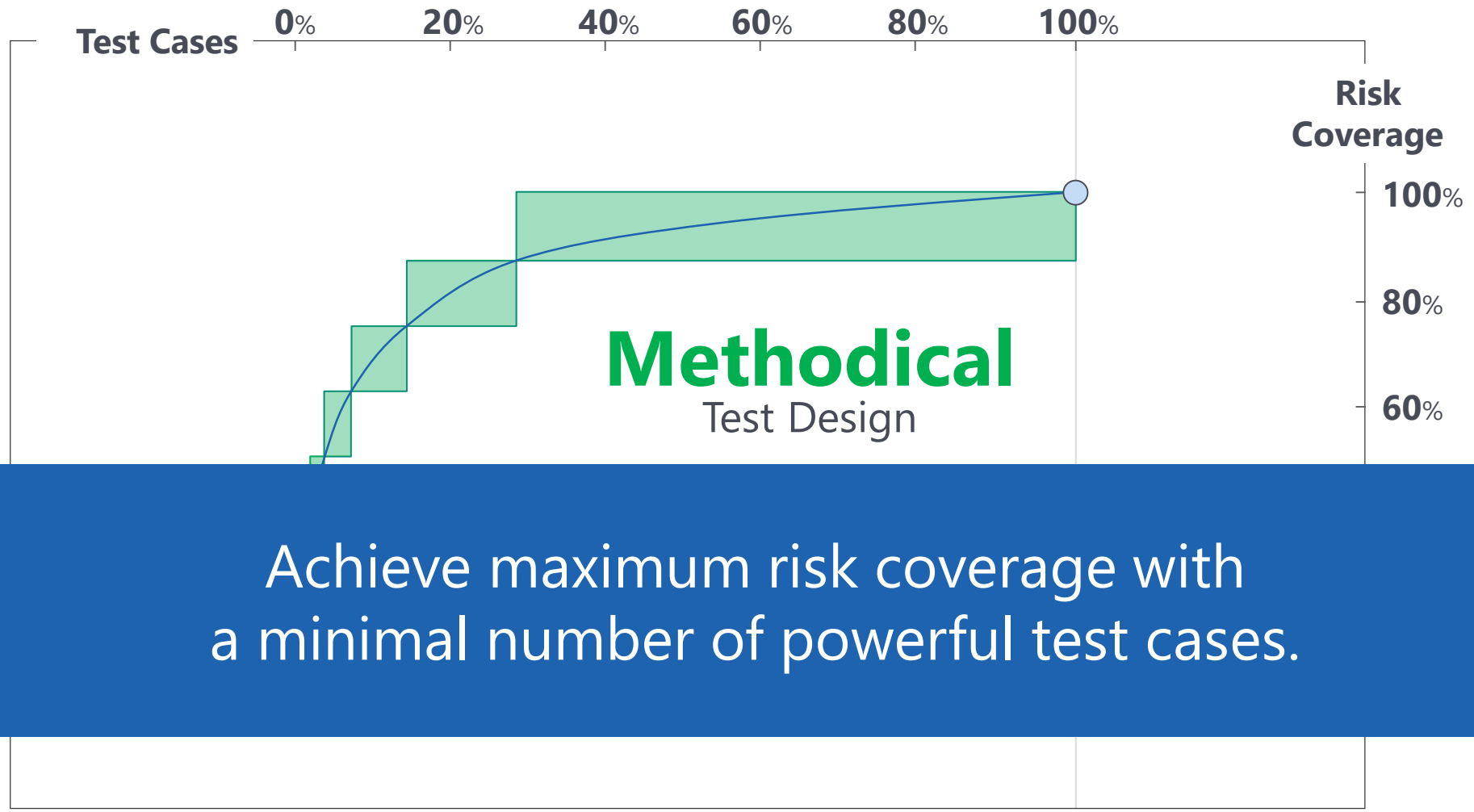
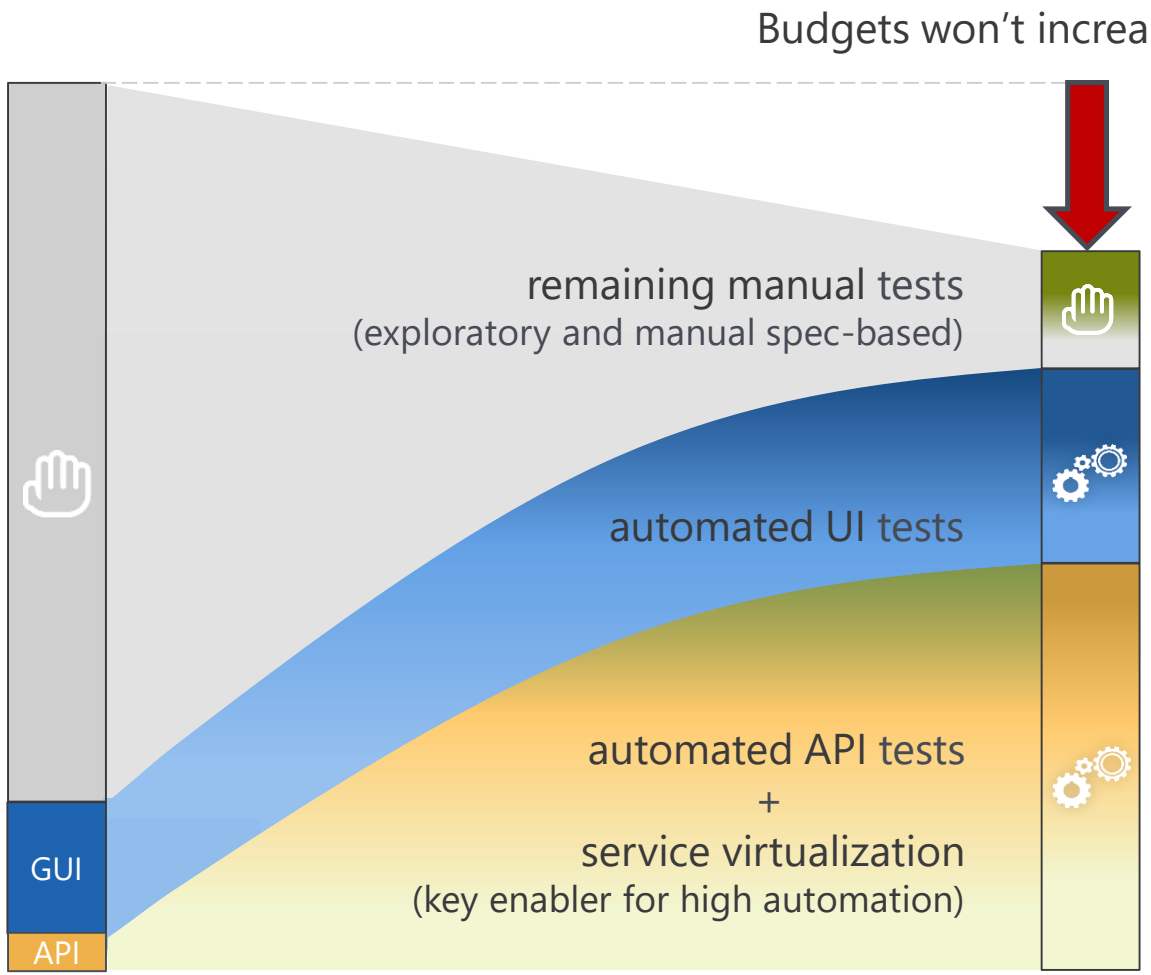


Computer-Aided Test Portfolio Optimisation

TRICENTIS



Achieve maximum risk coverage with
a minimal number of powerful test cases.



Automate

Model-Based Test Automation (MBTA) for UI and API

Automating the automation framework.

Testing Future

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Record
Replay

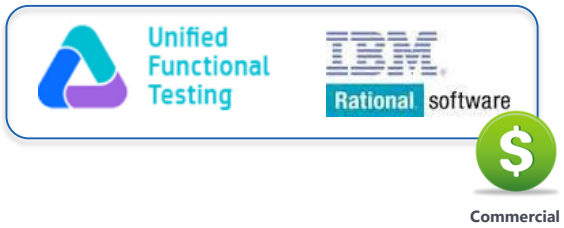
1st Generation

Test Automation
Framework

2nd Generation

10%
Automation

Evolution of Automated Testing



Keyword Driven Data Driven

Custom Hybrid

Functionally Decomposed

Example:

"…select invoice with the car registration number VIC-3456"

```
selenium.open("invoice-table.html");

//Find out how many rows this table has.
int totalRows=selenium.getXpathCount("//table[@name='carTable']/tbody/tr").intValue();

for(int row=1; row<=totalRows; row++){
 String name = selenium.getText("//table[@name='carTable']/tbody/tr["+row+"]/td[1]");
 if(name.equalsIgnoreCase("VIC-3456")){
  //When you find row get the value of fourth column of that table.
  invoice = selenium.getText("//table[@name='carTable']/tbody/tr["+row+"]/td[4]");
 }
}
assertEquals("Verify Invoice", "90035562",invoice);
}
```

Great for developers who can code
…**but** is even harder to understand for the business team

Conclusion: Only for developer & Expensive to maintain

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+ ← **Programming** Required → -

Record
Replay

1st Generation

Test Automation
Framework

2nd Generation

No
Scripting

Model-Based
Test Automation

Next Generation

Script-Based

10% Automation

30% Automation

+90% Automation

- ← **Business** Readable → +

Future of Automated Testing

Application **Pages**

Start Date: MM/DD/YYYY

Insurance Sum [$]: – please select –

Merit Rating: – please select –

	Silver	Gold	Platinum	Ultimate
Price per Year ($)	250.00	738.00	1,449.00	2,760.00
Online Claim	No	Submit	Submit	Submit
Claims Discount (%)	No	2	5	10
Worldwide Cover	No	Limited	Limited	Unlimited
Select Option	○	○	○	○

☐ Legal Defense Insurance

Courtesy Car: – please select –

« Prev | Next »

City:

O tion: – please select –

Scan Application....

sampleapp.tricentis.com

Technical Name	Value Range
Vehicle Data	
Make	-
Engine Performance [kW]	-
Year of Construction	2016;2015;2014;2013
Number of Seats	1;2;3;4;5;6;7;8;9
Fuel	Petrol;Diesel;Gas;Other
List Price [$]	-
License Plate Number	-
Usage	Private;Commercial
Annual Mileage	-
Next	{CLICK};{RIGHTCLICK}
Insurant Data	
Product Data	
Start Date	01/03/2016;01/04/2016
Insurance Sum [$]	3Mio;7Mio;10Mio;15Mio
Payment Option	Yearly;Quarterly;Monthly
Next	{CLICK}
Quote Details	
Price List	
<Row>	Price per Year($);Online Claim; ..
<Col>	Silver; Gold; Platinum; Ultimate

Technical Information

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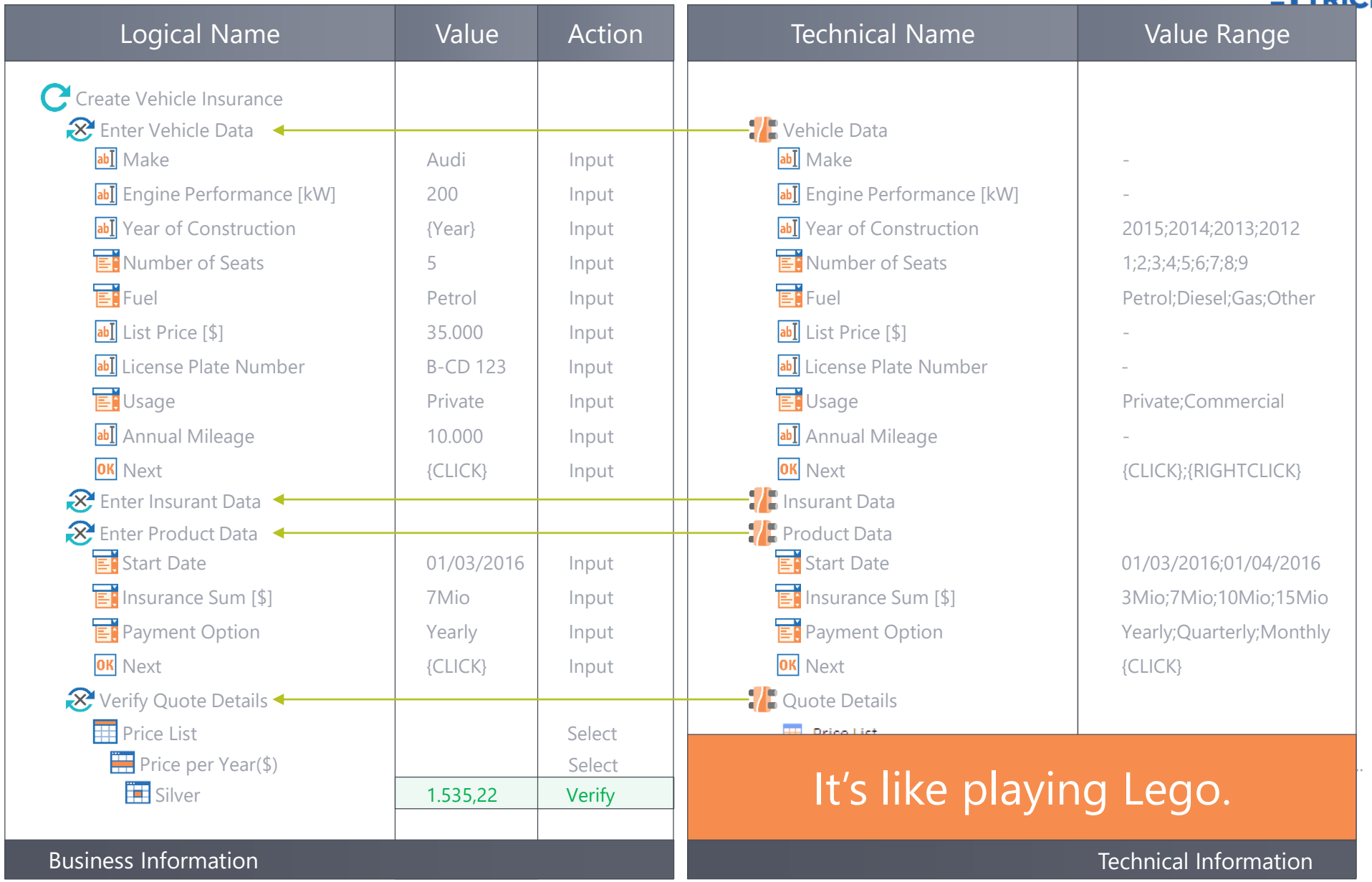

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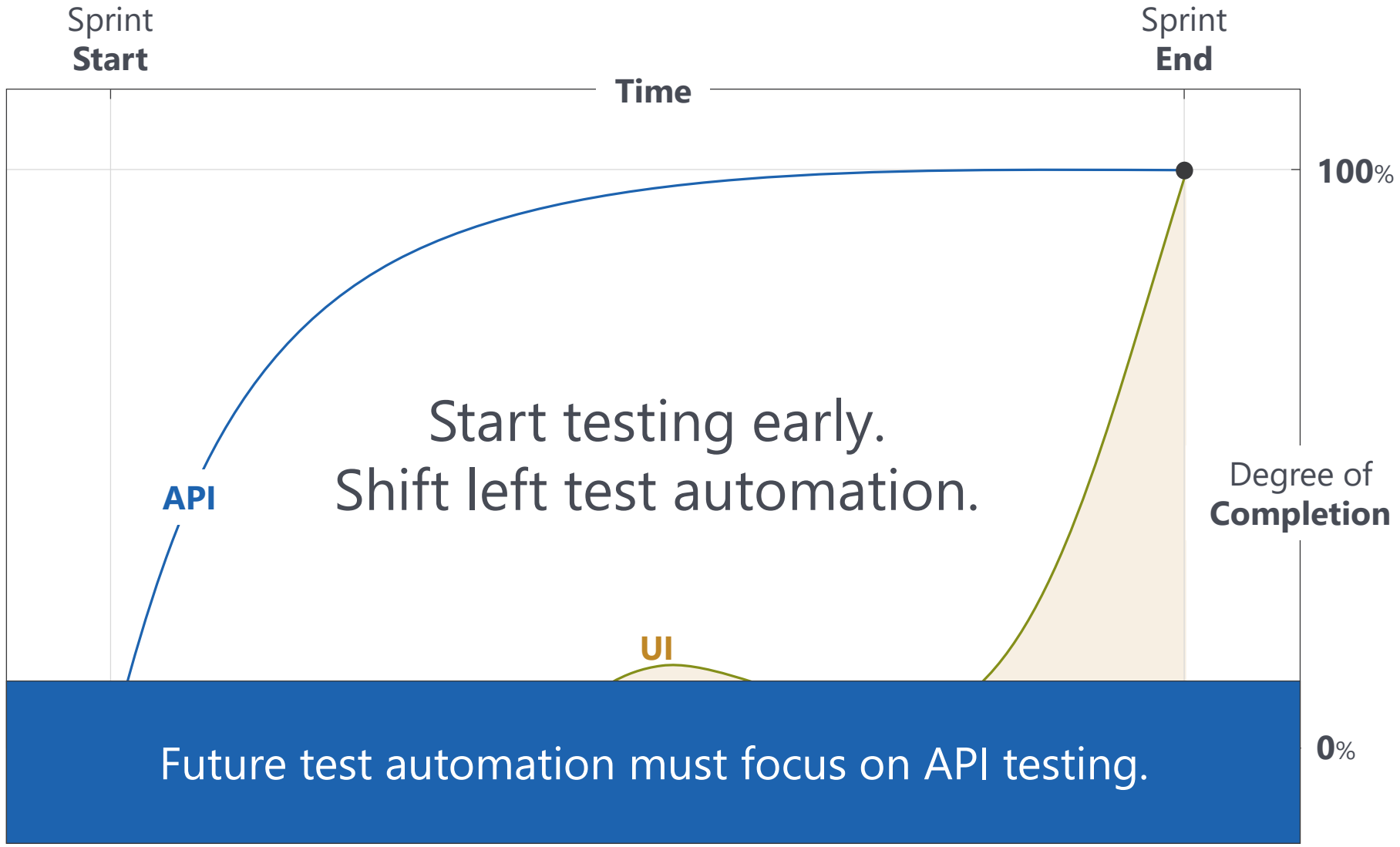
Efficiency
Gain

+4x
Creation

+6x
Maintenance

+20x
Execution



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UI Test Case

Browser

Enter Vehicle Data		
Make	Audi	Input
Engine Performance [kW]	200	Input
Year of Construction	{Year}	Input
Number of Seats	5	Input
Fuel	Petrol	Input
List Price [$]	35.000	Input
License Plate Number	B-CD 123	Input
Usage	Private	Input
Annual Mileage	10.000	Input
Next	{CLICK}	Input
Enter Insurant Data		
Enter Product Data		
Start Date	01/03/2016	Input
Insurance Sum [$]	7Mio	Input
Payment Option	Yearly	Input
Next	{CLICK}	Input
Verify Quote Details		
Price List		Select
Insurance Sum		Select
Gross Premium [$]	1.535,22	Verify

Business Information

API Test Case

Webservice

Enter Vehicle Data		
Make	Audi	Input
Engine Performance [kW]	200	Input
Year of Construction	{Year}	Input
Number of Seats	5	Input
Fuel	Petrol	Input
List Price [$]	35.000	Input
License Plate Number	B-CD 123	Input
Usage	Private	Input
Annual Mileage	10.000	Input
Enter Insurant Data		
Enter Product Data		
Start Date	01/03/2016	Input
Insurance Sum [$]	7Mio	Input
Payment Option	Yearly	Input
Verify Quote Details		
Price List		Select
Insurance Sum		Select
Gross Premium [$]	1.535,22	Verify

Business Information

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UI Test Case			API Test Case		
Browser			Webservice		
Enter Vehicle Data			Enter Vehicle Data		
Make	Audi	Input	Make	Audi	Input
Engine Performance [kW]	200	Input	Engine Performance [kW]	200	Input
Year of Construction	{Year}	Input	Year of Construction	{Year}	Input
Number of Seats	5	Input	Number of Seats	5	Input
Fuel	Petrol	Input	Fuel	Petrol	Input
List Price [$]	35.000	Input	List Price [$]	35.000	Input
License Plate Number	B-CD 123	Input	License Plate Number	B-CD 123	Input
Usage	Private	Input	Usage	Private	Input

Manual Testers become Automation Specialists

Insurance Sum [$]	7Mio	Input	Insurance Sum [$]	7Mio	Input
Payment Option	Yearly	Input	Payment Option	Yearly	Input
Next	{CLICK}	Input			
Verify Quote Details			Verify Quote Details		
Price List		Select	Price List		Select
Insurance Sum		Select	Insurance Sum		Select
Gross Premium [$]	1.535,22	Verify	Gross Premium [$]	1.535,22	Verify
Business Information			Business Information		

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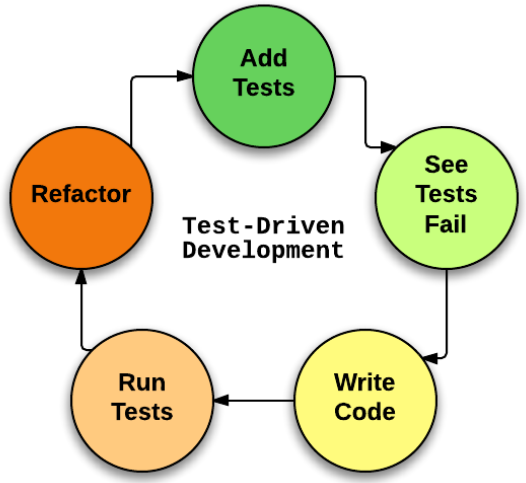
Behaviour-Driven Development (**BDD**) is a software development process based on Test-Driven Development (TDD)



BDD gives a clearer understanding as to what the system should do from the perspective of the developer and the customer.

TDD only gives an understanding of what the system should do from a developer perspective.

BDD **combines techniques and principles** of

- TDD
- Domain-Driven Design
- Object-Oriented Analysis & Design

Better collaboration
between developers
test analysts and
business analysts

Executable documentation of the software.

```
Feature:
  When I go to the vehicle page, and select type of vehicle I should have the chose
n vehicle displayed on the next page.

  Scenario: Motorbike                                #
    Given that I have gone to the Vehicle page       #
    When I select "Motorcycle" from the selection    #
    And click on the Next button                     #
    Then "motorcycle" should be my type of vehicle   #

  Scenario: Enter scooter data
    Given that I am on the vehicleData page
    When I select "Scooter" from the Type of vehicle
    And enter "vespa" as Make
    And enter "100" as CylinderCapacity
    And enter "50" as Performance
    And enter "1000" as ListPrice
    And enter "5000" as MileageYear
    And click on the Next button
    Then the Insurant page is displayed

  Scenario: Enter insurant                     # typeO
    Given that I am on the insurant page       # typeO
    When I enter "Alain" as FirstName          # typeO
    And enter "T" as LastName                  # typeO
    And enter "01/01/1990" as DateOfBirth      # typeO
    Then the ProductChoice page is displayed   # typeO

  Scenario: Goto Summary page                   # type
    Given that I am on the ProductChoice page   # type
    And click on the Next button                # type
    And click on the Next button                # type
    Then the summary page is displayed          # type

  Scenario: Verify Summary page                # typeOf
    Given that I am on the summary page        # typeOf
    When the "PriceList" table is displayed    # typeOf
    Then the yearly amount is 2913.96          # typeOf
      Product DescriptionNet Premium [EUR]Gross Prem

      Automobile Liability:165,18198,22
      Premium Tax:171,60205,92
      Legal Defense Insurance:369,20443,04
```

```ruby
require "rubygems"
require "watir-webdriver"
require "test/unit/assertions"

b = Watir::Browser.new

Given /^that I have gone to the Vehicle page$/ do
b.goto("file:////home/alain/sampleApp/_insu/TypeOfVehicle.html")
end

When /^I select "(.*)" from the selection$/ do |item|
s = b.select_list :id => 'TypeOfVehicle'
s.select item
s.selected_options
end

When /^I select "(.*)" from the Type of vehicle$/ do |item|
s = b.select_list :name => 'TypeOfVehicle'
s.select item
s.selected_options
end

And /click on the (.*) button$/ do |buttonName|
btn = b.button :value, buttonName
btn.exists?
btn.click
end

And /enter "(.*)" as (.*)$/ do |text,name|
t = b.text_field :name => name
t.exists?
t.set text
t.value
end
```

Open Source (Cucumber, JBehave, Specfolw with Selenium, Watir, etc.)

- **Requires coding!** Each **GIVEN**, **WHEN**, **THEN**, **AND** in the BDD scenario (left) needs a matching function call (right).
- **No** support for **systematic scenario identification** and definition

BDD – **A Working Example**.

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Name	Standard Scenario	Engine Performance Between 1.00K and 1.50K [KW]	Engine Perform...	Engine Perform...	Year of Manufa...	Fuel is Petrol
Automobile	Standard Scenario	Engine Performance Between 1.00K and 1.50K [K...	Engine Perform...	Engine Perform...	Year of Manufac...	Fuel is Petrol
Given						
Insurance Type	Automobile Insurance	Automobile Insurance	Automobile ...	Automobile ...	Automobile ...	Automobile ...
Vehicle Type	Automobile	Automobile	Automobile	Automobile	Automobile	Automobile
When						
Vehicle Data	Standard	Engine Performance in [1000,2000] [kW]	Engine Perf...	Engine Perf...	Year of Man...	Fuel is Petrol
Insurant Data	Standard	Standard	Standard	Standard	Standard	Standard
First Name	John	John	John	John	John	John
Last Name	Doe	Doe	Doe	Doe	Doe	Doe
Age [yrs]	[18,30]	[18,30]	[18,30]	[18,30]	[18,30]	[18,30]
Gender	male	male	male	male	male	male
Occupation	Employee	Employee	Employee	Employee	Employee	Employee
Telephone	+43 (1) 263 24 09	+43 (1) 263 24 09	+43 (1) 263 2...	+43 (1) 263 2...	+43 (1) 263 2...	+43 (1) 263 2...
E-Mail	frontdesk@tricentis.com	frontdesk@tricentis.com	frontdesk@t...	frontdesk@t...	frontdesk@t...	frontdesk@t...
Product Data	Standard	Standard	Standard	Standard	Standard	Standard
Preferred Start D...	Next Month	Next Month	Next Month	Next Month	Next Month	Next Month
Insurance Sum [€]	[3M, 15M]	[3M, 15M]	[3M, 15M]	[3M, 15M]	[3M, 15M]	[3M, 15M]
Payment Option	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly	Quarterly
Damage Insurance	Partial Coverage	Partial Coverage	Partial Cove...	Partial Cove...	Partial Cove...	Partial Cove...
Optional Products	Worldwide Protection & Defens...	Worldwide Protection & Defense Insurance	Worldwide ...	Worldwide ...	Worldwide ...	Worldwide ...
Courtesy Car Opt...	No Courtesy Car	No Courtesy Car	No Courtesy...	No Courtesy...	No Courtesy...	No Courtesy...
Then						
Gross Premium						
US Market [USD]	3.838,80	3.898,80	3.945,80	4.240,40	3.870,90	3.800,80
SG Market [SGD]	5.822,42	5.749,17	5.264,33	6.074,24	6.360,37	5.604,66
CH Market [CHF]	4.846,20	4.229,80	4.125,12	4.182,18	3.665,04	4.873,20

BDD using TCD.

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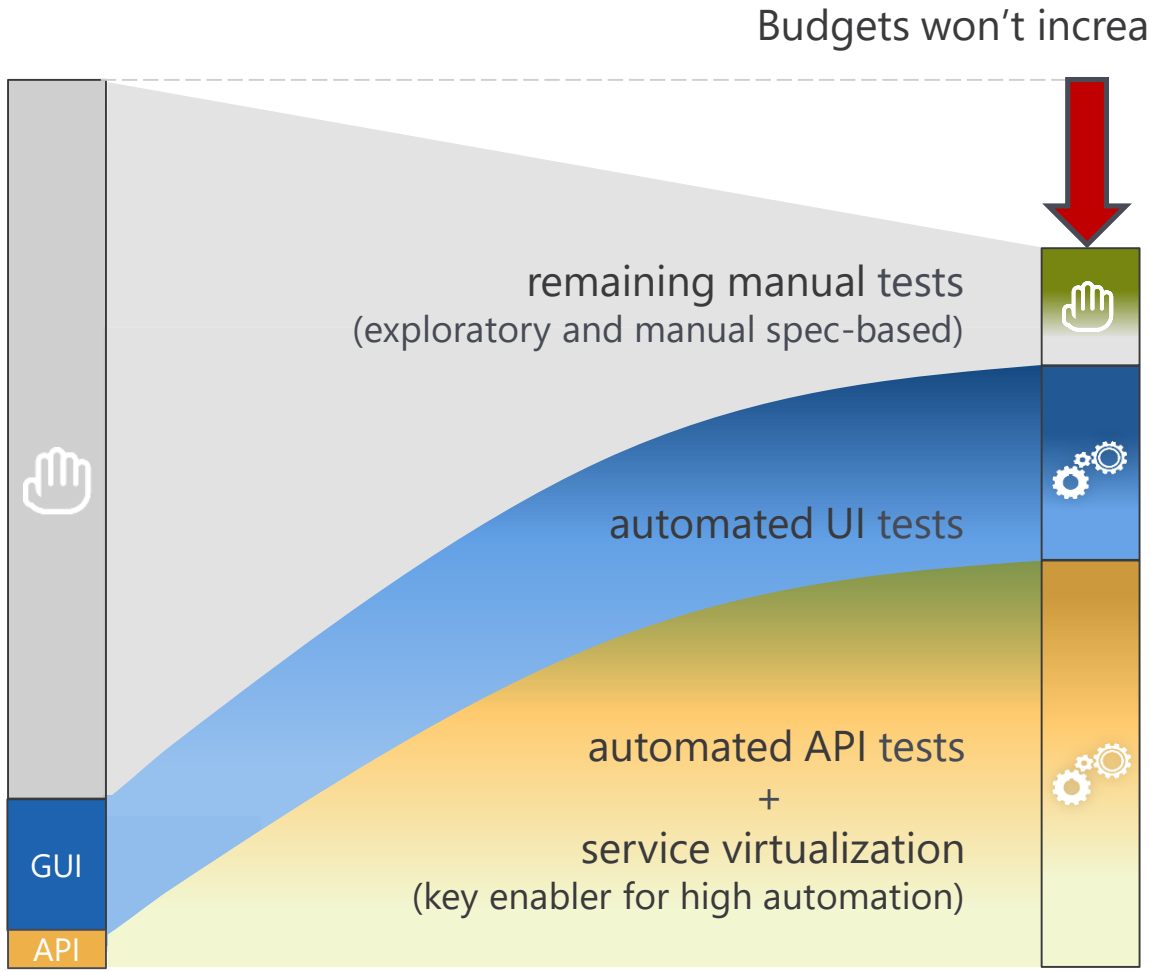


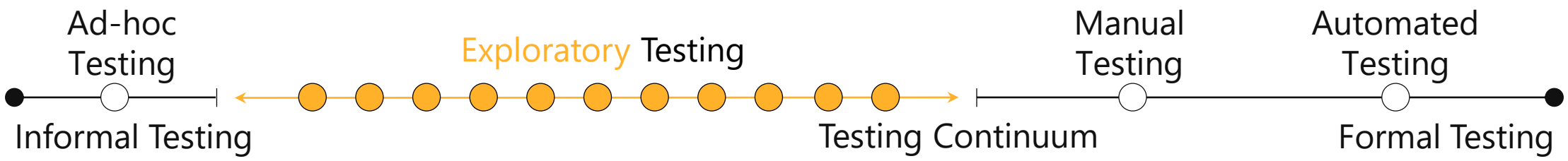
Explore

Session-Based Exploratory Testing

Make your testing intellectually rich.

Testing Future

TRICENTIS



Testing Continuum

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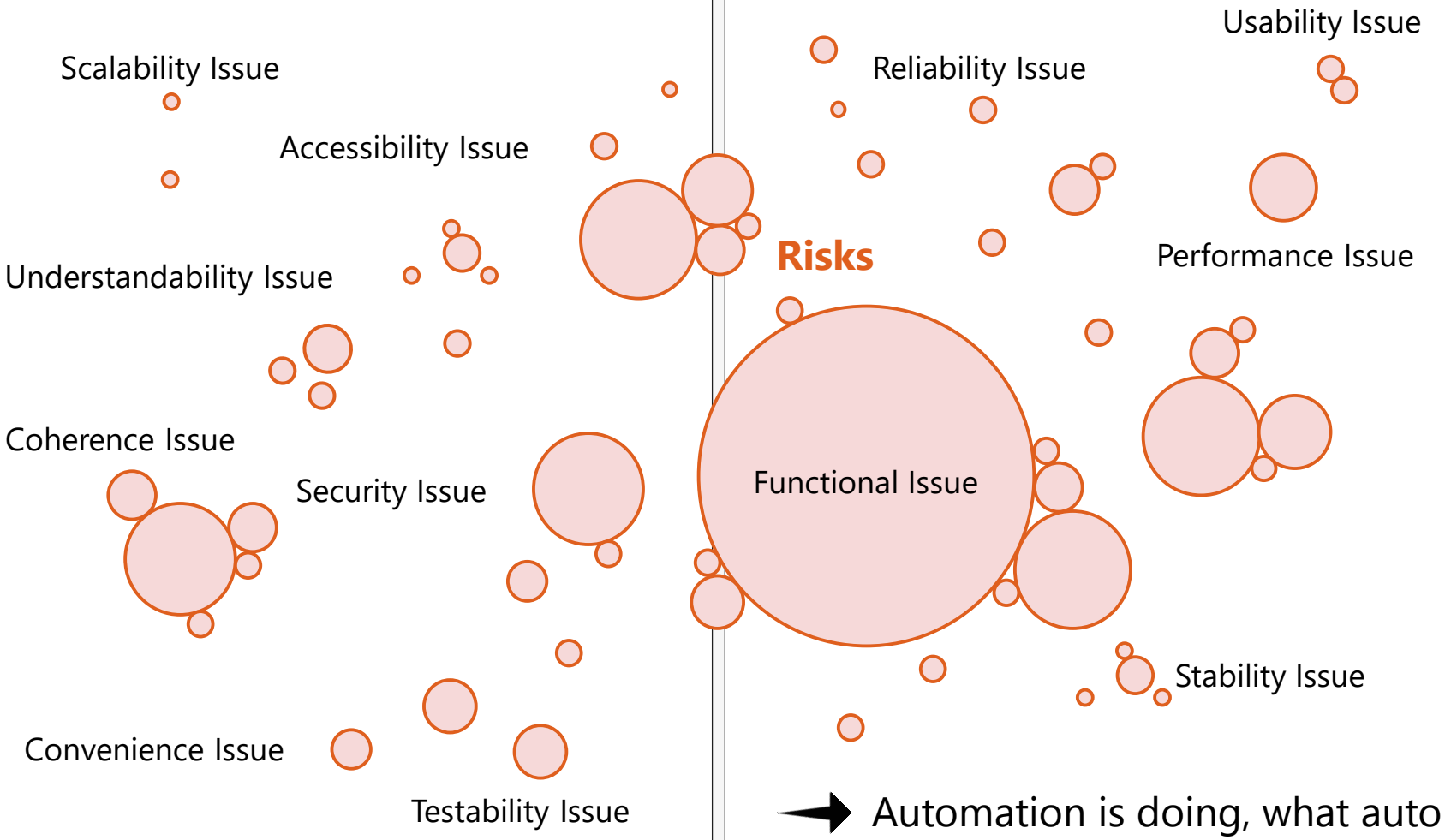
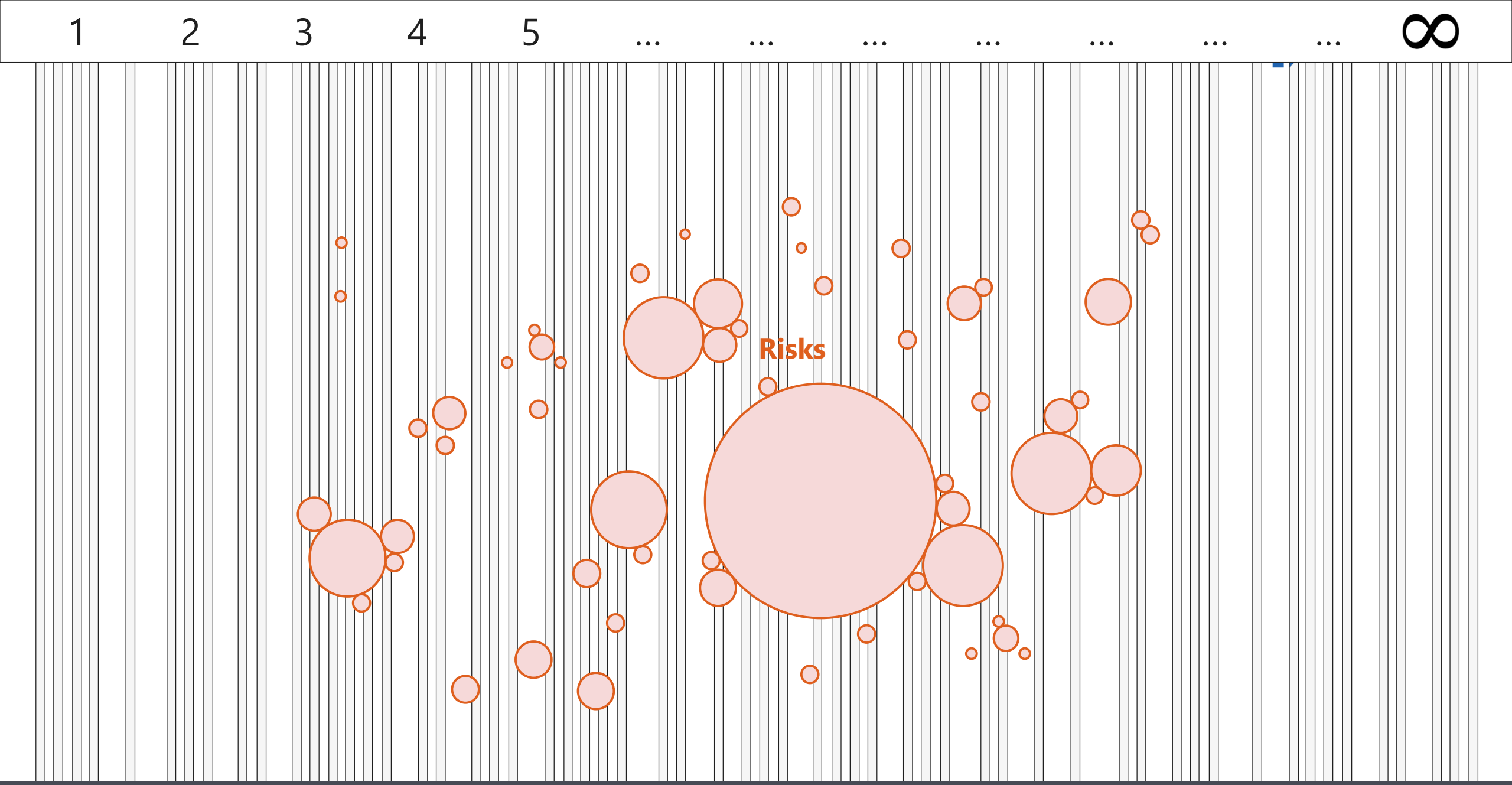
I'm an automated test case.



Automation is doing, what automation does.



Automated Testing

I'm the same test case executed manually.

I'm an automated test case.

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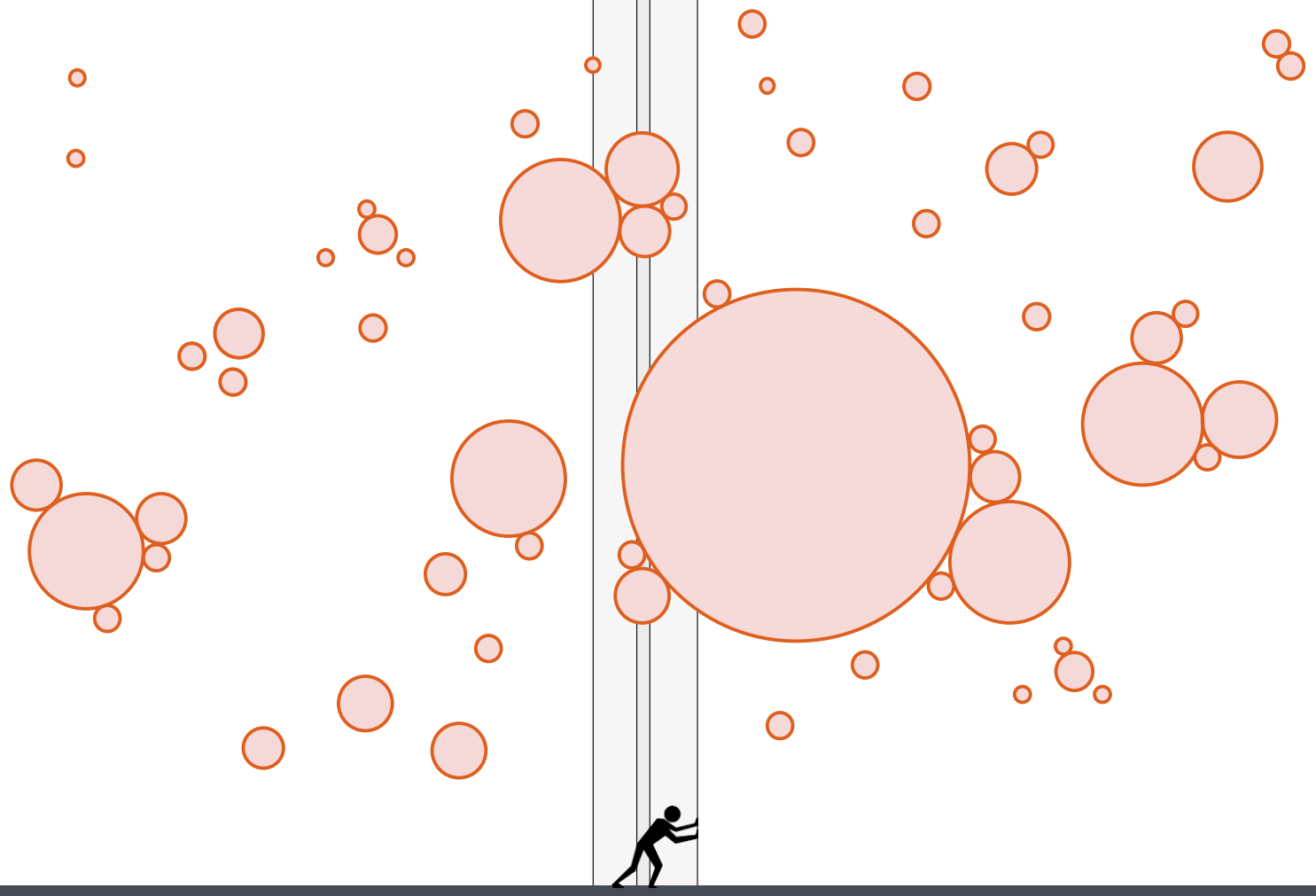

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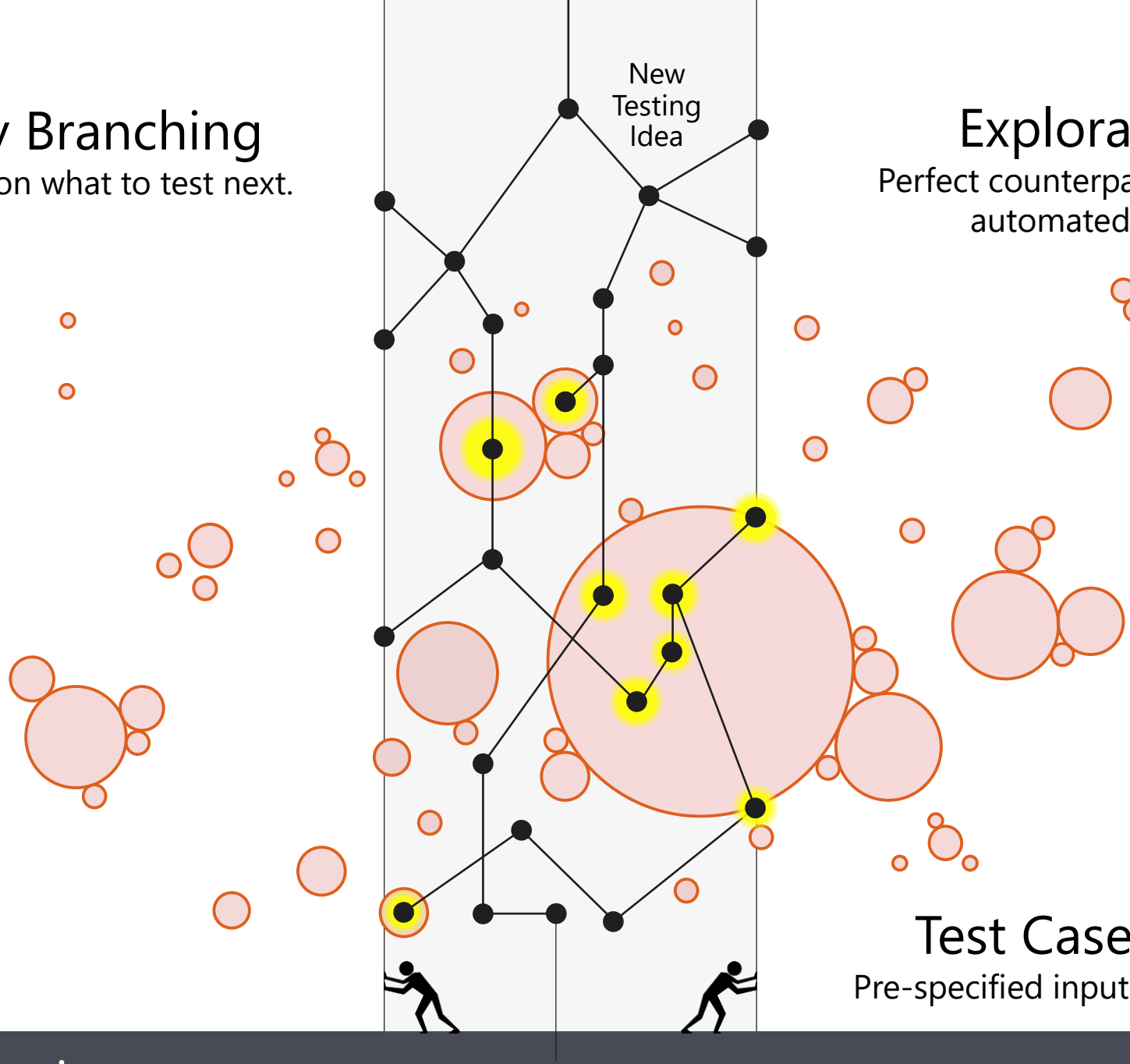
Exploratory Branching

The art of deciding on what to test next.



Exploratory Testing

Perfect counterpart to specification-based automated & manual testing.

Plan as you test!

Story-Based

Motivating

Credible

Test Cases vs. Scenarios

Pre-specified inputs vs. hypothetical situation

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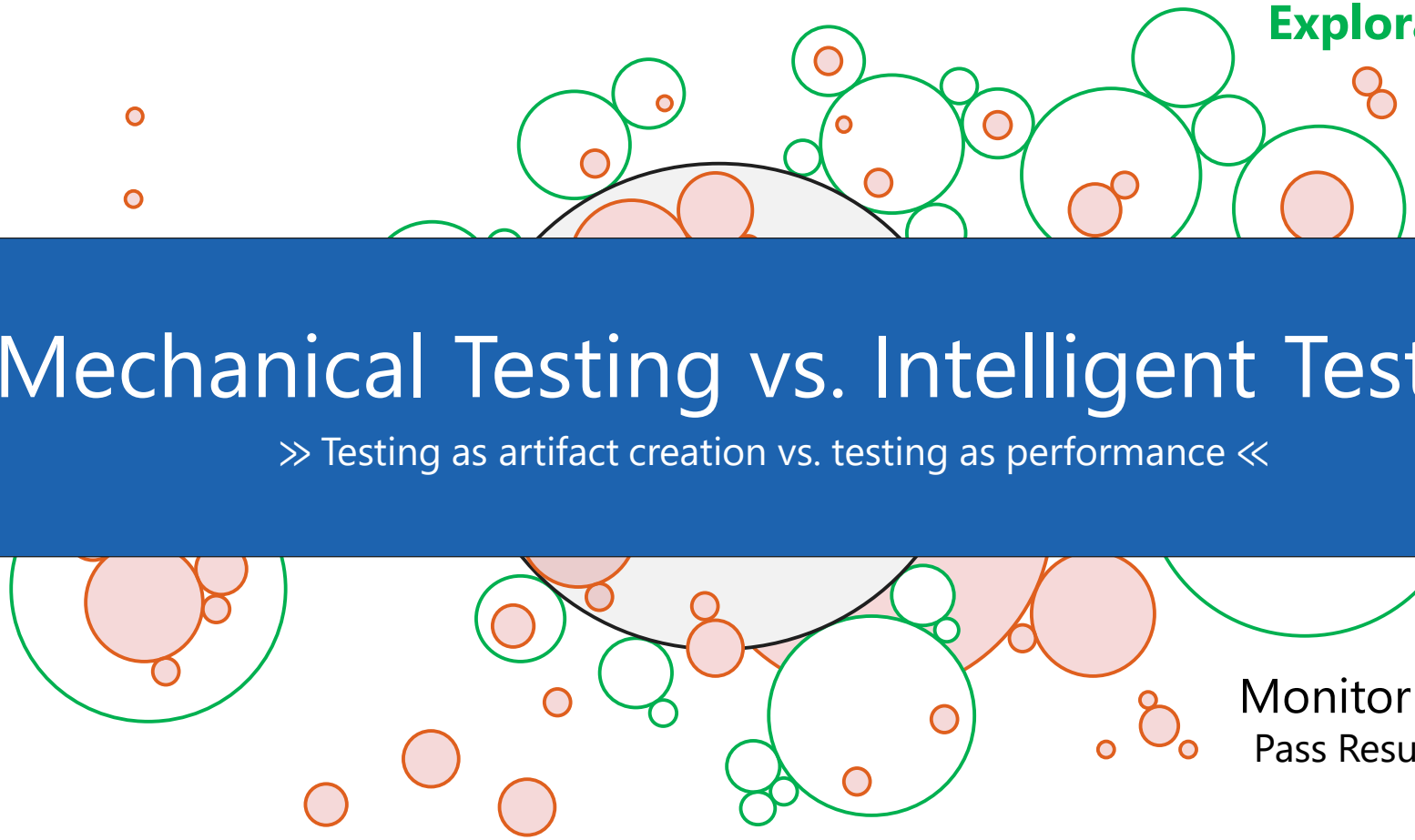
Exploratory Testing

Mechanical Testing vs. Intelligent Testing

» Testing as artifact creation vs. testing as performance «



Monitor Known Risks

Pass Result vs. Fail Result

*That's an illustration. Don't confuse it with reality.

Main Purpose

Agile Testing Law

TRICENTIS

Checked

» Efficient Automated Testing «

+

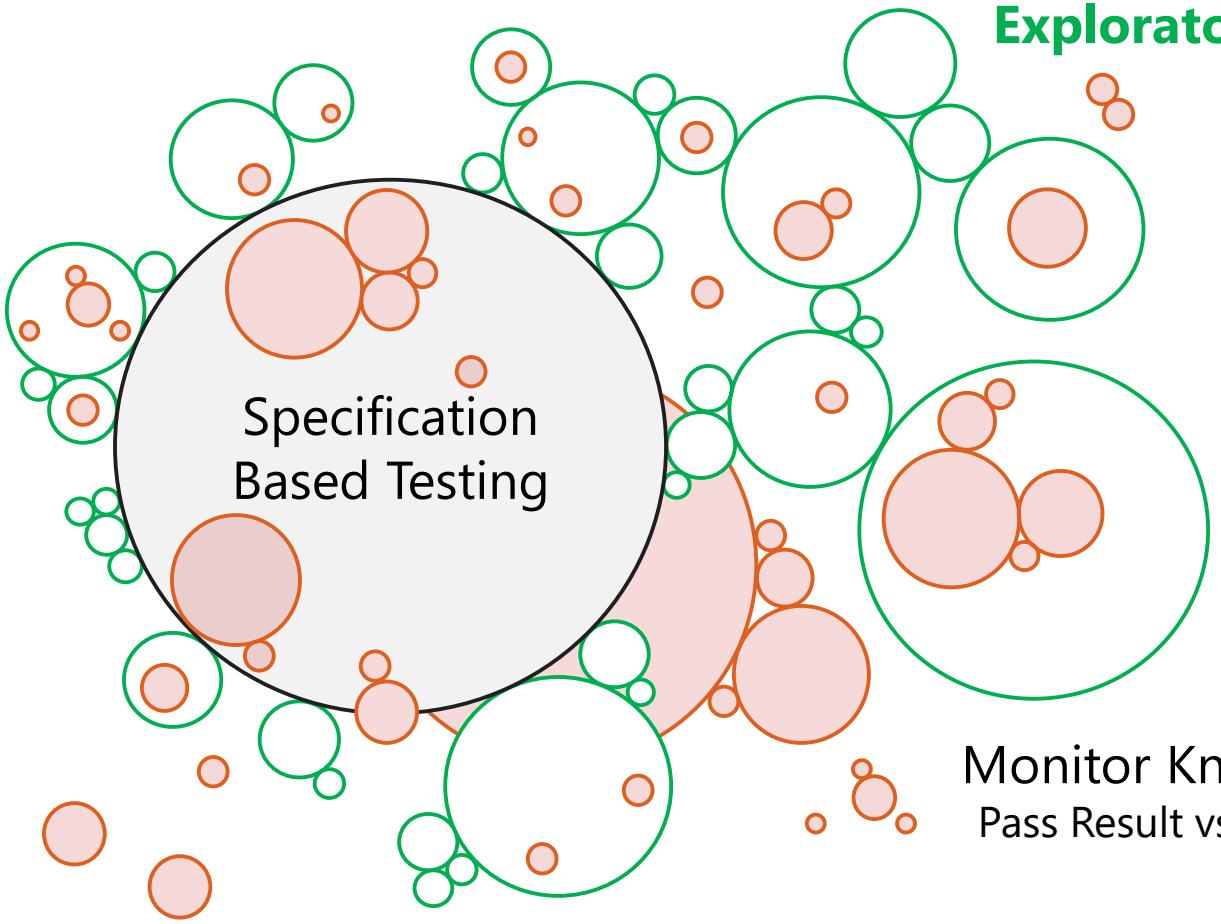
Explored

» Effective Exploratory Testing «

=

Tested

» Productive Testing «



Monitor Known Risks

Pass Result vs. Fail Result

$$R_{\mu\nu} - \frac{1}{2}Rg_{\mu\nu} + \Lambda g_{\mu\nu} = \frac{8\pi G}{c^4}T_{\mu\nu}$$

Agile Equation Of Motion

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Automation is a must.

Manual testing is unjustifiable.

Exploratory testing is a necessity.

*We don’t need humans doing something that a machine can do. What we do want the human testers doing is exploratory testing.

Core Conclusion

”We are Passionate about Testing”