Hexawise
Introduction

Topics
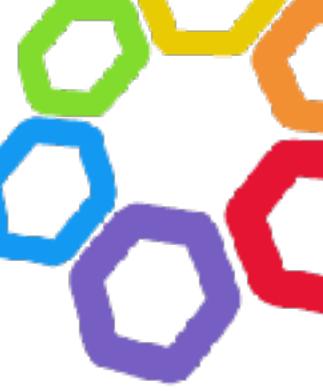
1. **Brief Hexawise Overview**

2. **Case Studies**
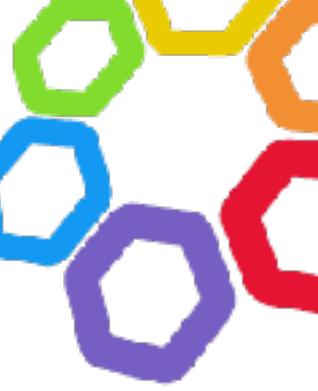
What is Hexawise?

**Hexawise is a test design optimization tool that allows users to quickly <u>generate</u> tests from a model of variation ideas of their System Under Test.**

The vast majority of commercial Software Testing tools solve problems related to Test Automation and Test Management – leaving these portions of the market saturated while Hexawise leads the Test Design segment of the market.

Where Hexawise "fits"
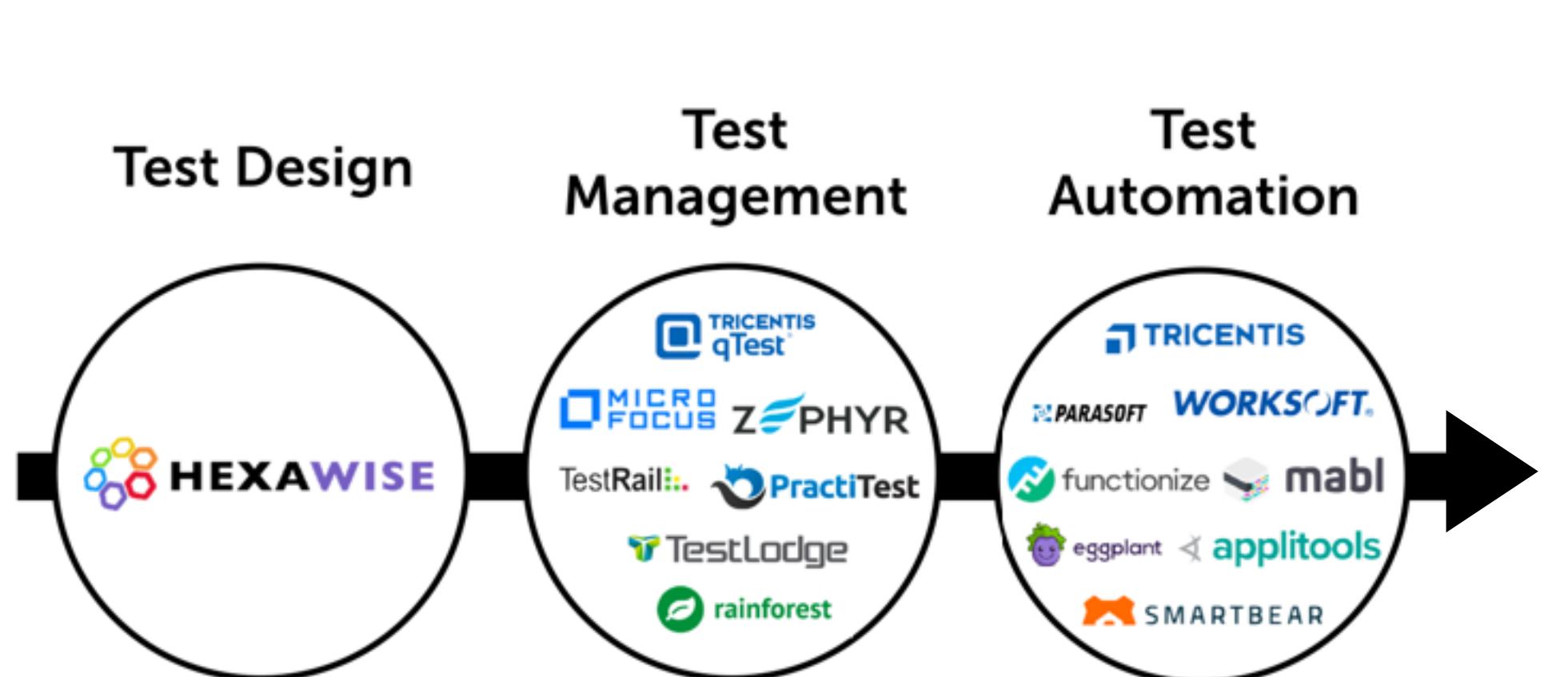
What Hexawise "does" (& "doesn't do")
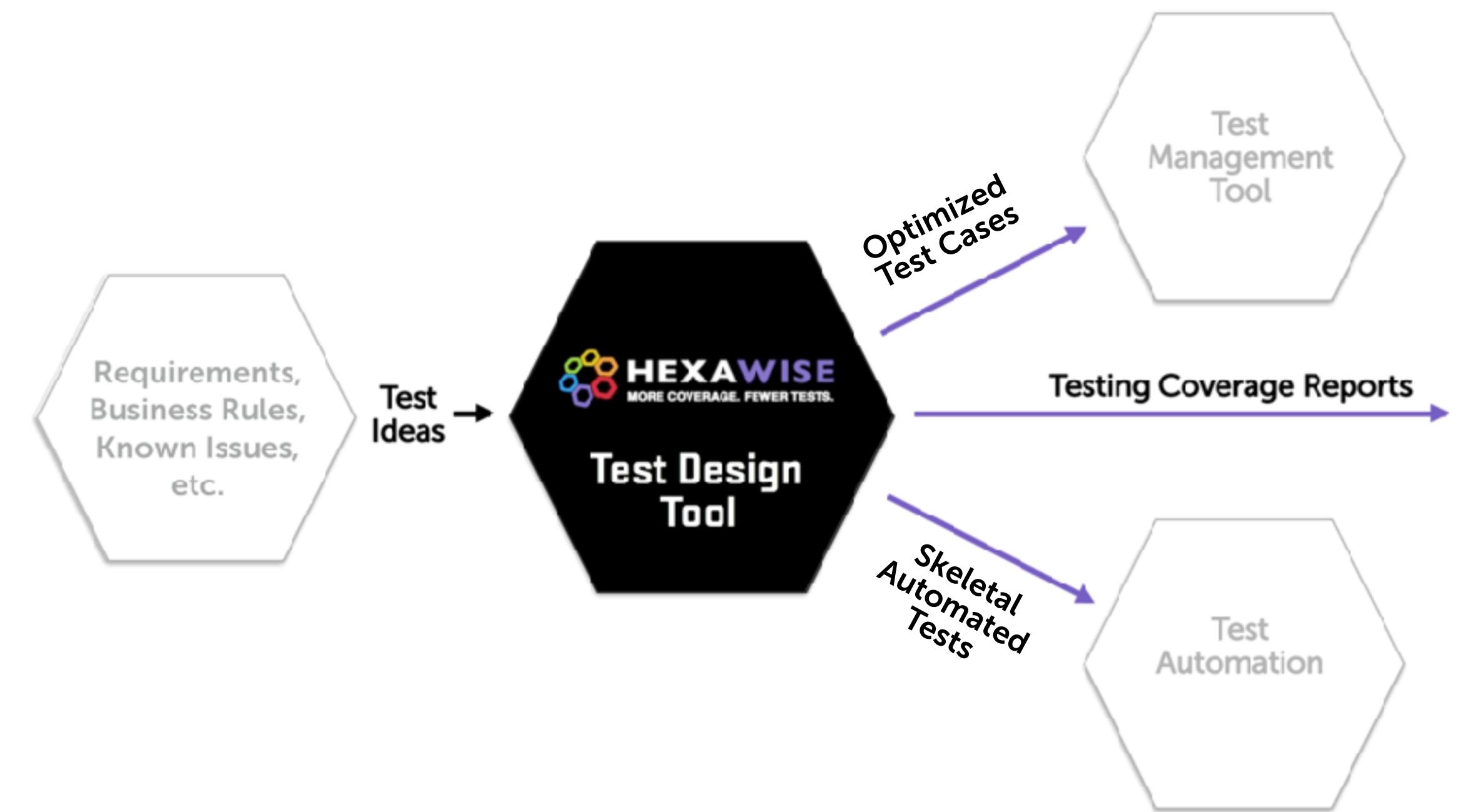
Proven and Broadly Applicable
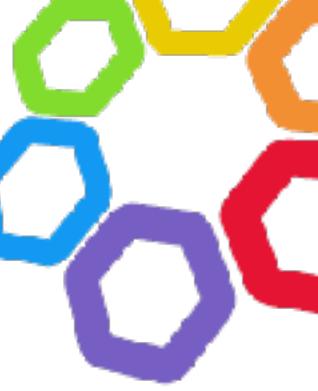
Hexawise is a proven software testing solution, widely used in every type of project, including:
- Manual & automated testing
- Agile, DevOps, CI/CD, etc.

More than 100 of the

FORTUNE 500

use Hexawise.

Rapid Test Generation with Model-Based Testing

The process for creating tests in Hexawise is different than what most people are used to.

Test a new feature...

"Economy Plus"

- ✓ Economy
- Premium/Business

FIND FLIGHTS

What is Model-Based Testing "Not"?

Verify that when a user selects Economy Plu[s]

What is it then?

Flight
- Browser
  - IE
  - Chrome
  - FF
- Type of Flight
  - One Way
  - Round Trip
- Connections
  - None (Direct)
  - Connecting / Same Airline
  - Connecting / Partner Airline
- Class
  - Economy Plus
  - Economy
  - Premium/Business

Test Cases
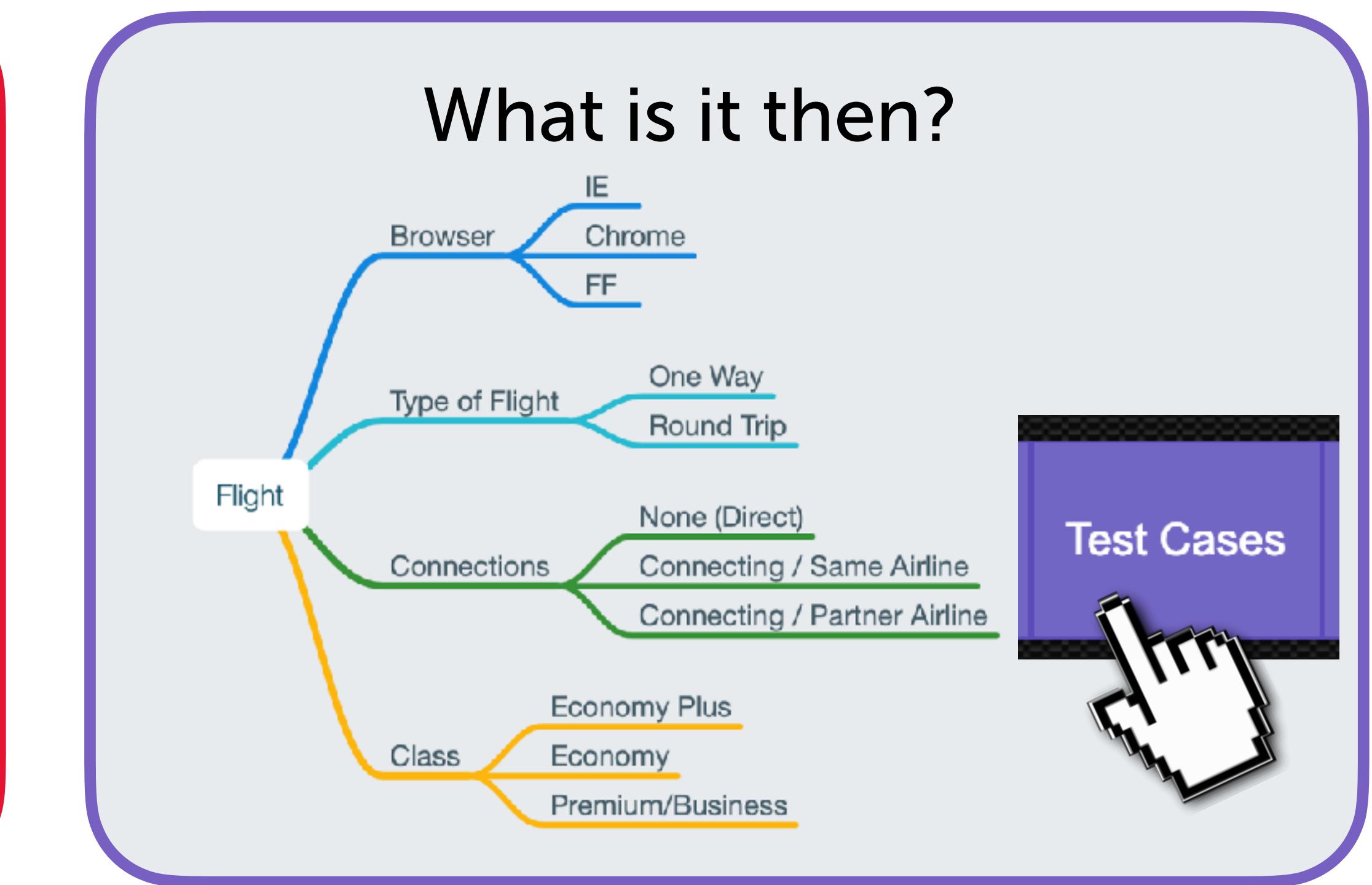
Typical Hexawise Benefits

Several key benefits delivered by Hexawise are observable and quantifiable. While the size of benefits will vary by project, typical benefits are shown below:

During test design...
Select and document tests.
Much faster.

50% time savings
(3 days vs. 6 days)

When deciding how much to test...
Understand coverage.
More precisely.

Greater thoroughness
(~1/10 as many gaps even using fewer tests)

During test execution...
Achieve greater coverage.
In fewer tests.

33% time savings
(2 days vs. 3 days)

When automating tests...
Create automated tests.
With less coding.

Generate automation code
(for your automation framework)
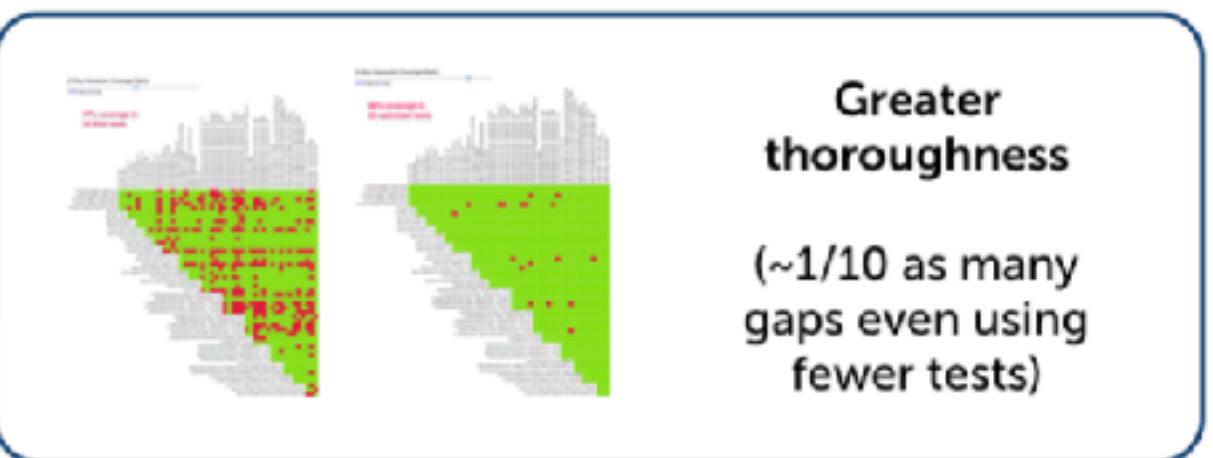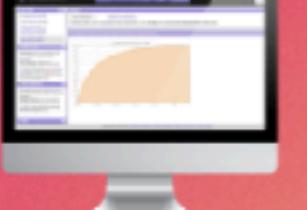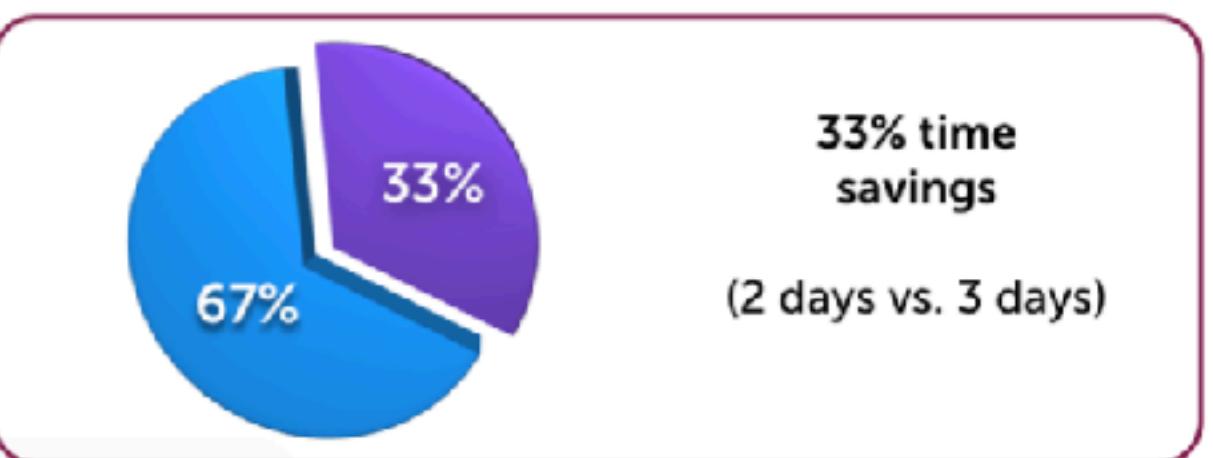
Greater efficiency

+

More thorough test sets

=

2X as many defects found per tester hour and faster speed to market
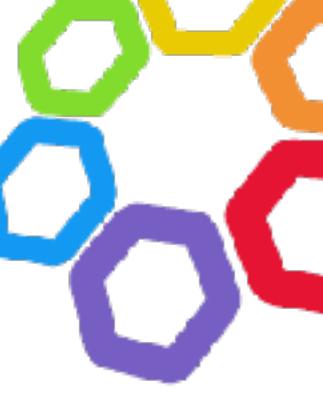
# Hexawise tests maximize coverage in the fewest possible tests.

Test generation algorithms in Hexawise ensure that every test condition in every test is optimally selected to maximize coverage of system interactions and minimize wasteful redundancies:
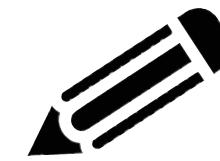
Tests selected one-at-a time by hand...

... become wastefully-repetitive...
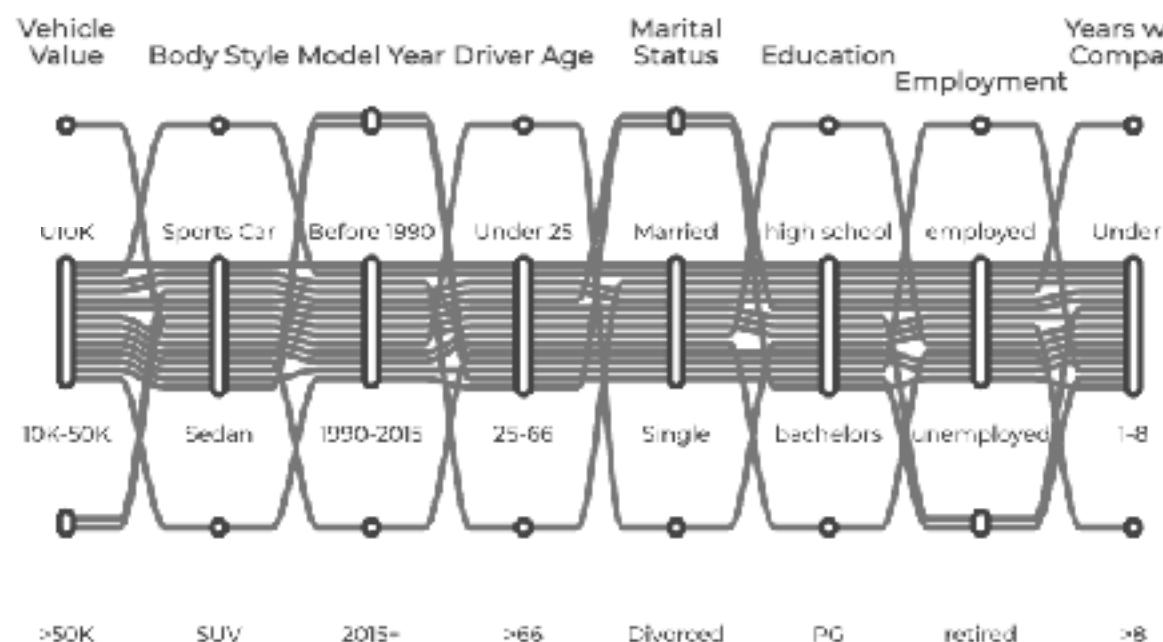
Each line represents a test. All the lines going through the default values in the middle represent wasteful repetition.

... and leave coverage gaps.

Test 17
53%
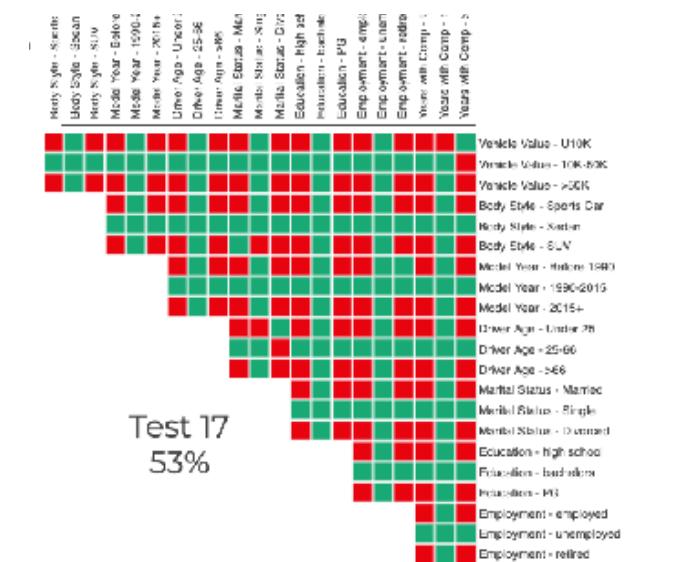
Green = system interactions **tested** in 17 tests.
Red = system interactions **not tested** in 17 tests.

Tests generated using Hexawise...

... are different. They find more defects
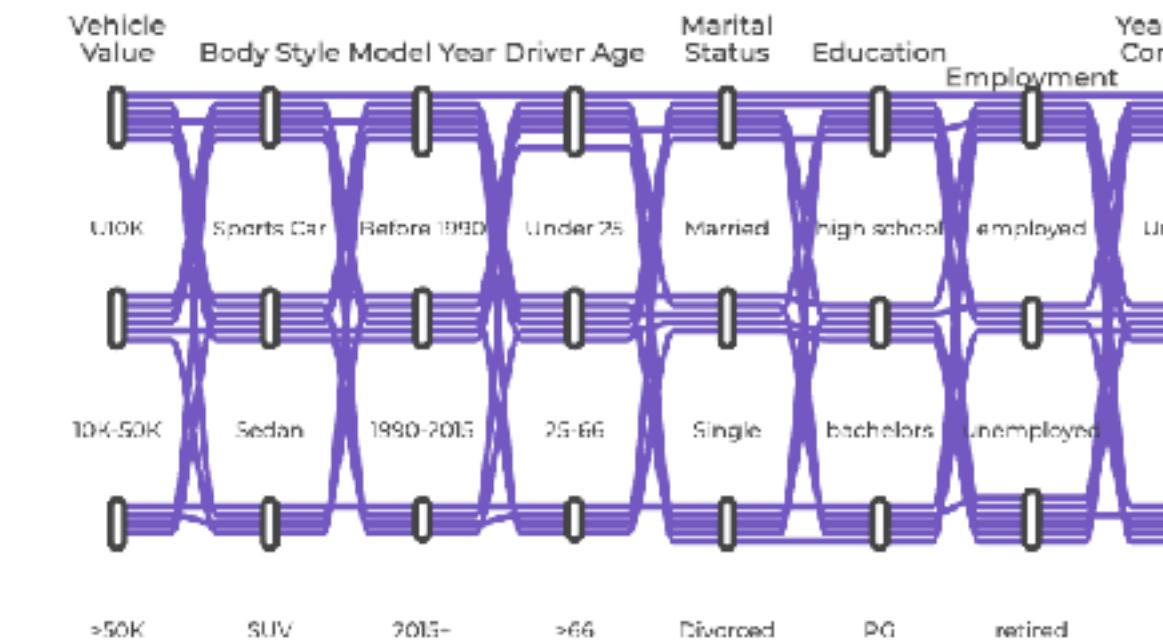
Each line represents a test. Notice that instead of wasteful repetition, there is systematically maximized variation between scenarios.

## ... by covering all interactions in as few tests as possible.

Test 17
100%
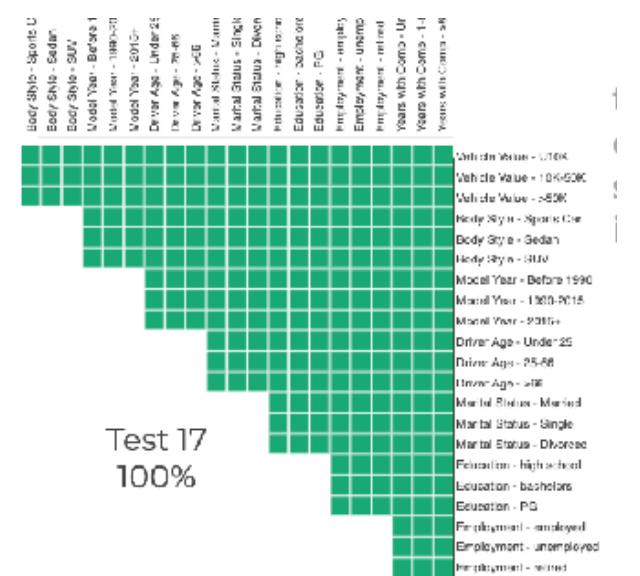
Green = system interactions **tested** in 17 tests.
Red = N/A (all are tested)

Hexawise Overview Video (Main Features and How it Works)

Hexawise is unlike almost all other testing tools. Seeing the tool in action is invaluable. Please watch this 5-minute overview video to gain a quick understanding of what Hexawise actually does (and does not do):
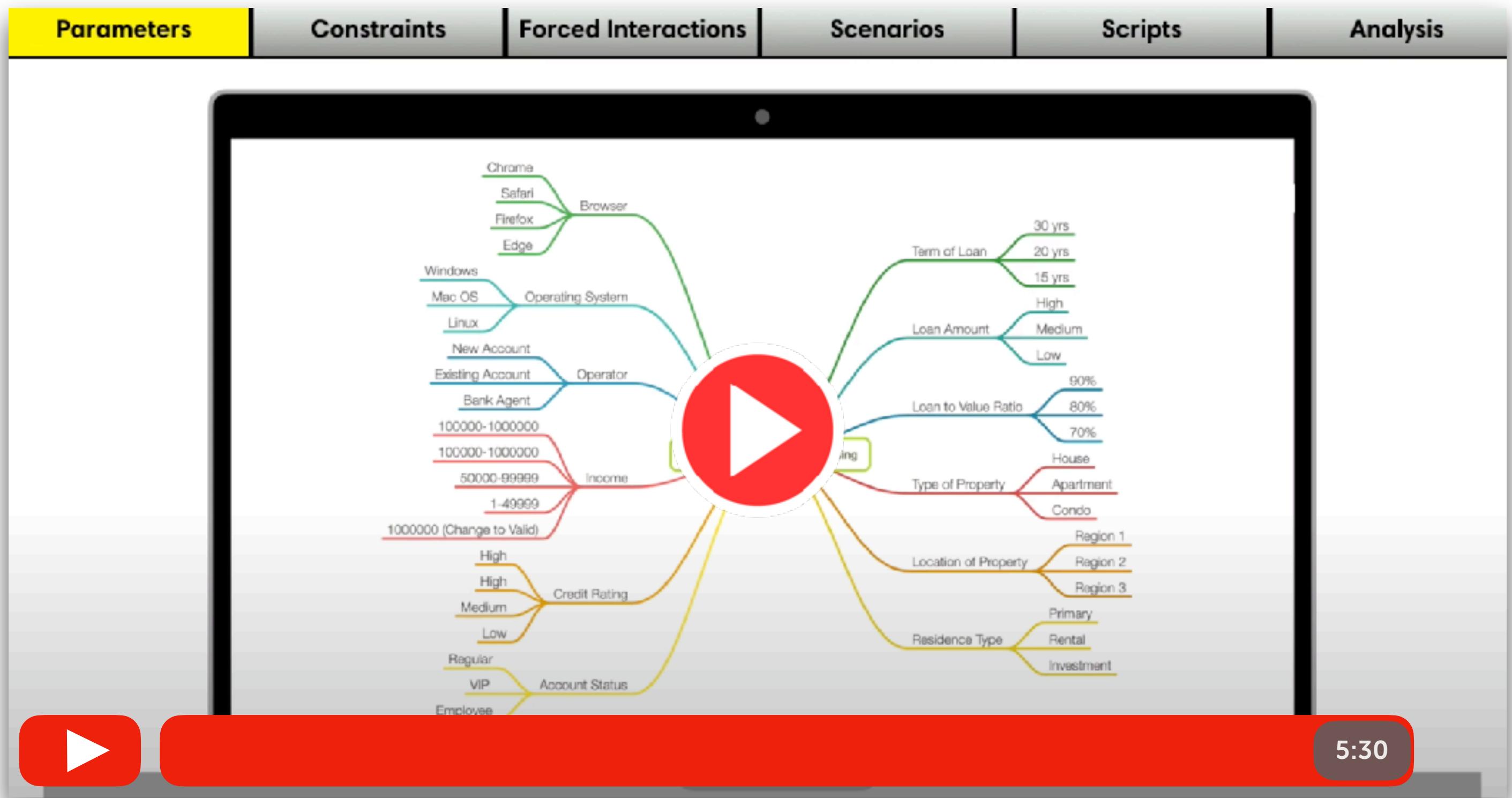

https://www.youtube.com/watch?v=4kw3Q207Bhs&ab_channel=Hexawise

Accelerating Test Automation Efforts

Hexawise Automate allows test designers to create parameterized, Gherkin, "Given-When-Then" scripts that can quickly be exported into various automation-friendly formats. And, as always with Hexawise-generated tests, the test sets will be extremely thorough and varied.
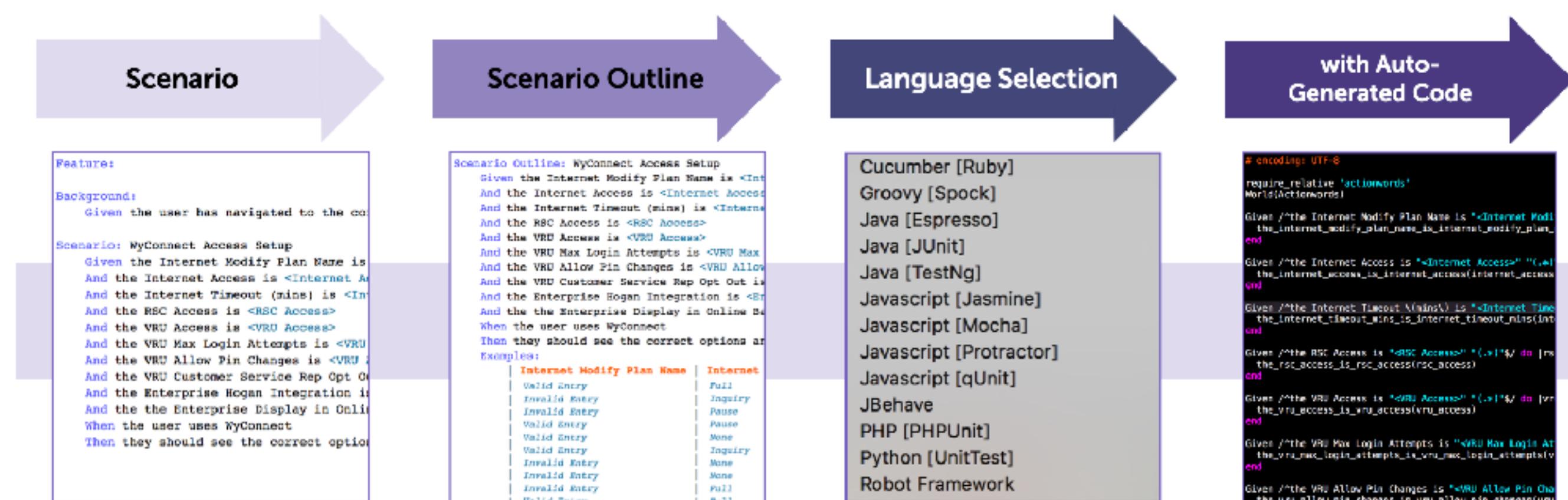
EY's 4-minute video highlighting how Hexawise drives test automation

Non-technical testers are able to write a single script that automatically creates all necessary scenarios when exported in any language of their choosing. By doing so, optimized test design accelerates automation efforts much earlier in the lifecycle.

Topics

1. **Brief Hexawise Overview**

2. **Case Studies**

Large Cost Savings in Gain-Sharing Deals

Global Health Insurance Provider

Hexawise speeds time to market and reduces costs. The team saved $1.5 million in testing costs when using Hexawise to design tests for a 5-country new product rollout.

$1.5M

COST REDUCTION IN A SINGLE PROJECT

During test design...

Select and document tests.

Much faster.
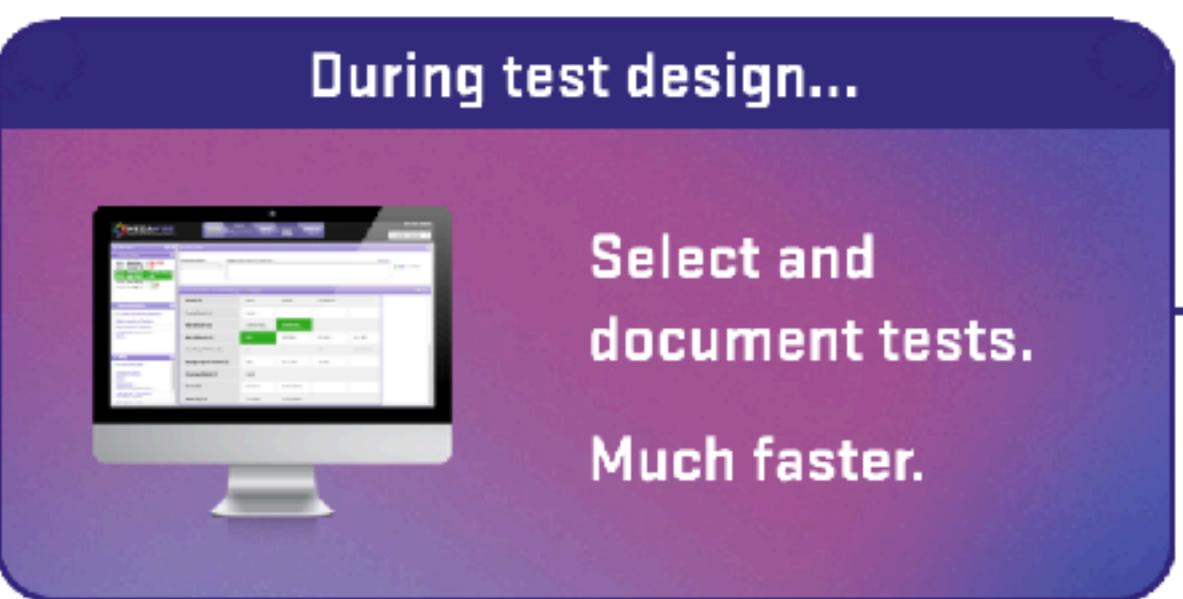
By automating test selection and test documentation processes by using Hexawise, the team reduced man days required to complete these (previously manual) activities by more than 60%.

During test execution...

Achieve greater coverage.
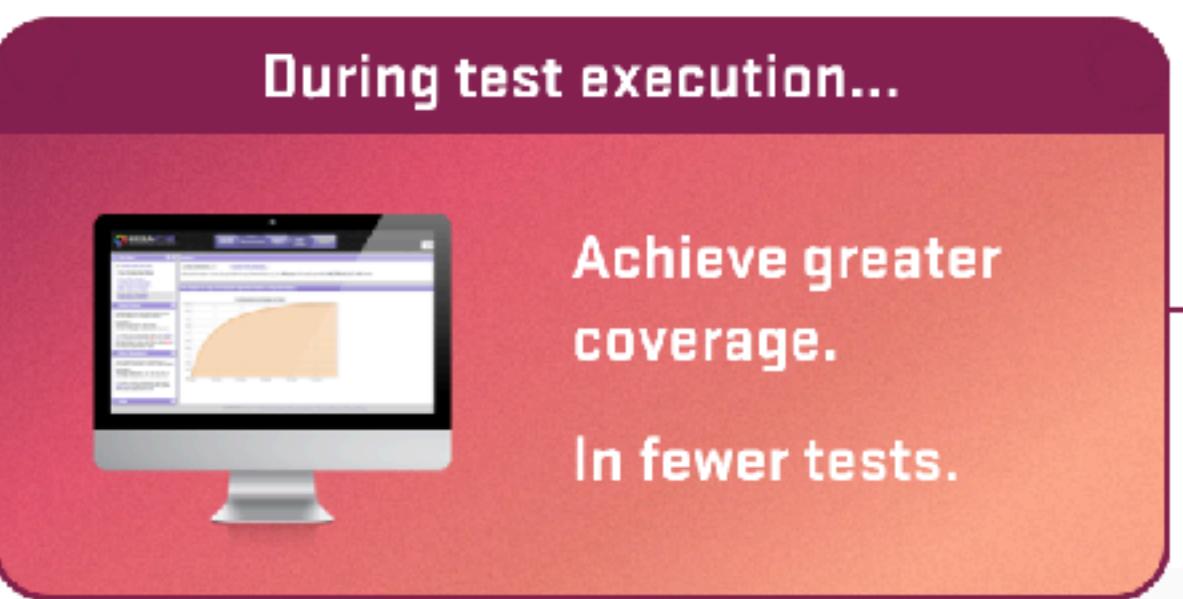
In fewer tests.

By using Hexawise to systematically generate relatively fewer tests, and to systematically eliminate wasteful repetition from test sets, the team required 50,000 fewer tests to be executed.

More Coverage, Fewer Tests

Large Insurance Firm

In addition to testing every requirement, Hexawise will also test every single pair of test inputs together in as few tests as possible. By doing so, Hexawise consistently helps find more defects. Coverage charts from a "before and after" study reveal these thoroughness and efficiency benefits:
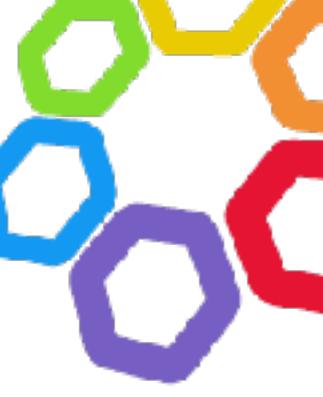
97%

COVERAGE IN HALF AS MANY TESTS

Existing coverage <u>without</u> Hexawise
53% coverage after 50 tests
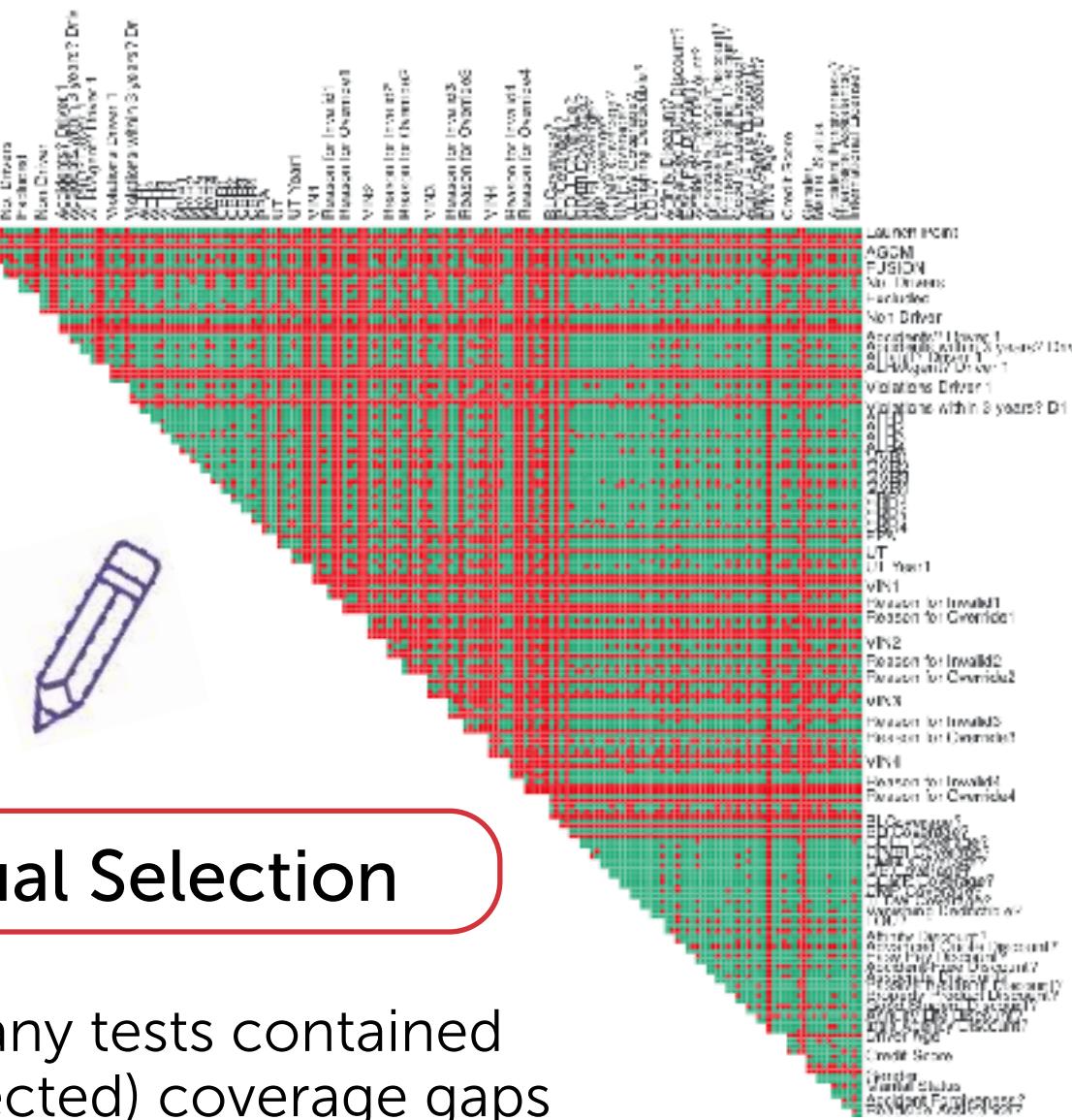
Manual Selection

Twice as many tests contained many (undetected) coverage gaps

Test coverage <u>with</u> Hexawise
97% coverage after first 25 tests
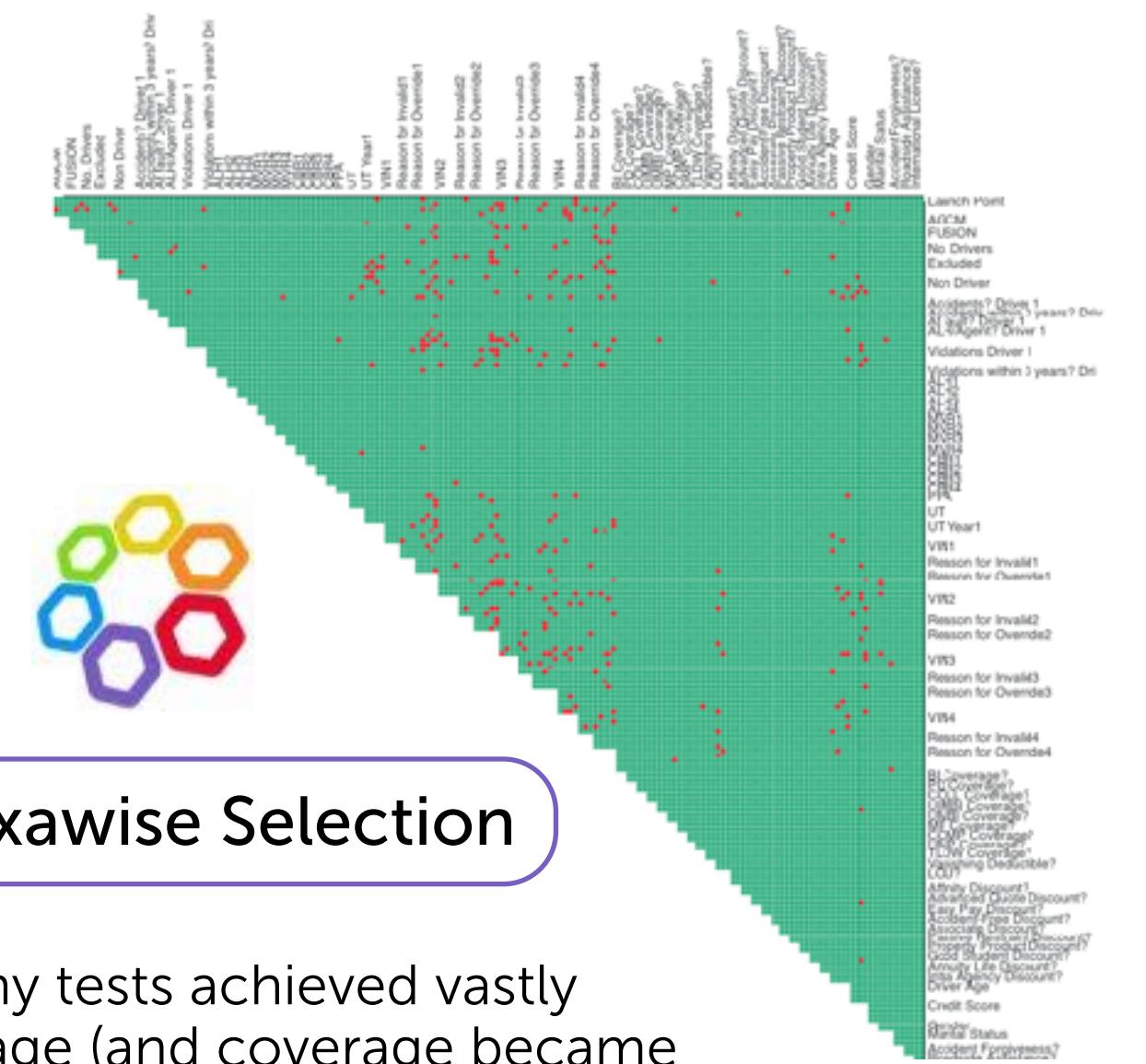
Hexawise Selection

Half as many tests achieved vastly superior coverage (and coverage became precisely understood and communicated)

Automation Enablement and Firm-Wide Test Case Reductions
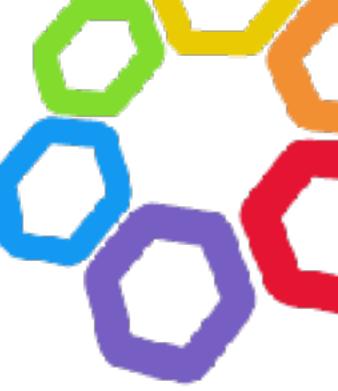
Global Bank

>30%

REDUCTION IN 1 MILLION REGRESSION TESTS

ACCELERATED TEST AUTOMATION

The bank had more than a million regression tests that were being manually executed. Rather than trying to automate all of them, they used Hexawise to identify the <u>right tests</u> to automate.

On average, teams reduced tests by 30% while increasing coverage. Hexawise tests were data-driven and easier to automate and maintain.

During test execution...

Achieve greater coverage.

In fewer tests.
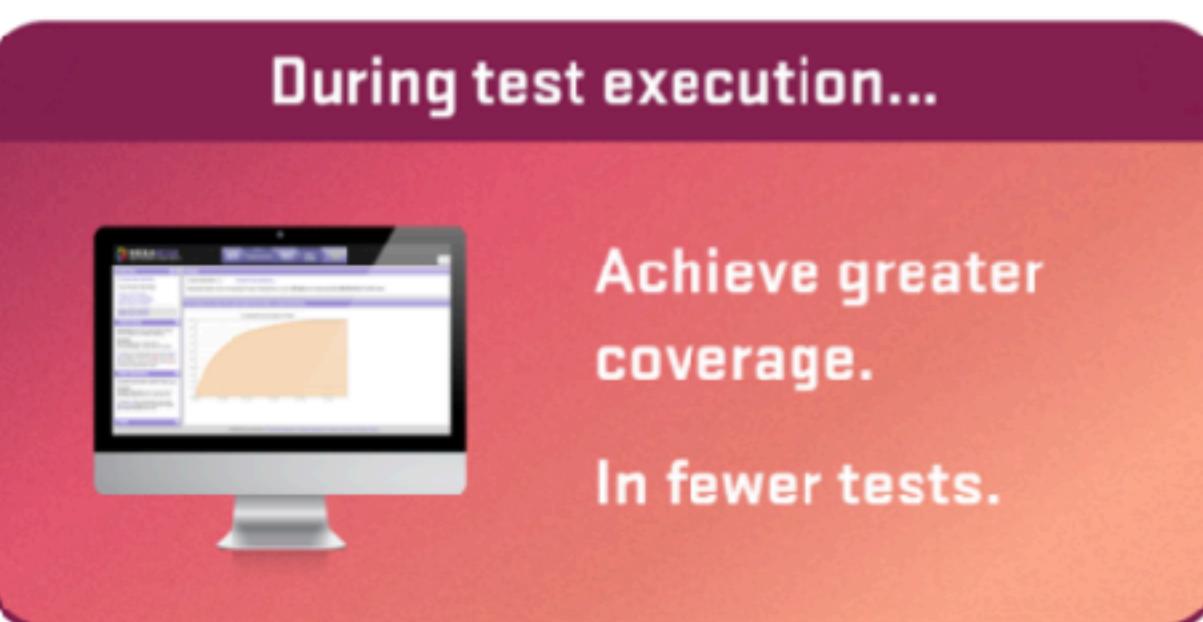
- Hexawise was used on a global project involving every major business unit at the bank.

- By generating optimized test sets in Hexawise, the bank reduced hundreds of regression suites by an average of 30%.

When automating tests...

Create automated tests.

With less coding.
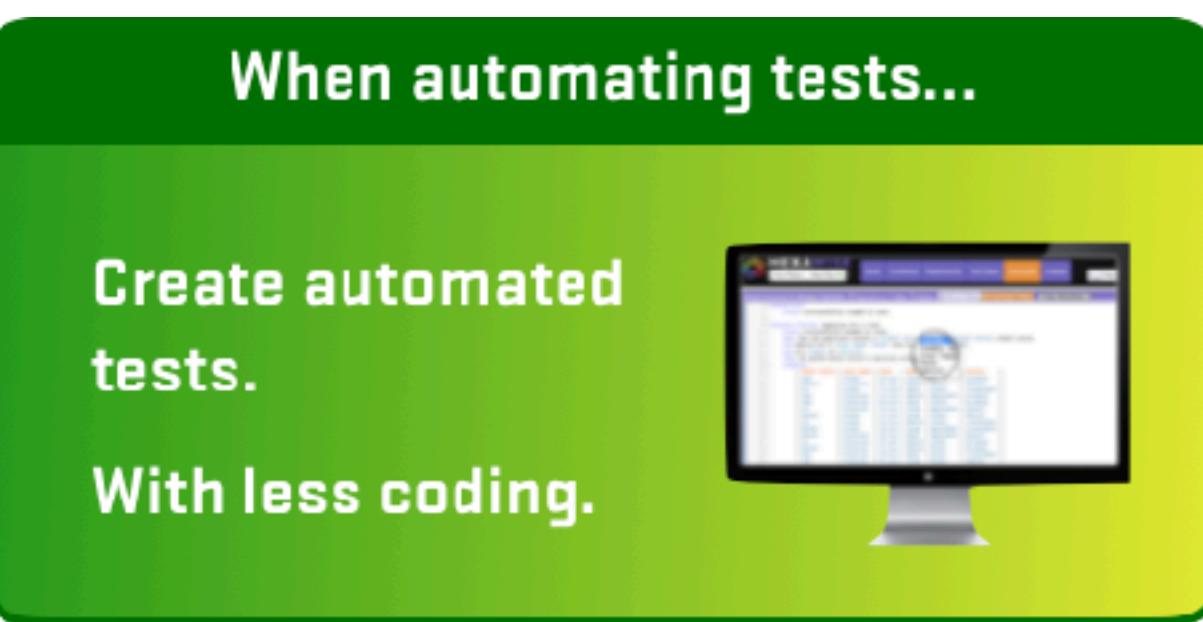
- All Hexawise test sets are data-driven, which enables rapid automation and maintenance.

- Some teams exported into Gherkin feature files. Others exported into skeletal automated tests in one of Hexawise's 20+ supported languages.

Achieving Extraordinary Thoroughness / Eliminating Costly Defects

Leading Asset Management Firm

100%

ELIMINATION OF ALL DEFECTS FOR 4+ YEARS (AND COUNTING)

Hexawise systematically increases testing thoroughness.

Before using Hexawise, teams encountered serious defects in production related to their "Know Your Customer" rules.

Designing thorough sets of tests in Hexawise immediately fixed this high-profile problem. There have been zero "Know Your Customer" defects in production since teams started using Hexawise in 2017.

Possible Scenarios:
> 10,000,000

Hexawise-Generated Test Scenarios:
1,800

Defects in Production:
None in 2+ Years

Experience Report (10 min video)

10:21

https://youtu.be/KL7IGmwzSzY?t=50
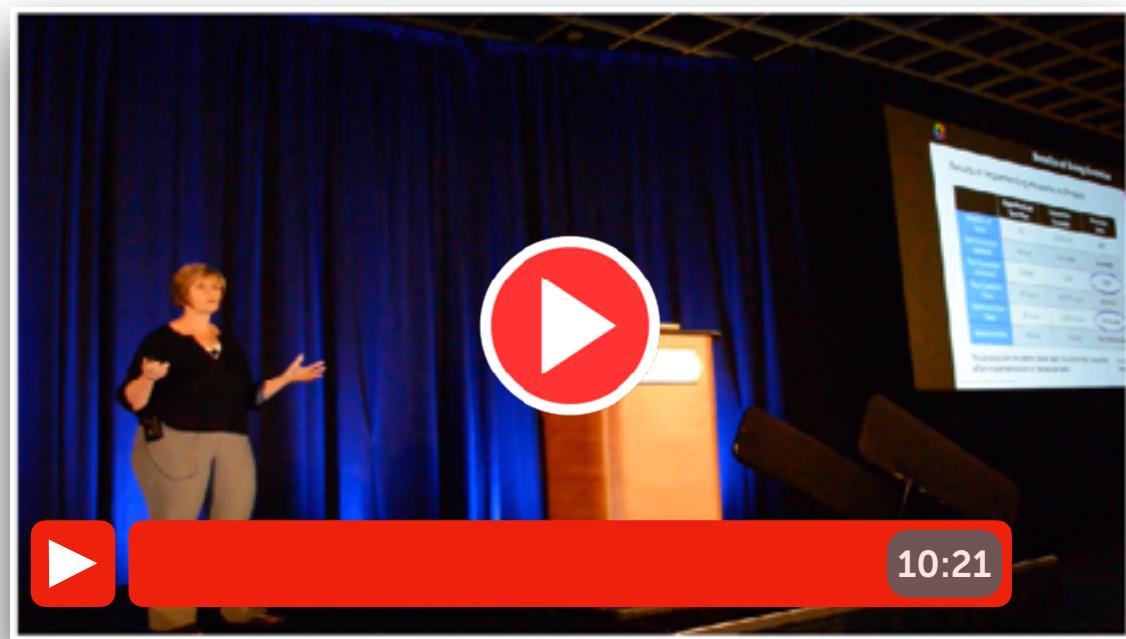
Reducing Testing Costs 90% While Improving Defect Containment
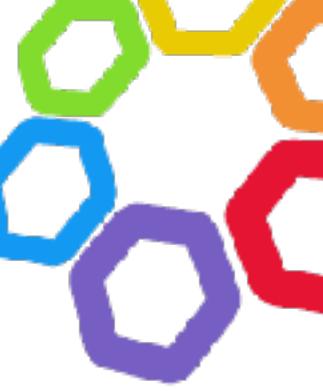
Leading Capital Markets Firm

90%
DECREASE IN TESTING COSTS

95%
REDUCTION IN PERCENTAGE OF DEFECTS FOUND DURING UAT

Hexawise both cuts costs and improves defect containment.

The company faced repeated quality challenges with every release of their portfolio reporting tool (which had been heavily customized for them).

When the team switched to designing their tests in Hexawise, they witnessed an immediate jump in quality and also reduced testing project costs by 90%. The number of defects found during User Acceptance Testing plummeted from 33% to just 1.5%.

Experience Report (10 min video)

Without Hexawise
?
33%
67%

Unknown testing coverage

67% of defects found prior to User Acceptance Testing

With Hexawise
1.5%
98.5%

Precisely understood (and improved) coverage)

98.5% of defects found prior to User Acceptance Testing

10:08

https://youtu.be/eeQmBplRanY
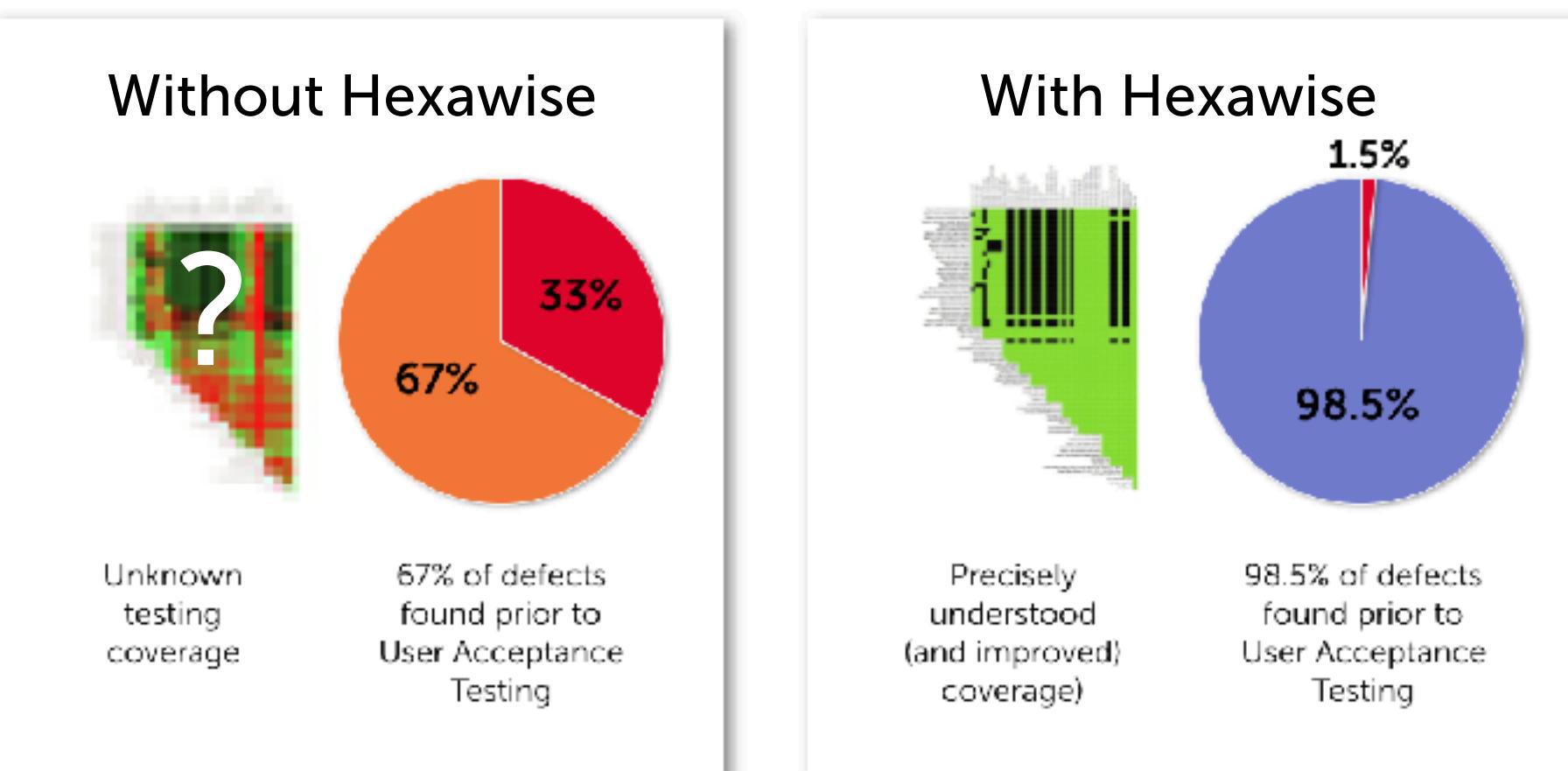
Dramatic Time Savings in Test Planning

Large Insurance Firm

Teams used Hexawise to develop an optimized set of test cases for a Defensive Driver Discount application that was experiencing too many defects in production.

By using Hexawise to ultimately generate an optimized set of test cases within seconds, the team saw dramatic improvements in time and effort needed to select and document the right test cases for execution.

65%

TIME SAVINGS IN TEST PLANNING

Test Planning Components

- ■ Regression updates
- ■ Test data creation
- ■ Review
- ■ Documentation
- ■ Design
- ■ Analysis

70 — Total Time = 57 hours

35

Total Time = 20 hours

0

Without Hexawise

With Hexawise
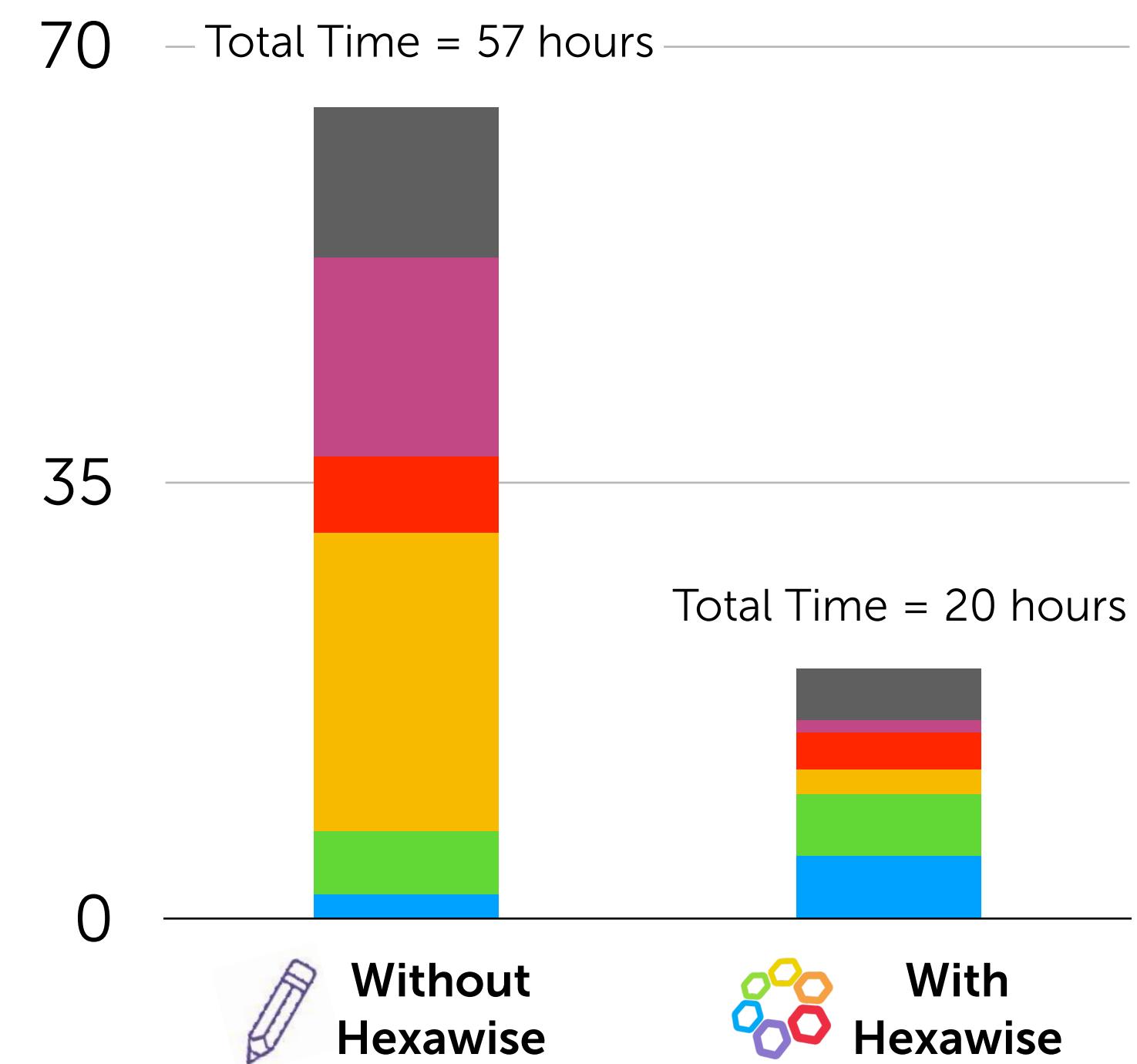
Much Greater Coverage Even When Using 1/4 as Many Tests
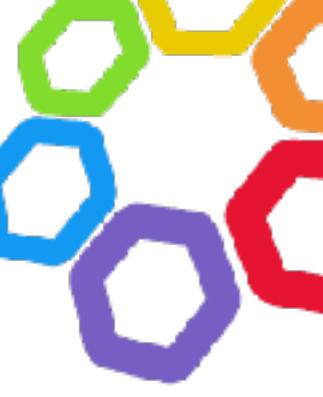
Large Health Insurance Firm

75%
FEWER TESTS USED

8X
AS MANY DEFECTS PER TEST

Teams carefully measured efficiency and thoroughness benefits of Hexawise across 15 projects. They found twice as many defects even while using only one quarter as many of Hexawise's algorithmically-generated tests.

As compared to their existing 1,818 manually-selected tests, the 448 optimized Hexawise tests they generated identified **twice as many defects**.

1,818 original tests
(with many coverage gaps)

- vs -

448 optimized Hexawise tests
(which found twice as many defects)

No. of Scenarios

400

200

0

Login · Registration · Global Frames · Profile · Plans and Benefit · Claims · CSR · Customer Care · Pharmacy

■ Original tests   ■ Hexawise tests
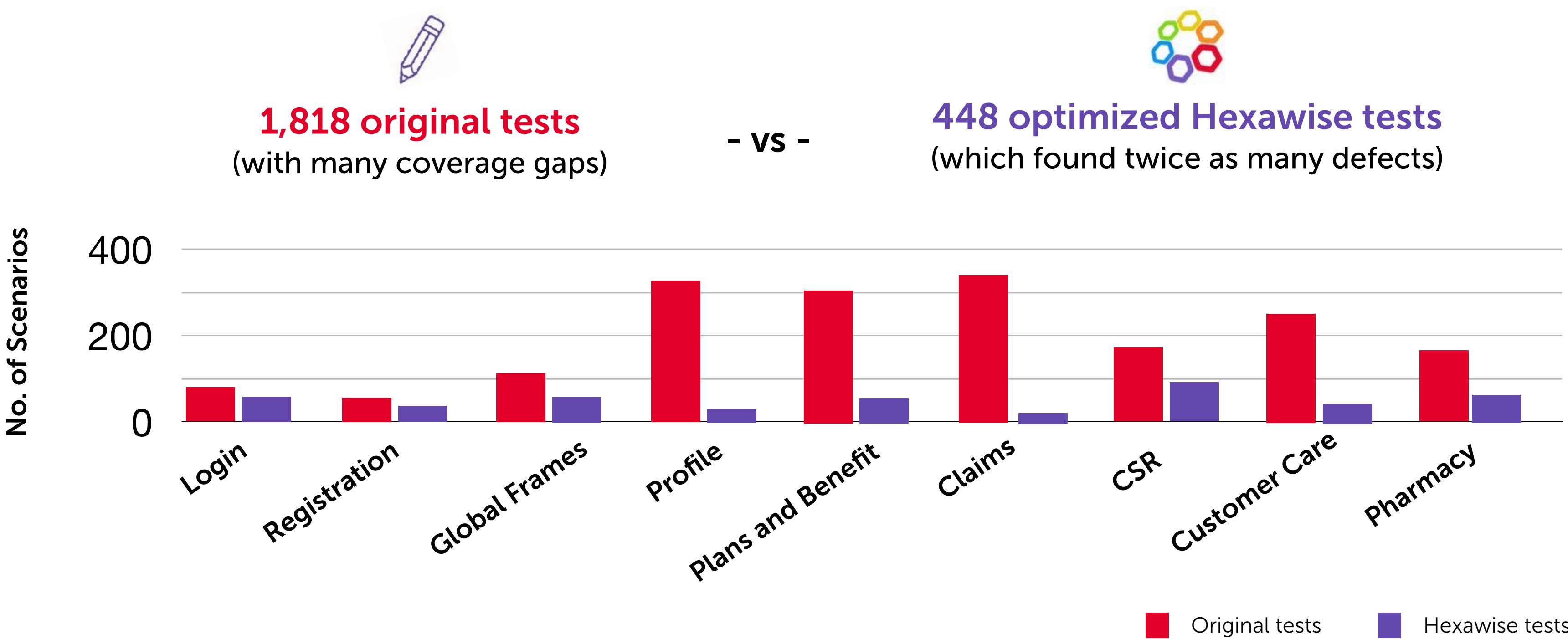
Achieving In-Sprint Test Automation with Hexawise Automate

Large Health Insurance Firm

Hexawise is used heavily by testers, business analysts, and developers throughout the pipeline in order to ultimately achieve thorough, efficient in-sprint automation of Hexawise scenarios.

Business analysts and testers collaborate upfront to establish a consistent, strong set of Hexawise Inputs, using the Mind Map feature to easily view the critical aspects of the system under test. Once test cases are generated, testers and developers create Gherkin-style automated scripts inside Hexawise Automate that are easily maintained throughout sprints.

Non-coders generate powerful BDD test scenarios, and export skeletal automated tests.

IN-SPRINT AUTOMATION

AND GREATER COLLABORATION WITH BEHAVIOR-DRIVEN DEVELOPMENT

Rapid Identification of Mistakenly Paid Claims

Large Health Insurance Firm

In their very first small pilot project, a single Hexawise user at the client identified defects in claim handling logic responsible for $1.6 million in erroneously paid claims.
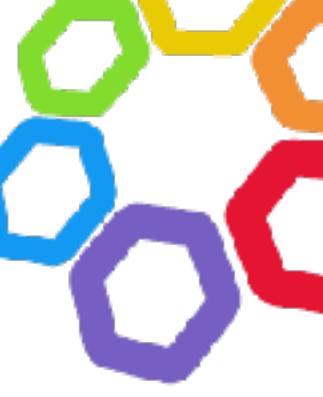
$1.6M

COST AVOIDANCE FROM MISTAKENLY PAID CLAIMS

When deciding how much to test...

**Understand coverage.**

More precisely.

During test execution...

Achieve greater coverage.

In fewer tests.

- Test coverage achieved became much better understood.

- Existing claims processing tests left thousands of coverage gaps involving combinations of Procedure Codes, Benefits Accumulators, Benefits Deductibles, etc.

Before Hexawise
Coverage Gaps (in Red) Missed Defects
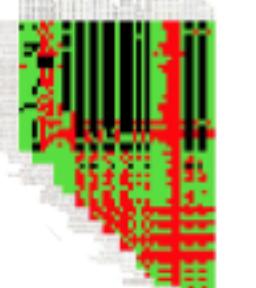
With Hexawise
(Erroneous Payments Detected)

- Closing those coverage gaps with Hexawise's optimized tests quickly revealed defects responsible for $1.6 in mistakenly paid claims.

# Confidently Determining "How Much Testing is Enough?"
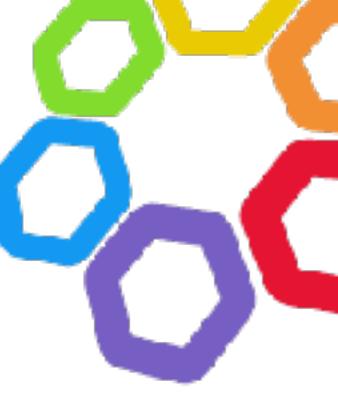
Large Healthcare Firm

Teams also used Hexawise to identify projects that had been dramatically under-testing.

- Hexawise made it immediately clear which projects were under-testing.
- Coverage gaps became instantly apparent and were quickly closed.

Teams confidently determined "how much testing is enough?"

GUESSWORK

85 Existing Tests

Option A — 50% fewer tests — Same Coverage

Option B — Same number of tests — Better Coverage

Option C — Higher number of tests — Dramatically Better Coverage
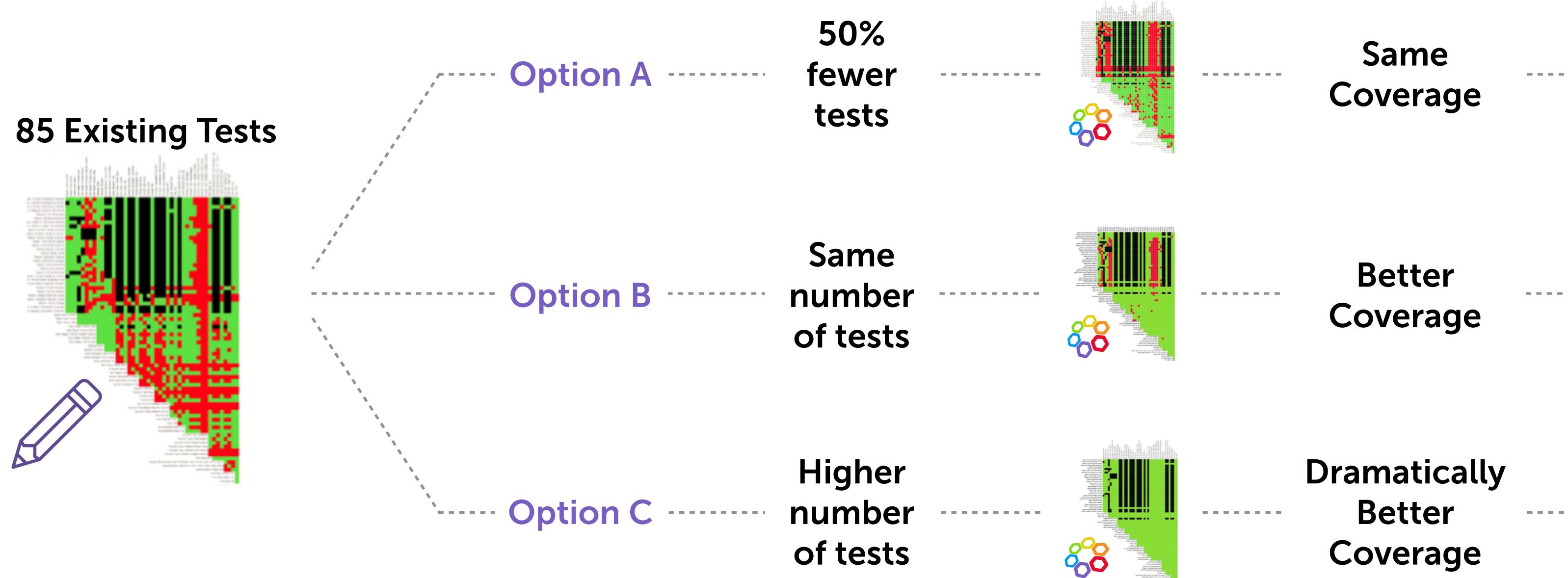
Dramatically Higher Tester Productivity

Large Health Insurance Firm

Teams used Hexawise to more than triple defects found per tester hour. This was the average impact measured in a nine-project benefits measurement study.

3X
DEFECTS PER TESTER HOUR

During test design...
Select and document tests.
Much faster.
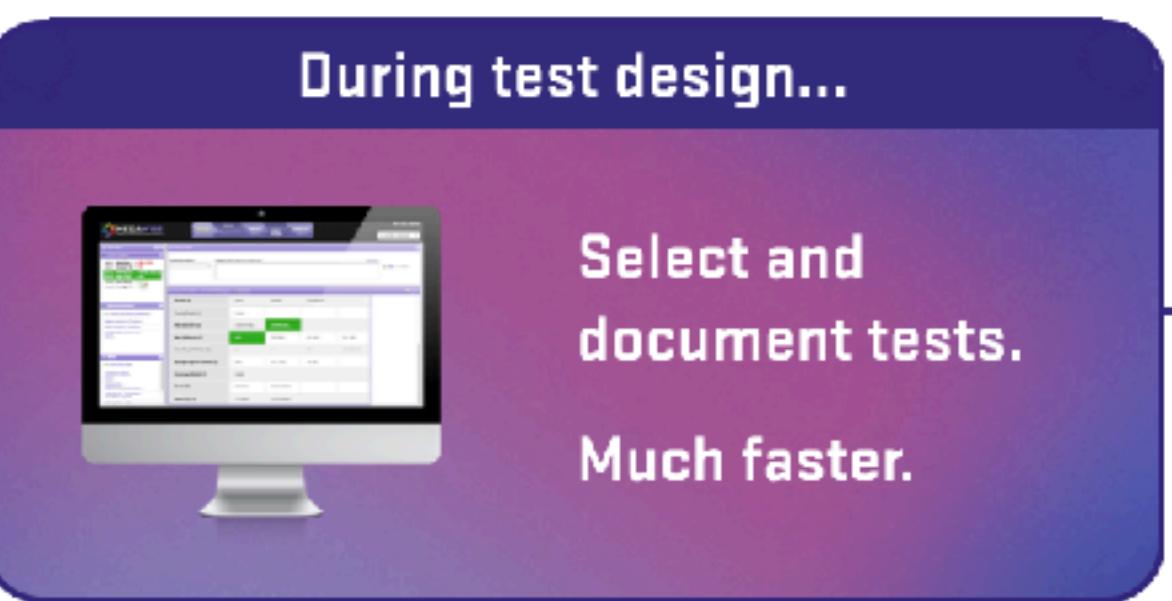
- On average, teams spent 30-50% less time selecting and documenting tests.
- One team found Hexawise to be 4X faster.

During test execution...
Achieve greater coverage.
In fewer tests.
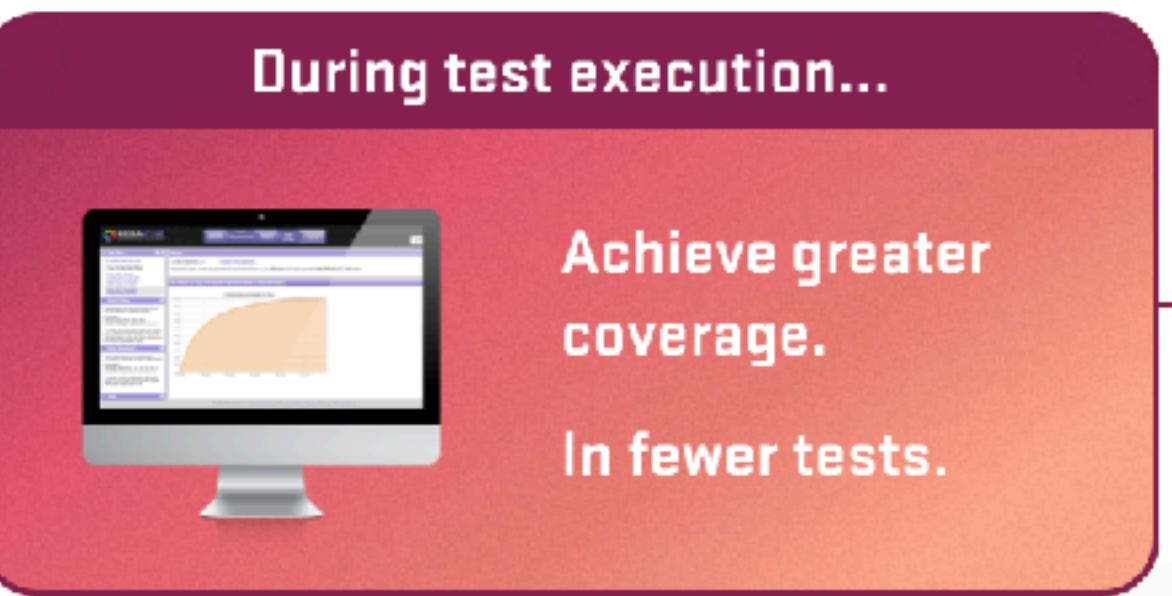
By systematically covering dramatically more interactions in fewer tests, teams consistently found more defects in less time.

Original test sets
- Poor coverage
- Larger test sets

Hexawise test sets
- Excellent coverage
- ~ Half as many tests