Sopra group

Efficient Test Automation on an Agile Project

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Agenda

1. The Client & the Project
2. Implementing Automation
3. Tools, tools, tools
4. Application Overview
5. Evolution (DSL, Data, Structure)
6. Making the Process Work
7. Q&A

The Client & the Project

Business Background

- Our client provides financial support to students, providing loans and non-repayable grants for living, studying and tuition costs
- Smooth on-line loan application process is essential
  - aligned with the Government's **'Digital by Default**' strategy
  - a positive experience for students
  - process of managing loans is extremely complex

Project Background

- existing web portal was confusing for customers, with each loan application on average resulting in 3.6 calls to the call centre for additional support.
- cost of avoidable contact was £2.9 million per year
- customer satisfaction was measured at 64% dissatisfied.
- move towards modern service provision via the development of a new customer web portal.
- aim is to drive traffic away from the call centre towards fully capturing applications on the web.

Implementing Automation?

Keep fixing it.

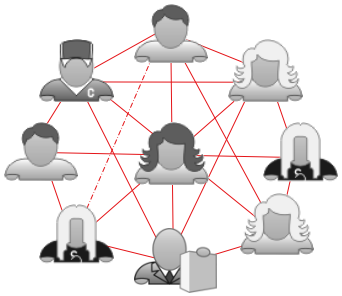
Define a lot of manual test procedures

Purchase an expensive GUI test execution tool

Hire an automation team to automate each procedure

Build a comprehensive test library and framework

Implementing Automation



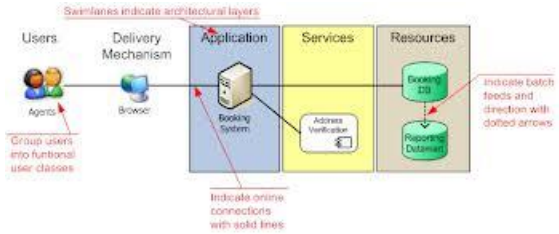
Processes

People

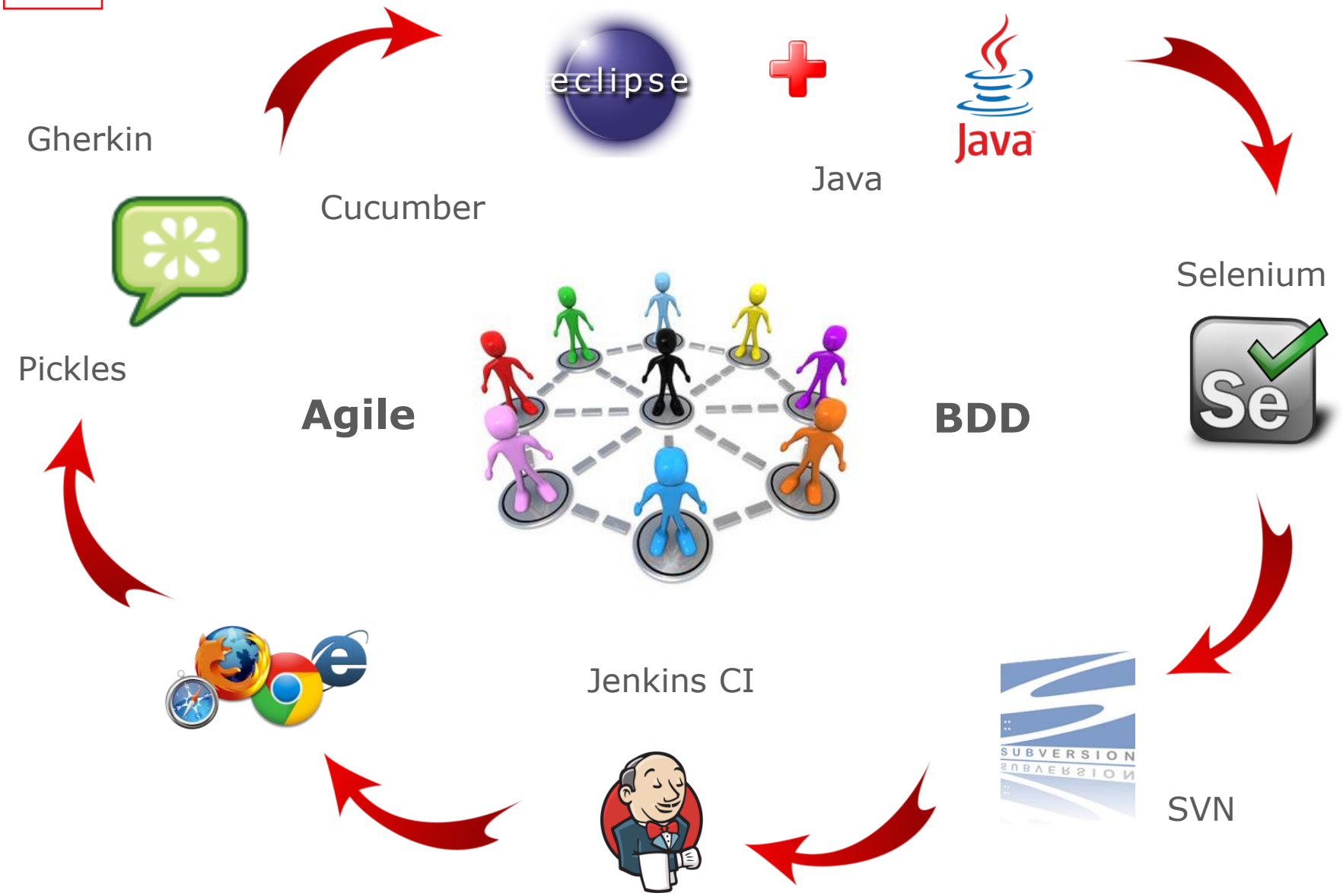
Tools

Application - overview

- Web portal to create, manage, submit and track application with captured customer data
- Multiple screens
- Many paths throughout the application process
- Various data capture – from simple Yes/No to complex recursive data objects
- Integration with multiple legacy systems through web services
- High focus on the usability and user experience aspects



Tools, tools, tools



Evolution: DSL - your friend or enemy?

- **Before: No upfront DSL design led to over 600 step definitions, causing:**
  - Minimal reuse of the existing steps/code
  - Lack of clear understanding what step does and how
  - No practical use of the tests as documentation of system to business
  - High cost of step implementation
  - Difficult maintenance and increasing technical debt in the test code

- **After: Core of ~30 designed, parameterised steps used in 95% of the tests**
  - Easy test creation – using steps as templates with parameters published in the project wiki
  - Clear understanding what to expect from the step
  - Tests useful for the analysts, testers, developers and business
  - High reusability
  - Test automation effort reduced several times over
  - Allow to use defined (business journeys) or explicit data (component/system tests)
  - Limited number of additional, component test focused steps

DSL – Examples:

- **Before:**
  - **“I click Next button”**
  - **“Button Yes has been clicked”**
  - **“I have clicked Save button”**
  - **“I use the previous page link”**
- **After:**
  - **“I click the (.*) ”**
  - **All available buttons and links published on wiki**
  - **New elements easy to add to the mapping table (abstraction layer)**

Evolution: Data – drives tests or you crazy?

- **Before: No test data design or approach, causing:**
  - Complex and difficult to understand scenarios
  - High duplication of steps in test scenarios
  - Difficult test data management
  - Reduced coverage of tests

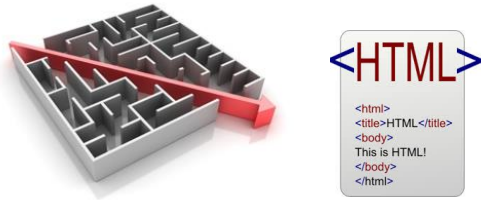
- **After: Test data designed and stored as "persona" concept**
  - Persona's data leads to user story or specific test path with desired data
  - Short and concise scenario – 2 steps to get to any point in the application process
  - Easy data management
  - Higher coverage at lower cost
  - Faster test execution – ability to create application with required data through web services allow direct jump to page directly rather than using Selenium

Data – Examples:

- **Before:**
  - “I login as user JOHN SMITH”
  - “I answer X for the first question”
  - “I enter A data”
  - “I answer Y for the second question”
  - “I enter B data”
  - “I answer Z for the second question”
  - “I enter C data”
  - “I click Next button”
  - “I am navigated to the next page”
  - “My first question data is A”
  - “My second question data is B”
  - “My third question data is C”
- **After:**
  - “I am logged in persona JOHN SMITH on page X”
  - “I have completed page Y until and including question Z”
  - “My first page data is persisted”

Evolution: “Id”entify your page elements

- **Before: No abstraction from maze HTML ids, causing:**
  - Difficult test creation
  - Confusing test scenarios and thus system documentation
  - More complex and less readable tests

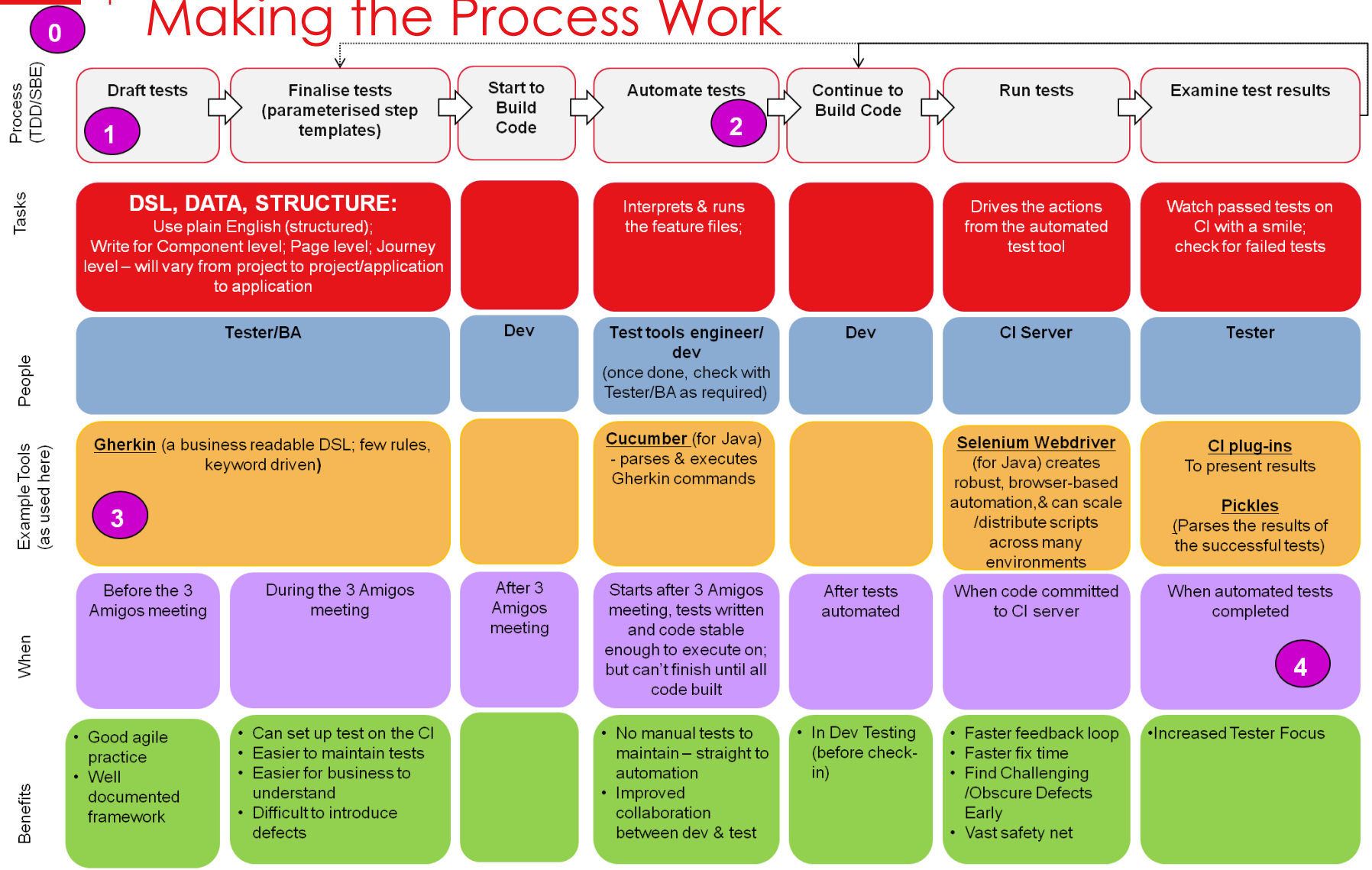


- **After: Mapping abstraction layer – from HTML id (part id) to a name**
  - Meaningful name of the component – be it a button, field or an error message
  - Clear to understand tests and thus system documentation
  - Easy to manage and update
  - Single place – no confusion where to look for

Evolution: Structure your tests

- **Before: No clear structure and purpose for the tests, causing:**
  - Difficult test management
  - Duplication of scenarios across tests
  - Missed crucial scenarios
  - Tests as documentation difficult to use by business
- **After: Split into “Journey”, “Page” and “Component” tests.**
  - “Journey” tests are user story related scenarios - UAT if you like - taking persona for a journey through the full or part of the application process
  - “Page” tests are classed as system tests, providing more detailed coverage for the specific page, business logic or data handling
  - “Component” tests are focused on specific components of the application – such as numeric data capture field or address capture, providing most detailed coverage
  - Clear view what tests are required and what level of coverage are to be achieved
  - Easier test scenarios / execution management and partitioning

Making the Process Work



0 – At start of project build the skeleton automation framework
1 - Depending on the project - either BA prepares the gherkins as the base stories or tester prepares the drafts based on stories; but good agile practice is to collaborate & talk to each other often (not as a separate task)
2 - 99% of time it's more practical to build code first, automate tests later - with an overlap; automate tests sometimes could start when build of code starts, sometimes later
3 - Cucumber/Java is what we applied, You could use alternative tools like Twist, Cucumber & Ruby, Capybara, C# etc.
4 - After 3 amigos, you can tag the tests with appropriate annotation, and have them executed on the CI in a separate job (for example "Work In progress), so from a progress perspective it is clear how much work is still to be completed in-sprint.

Thank You