

Automated Testing of Blaise 5 Survey Instruments using Playwright

Patrick Wenzel, Svetlana Rabinovich, Todd Flannery
Westat, USA

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Overview

- Automated Testing of Large Surveys is a challenge
- Web survey mode of Blaise 5 allows modern end-to-end testing tools such as Playwright
- This paper looks at some of the challenges in using Playwright on a large survey
- **Shift Left Testing** Approach

Playwright Testing Framework

The Playwright framework provides powerful tools for end-to-end testing of web applications:

- **Locators**

Identify labels, text, buttons, and other HTML elements.

- **Assertions**

Verify that elements behave or appear as expected.

- **Tests**

Execute automated tests to validate your application.

Simple Playwright Test

```
//  
// First Question...  
//  
console.log('On Question 1');  
  
// Check if the question text is present  
const textLocator_q1 = page.locator('text=Which of the following kinds of beers, ales or malt liquors have you ever consumed?');  
const isVisible_q1 = await textLocator_q1.isVisible();  
  
// Assert the text is present  
await expect(textLocator_q1).toBeVisible();  
  
// Log the result  
console.log(`Question Text is ${isVisible_q1 ? 'visible' : 'not visible'}`);  
  
// try to select the option checkbox that has a label of "Indian Pale Ale (IPA)"  
page.locator('label:has-text("Indian Pale Ale (IPA)")');  
await selectOptionByText(page, "Indian Pale Ale (IPA)");  
  
// call function to click the 'Next' button  
await clickNextButton(page);
```

Getting Playwright to Work with Blaise 5 Surveys

We encountered multiple challenges in getting Playwright test scripts to work against Blaise 5 Surveys, including:

- Determining when a page had changed. Because Blaise 5 is implemented as Angular.js Single-Page Application (SPA) it was difficult to determine when the page had changed. We found that simply monitoring changes to the field names worked reliably.
- Selecting option buttons. We found that selecting the option label and using the "for" attribute allowed us to select an option.
- Selecting radio buttons without labels. We found that using the end of the "aria-label" allowed us to select the appropriate radio button.

Data Driven Approach

Writing 100's of test cases was too labor intensive, so instead we developed a data driven approach that read the test cases from an Excel file:

1	Blaise Information		Survey Information			Test Cases		Questionnaire Information	
2			2024 Beer Survey						
3			Domestic Beer Section						
4	Blaise Field Name	Blaise Field Type	Question ID	DBTC001	DBTC002	DBTC003	Question Text	Question Response Codes and Labels	
5	SelectTheID	STRING	Preload Scenario Code	DBPreloads001	DBPreloads002	DBPreloads003	n.a.	n.a.	
6	BEER.DB1001	ENUMERATION	DB1001	No	No	No	You were just asked questions about imported beers. Besides those products, have you ever consumed any domestic beers?	1) Yes (Specify) 2) No	
7	BEER.DOMESTIC.DB1002	ENUMERATION	DB1002	<skip>	<skip>	<skip>	Have you ever consumed a domestic beer, even one or two times? (Domestic beer includes any beer brewed in the United Status.)	1) Yes 2) No [GO TO BOX DBV02]	
8	BEER.DOMESTIC.DB1004	ENUMERATION	DB1004	Yes	No	Yes	In the past 30 days, have you drank a domestic beer, even one or two times? (Domestic beer includes any beer brewed in the United Status.)	1) Yes [GO TO BOX DBR04] 2) No	
9	BEER.DOMESTIC.DB1002_12M	ENUMERATION	DB1002_12M	<skip>	Yes	<skip>	In the past 12 months, have you drank a domestic beer, even one or two times?	1) Yes 2) No	
10	BEER.DOMESTIC.DB1003	ENUMERATION	DB1003	Every day	Some days	Some days	Do you now consume domestic beers...? Please do not include imported beers when answering.	1) Every day 2) Some days	
11	BEER.DOMESTIC.DB9011	ENUMERATION	DB9011	<skip>	<skip>	<skip>	Around this time 12 months ago, were you consuming domestic beers in bottles, cans or draft?	1) Yes 2) No [GO TO BOX DBV02]	
12	BEER.DOMESTIC.DB1009.NN	INTEGER	DB1009	<skip>	<skip>	<skip>	About how long has it been since you last took a sip from an domestic beer? (If it was earlier today, enter 1 day.)	1) _ _ Days 2) _ _ Months	

Survey Section Testing Challenges

Once we had a data driven approach, we realized that creating test cases for large surveys with over 1,000 questions was difficult and time consuming.

We moved to survey section testing approach but that created new challenges, including:

- Survey sections had to be hosted separately.
- We needed to create preload variables to handle global variables and questions that were answered in previous sections.

Survey Section Testing Advantages

The advantages to survey section testing include:

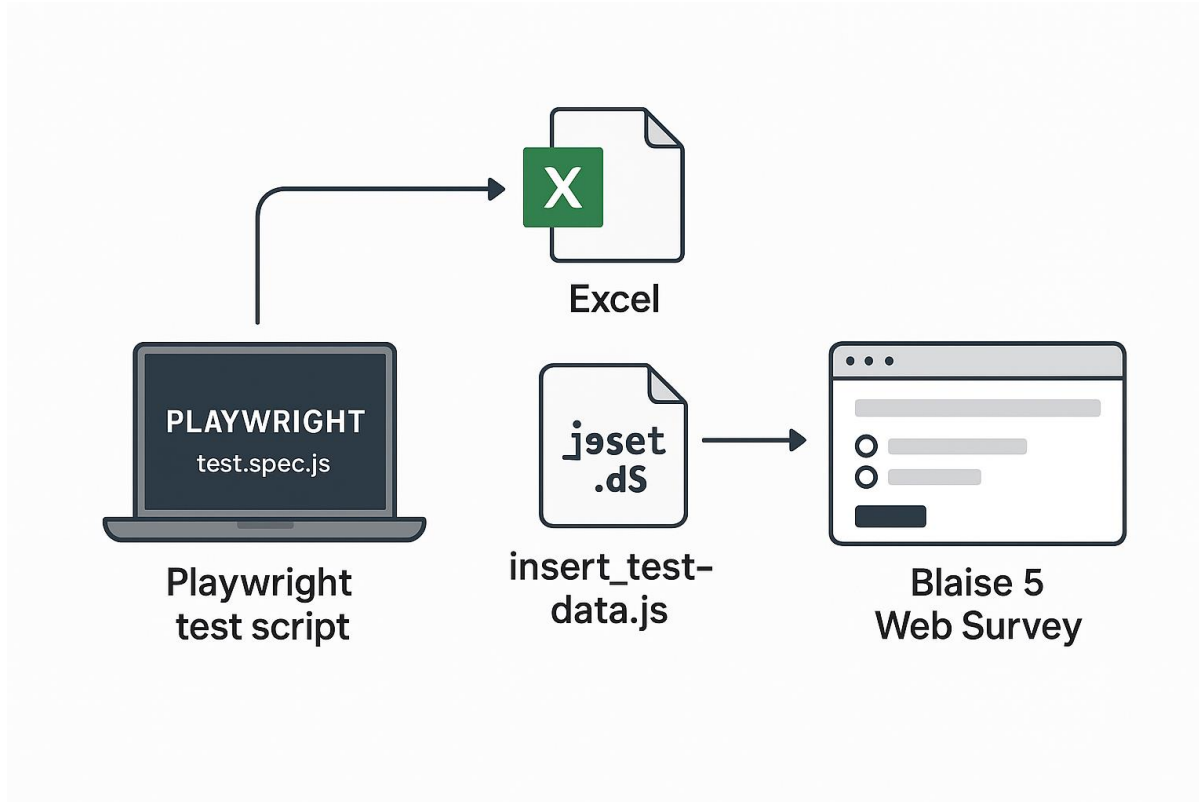
- The Blaise programmers create the test cases as they implement the survey sections.
- The Blaise programmers could get rapid feedback on the survey sections. This is part of the “shift-left” approach to testing.
- The survey section test cases can be run after any changes are made to the section to ensure the changes did not cause adverse effects.

Running Multiple Test Cases

One last challenge was getting Playwright to run multiple test cases. Since we had used a data driven approach for the data fields, we assumed we could use a similar approach to running multiple test cases. But it turned out that the “tests” must be statically defined in a Playwright test script.

Our solution was to write a small node.js script which read the test case parameters from an Excel file and inserted an array of the test case parameters at the top of the test script.

System Flow Diagram



Future Directions

Our current approach is a “garden path” testing, looking for known routes through the survey with valid data.

But we anticipate future testing, including:

- Validation Testing. Inserting invalid data into the survey to ensure that the survey responds appropriately.
- Visual Testing. Playwright support the ability to capture screenshots from a page and to compare screenshots to detect differences.

Conclusions

- Modern End-to-End Testing Tools can be used against Blaise 5 surveys
- Automated Testing can reduce the need for manual testing
- Survey Section Testing allows rapid testing and immediate feedback to the Blaise programmers