

Maximizing the UAT Kit to minimize Testing Time for Infrastructure, Framework, and Software upgrades

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A Social Good Engineering Fable



HELLO

My Name Is

Name: Charity

Company: Social Good Org

Job Title: Software Engineer

Passions: Technology & Social Good

A Social Good Engineering Fable



- Broken Customizations
- Time to Test
- Opportunity Cost
 - Core/Non Core

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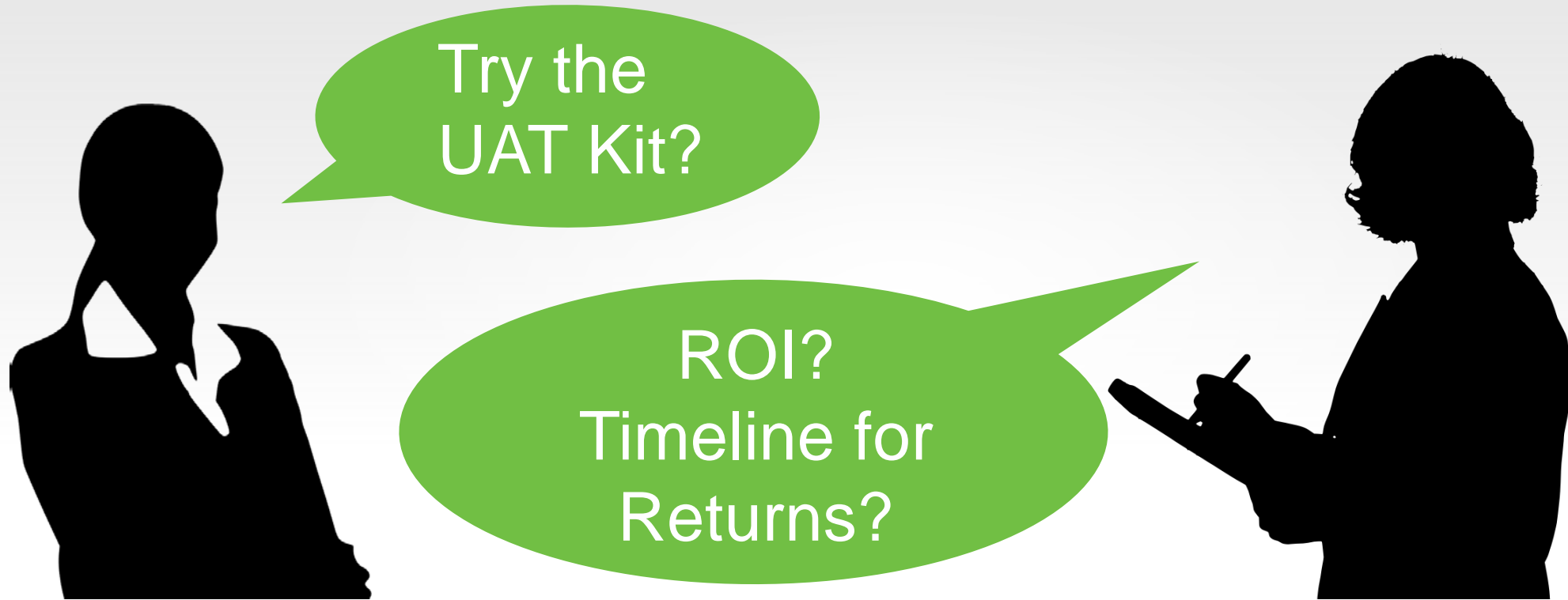


A Social Good Engineering Fable

The Blackbaud UAT Kit

- Focus on Social Good Outcomes
- Industry Standard, Reliable, Consistent
- App and Infrastructure Upgrades
- Adopt Security, New Feature, and Bug Fixes Faster

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A Social Good Engineering Fable



- Concern around barriers to entry
 - New language (Gherkin, XPath)
 - Partial test cases internally
 - What do the test look like?
- Need some examples
- 33 Open Sourced Core Tests
- 3 Months

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We need to upgrade to SP 16.

My team can't test, we're starting the annual campaign.

I ran all your test scenarios, it took about 2 hours, I can run them again for you if you want.

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You ran 60 days worth of tests in 2 hours?

Well, 2 tests failed, so I had to fix those and run them again. I probably had 2 days in it. We're good to upgrade in my opinion.

The Fable Morals

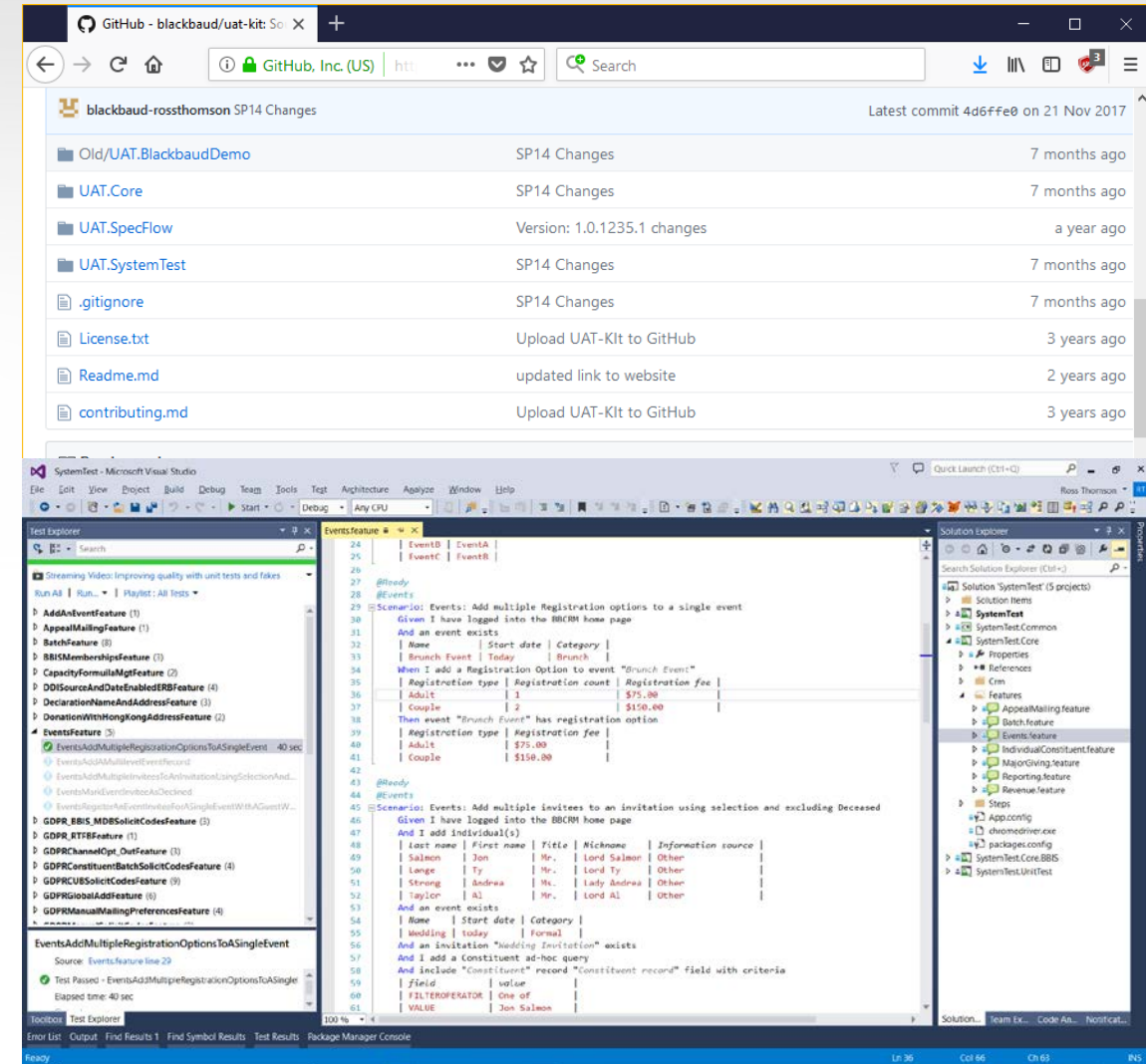
- Opportunity Cost ~ Manual Testing
- Opportunity Cost ~ Organizations Outcomes
- Social Good Outcomes ~ Tools
- UAT Kit ~ Reduced Time
- UAT Kit ~ Increased Confidence
- UAT Kit ~ Easier to Learn

System Tests

- In our Fable above the outcome of Charity's work is a set of System Tests!
- What is a System Test:
 - Drive the system under test in emulation of an end user
 - No direct API / Database interaction
 - All tests must drive the application in only ways that a user would do
- Why are they so effective:
 - Pro: They emulate exact user behavior (BDD)
 - Pro: High system coverage; fully end to end
 - Pro: Repeatable, build into continuous integration etc.
 - Con: They are complex; complexity is expensive to create

What is the UAT Kit

- A System test kit ready to go for your use!
 - Short circuit the expensive of writing one
- Delivered to you via the Microsoft Nuget platform
 - <https://www.nuget.org/packages?q=blackbaud+uat+kit>
- Sample code and the full framework delivered to you via GitHub
 - <https://github.com/blackbaud/uat-kit>



Barriers to entry

► You need to learn or already know:

- C# and Nuget
- MSTest or Nunit
- Gherkin Syntax (Behavior Driven Development)
- XPath
- UAT kit itself

► You need to get running

- A CRM instance to run tests against (system under test)
- Visual Studio 2013 / 2015
- Create a project, add the nugets and create tests OR (test system)
- Get the GitHub SystemTest.Core project (test system)

Gherkin Syntax

- Cucumber Gherkin Syntax, part of Behavior Driven Development (BDD) developed by Dan North / Chris Matts:

- Given – preconditions =

Scenario: Events: Add multiple Registration options to a single event

Given I have logged into the BBCRM home page

And an event exists

Name	Start date	Category
Brunch Event	Today	Brunch

- When – behavior =

When I add a Registration Option to event "Brunch Event"

Registration type	Registration count	Registration fee
Adult	1	\$75.00
Couple	2	\$150.00

- Then – testable result =

Then event "Brunch Event" has registration option

Registration type	Registration fee
Adult	\$75.00
Couple	\$150.00

Blackbaud CRM UI xPath

- CRM UI is complex – underlying framework retains UI elements and hides them
 - xPath allows targeting of the visible element only:
- So how does an value in a gherkin become an xPath:

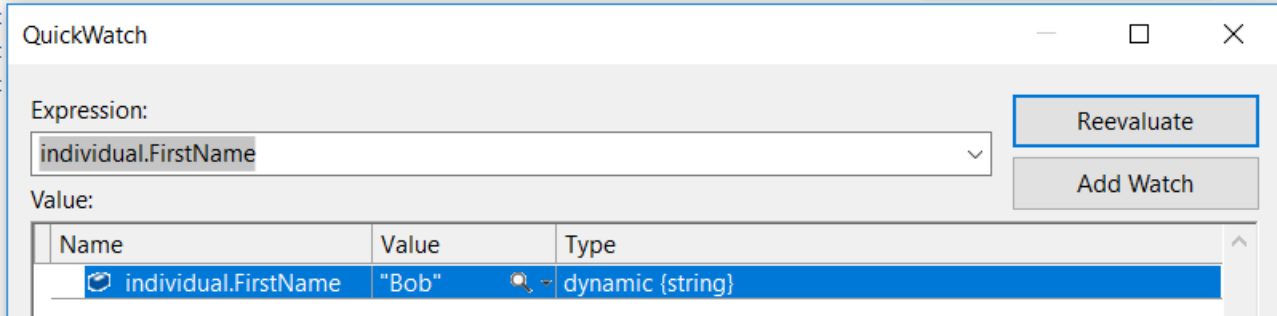
```
Scenario: Individual Constituent: Add a new Individual Constituent record
  Given I have logged into the BBCRM home page
  When I add individual(s) with address
    | Title | Nickname | Information source | Last name | First name |
    | Mr.   | Bobby   | Other              | Prospect | Bob        |
  Then individual constituent is created named "Bob Prospect"
  And Personal information is displayed on Personal Info tab
    | First name | Last name | Title | Nickname |
    | Bob       | Prospect | Mr.   | Bobby   |
```

Blackbaud CRM UI xPath (2)

- Gets passed as table value (in this instance) in to the code:

```
[Then(@"Personal information is displayed on Personal Info tab")]
0 references | Rae Cavanaugh +1 | 2 changes
public void ThenPersonalInformationIsDisplayedOnPersonalInfoTab(Table table)
{
    IList<dynamic> individuals = table.CreateDynamicSet().ToList();
    foreach (dynamic individual in individuals)
    {
        ConstituentPanel.SelectTab("Personal Info");
        individual.LastName += uniqueStamp;
        BaseComponent.GetEnabledElement(XpathHelper.XPath.VisiblePanel + string.Format("//span[contains(@id, '_FIRSTNAME_value') and ./text()='{}']", individual.FirstName));
        BaseComponent.GetEnabledElement(XpathHelper.XPath.VisiblePanel + string.Format
        BaseComponent.GetEnabledElement(XpathHelper.XPath.VisiblePanel + string.Format
        BaseComponent.GetEnabledElement(XpathHelper.XPath.VisiblePanel + string.Format
    }
}

[When(@"I add the address to the current individual")]
0 references | Rae Cavanaugh +1 | 2 changes
public void WhenIAddTheAddressToTheCurrentIndividual(Table table)
{
}
```



QuickWatch

Expression: individual.FirstName

Value:

Name	Value	Type
individual.FirstName	"Bob"	dynamic {string}

Buttons: Reevaluate, Add Watch

- (<https://www.nuget.org/packages/SpecFlow.Assist.Dynamic/>)

Blackbaud CRM UI XPath (3)

- XPath gets constructed as a string concatenating the following parts together:
 - XPathHelper.XPath.VisiblePanel (stuct in the SystemTest.Common)
 - `\"//div[contains(@class,'bbui-pages-contentcontainer') and not(contains(@class,'x-hide-display'))]\"`
 - String.format expression adding the incoming element “Bob” into the string expression
 - `Value = \"//span[contains(@id,'_FIRSTNAME_value') and ./text()='Bob']\"`
- Resulting XPath:
 - `\"//div[contains(@class,'bbui-pages-contentcontainer') and not(contains(@class,'x-hide-display'))]//span[contains(@id,'_FIRSTNAME_value') and ./text()='Bob']\"`

Blackbaud CRM UI xPath (4)

► Full xPath gets passed to Chrome:

Chrome is being controlled by automated test software.

Personal

First name: Bob

Middle name:

Last name: Prospect1512472393.61009

Title: Mr.

Suffix:

Nickname: Bobby

Marital status:

Birth date:

Title 2:

Suffix 2:

Gender: Male

Maiden name:

Gives anonymously: No

Website:

Name formats (0)

Aliases (0)

Elements

Console

Sources

Network

Performance

Memory

Application

Security

Audits

Styles

Computed

Event Listeners

Filter

element.style {

script {

display: none;

Inherited from

body#ext-gen3.bbui-skin-webshell

.bbui-skin- bbui-ext-jquery...78_bbcf.ashx:3

webshell, body.bbui-skin-webshell {

text-align: left;

padding: 1.5em;

margin: 0;

padding: 0;

html.ext-strict

body#ext-gen3.bbui-skin-webshell.ext-webkitext-chrome

script

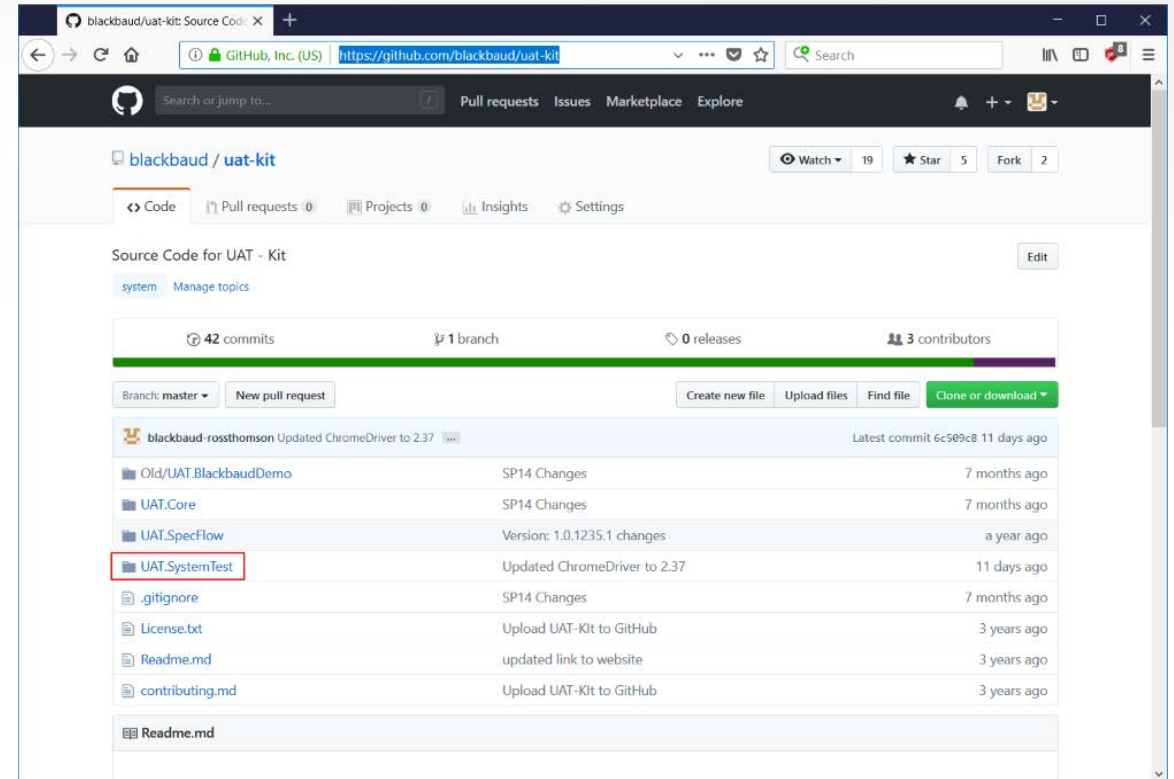
//div[contains(@class,'bbui-pages-contentcontainer') and not(contains(@class,'x-hide-display'))]/span[contains(@id,'_FIRSTNAME_value') and ./text()='Bob']

1 of 1

Cancel

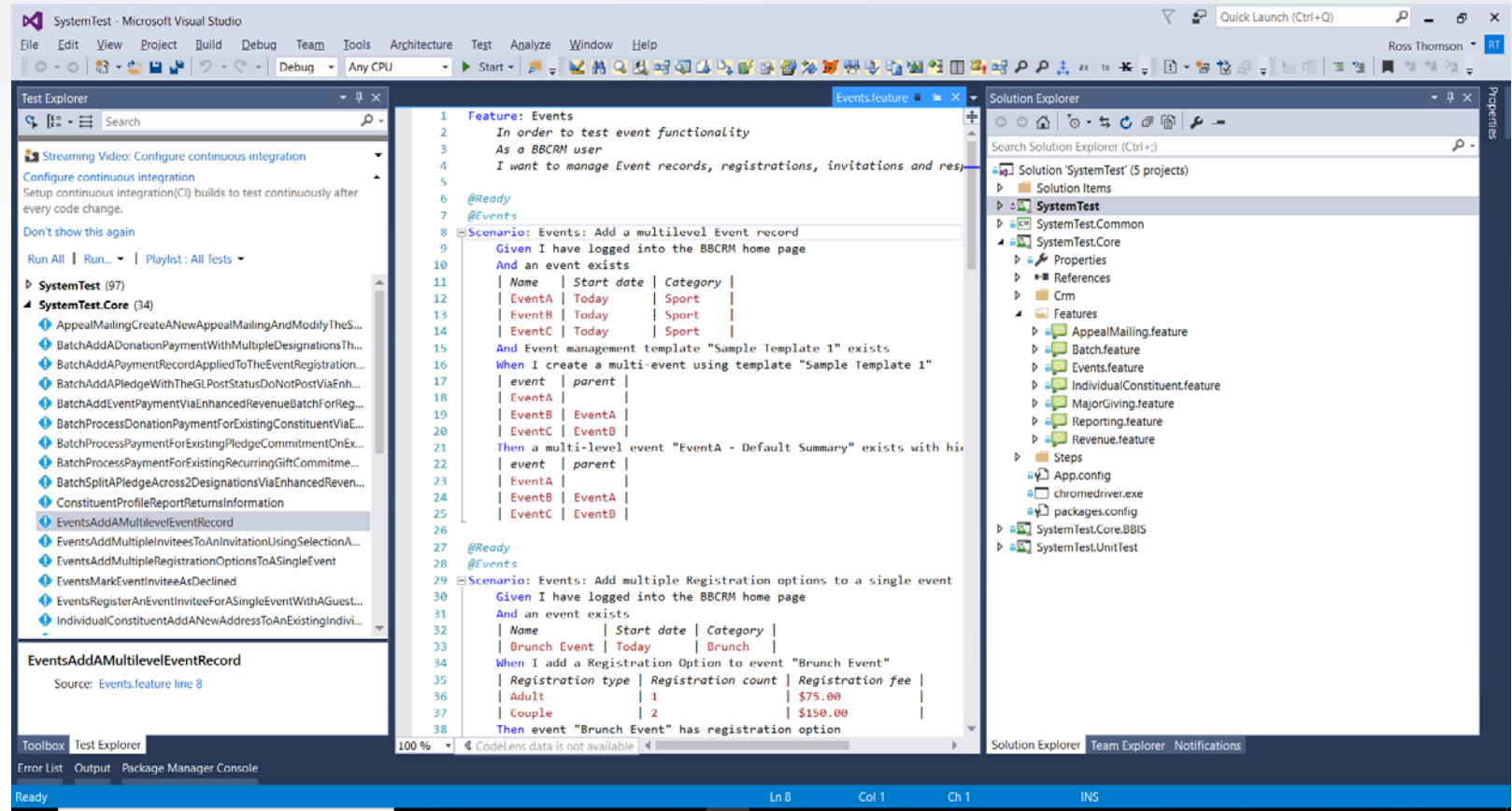
Blackbaud makes Charity's life easier

- Full code in GitHub for the Nugets - <https://github.com/blackbaud/uat-kit>
- Sample project with 33 tests in GitHub:
 - SystemTest.Core
- Lets get the tests!



Running tests!

- SystemTest.Core
- 2 changes we need to make to run:
 - URL for system under test
 - Credentials for SUT
- Let's see the XPath slides in action via breakpoint.
- Run an event test from cold



Resources

- Martin Fowler BDD description - <https://www.martinfowler.com/bliki/GivenWhenThen.html>
- Dan North home page: <https://dannorth.net/about/>
- Wikipedia BDD page: https://en.wikipedia.org/wiki/Behavior-driven_development
- Specflow, BDD for .Net: <http://specflow.org/>
- Selenium: <https://www.seleniumhq.org/projects/webdriver/>

Summary

- Do the same testing, in less time, spend more time on your mission
- New tools to learn – XPath, Gherkin, UAT kit
- Leverage the open source tests to get going – SystemTest.Core
- Roll your own tests for your customizations or bespoke solutions



Any Questions?

Thank you!



Further information or questions:

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