

Robot Framework: More than just automation

By Joshua Gorospe
Senior Test Engineer, Intersection

Introduction

I work at Intersection, a Sidewalk Labs, Alphabet owned company.

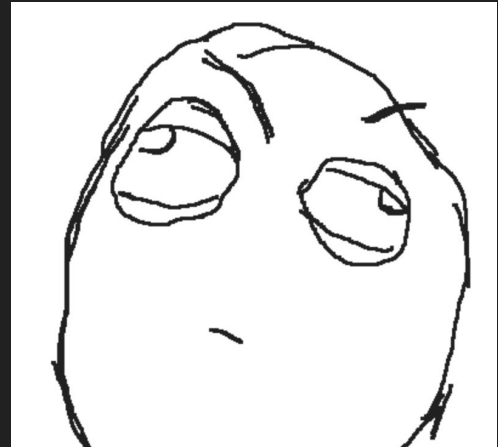
Delivers products such as. In the past, we provided client services for.

- Link Wifi Kiosks
 - New York
 - London... and more
- MTA On-The-Go Kiosks
 - Large telecom companies
 - Hudson Yards
 - Large retail companies
 - Large real estate companies



Automation alone is not enough...

Huh??? ...





Well...this...



Also...this...





Airport Digital Concierge

FRI 6:49PM

We've received an update for your flight


American Airlines #1621 arrived at Miami Intl (MIA) at 06:48PM EDT from LaGuardia (LGA)

Destination (Miami Intl / MIA): Gate D17

7:41AM

hi

Hello, welcome to LaGuardia Airport. Where are you going today? Enter airport code.



Airport Digi...

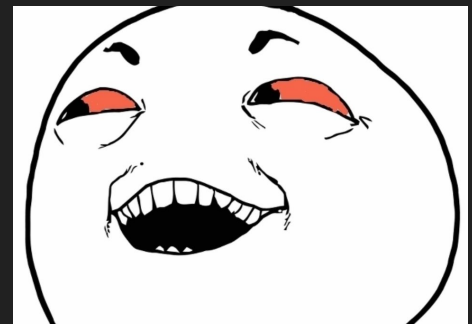
Options

- Search in Conversation
- Manage Messages
- Leave Feedback
- Notifications

Facebook Page

...and...

...conversational
agents.



Really quick story...

Roughly 8 months ago. I worked on a project that was supposed to be only a 2 month project ... it grew to become a 6 month project with **291 end-to-end test scenarios**... and there was only one tester...

The screenshot shows the TestRail web application interface. The browser address bar displays the URL: `https://intersection.testrail.com/index.php?/suites/view/889&group_by=cases:section_id&group_order=asc`. The page title is "Test Cases - TestRail". The navigation bar includes links for "Return to Dashboard", "Working On", "Joshua Gorospe", "Help & Feedback", and "Administration". The main content area is titled "Test Cases" and shows a list of 277 test cases. A callout box on the right side of the interface indicates: "Contains 1 section and 291 cases. Edit description".

ID	Title
C429732	Yardarm Project Test Scenario - 2018: (VMS STYLN - 10 HY Project - February 2018) Query Visitor Management Service API and validate returned JSON for the default 10...
C429733	Yardarm Project Test Scenario - 2018: (VMS STYLN - 10 HY Project - February 2018) Check the integrations with Proxyclick and the Visitor Management Service for the de...
C429734	Yardarm Project Test Scenario - 2018: (VMS STYLN - 10 HY Project - February 2018) Check the latency of all the Proxyclick and Visitor Management Service integrations w...
C1039303	Yardarm Project Test Scenario - 2018: (55 HY VMS - September 2018) New 55HY URL Query Visitor Management Service API and validate returned JSON
C1039305	Yardarm Project Test Scenario - 2018: (55 HY VMS - September 2018) New 55HY URL Check the integrations with Proxyclick and the Visitor Management Service
C1039302	Yardarm Project Test Scenario - 2018: (55 HY VMS - September 2018) New 10HY URL Query Visitor Management Service API and validate returned JSON
C1039304	Yardarm Project Test Scenario - 2018: (55 HY VMS - September 2018) New 10HY URL Check the integrations with Proxyclick and the Visitor Management Service
C460009	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Guest Management - Provides requirements for managing guest registration and keys within the Servi...
C460011	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Rentable Items - Reviewing and leasing items available for rent, such as bike lockers or storage rooms
C460012	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Notifications - Setting notifications preferences, events that trigger notifications and notification display
C460013	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Payments - Viewing charges, setting up payment methods and autopay, and submitting one time pay...
C460014	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Space Reservations - Reviewing and reserving spaces available for rent, such as party rooms or BBQ ...
C460015	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Marketing Preferences - Setting marketing preferences via application
C460016	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Packages - Display Packages List of delivered packages assigned to current user
C473253	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Packages - Display Drop Off List of outside party pick ups
C488116	Yardarm Project Test Scenario - 2018: (MIM Residential Application) Packages - Update Package Preferences through application UI
C460006	Yardarm Project Test Scenario - 2018: (MIM Residential Application) User Profiles - Create the user's profile and check for a new Okta profile
C473215	Yardarm Project Test Scenario - 2018: (MIM Residential Application) User Profiles - Move the user's profile from Prospect to the Tenant User Group by updating a record in...
C473247	Yardarm Project Test Scenario - 2018: (MIM Residential Application) User Profiles - Email credentials to the new user (resident) of the account
C473248	Yardarm Project Test Scenario - 2018: (MIM Residential Application) User Profiles - Email Credentials to an existing user (resident)
C473249	Yardarm Project Test Scenario - 2018: (MIM Residential Application) User Profiles - Associate users and group profiles by unit

... I could only automate 1/4th of it.

For this specific project.

If I had focused ONLY on creating automation for 291 TestRail test scenarios, during all of those sprints...

A lot of the testing would NOT get done.

I needed flexibility and freedom to rapidly search for bugs... so I set up a hybrid manual-automated approach and combined it with other tools. For example I used git log to identify bug hotspots, and generated bug prediction scores for each commit using a machine learning tool called GitRisky.

The screenshot displays a workflow for bug prediction and manual testing. On the left, a terminal window shows the output of the Bug Prediction Machine Learning Model for two different Git commits. The first commit (135f58f) has a bug score of 0.0 / 1.0, while the second commit (100b6dc) has a score of 0.2 / 1.0. The terminal also shows the commit history and the files changed in each commit.

In the center, a 'Robot Framework' dialog box titled 'MANUAL EXPLORATORY TEST 1 - WHEELHOUSE' is open. It contains instructions on how to use the Bug Prediction Hotspot descriptions and the risk analysis Bug Score to perform a deep exploratory test and investigation of the Airport Concierge Bot's greeting and response capabilities. The dialog box includes a 'PASS' button and a 'FAIL' button.

On the right, a Messenger chat interface is shown, representing the 'Airport Digital Concierge' bot. The chat history shows a message from the bot: 'We've received an update for your flight American Airlines #1621 arrived at Miami Intl (MIA) at 06:48PM EDT from LaGuardia (LGA). Destination (Miami Intl / MIA): Gate D17'. The user has responded with 'hi', and the bot has responded with 'Hello, welcome to LaGuardia Airport. Where are you going today? Enter airport code.'

Please provide a Testrail test scenario ID number for this testing session.

TESTRAIL TEST SCENARIO ID NUMBERS ONLY PLEASE.

Do not include the C (for example C12345) in the text box field, or this test will fail.

536736

OKCancel

cxcomm-normalizers Bug Prediction Machine Learning Model is creating : 04fb794 -----

Commit 04fb794 has a bug score of 0.2 / 1.0

commit 04fb7944537d3b797b7ecd1d3bed21ac15d2883

Date: Tue May 29 13:54:20 2018 -0400

Adding imageUri to home expert

normalizers/yardi/1.0-rev-m4/conf/mim.conf | 5 +++

.../yardi/1.0-rev-m4/service/PlaceEntitiesRetrievedNormalizer.scala | 3 +++

2 files changed, 5 insertions(+), 3 deletions(-)

End Of cxcomm-normalizers

This container finished running on Mon Jun 18 18:05:29 UTC 2018

The following four required fields must be filled out before continuing the test

[1] Please provide a Yardarm Test Environment (Dev, QA, or Staging) for this test

[2] Please provide a Yardarm Buildkite esb-build Pipeline Build number for this test

[3] Please provide a Yardarm Buildkite esb-deploy Pipeline Build number for this test

[4] Please provide your first name: Joshua

Securehttps://intersection-kb.atlassian.net/browse...YAR-211

YAR Sprint 4 ends 03/Jul/18

Completed sprint:

YAR Sprint 3 ended 19/Jun/18

View on Board

TestRail: Cases

C536736 Sprint -> Enroll user in Autopay for a given bill

Project: ICS - Yardarm

Add Test Case

Please provide a Jira task ID number for this testing session.

JIRA ID NUMBERS ONLY PLEASE.

Only enter numbers into the text box field, or this test will fail.

211

OKCancel

Yardwork / YAR-211

Enroll user in Autopay

Type: Task

Priority: High

Labels: None

Epic Link: Payment

Sprint: YAR Sprint

Anypoint Management Center

Runtime Manager

QA

yardarm-mim-qa

Live Console

Deploy

Today

17:43:06.768 07/05/2018 Worker-0 ActiveMQ Session Task-17 WARN

No handler configured for eventType train-schedule-retrieved

17:53:11.223 07/05/2018 Worker-0 ActiveMQ Session Task-18 WARN

No handler configured for eventType train-schedule-retrieved

17:53:11.223 07/05/2018 Worker-0 ActiveMQ Session Task-18 INFO

Received JMS message: {"body":{"timestamp":1530827591199,"data":[{"rowCrtDtm":"2018-07-05T21:53:11.139742","startDtm":"2018-07-05T21:53:11.084","rowCrtBy":"current_user"}]}

Store Values For Report Stamps \${TESTRAIL} \${JIRA}

Take Screenshot

MANUAL FUNCTIONAL TESTRAIL TEST - YARDARM MIM : Read the Testrail test scenario description and referenced Jira tasks. Use the Bug Prediction Hotspot descriptions and the risk analysis Bug Score provided by the Su

Take Screenshot

Execute Manual Test

MANUAL FUNCTIONAL TESTRAIL TEST \${TESTRAIL} - YARDARM MIM : Read the Testrail test scenario \${TESTRAIL} description and referenced Jira tasks. --> https://intersection.testrail.c

are ready to move on, please press PASS or FAIL and be prepared to enter notes into the Robot Framework Dialog Box.

MANUAL FUNCTIONAL TESTRAIL TEST \${TESTRAIL} - DETAILED NOTES - YARDARM MIM : Please provide the Mule request type (GET, POST etc.), a full Mule endpoint URL, Active

dev.cloudhub.io/api/users/fb4@gmail.qqq, Event Store Streams = normalized-api-person-entity-request-processed

Should Not Be Empty \${value}

Log \${value}

[Tags] TESTRAILID:\${TESTRAIL} Yardarm_MIM_Manual_Functional_Test Yardarm_MIM_End_To_End_Functional_Test

*** Keywords ***

Store Values For Report Stamps

[Arguments] \${TESTRAIL} \${JIRA}

Yardarm Master Identity Management Platform Processes | FAIL |

2 critical tests, 1 passed, 1 failed
2 tests total, 1 passed, 1 failed

```
=====
Output: /Users/joshuagorospes/Yardarm/cxcomm-test-automation_current-work-in-progress/Human-
Controlled_Manual_Testrail_Test_Run_Loops_With_Bug_Prediction_Machine_Learning/Results/Test-
Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3/Joshua-Date_07-05-2018_Time_1759-
1530827978-Iteration-3-functional_test_output.xml
Output: /Users/joshuagorospes/Yardarm/cxcomm-test-automation_current-work-in-progress/Human-
Controlled_Manual_Testrail_Test_Run_Loops_With_Bug_Prediction_Machine_Learning/Results/Test-
Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3/Joshua-Date_07-05-2018_Time_1759-
1530827978-Iteration-3-functional_test_output.xml
Log: /Users/joshuagorospes/Yardarm/cxcomm-test-automation_current-work-in-progress/Human-
Controlled_Manual_Testrail_Test_Run_Loops_With_Bug_Prediction_Machine_Learning/Results/Test-
Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3/Joshua-Date_07-05-2018_Time_1759-
1530827978-Iteration-3-log.html
The Robot_Framework_Results_TestRail_Integration tools are uploading the results of this man-
ual exploratory session to the following TestRail project.
--> https://intersection.testrail.com/index.php/projects/overview/45
upload: Results/Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3/Joshua-Date_
07-05-2018_Time_1759-1530827978-Iteration-3-functional_test_output.xml to s3://yardarm-func-
tional-test-results/Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3/Joshua-
Date_07-05-2018_Time_1759-1530827978-Iteration-3-functional_test_output.xml
upload: Results/Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-1/Joshua-Date_
07-05-2018_Time_1759-1530827978-Iteration-1-log.html to s3://yardarm-functional-test-result-
s/Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-1/Joshua-Date_07-05-2018_Ti-
me_1759-1530827978-Iteration-1-log.html
upload: Results/Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3/Joshua-Date_
07-05-2018_Time_1759-1530827978-Iteration-3-log.html to s3://yardarm-functional-test-result-
s/Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3/Joshua-Date_07-05-2018_Ti-
me_1759-1530827978-Iteration-3-log.html
```

Joshua tested Yardarm MIM Jira Task 212 in the QA environment -- The Testrail Test Scenario in this test run traces back to esb-build Buildkite Build 37 and esb-deploy Buildkite Build 30 -- Test Log

Test Statistics

Total Statistics	Total Statistics	Total	Pass	Fail
Critical Tests	Critical Tests	2	1	1
All Tests	All Tests	2	1	1
Statistics by Tag				
CID:536736	CID:536737	1	0	1
Yardarm_MIM_End_To_End_Functional_Test	Yardarm_MIM_End_To_End_Functional_Test	1	0	1
Yardarm_MIM_Manual_Functional_Test	Yardarm_MIM_Manual_Functional_Test	1	0	1
Statistics by Suite				

Name

- Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-1
 - Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-1-functional_test_output.xml
 - Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-1-log.html
 - screenshot_1.jpg
 - screenshot_2.jpg
 - screenshot_3.jpg
- Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-2
 - Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-2-functional_test_output.xml
 - Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-2-log.html
 - screenshot_1.jpg
 - screenshot_2.jpg
 - screenshot_3.jpg
- Test_Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3
 - Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3-functional_test_output.xml
 - Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-3-log.html
 - screenshot_2.jpg

Take Screenshot

00:00:00.154

Takes a screenshot in JPEG format and embeds it into the log file.

20180705 18:07:55.109 / 20180705 18:07:55.263 / 00:00:00.154

INFO

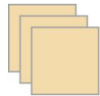
```
Python File Edit Window Help
Human_Controlled_Manual_Testrail_Test_Run_Loops_With_Bug_Prediction_Machine_Learning
[1] Please provide a Yardarm Test Environment (Dev, QA, or Staging) for this test
[2] Please provide a Yardarm Buildkite esb-build Pipeline Build number for the test
[3] Please provide a Yardarm Buildkite esb-deploy Pipeline Build number for the test
[4] Please provide your first name: Joshua
[5] Please provide the number amount (enter ONLY numerical digits) of Testrail
controls how many times this test tool runs: 3
=====
Yardarm Master Identity Management Platform Processes
Yardarm Master Identity Management Platform Processes | FAIL |
MANUAL FUNCTIONAL TEST SETUP - YARDARM MIM : Set up the MIM QA Env... | PASS |
MANUAL FUNCTIONAL TEST SETUP - YARDARM MIM : Read the Testrail ... | FAIL |
Please provide precise details about the failure you found. After this test run
to a Yardarm MIM Jira Bug.
Yardarm Master Identity Management Platform Processes
2 critical tests, 1 passed, 1 failed
2 tests total, 1 passed, 1 failed
=====
Output: /Users/joshuagorospes/Yardarm/cxcomm-test-automation_current-work-in-
progress/Human-
Controlled_Manual_Testrail_Test_Run_Loops_With_Bug_Prediction_Machine_Learning/Results/Test-
Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-1-functional_test_output.xml
Log: /Users/joshuagorospes/Yardarm/cxcomm-test-automation_current-work-in-
progress/Human-
Controlled_Manual_Testrail_Test_Run_Loops_With_Bug_Prediction_Machine_Learning/Results/Test-
Run_Joshua-Date_07-05-2018_Time_1759-1530827978-Iteration-1-log.html
The Robot_Framework_Results_TestRail_Integration tools are uploading the result
of this manual exploratory session to the following TestRail project.
--> https://intersection.testrail.com/index.php/projects/overview/45
=====
Yardarm Master Identity Management Platform Processes
Yardarm Master Identity Management Platform Processes | FAIL |
MANUAL FUNCTIONAL TEST SETUP - YARDARM MIM : Set up the MIM QA Env... | PASS |
MANUAL FUNCTIONAL TEST SETUP - YARDARM MIM : Read the Testrail ... | FAIL |
Please provide precise details about the failure you found. After this test run
to a Yardarm MIM Jira Bug.
```


ICS - Yardarm

[Overview](#)[Todo](#)[Milestones](#)[Test Runs & Results](#)[Test Cases](#)[Reports](#)

Test Runs & Results

Open

[Joshua Gorospe](#)

Hudson Yards QA Test Plan -- Version 2.0

By Joshua G. on 7/4/2017 | [Edit](#)

0 Pending, 0 Passed, 0 Failed, 0 Blocked, 0 Untested, 0 Retest and 0 Skipped.

Completion Pending



Hudson Yards QA Test Plan -- Version 1.1

By Joshua G. on 10/11/2016

Completed

«

[Thursday, July 05, 2018](#)

Joshua -- Yardarm MIM QA Environment -- 06:08 PM Test Run For Jira Task 58, esb-build Buildkite Build 37, and esb-deploy Buildkite Build 30

Joshua -- Yardarm MIM QA Environment -- 06:06 PM Test Run For Jira Task 212, esb-build Buildkite Build 37, and esb-deploy Buildkite Build 30

Joshua -- Yardarm MIM QA Environment -- 06:05 PM Test Run For Jira Task 211, esb-build Buildkite Build 37, and esb-deploy Buildkite Build 30

Yardarm Dev Environment -- Daily Scheduled TE Test Automation Run Has Completed

Raphael -- Yardarm MIM QA Environment -- 05:46 Test Run For Jira Task 252, esb-build Buildkite Build 21, and esb-deploy Buildkite Build 28

Raphael -- Yardarm MIM QA Environment -- 04:02 Test Run For Jira Task 287, esb-build Buildkite Build 21, and esb-deploy Buildkite Build 28

Yardarm Dev Environment -- Daily Scheduled TE Test Automation Run Has Completed

Robot Framework is the core of the CXComm TestRail + Jira test reporting process. It was a part of the success of my project.

CXComm
= Intersection's
Connected
Communities
Team

Return to Dashboard

Yardarm

Overview Todo Milestones Test Runs & Results Test Cases Reports

C475119 Edit Test Case

Title *
Yardarm Project Test Scenario - 2018: (MIM Platform) User Profiles - Check that the Mule Integration Poller gets new user profiles and check Okta for those new users

Section *	Template *	Type *	Priority *
Test Cases	Test Case	Functional	5 - Must Test

Estimate	Milestone	References	Automation Type
		YAR-18, YAR-19, YAR-20, YAR-21, YAR-22	

TestRail: Results
Tuesday, June 05, 2018
T544782 Yardarm Project Test Scenario - 2018: (MIM Platform) Service Requests - Check the response of the Service Request API after sending a POST request to create a new service request
PASSED

Attachments
Drop files to attach, or browse.

Activity
All Comments Work log History Activity Zendesk Support

Joshua Gorospe added a comment - 31/May/18 4:17 PM

Testing Notes:
Evan Frohlich
Would it be faster to test this through the API or sending data to ActiveMQ (which queue should it go to)? Which Event Store streams does this generate?

Joshua Gorospe added a comment - 31/May/18 5:40 PM - edited

Testing Notes:
According to Evan. I could get any raw message and send it to ActiveMQ. Change "raw event ID" and "raw event type", then the Event Store streams can be generated.
Also I could send a create Service Request to the endpoint (POST) etc.
As of now, most of the Service Requests API tickets are still in the Review column.

Agile
Active sprint: YAR Sprint 3 ends 19/Jun/18
Completed sprint: YAR Sprint 2 ended 05/Jun/18
View on Board

TestRail: Cases
C496847 Yardarm Project Test Scenario - 2018: (MIM Platform) Service Requests - Check the response of the Service Request API after sending a POST request to create a new service request
Project: Yardarm
Related: YAR-01
Add Test Case

Robot Framework helped quickly bridge gaps in the CXComm test process.

It also helped developers on my team jump in, quickly get focused, learn how to think like a tester, and assist me with hunting down bugs.

If you want to see the code for a Session-based Test variation of this hybrid approach.

<https://github.com/jg8481/Robot-Framework-Lone-Tester-Strategies-RoboCon-2019>

^ This link is also posted in the robocon Slack channel.

...(off-topic I also have Robot + Graphwalker + Docker model-based test examples in there as well)

In the not-so-near future...

I personally believe that a variation of this approach + **session-based test management combined with RPA** could be even more effective.

In the near future.

I want to explore Jupyter Notebook robotkernel (great idea Asko and Nicholas!). Possibly re-do my approach utilizing that, and combine it with Graphwalker (model-based test tool) and GitRisky. I wrote a Medium article describing some ideas I have about **tests that learn from the tester, past test results, and generates Graphwalker paths for parallel running model-based tests in Docker**.

<https://ixn.intersection.com/continuous-learning-to-guide-testing-decisions-a69ee295c1fd>

^ This link is also in the robocon Slack channel.

Thank you Robot Framework community.

Meetup Organizers,
we should meet up later
let's take a group photo.