



## **W4**

Test Analytics, AI/ ML  
Wednesday, May 2nd, 2018  
11:30 AM

# **AI-Driven Testing as a Service: Fad, Fiction, or Future?**

Presented by:

**Tariq King**

Ultimate Software

Brought to you by:

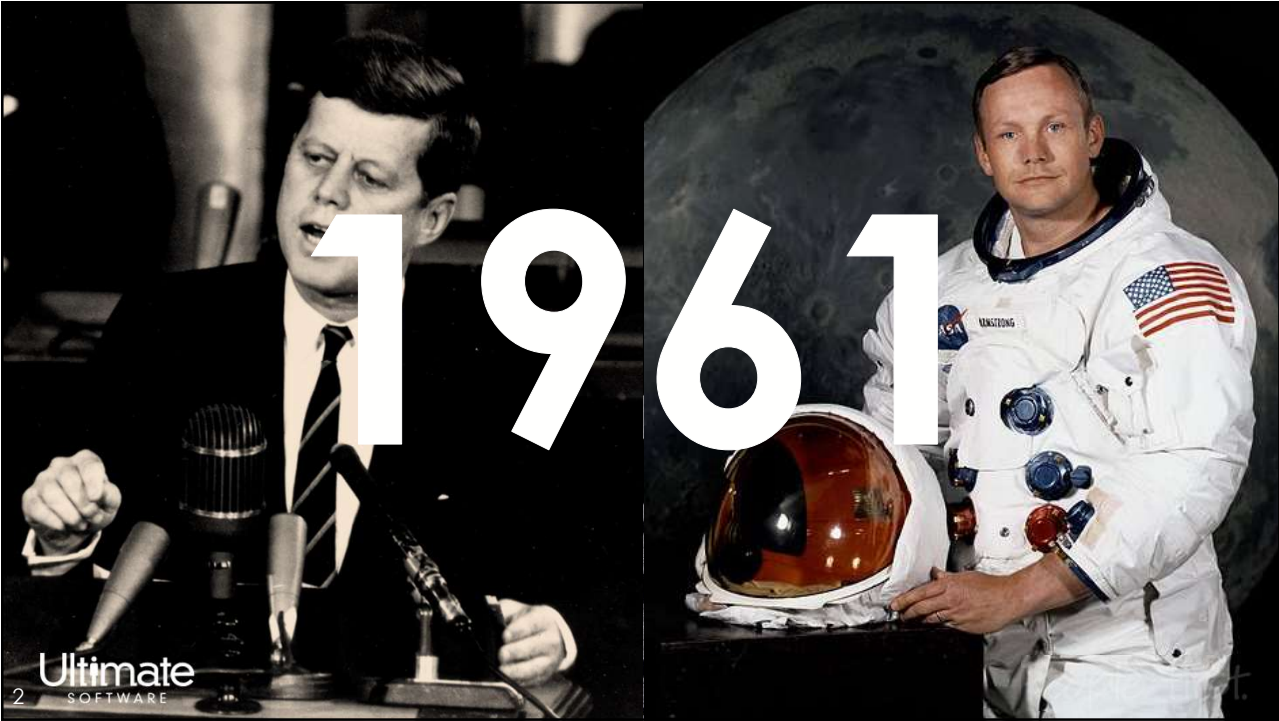


350 Corporate Way, Suite 400, Orange Park, FL 32073  
888-268-8770 · 904-278-0524 - [info@techwell.com](mailto:info@techwell.com) - <http://www.stareast.techwell.com/>

# Tariq King

## Ultimate Software

Tariq King is the director of quality engineering at Ultimate Software. With more than fifteen years of experience in software testing research and practice, Tariq provides technical leadership, people leadership, strategic direction, and staff training in software quality and test engineering. He has previously held positions of test manager, test architect, test lead, researcher, and college professor. Tariq is a frequent presenter at conferences and workshops, has published more than thirty research articles in IEEE and ACM sponsored journals, and has developed and taught software testing courses in both industry and academia. Contact Tariq via LinkedIn.





RIGHT-TO-LEFT  
THINKING

3 Ultimate  
SOFTWARE

*People first.*



2015

4 Ultimate  
SOFTWARE

*People first.*



# BACK TO THE FUTURE

Doc in January 2018 the quality, speed, and user experience of **UtiPro** is amazing!

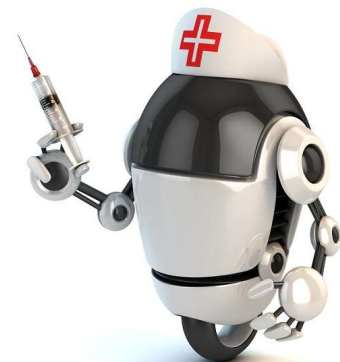
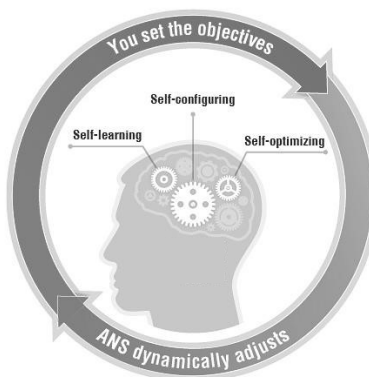


I wonder how they did it... Marty go back to **2017** and look at the state of **Product Development**.

5 Ultimate SOFTWARE

## Self-Healing and Self-Testing

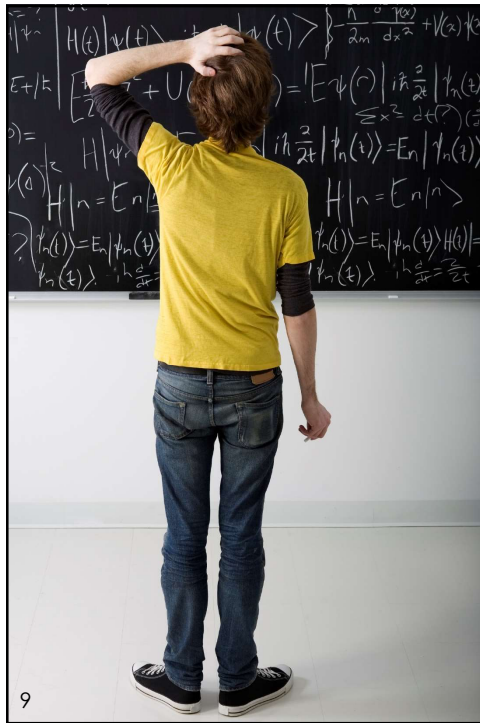
Failure Recovery and Built-In Self-Checks.



6 Ultimate SOFTWARE

People first.

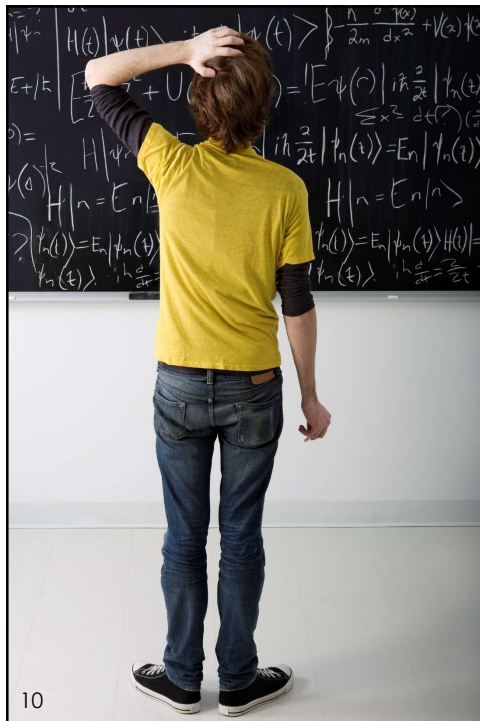




# TESTING IS HARD

ESPECIALLY AT SCALE

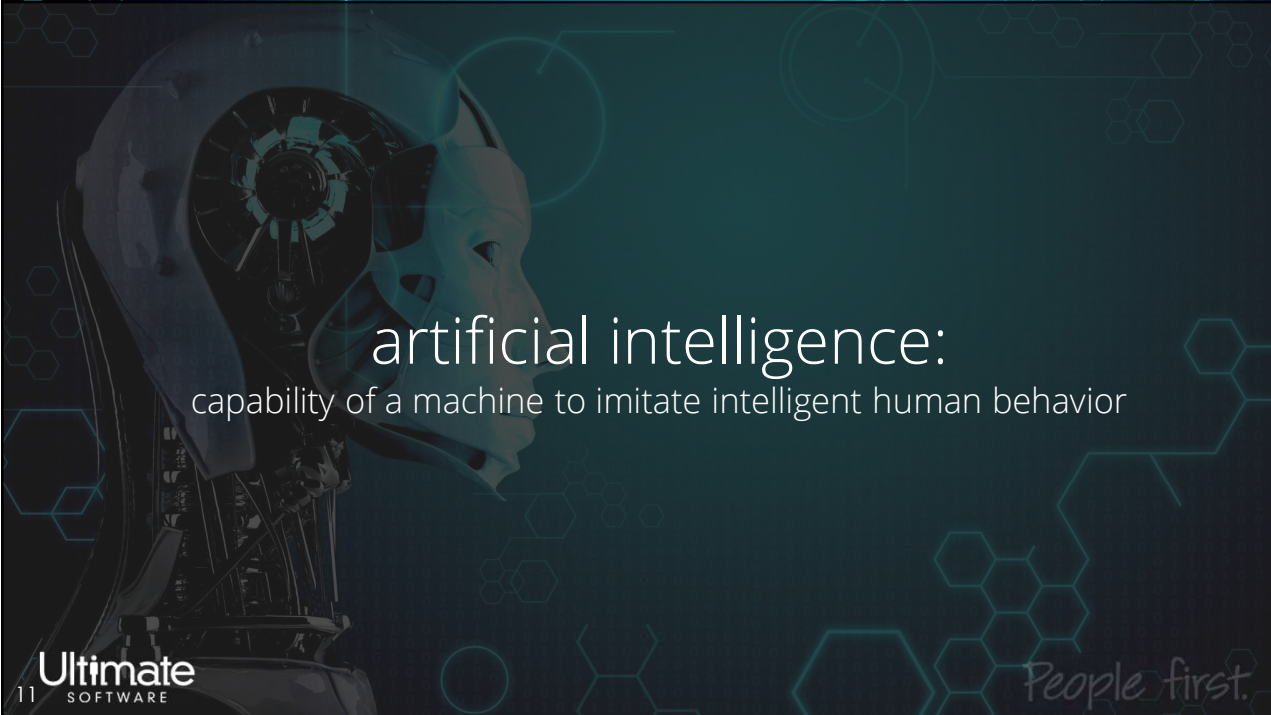
*People first.*



**30** teams  
**500** people  
**300** engineers  
**100** testers  
**20M** lines of code  
**300K** documented tests  
**280K** automated tests  
**CONTINUOUSLY**

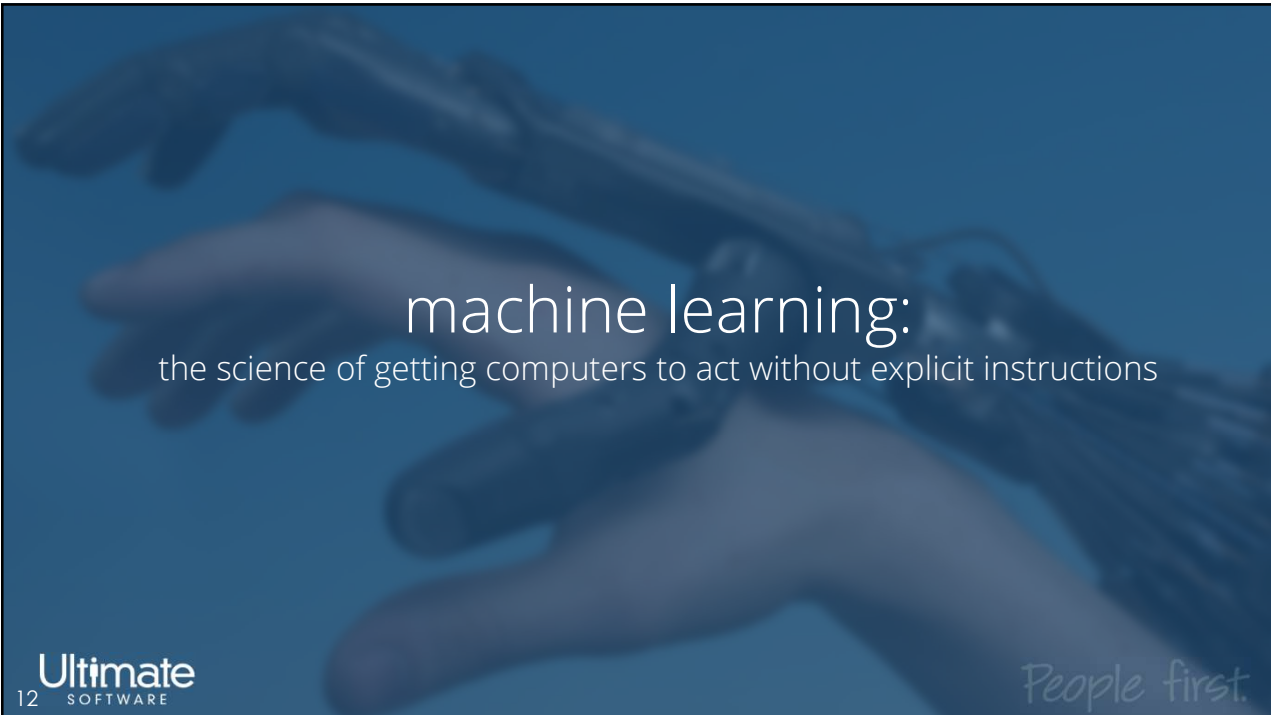
*People first.*





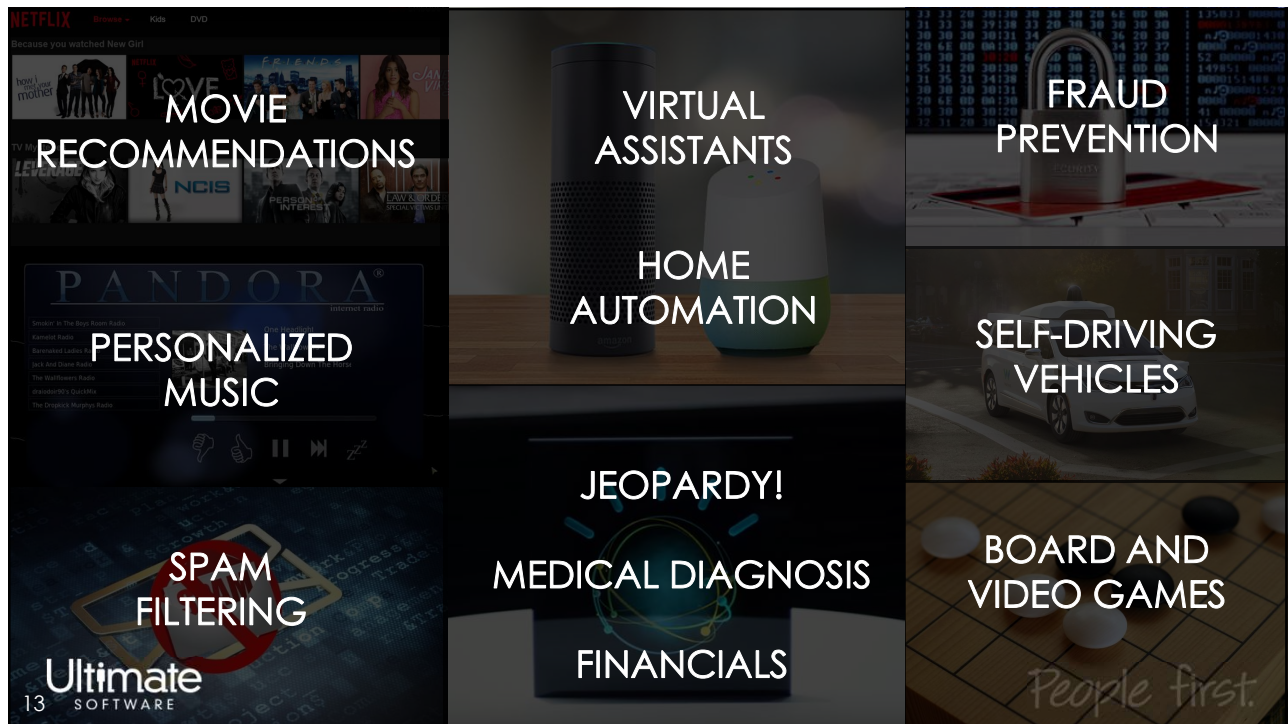
artificial intelligence:  
capability of a machine to imitate intelligent human behavior

11 Ultimate SOFTWARE People first.

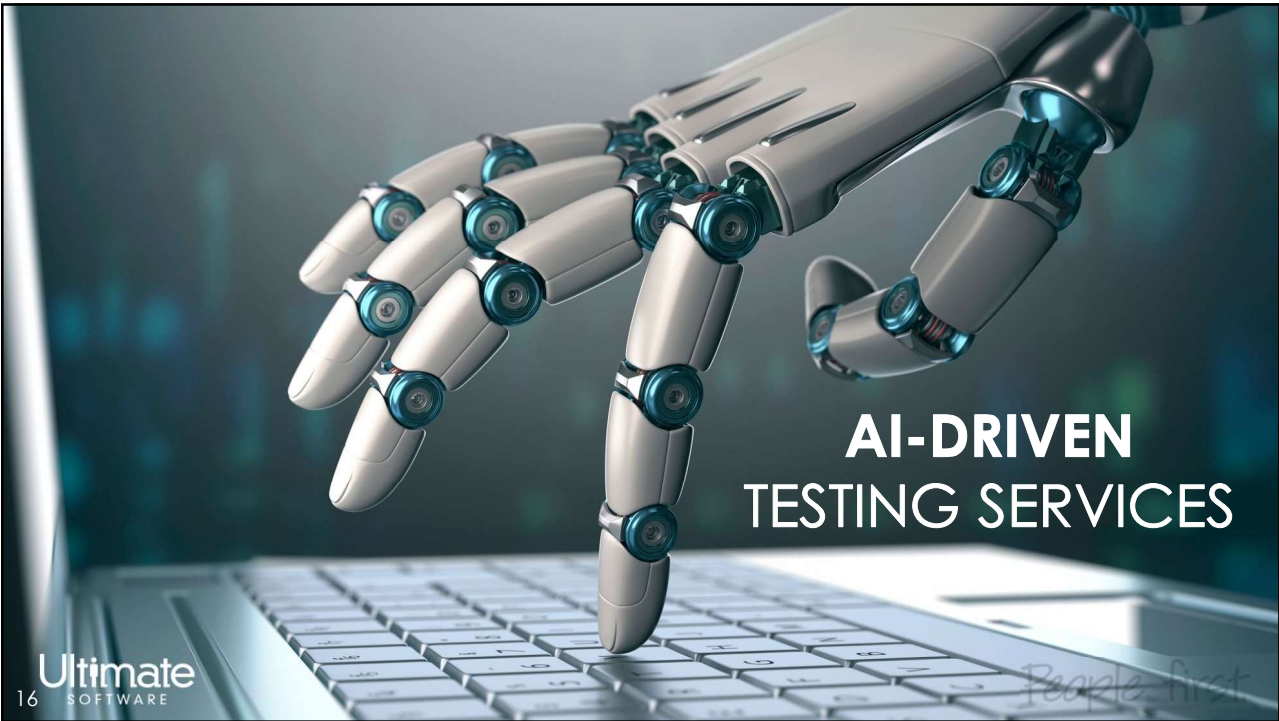


machine learning:  
the science of getting computers to act without explicit instructions

12 Ultimate SOFTWARE People first.







functionize      testrigor      SOFY.AI      APPDIFF

appachhi      UNRAVEL

Ultimate  
17 SOFTWARE

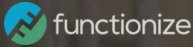
People first.

Ultimate  
18 SOFTWARE

People first.

<b>CLAIMS</b>	<b>FEATURES</b>	<b>KNOWLEDGE</b>	<b>PEOPLE</b>
			
Explicit Precise Realistic	Functional General Purpose Innovative	Domain Implementation Challenges	Clients Staff Members Investors


*People first.*



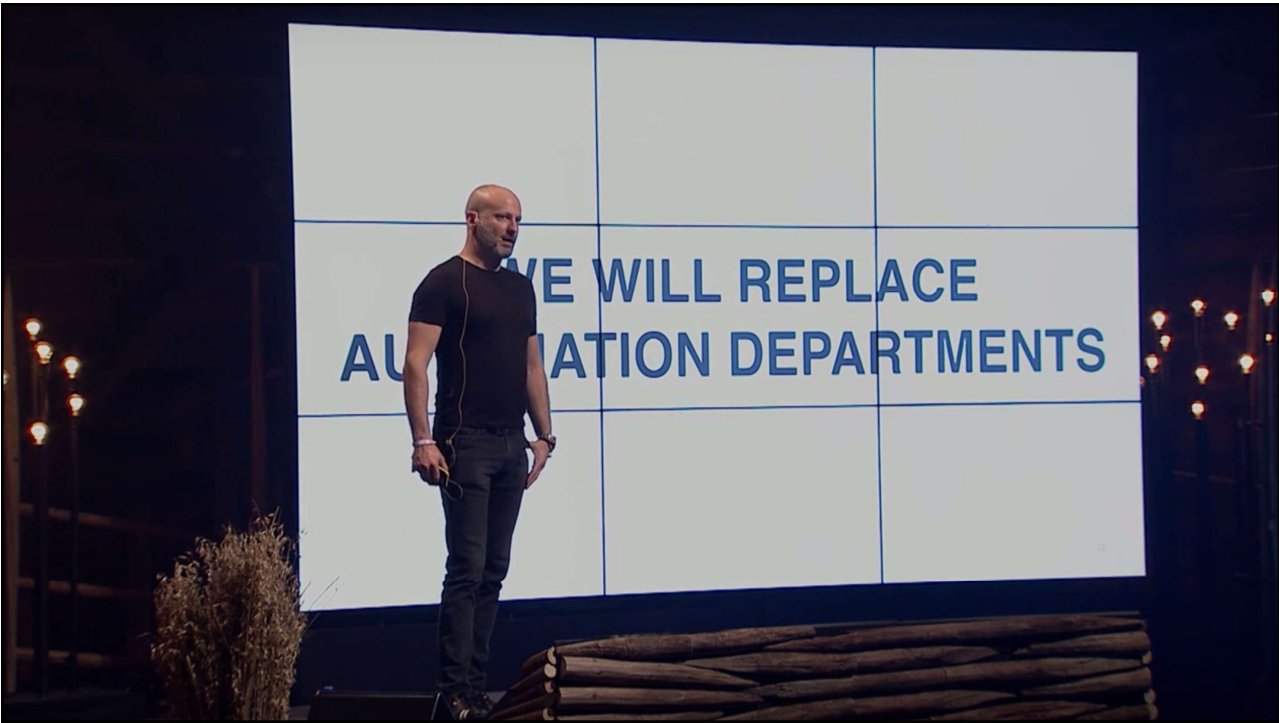
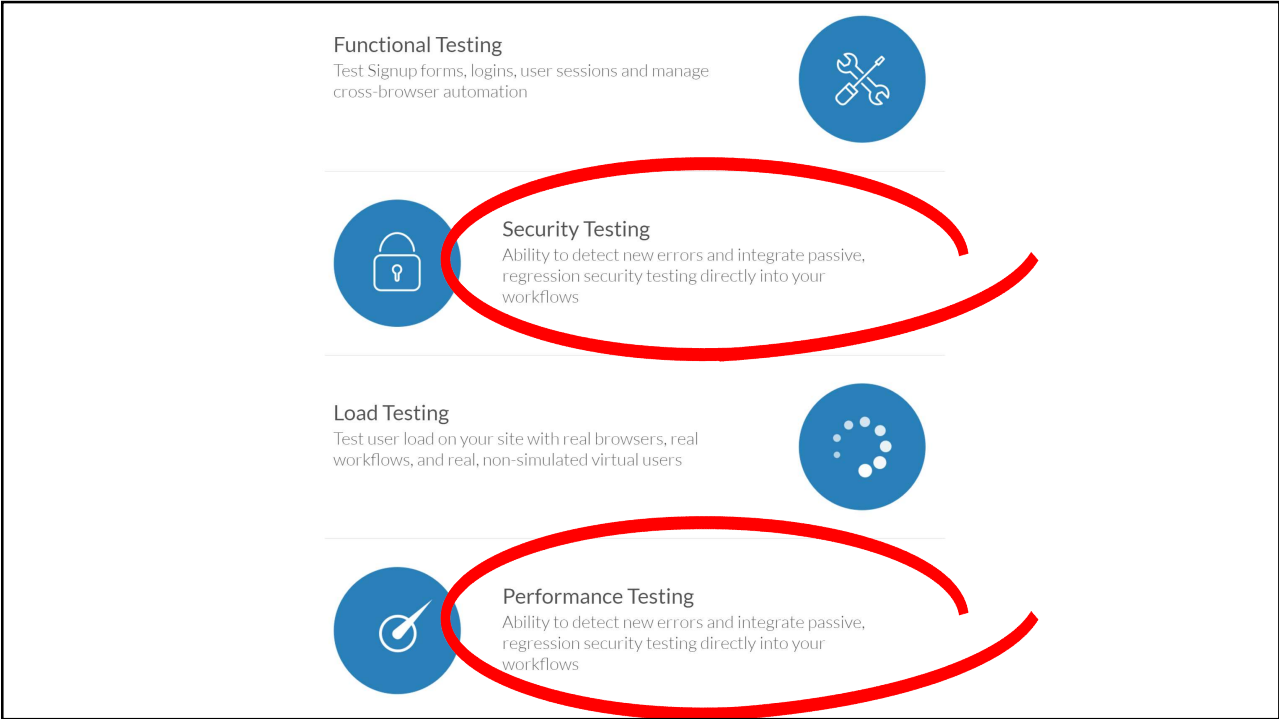
[Blog](#) [About Us](#) [Sign in](#) [Learn More](#)

## THE POWER OF AI-DRIVEN SOFTWARE TESTING AUTOMATION

Functionize is end-to-end testing automation as a service. Create cross-browser, cross-device tests that run on the cloud in minutes.

[Learn More](#)

COMPLETE COVERAGE IN A SINGLE CLOUD PLATFORM



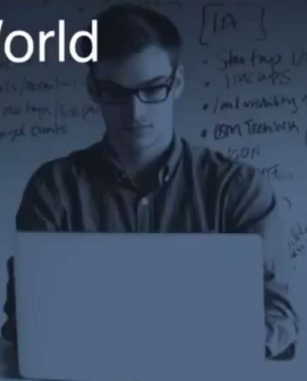




# What We Expect From the Smartest Testing Application in the World

HUSTEF  
24-25 October 2016

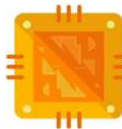
Ray Grieselhuber  
Co-Founder & COO  
Functionize, Inc.



## KEY TECHNOLOGIES USED



Test cases captured / curated in advanced browser plugin



Analysis engine learns the application

- Neural nets
- Apache Spark
- Cassandra



Tests are executed on cloud infrastructure





# INVESTMENT



TOTAL  
\$688K

Unknown Investor



FUNDING DATE

ROUND

AMOUNT

August 2016

Debt

\$688K

Source: **Owler** 




testrigor Blog Sign in Register Free

# 100% Coding-Free Autonomous Tests


How does it work? We save the state of your mobile app or website, and compare it to a previous version with new one to auto-detect issues using known issue patterns.

Register now to start using free version →




**Accelerate Releases**

Reduce time spent on regression testing through TestRigor.



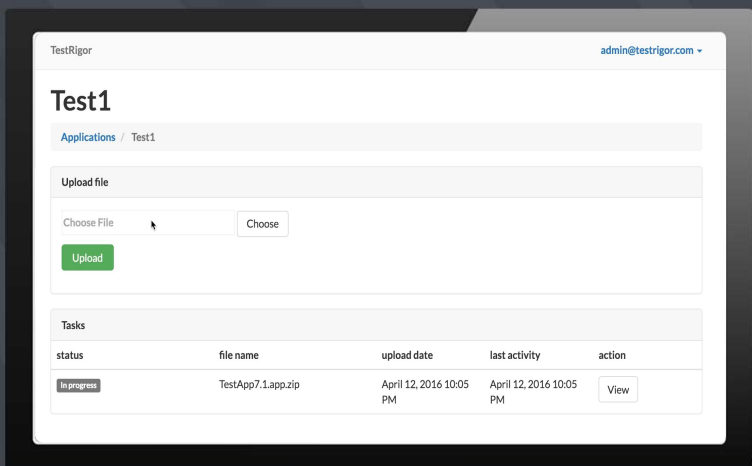
**All Combinations**

Test all screens and every input combination possible using TestRigor Bots, not just the ones you have time for.



**Improve Regression Coverage to 100%**

Increase coverage and eliminate production bugs to provide better products and increase ROI!



The screenshot shows the TestRigor web interface. At the top, it says 'TestRigor' and 'admin@testrigor.com'. The main heading is 'Test1'. Below it, there's a breadcrumb 'Applications / Test1'. A section titled 'Upload file' contains a 'Choose File' button, a 'Choose' button, and an 'Upload' button. Below that is a 'Tasks' section with a table:

status	file name	upload date	last activity	action
In progress	TestApp7.1.app.zip	April 12, 2016 10:05 PM	April 12, 2016 10:05 PM	View

At the bottom left is the TestRigor logo, and at the bottom right is the source URL: <https://www.youtube.com/watch?v=leOFsQKhXH8>



# INVESTMENT

TOTAL

# ?

**SBIR · STTR**  
America's Seed Fund

Award Charts

Company currently does not have any award associated.

Award Listing

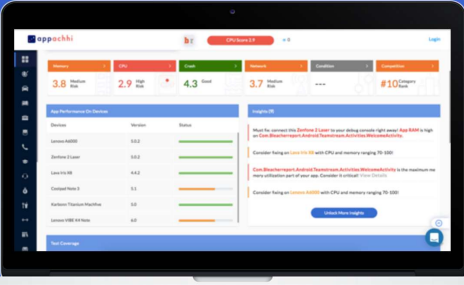
Company currently does not have any award associated.

Source: <https://www.sbir.gov/node/1202141>










appachhi Home Test Plans Blog

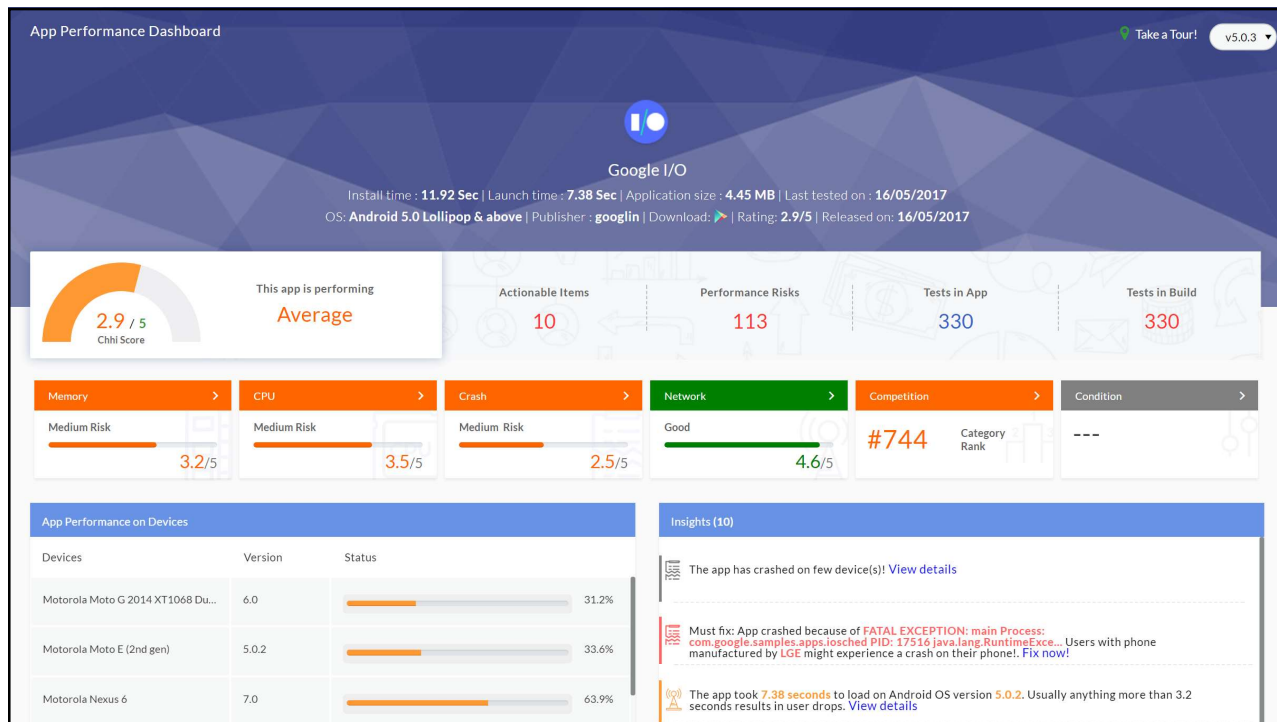
Get your App Performance & Functional Test Report in 14 Minutes!  
Reduce uninstalls affected by robustness

[Sample Reports](#)   [Test My App](#)



A.I. driven testing with real user conditions on real phones

<p>Functional Testing</p>  <p>Define flows or let the bot, flow</p>	<p>Network Testing</p>  <p>Impact across real networks</p>	<p>Memory Management</p>  <p>Test for high consumption</p>
<p>CPU Analysis</p>  <p>Test for CPU spikes</p>	<p>Fragmentation Testing</p>  <p>Test across manufacturers</p>	<p>Crash Finder</p>  <p>Threads that are threats</p>
<p>User Condition Testing</p>  <p>Get closer to real user testing</p>	<p>Regression Testing</p>  <p>Build consistency testing</p>	<p>Corner Case Testing</p>  <p>Flows that you didnt imagine</p>



### Test Coverage

Network: WiFi | 2G | 3G | 4G

Conditions: None | Intermittently Consume Ram During Test | Change Orientation During Test | Low RAM | Orientation | Varying RAM | Battery

Test Flows	Motorola Moto G 2014 XT1048 Dual 8GB	Motorola Moto E (2nd gen)	Motorola Nexus 6	Spice Mi-498 Dream Uno	OnePlus 2	Coolpad Note 3	Moto G (3rd Gen)	Karbonsn Titanium Machfive	LG Nexus 5X	YU Yuphoria
Install App	Success +	Success +	Success +	Success +	Success +	Success +	Success +	Success +	Success +	Success +
View My I/O S...	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Success +	Success +
View Schedule	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Success +	Success +
Read The Feed...	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Success +	Risk +
View Info	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Success +	Success +
Filter By Andr...	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Crash +	Success +
View Sessions ...	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Success +	Success +
Explore Travel ...	Risk +	Risk +	Risk +	Success +	Success +	Success +	Risk +	Success +	Success +	Success +
Clear All Filter ...	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Success +	Risk +
View About	Risk +	Risk +	Success +	Success +	Success +	Success +	Risk +	Success +	Success +	Success +

Competition Benchmark

This app is ranked **#744** in Books & Reference

739	740	741	742	743
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We are **AppAchi**. We have users in **175** cities.



"Our app is more robust in flows tested by AppAchi"

Swapnil Gupta - Founder - Riyaz App - 100K Downloads

Test My App

The image shows a world map with numerous small circular location pins scattered across various continents, primarily concentrated in North America, Europe, and South America. The map is light blue and white. Below the map is a dark blue banner with white text and a button.

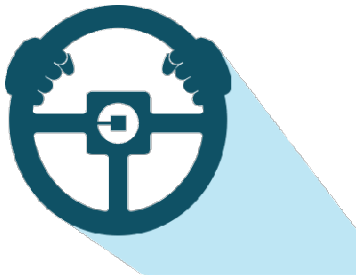


# INVESTMENT



TOTAL  
\$250K

Driving Uber



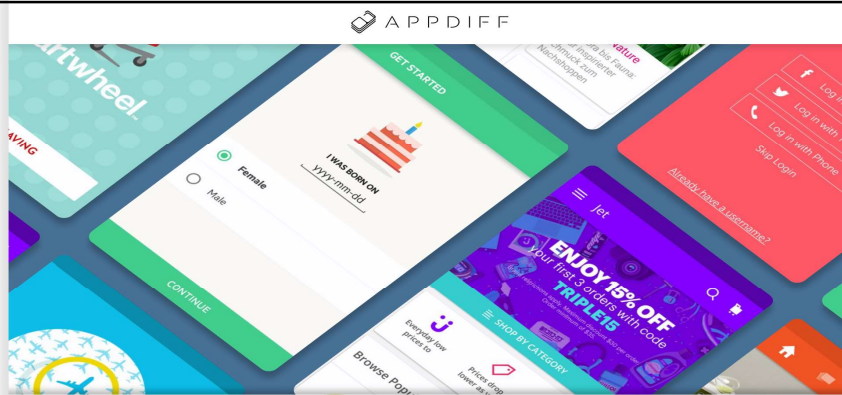
Family and Friends



 appachi



A P P D I F F



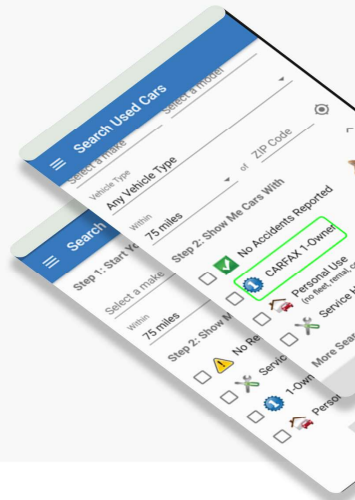
## Superpower your testing

The smartest and simplest way to test. Intelligent bots tap, type, and swipe through your mobile app while measuring performance and tracking the user experience. No setup, no code, just results in minutes.

Introducing the Application Diff

## The difference is the diff.

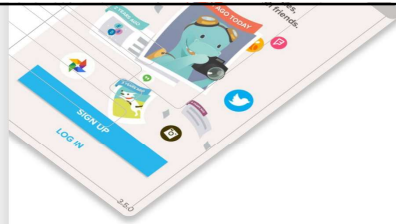
Agile development leaves mobile teams struggling to achieve adequate test coverage. The diff approach alerts you to regressions that appear, freeing you to focus on the changes that actually matter.



The Intelligent Test Bots

## Meet your newest testers.



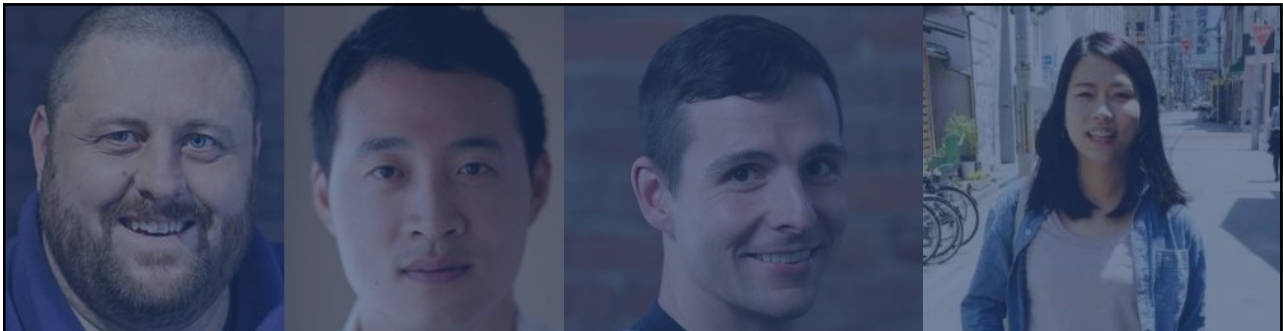
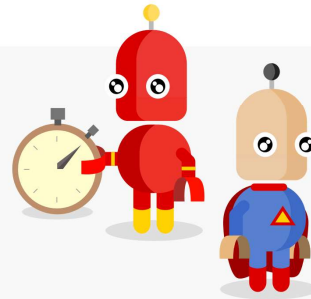


Appdiff's bots analyze your app's complete UX and performance profile. Inspect every path taken through your app, and benchmark your performance against the competition.

*Zero Code, Zero Infrastructure*

## No setup required.

Just upload your app and we'll send you results in minutes—it doesn't get any easier.

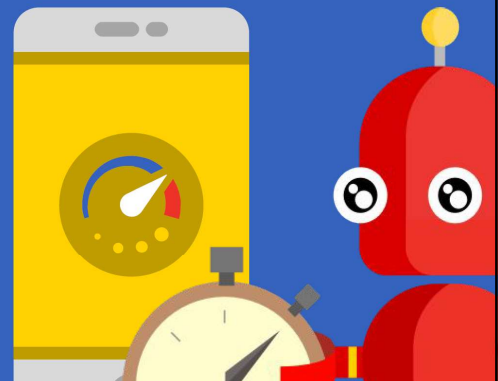


APPDIFF

STAR EAST


A TECHWELL EVENT

# AI and Machine Learning for Testers








# INVESTMENT




TOTAL

# \$5M

	FUNDING DATE	ROUND	AMOUNT
	September 2016	Seed	\$2.5M
	December 2015	Equity	\$2.5M

Source:  Owler





SOFY.AI PREVIEW

WHY SOFY? FEATURES HOW IT WORKS PRICING ABOUT US

Sign In Try Now

# EASIEST WAY TO TEST YOUR MOBILE APP

SOFY makes it easy to test your Android or iOS mobile app for performance, reliability, functionality and UX. No scripts. No setup. Results in minutes.

Try It Free

## MEET SOFY THE NEWEST MEMBER OF YOUR TEAM

COMPREHENSIVE APPLICATION & DEVICE TESTING

**Say NO to scripts**  
With SOFY on your team you don't need to write test automation scripts ever again.

**SOFY gets smarter everyday**  
SOFY is trainable and she gets smarter everyday. She learns from you and other app developers.

**Gets test results in minutes**  
SOFY allows you to test your app in minutes thereby reducing time to launch your app.

**Multiple devices & platforms**  
You can test your app on both the iOS and Android platforms, across multiple devices - all at the same time.

**Benchmark against competition**  
With SOFY you can benchmark your app and see how it performs against your competitor's apps.

**SOFY is there when you need her**  
No more waiting to test apps. SOFY is always available to test your app the moment it's ready to go.

## HOW IT WORKS



### UPLOAD

Upload the .apk or .ipa files of your app.



### START TESTING

SOFY runs tests and provides a comprehensive analysis to see data speeds and connectivity throughout an app.



### GET REPORT

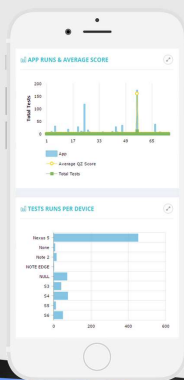
SOFY produces a report on the Performance, Reliability, Functionality and the UX of your app.



## SEE THE TEST RESULTS IN MINUTES

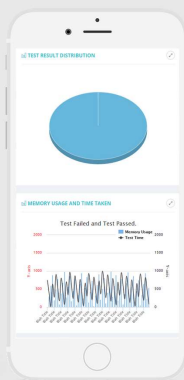
### PERFORMANCE

Observe how your app is performing.



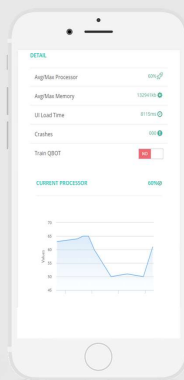
### RELIABILITY

Monitor the reliability of your app.



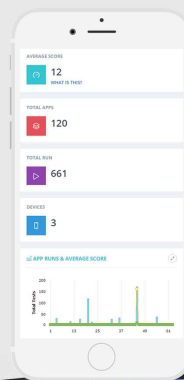
### FUNCTIONALITY

Verify your app functions as expected.



### UX VALIDATION

Understand how your user's experience your app



## TEAM BEHIND SOFY



Syed Hamid  
C.E.O



Justin Hartin  
Director Engineer



Sajid Rehman  
Senior Software Eng.



Maroof Mushfiq  
Graphic Desg.



Madan Lal  
Software Eng.



Syed Hussain Mehdi  
Software Eng.



Kalyani Dandibhotla  
Software Test Eng.



Farheen Fathima  
Software Test Eng.



Hallar Haryani  
Software Eng.

## OUR BUSINESS ADVISORS



William D  
Legal Advisor



Hal Howard  
Advisor



John Poli  
Advisor

# INVESTMENT



TOTAL  
?



**Entrepreneurial Spirit - Startup of the Year**  
*Recognized as a startup business that is poised to achieve consistent and significant growth.*



Within the first few months of launching they have already signed up 30+ customers.



formerly





# Test web apps faster with machine learning

Sign up to be an Unravel alpha customer

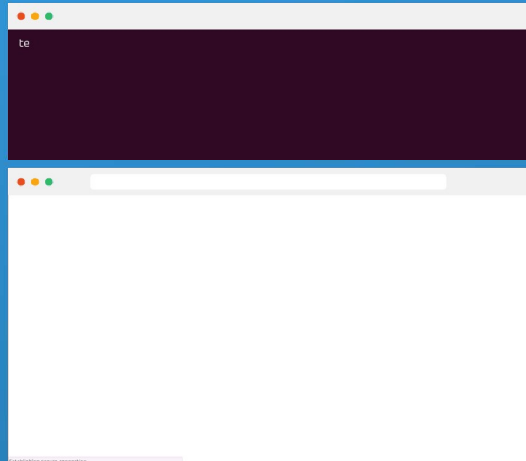
First name

Last name

Email address \*

Company

By subscribing, you are opting in to our mailing list

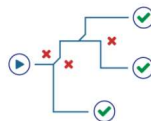


## Unravel Features

```
my_test
1 Go to 'www...'
2 Fill in the form with 'test'
3 Submit the form
4 Ensure title starts with 'test'
```

### Natural language testing

Write your tests in English that anyone on the team can read.



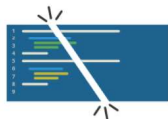
### Machine learning powered

Describe your intent and our machine learning models can complete your user journey for you.



### Infrastructure-free testing

Run your tests on our test cloud and receive immediate feedback from our REST API.



### Never write Selenium again

Unravel eliminates brittle Selenium tests and false positives in your continuous integration builds.



### Immediate validation & execution

Our web-based IDE allows immediate test validation and execution in a real browser.



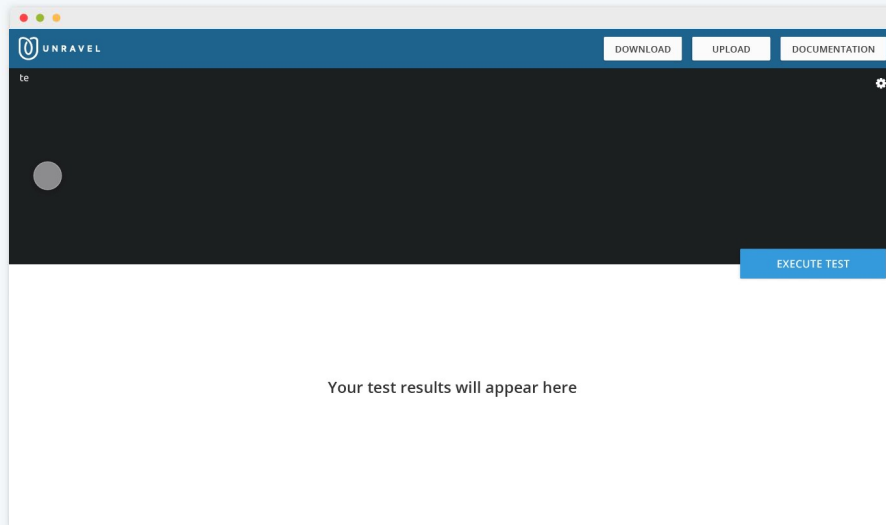
### Video from real browsers

Know exactly what your tests are doing with video of every single test.



## Integrated Development Environment

Write tests in natural language and clearly identify points of failure.



## The IDE exports the test as a YAML object

```
1 test_definition: |
2   Load url https://www.welleco.com
3   Assert "Super Elixir"
4   Assert tag "Google Tag Manager" called
5   Assert tag "Google Analytics" called
6   Click "shop our products" link
7   Click "shop all" link
8   Click "greens-to-go" link
9   Assert "Greens-to-Go" text
10  Click "add to cart" link
11  Go to cart
12  Assert "Greens-to-Go" text
13  Click "check out" button
14  Assert "Customer information" text
15  Fill the "customer information" form
16  Click "continue to shipping method" button
17  Assert "Shipping" text
18  Wait for 2 seconds
19  Click "continue to payment method" button
20  Assert "Payment" title
21  Assert "Google Tag Manager"
22  Assert "Google Analytics"
23
24 data_profile:
25   first_name: Elle
26   last_name: MacPherson
```

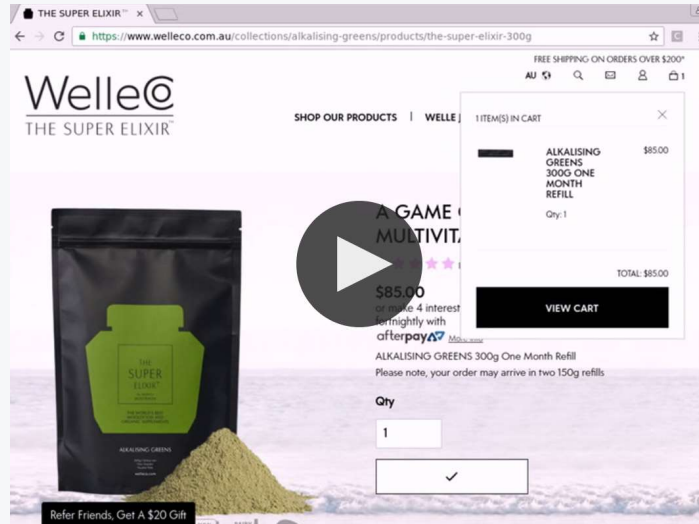
## Enqueues the test and then polls for the response

```
1  #!/bin/bash
2
3  test_file_path="$1"
4
5
6  function submit_test () {
7      curl -X POST -d @- "https://api.unravel.io/test" |
8      jq --raw-output '["queue-url"]'
9  }
10
11
12  function poll_status () {
13      curl -o /dev/null -w "%{http_code}" $1
14  }
15
16
17  queue_url="$(cat "$test_file_path" | submit_test)"
18
19  while true
20  do
21      if [ "$(poll_status "$queue_url")" == "303" ]
22      then
23          break
24      else
25          echo "Waiting for $queue_url to complete..."
26          sleep 2
27      fi
28  done
29
30  curl -L "$queue_url"
```

## Unravel API returns a YAML object containing the test results

```
1  execution_steps:
2  - Load url https://www.welleco.com:
3    - - command: Load url https://www.welleco.com
4      message: ''
5      passed: true
6  - Assert "Super Elixir":
7    - - command: Assert "Super Elixir"
8      message: "'Super Elixir' element visible"
9      passed: true
10 - Assert tag "Google Tag Manager" called:
11   - - command: Assert tag "Google Tag Manager" called
12     message: "'Google Tag Manager' was found"
13     passed: true
14 - Assert tag "Google Analytics" called:
15   - - command: Assert tag "Google Analytics" called
16     message: "'Google Analytics' was found"
17     passed: true
18 - Click "shop our products" link:
19   - - command: Click "shop our products" link
20     message: ''
21     passed: true
22 - Click "shop all" link:
23   - - command: Click "shop all" link
24     message: ''
25     passed: true
26 - Click "greens-to-go" link:
27   - - command: Click "greens-to-go" link
28     message: ''
29     passed: true
```

Each test is recorded and the video made available for download.



## Founders



Santina Doherty

CEO

Previously senior manager Ryanair, Head of Ryanair Advertising, Ryanair.com, Ancillary Revenue, 10 years and VP Commercial Development, Hostelworld, 3 years

International Commerce Graduate, University College Dublin



Dónal Troddyn

CTO

Experienced offensive website security developer. Deep domain knowledge automated web testing technologies, advertising and analytics tracking.

Computer Science Graduate, University College Dublin

# INVESTMENT



TOTAL  
**\$617K**

**tribal.vc**

FUNDING DATE

October 2016

ROUND

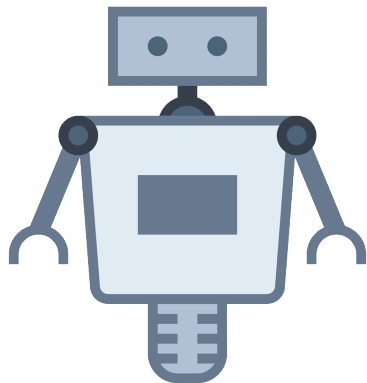
Seed

AMOUNT

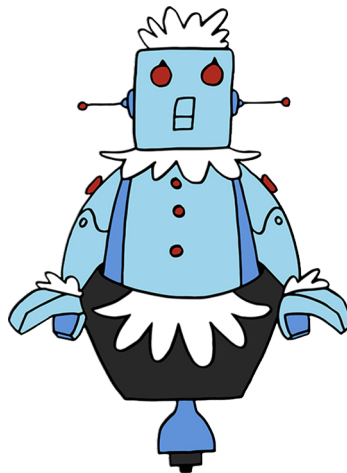
**\$617K**

Source: **crunchbase**

<https://www.crunchbase.com/organization/unravel-analytics#/entity>



FAD?



FICTION?

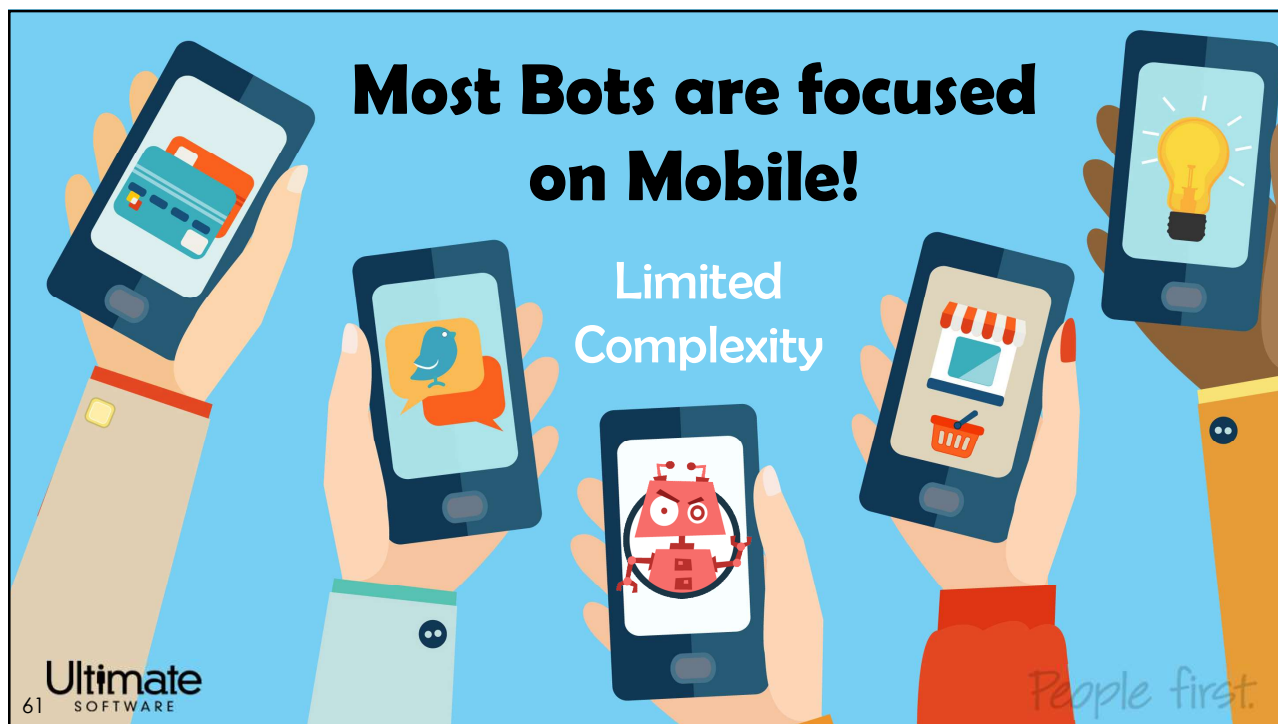


FUTURE?

60 **Ultimate**  
SOFTWARE

*People first.*



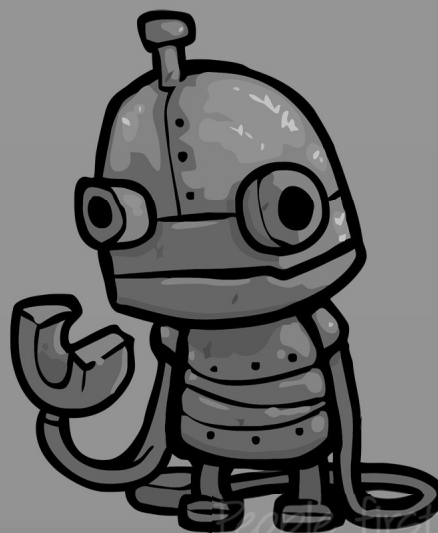


## The Bots are at best Semi-Intelligent!

But...

They only have to be better than the “average” tester.

There is definitely power in numbers.



Ultimate  
62 SOFTWARE

# The Bots are at best Semi-Intelligent!



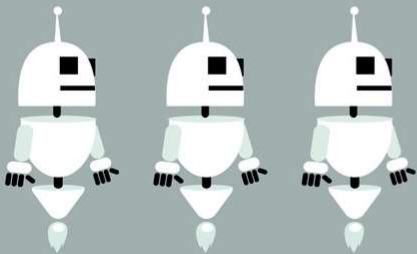
Hundreds of semi-intelligent bots can provide actionable insights and accelerate coverage.

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Ready or not, here AI comes!

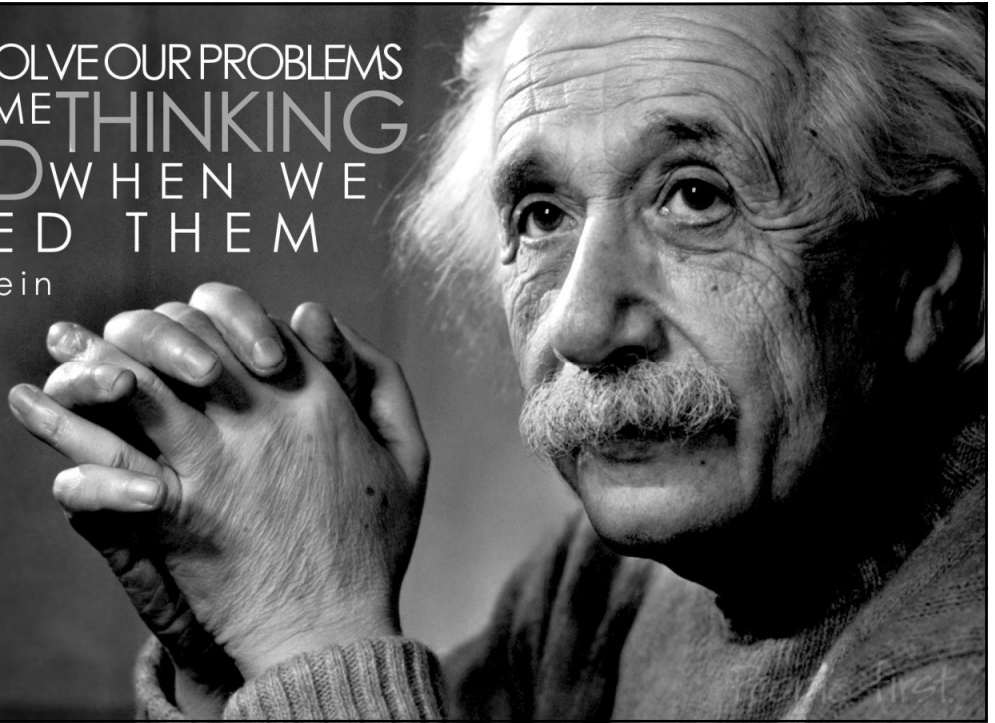


**The Bots  
are  
already  
in the  
Building  
But...  
Are We?**

Your services are no longer needed!

*People first.*

WE CANNOT SOLVE OUR PROBLEMS  
WITH THE SAME THINKING  
WE USED WHEN WE  
CREATED THEM  
-Albert Einstein



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THE END

THANK YOU!

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*People first.*