Implementing Continuous Testing for Digital App Success

October 2018

With Forrester guest speaker:
Diego Lo Giudice
Speakers

Tal Barmeir
CEO

Diego Lo Giudice
VP, Principal Analyst
@dlogiudice

Special Guest Speaker
We will cover the test automation market where Experitest was top ranked by Forrester

- Largest market presence
- Strong existing product and roadmap
The future of testing: imitate intelligent human being testing

SMART TESTING
Test like the human brain with AI

VISUAL TESTING
Test like the human eye with layout testing

INTUITIVE TESTING
Test using human logic with codeless automation testing
Agenda

01 Continuous and smarter testing trends  25 min
02 Ensuring customer experience with visual testing  10 min
03 Test creation simplicity with codeless automation  10 min
04 A continuous testing case study  5 min
05 Summary & Q&A  10 min
Continuous and smart testing trends

Diego Lo Giudice, Vice President, Principal Analyst
@dlogiudice

October 9, 2018
We work with business and technology leaders to develop customer-obsessed strategies that drive growth.
Digital leaders are obsessed about CX

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**Forrester Data**

**The Revenue Impact Of Improving Each Industry’s Average CX Index Score By One Point**

*Make A Modern Business Case For Agile And DevOps-Driven Digital Transformation*

A one-point improvement in CX Index™ score results in:

<table>
<thead>
<tr>
<th>Industry</th>
<th>Annual incremental revenue per customer*</th>
<th>Average number of customers per company†</th>
<th>Total revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto manufacturers: mass market</td>
<td>$48.50</td>
<td>18 million</td>
<td>$973 million</td>
</tr>
<tr>
<td>Hotels: upscale</td>
<td>$7.54</td>
<td>44 million</td>
<td>$332 million</td>
</tr>
<tr>
<td>Wireless service providers</td>
<td>$3.39</td>
<td>82 million</td>
<td>$278 million</td>
</tr>
<tr>
<td>Big-box retailers</td>
<td>$2.44</td>
<td>100 million</td>
<td>$244 million</td>
</tr>
<tr>
<td>Auto and home insurance providers</td>
<td>$14.32</td>
<td>15 million</td>
<td>$215 million</td>
</tr>
<tr>
<td>Airlines</td>
<td>$3.49</td>
<td>48 million</td>
<td>$168 million</td>
</tr>
<tr>
<td>Traditional retail banks</td>
<td>$8.27</td>
<td>15 million</td>
<td>$124 million</td>
</tr>
<tr>
<td>TV service providers</td>
<td>$6.11</td>
<td>17 million</td>
<td>$104 million</td>
</tr>
<tr>
<td>Internet service providers</td>
<td>$5.26</td>
<td>16 million</td>
<td>$84 million</td>
</tr>
<tr>
<td>Rental car providers</td>
<td>$1.67</td>
<td>40 million</td>
<td>$67 million</td>
</tr>
<tr>
<td>Auto manufacturers: luxury</td>
<td>$104.16</td>
<td>350,000</td>
<td>$36 million</td>
</tr>
<tr>
<td>Direct banks</td>
<td>$9.96</td>
<td>3 million</td>
<td>$30 million</td>
</tr>
<tr>
<td>Credit card providers</td>
<td>$0.08</td>
<td>61 million</td>
<td>$5 million</td>
</tr>
</tbody>
</table>

Base: 122,500 US online adult customers (ages 18+) of at least one industry who interacted with that industry within the past 12 months (bases vary by industry)

Source: Forrester Data Customer Experience Index Online Survey, US Consumers 2016

*This analysis shows the effect on revenue potential of increasing CX Index scores by one point from the average CX Index score of the largest brands in the industry. Curves for individual brands differ from this industry curve. For brands that don’t have a linear relationship between CX and revenue, the revenue effect of improving CX by one point will vary greatly depending on the CX Index score that serves as the starting point for this analysis.

†The number of customers represents that of a big player in the industry based on inputs that include Forrester Data Consumer Technographics® data, Forrester’s analysts, and publicly available industry data.

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Source: Forrester Research, Inc. Unauthorized reproduction, citation, or distribution prohibited.
UX is still largely influenced by what clients see...

https://www.linkedin.com/pulse/your-employees-seeing-bigger-picture-anand-raj-markandu/
With AI, UX is also becoming an experience based on quality of hearing and voice...
Customer-obsessed DNA

FROM

Customer aware  Data rich  Perfect  Siloed

TO

Customer led  Insights driven  Fast  Connected
While Speed Matters...
It cannot come without quality…
Testing is at the heart of this revolution, so how do we test ….

› Great CX
› Great Quality…
› …And all at Great Speed ?
Continuous Testing

Source Forrester: Vendor Landscape: Continuous Testing Services For Agile And DevOps Environments
Continuous Testing, what is it?

- Enables quality@speed software delivery continuously (In CI/CD Pipelines). Where:
  - All testing activities are run continuously in an integrated fashion with development and delivery
  - Testing shifts left in the SDLC
  - Code is verified on the go
  - Immediate bug fixing enabled
  - Test environments are provisioned instantly
  - Unit, functional and nonfunctional tests are run in an automated way
  - Orchestrated by continuous integration and continuous delivery tools.
Automation requirements are paramount in CI/CD: But can we eliminate more manual? Like UAT?
How about Augmenting Testing persona?

Business
Technical
Developers
Many think AI can help in testing...
Is AI becoming more popular for improving testing ?!

Which of the following statements reflect your development team's approach to using AI and Machine Learning techniques in software testing.

<table>
<thead>
<tr>
<th>Approach</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>We don't use any AI and machine learning to test better and faster</td>
<td>23%</td>
</tr>
<tr>
<td>We use AI and Machine Learning to test better and faster to increase quality</td>
<td>37%</td>
</tr>
<tr>
<td>We plan to use AI and machine learning to test better and faster but don't use any currently</td>
<td>26%</td>
</tr>
<tr>
<td>We don't plan to use any AI or Machine learning to test better and faster.</td>
<td>13%</td>
</tr>
</tbody>
</table>

Source : Forrester Research Business Technographics Developer Survey, 2018
US, EMEA, APAC Total Sample Size: N=3,228
Most common use cases is “incidents prevention” and test management – data crunching.

Which of the following describes the approach you are taking in using AI and Machine Learning for software testing?

<table>
<thead>
<tr>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>We use AI and machine learning algorithms to optimize our overall test management process</td>
<td>41%</td>
</tr>
<tr>
<td>We use AI and machine learning algorithms to prevent incidents in production</td>
<td>61%</td>
</tr>
<tr>
<td>We use AI and machine learning to augment testers capabilities during their testing process</td>
<td>50%</td>
</tr>
<tr>
<td>We use AI and machine learning algorithms to improve and increase test automation</td>
<td>26%</td>
</tr>
<tr>
<td>We use AI and ML for testing AI solutions</td>
<td>10%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Forrester Research Business Technographics Developer Survey, 2018
US, EMEA, APAC Total Sample Size: N=3,228
AI and Deep Neural Networks gaining traction for image recognition.... !

[Image of blueberry muffins and Chihuahuas]
Visual Testing leverages AI technologies (DL)

A Visual testing tool can do what a human can visually do:

- Recognise images, videos and text.
- Capture differences that a human eye can’t.

Supports humans in doing a better job in deciding what’s really right and what is really wrong in User Interfaces.

Visual testing enables automated testing and validation of UI consistency and improved experience. Mandatory for testing

- In continuous delivery.
- Across multiple heterogeneous devices, iOS and browsers.
Visual Testing is emerging to augment and automate more...

- Speeds UI changes during front end development
- Automates and augments UI consistency and experience
In a glance for AI in testing it’s still early days....

- Most all testing GSIs, and consulting organizations initial focus has been on leveraging machine learning and predictive algorithms
- Some existing testing tool vendors and new startups are bringing more AI and ML in testing
- Some experimentations leverage NLP sub-categories, some Deep Learning most Machine Learning (Statistical-bayesian, predictive)
- Testing Use cases: there are myths and realities!
- But the path to autonomous testing is like self driving cars, long time away.....
Thank you
Agenda

01 Continuous and smarter testing trends 25 min

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What is visual testing?
Test that things are laid out on the screen the way they should
Responsive Web Design makes this a big issue

**CONTENT IS LIKE WATER**

"You put water into a cup it becomes the cup. You put water into a bottle it becomes the bottle. You put it in a teapot, it becomes the teapot."

Josh Clark (originally Bruce Lee) - Seven deadly mobile myths
Illustration by Stéphanie Walter
A huge testing matrix: digital platform segmentation growing

Platform
- Desktop, 44.7%
- Mobile, 51.2%
- Tablet, 4.1%

Mobile OS
- Unknown, 3.05%
- iOS, 19.2%
- Other, 2.06%
- Android, 75.66%

Desktop OS
- Unknown, 2.45
- OS X, 13.18
- Linux, 1.66
- Chrome OS, 0.98
- Windows, 81.73

Mobile device vendor
- Unknown, 7.8%
- Apple, 19.2%
- Samsung, 30.8%
- Huawei, 6.2%
- Others, 29.9%

Mobile OS
- Unknown, 3.05%
- iOS, 19.2%
- Other, 2.06%
- Android, 75.66%

Desktop browsers
- Edge, 4.3%
- Opera, 2.3%
- Safari, 5.5%
- IE, 7.2%
- Firefox, 11.8%
- Other, 2.8%
- Chrome, 66.2%

Source: Statcounter, Global, April 2018
2 innovative solutions:

Automated visual testing
- Relative location
- Relative Spacing
- Content existence
- Size

Manual visual testing with Follow-Me
- Main browser
- Browser 2
- Browser 3
- Browser 4
Visual testing – video demo
Automated Visual Testing
Automatically verify design guidelines to ensure visual consistency

Quick & easy test creation
Single test for any browser and size
OCR text visual validation
Integration to Selenium testing
Follow-Me Manual Visual testing

Multiply manual testing efforts by testing on several browsers and OS

Perform an action once, and see it executed on several browsers and OS simultaneously.

Select the from 1000+ remote browser and OS on the digital assurance lab.
<table>
<thead>
<tr>
<th></th>
<th>Agenda</th>
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</tr>
</thead>
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<td>05</td>
<td>Summary &amp; Q&amp;A</td>
<td>10 min</td>
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</table>
What is codeless? Enable manual tester to create automation

Two Simultaneous Trends

Move testing and automation to development

Shift Left

Shift Right

Move automation to Manual team

Codeless addresses the Shift Right request for simplicity and no need for code knowledge
Everyone can take part in quality process

Tests can be created by people from different roles
- Better use cases and tests that reflect different points of view

➔ Faster test creation
➔ Shorter feedback
➔ Shorter release cycles
Codeless automation – video demo
Codeless automation – Tricentis demo
Experitest Codeless Automation Integration Program

 Allows codeless providers to embed SeeTest tools into their solutions

✓ Object identification, test creation and execution environment

✓ Benefits:
  • Enhance user experience with a device reflection
  • Improve test stability with object identification solutions
  • Integration to assurance lab infrastructure for execution (SaaS or on-Prem)

✓ Integration using API

✓ Examples: Worksoft, Tricentis, and more
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Case study:

Multinational bank

> 280 branches in 18 countries
> 4 m online banking customers
> 21,000 employees

Challenges:

- Omnichannel experience
- Over ten apps
- 8000+ test cases
- Internationally dispersed teams
- Internationally dispersed users
- Move to a DevOps culture – support developers and testers
Implemented solution:

Hybrid on Premise and SaaS Digital assurance lab
Web + mobile testing in same solution

**SaaS**
A private lab hosted at Experitest’s data centers
Distributed Teams access remote devices in several locations to test in users local networks

**On-premise**
Easily setup a lab on your enterprise’s premises with a SW only solution.
Implemented solution:

Test on 1000+ remote real devices using their local environment
Implemented solution -

**Functional + performance testing**

- Test on real devices and browsers in real locations
- Network virtualization to evaluate network impact
- Monitor device vitals – power, battery, memory
Implemented solution:

Developers use digital assurance lab

- Develop on real device with XCode and Android studio
- Test Automation with Espresso and XCTest
- Debug on real remote devices
- Receive reports and collaborate
- Use network tunnel to test pre-commit
Results

Fast release cycle and high customer rating

- 8000-9000 test cases
- 70% test coverage
- 5 day reduction in release cycle
- Added sanity testing
Questions?

Thank You!