T5
Bot Testing/Testing Bots
Thursday, May 3rd, 2018
9:45 AM

Automated Testing for New-Gen Digital Interactions: Chatbots, Alexa, and Siri

Presented by:
Sanil Pillai
Infostretch

Brought to you by:

350 Corporate Way, Suite 400, Orange Park, FL 32073
888-268-8770 - 904-278-0524 - info@techwell.com - http://www.stareast.techwell.com/
Sanil Pillai
Infostretch

Director of Infostretch Labs Sanil Pillai is an experienced engineering leader for digital and enterprise applications. He has built and managed both offshore and onsite engineering teams, managed mobile projects for Fortune 500 clients, and has deep technical and functional expertise. At Infostretch, Sanil has established agile development and continuous integration methodologies, tracking metrics, and monitoring processes to ensure continuous improvement in the development organization.
Automated Testing for New-Gen Digital Interactions: Chatbots, Alexa, and Siri

Welcome

1. The Hyper Connected World
   - Past Apps vs Current Apps
   - Omni Channel Offerings by Enterprise

2. Channel | Mobile App
   - Mobile App Test Automation Challenges
   - Mobile App Testing Strategies

3. Channel | Bots
   - Nuances of Bot Testing
   - Automate Testing of Chat Bot
   - Automate Testing of Voice Bot
The Hyper Connected World

Past Apps vs Current Apps

Standalone App or Limited Connected App

Hyper Connected App

- Connected via internet
- Sensor data sync
- Smart Device sync
- Camera Scanning
Omni Channel Offerings by Enterprises

- Mobile Apps
- Web Presence
- Smart Watch App
- VR App
- Bot
- Smart TV App

App Connected with BLE Smart Device

Peripheral Devices or Triggers

Syncing Data with BLE Smart Device

- Connect, Disconnect, Broadcast, etc.
- Sync Data
- Determine certain actions

Image Source: http://a.abcnews.com/images/Technology/abc_jawbone_up_wristband_app_it_130812_16x9_992.jpg
App extracting text from image

Peripheral Devices or Triggers

Using Mobile Camera Scanning Book
• Intelligent Image Capturing Algorithm
• OCR enabled


App Determining Location & Triggering Actions

Peripheral Devices or Triggers

Using Mobile Device Location
• Current Location
• Map rendering
• Identify nearest object & notify (e.g. Cab)

App Relying on Device Locale for Date & Time

*Peripheral Devices or Triggers*


**Notifying Relevant Info to Customer**

- Get Device Local Date & Time
- Determine and trigger notification for user’s action

App Relying on Biometric Authentication

*Peripheral Devices or Triggers*


**Authenticate User & Provide Info**

- Fingerprint Scanning
- Authenticate & Trigger Action
Mobile App Test Automation Challenges

• Existing popular tools like Appium do not support automation of device hardware testing (Camera, TouchID)

• Hardware level access for automation necessitates the need for code level instrumentation

• Testing use cases around interruptions are important but complex.

Automation Library Approach

<table>
<thead>
<tr>
<th>Automation Features</th>
<th>Mobile Automation Library Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touch ID</td>
<td>REST Web Services</td>
</tr>
<tr>
<td>Apple Pay</td>
<td></td>
</tr>
<tr>
<td>Camera</td>
<td>Command Handling &amp; Processing</td>
</tr>
<tr>
<td>GPS</td>
<td></td>
</tr>
<tr>
<td>Date Time</td>
<td></td>
</tr>
<tr>
<td>BLE</td>
<td></td>
</tr>
<tr>
<td>Accelerometer</td>
<td></td>
</tr>
<tr>
<td>Gyroscope</td>
<td></td>
</tr>
</tbody>
</table>
**Automation Approach**

![Diagram](image)

**Use Case: Automate the testing of location**

- A field staff needs to initiate the job that is assigned to him
- Condition is – person can initiate only if he is actually at that location
- Manual approach is costlier
- Traditional approaches can’t spoof the location
- Using Infostretch’s Mobile Automation Framework, we can spoof the location based on test data and can verify the scenario in less than 20 secs
Demo

Channel | Bots
Types of Bots

Chat Bot

Voice Bot

Tell Reception Bot, Acme International team is here

Welcome to Infostretch Corporation. Hope you had a pleasant drive.

Conversational UI

Big shift happening in the industry for the conversational interfaces or Zero UI interfaces. Need different approach to test Non-UI elements.

A taxi is on its way. It will arrive at 211 St. Stephen’s Green in 3 minutes. Your driver’s name is Travis.
Nuances of Bot Testing

Common Factors
- Ident Validation
- Response Validation

Specific Factors
- Specific Factors of Chatbot
- Specific Factors of Voicebot

User’s Intent Validation

User’s Intent
- User types something or speaks something
- Bot understands it
- Called as User’s Intent Understanding

Who won the Super Bowl last year?

Intent: Know Winning Team
- Team: Winning
- Game: Super Bowl
- Year: 2016
Bot’s Response Validation

Bot’s Response

Based on Intent understanding, bot can:
- Either call specific web service, or
- Reply based on intelligence embedded in the bot itself

Without user’s entry, bot can push information (e.g. Weather updates)

Factors to be tested for Chatbot

<table>
<thead>
<tr>
<th>Different Response – Same Query</th>
<th>Response time from bot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart bots would react differently to the same query. When a user mentions “thanks” it would reply as – “Welcome” or “My Pleasure” or “No problem”.</td>
<td>How much time your bot is taking to respond back to your user’s queries. Timeout defined for the bot response must also be aligned to that during automation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bot’s understanding of intents</th>
<th>Multiple Queries in single sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Different users asks the same query in different ways. User 1 asks – “Growth of my portfolio” User 2 asks “percentage change in my portfolio”</td>
<td>How does your bot handles the multiple queries in single statement? User asks – Show me the suspicious transactions value and total loss in 2017</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Typo Errors Understanding</th>
<th>Mixed Languages Query</th>
</tr>
</thead>
<tbody>
<tr>
<td>How far a bot can understand the typo error from a user without polluting with other intent.</td>
<td>Can your bot understand the multiple languages that has been asked? User may write – Combien avez-vous facturé pour mon POS system?</td>
</tr>
</tbody>
</table>
# Approaches

- Automation Testing of Bot
  - Imitating User’s Action
  - Headless Testing

---

## Imitating User’s Action - Approach

### Upload Test Data using Excel/CSV

- Infostretch Framework allows to test the bot’s flow end-to-end per Test Scenario
- It imitates user’s action and interacts with bot
- Captures the response of the bot and compares with the response data mentioned in Test Data Excel/CSV
Headless Testing

Upload Test Data using Excel/CSV

- Infostretch Framework spoofs and directly connects to bot server of “Bot under Test”
- User’s actions are sent directly bypassing the bot channel
- Captures the response of the bot and compares with the response data mentioned in Test Data excel/CSV

Test Data Options

Upload Test Data using Excel/CSV

- Create specific format from Mind Map diagram and push into bot Automation Framework
- It helps in reducing the maintenance time by managing the requirement changes in mind map itself
### Factors to be Tested for Voicebot

<table>
<thead>
<tr>
<th><strong>Different accents, gender</strong></th>
<th><strong>Punctuations</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>How does bot behaves for different accents &amp; gender combinations - American female, British Male</td>
<td>How bot interprets the punctuations: Tools, without any skill is helpless – vs - Tools, without any skill is helpless?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Same meaning different utterance</strong></th>
<th><strong>Background Noise</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, yeah, true, exactly, certainly, etc. can be used interchangeably, Bot must understand them.</td>
<td>Check for the effect of noise on the bot’s capability to understand user’s intent.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Different pronunciations</strong></th>
<th><strong>User speaking at distance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>People often pronounce assessor instead of accessory – does your bot understands the essence of user’s intention?</td>
<td>Effect of user speaking from distance, or in case of listening device being stationary (e.g. Echo) and user is moving and speaking – how does that impact bot’s behavior?</td>
</tr>
</tbody>
</table>
Approach
Intent Testing

Test Suite with Test cases running in sequence
Utterances as input (pre-recorded/run-time generated using third-party TTS API)
Change distance using Turtlebot, add Noise, etc.

Ask Automation Bot, Run Test Suite for Diagnosis

Thank You
Connect With Us
info@infostretch.com
+1-408-727-1100