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# Understanding User Feedback using Sentiment Analyzer & Analytics Automation

ROHIT SINGHAL

The eBay logo is displayed in a light green color on a teal background. The logo consists of the word "eBay" in a lowercase, sans-serif font, with the "e" and "a" being slightly larger than the other letters.

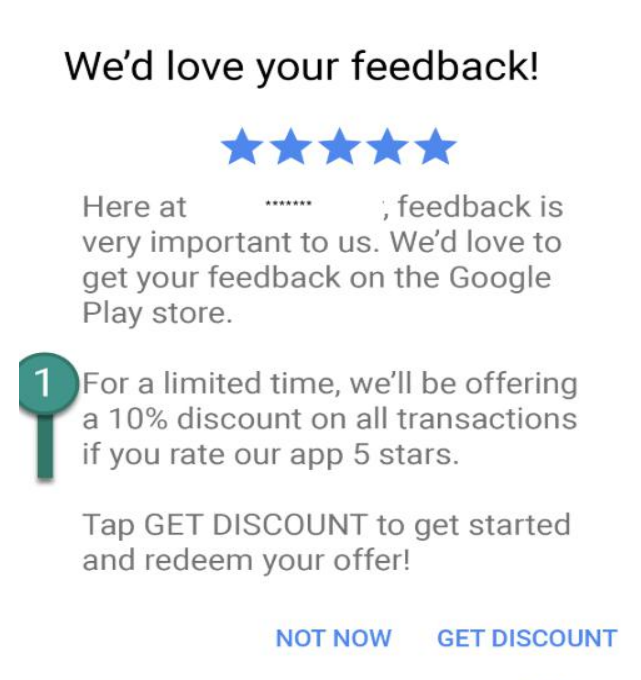
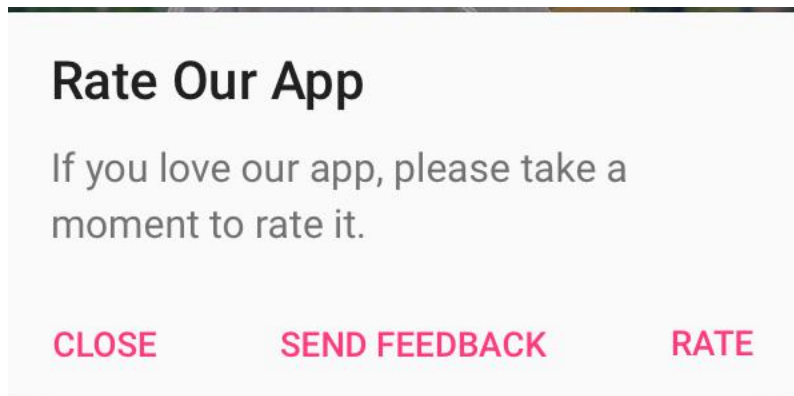
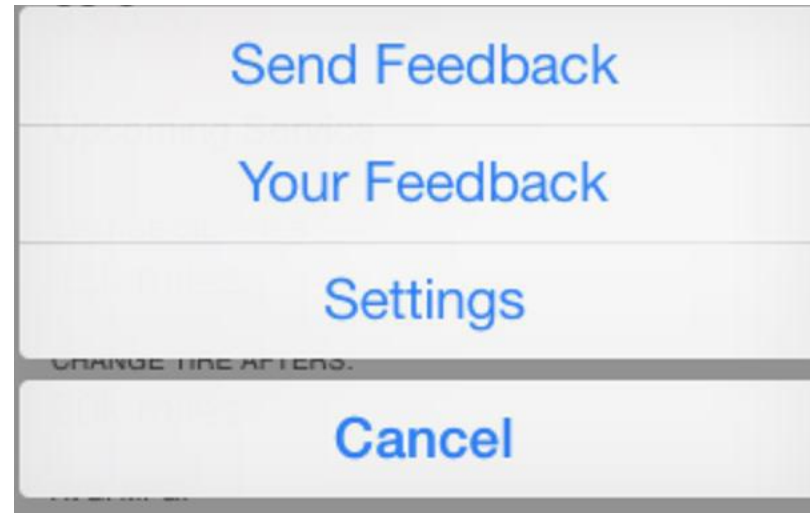
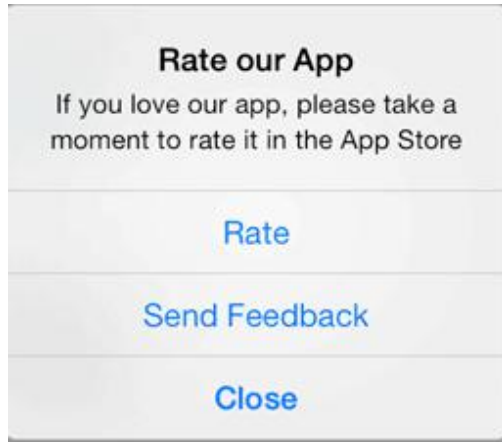


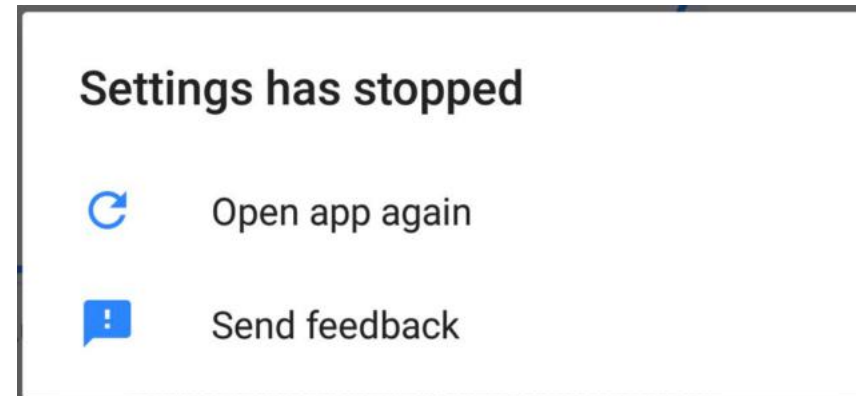
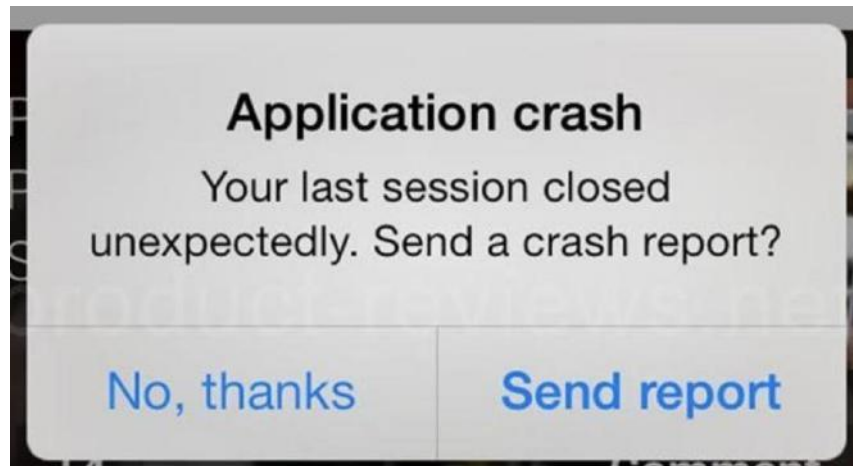
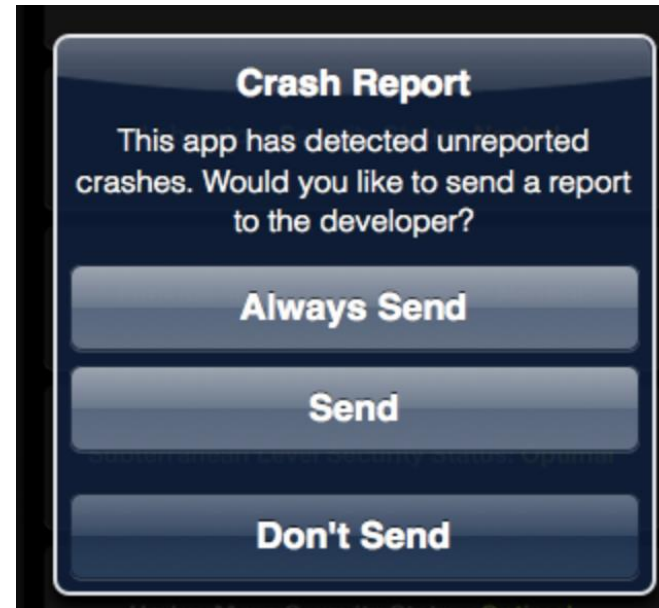
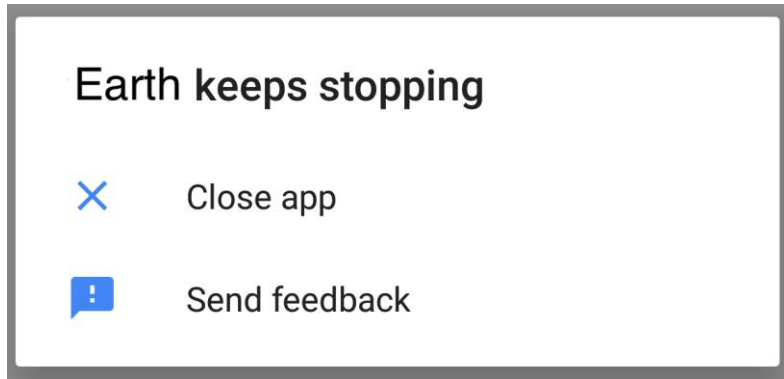
- I am Rohit Singhal
- QA Engineer @eBay, DE
- ~5 years in testing domain

 @rohsin29

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Session Expectations?





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Test Setup vs Real Users!

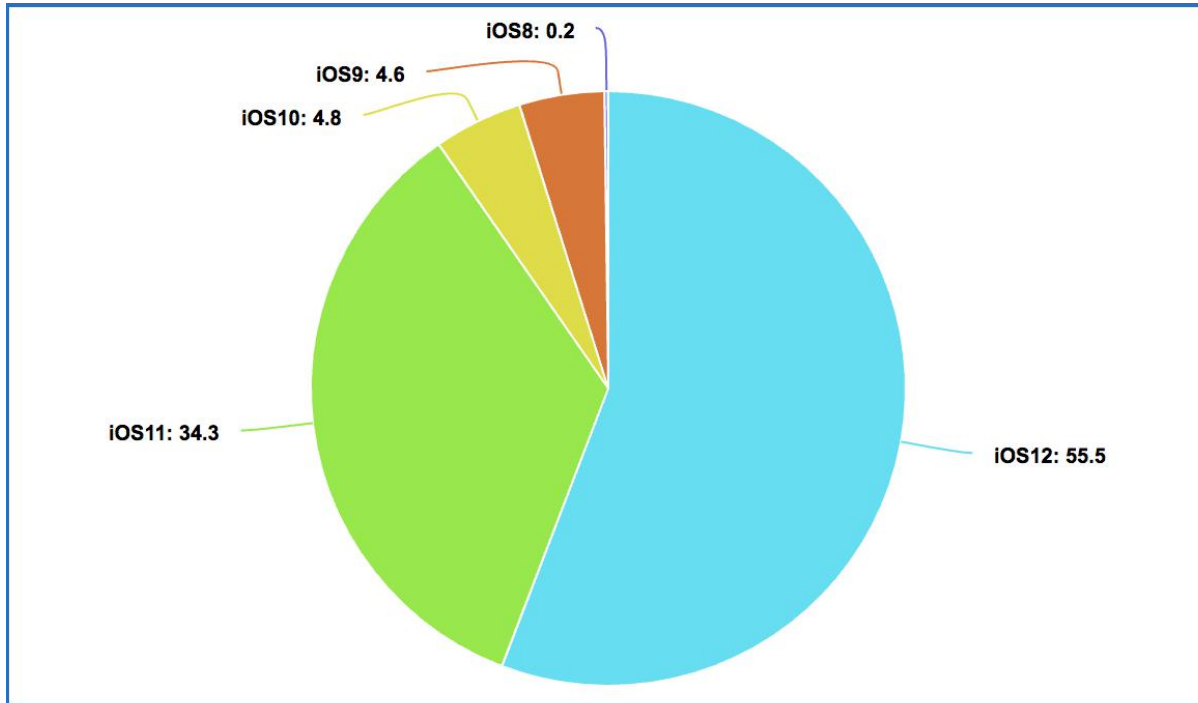


**Test Lab**

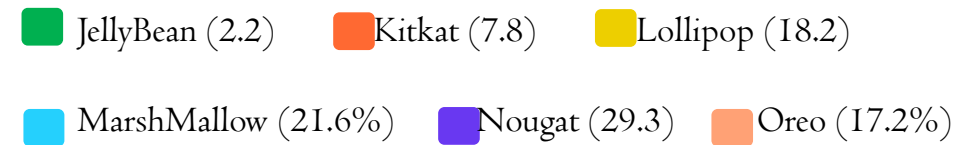
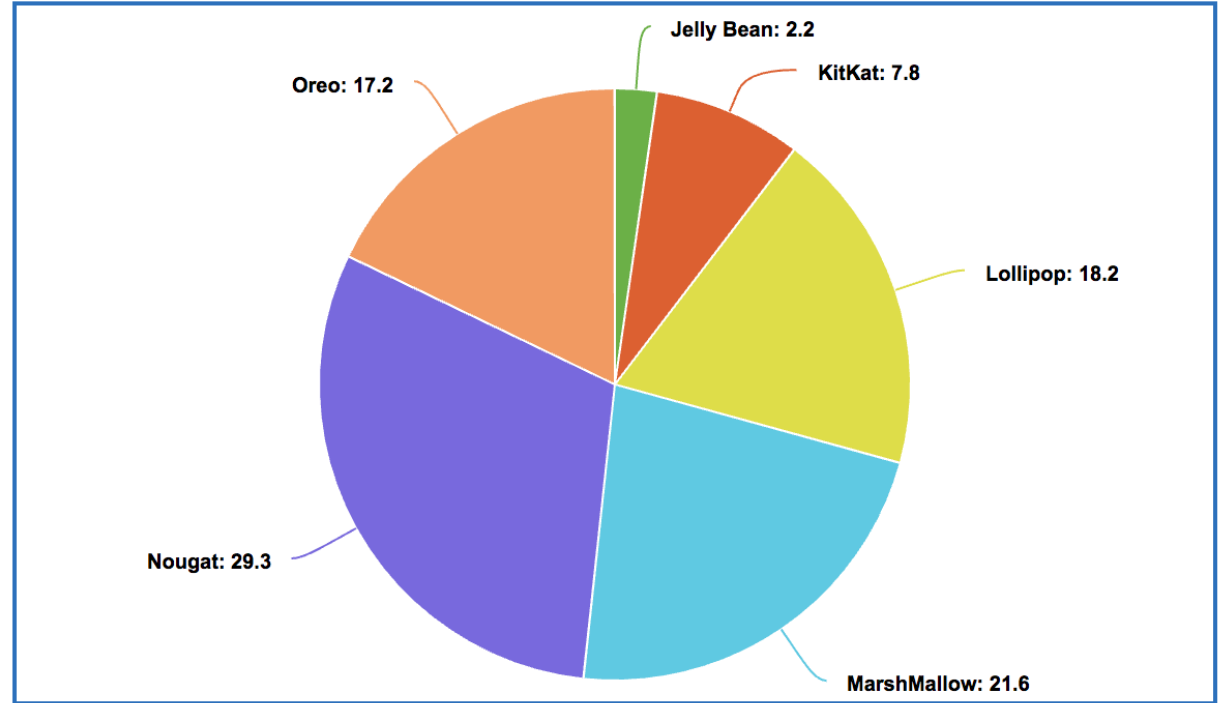


**Production**

## iOS Distribution

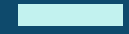


## Android Distribution



\*\*Source: david-smith.org/iosversionstats & Google





# Feedback Sources



# Fashion & Tech Deals - Shop, Sell & Save with eBay

eBay Mobile

16 USK: Ages 16+

INSTALL

Contains ads

#6 Top Apps Shopping



Downloads



2,803,930



Shopping



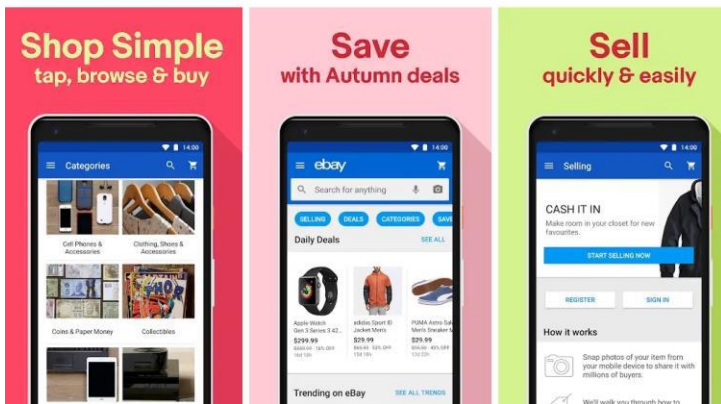
Editors' Choice



Similar

Deals on Clothes, Tech & More. Shop the Best Brands. Sell Items & Save on the Go

READ MORE



## REVIEWS

Review Policy

4.4



2,803,972 total





## Shop, Sell & Save with eBay 12+

Buy the Latest Tech & Fashion

eBay Inc.

#7 in Shopping

★★★★★ 4.8, 853K Ratings

Free



A social media banner for eBay. It features a purple horizontal bar at the top with a large red circle in the center containing the word "ebay" in white. Below this is a light grey rectangular area containing the text:

**eBay**   
@eBay

If you have questions or need help  
please contact us at [@AskeBay](https://twitter.com/AskeBay)

## Some Examples

Fails to open (G tab A 10.1 ) since last update! 3 hours ago

Easy to use, but since one of the latest updates it won't let me choose quantities from a drop down menu - e.g. I have just tried to buy 4 batteries, used the drop down menu to add 4 into my basket. Then the basket only shows 1 battery. Just an example of many recent attempts. Disappointing.

★★★★★ September 22, 2018



The latest update broke the fingerprint authentication.

in my saved searches, when i sort by nearest items first, it doesnt show items that are near just random locations. yes iv checked my location services etc. my fresh search of item sorts correctly my my saved item searches doesnt sort correctly. which has only recently hapoened. iv had the same save...

## Feature Requests

I love ebay, but the app gets 1 star for the simple fact that I can't check ebay bucks balance on it. I do not go on the website, so I have to just wait until I get them to see how much I have. Please Ebay, put this functionality on the app! Please? Please? Pleeeeeaseeee?



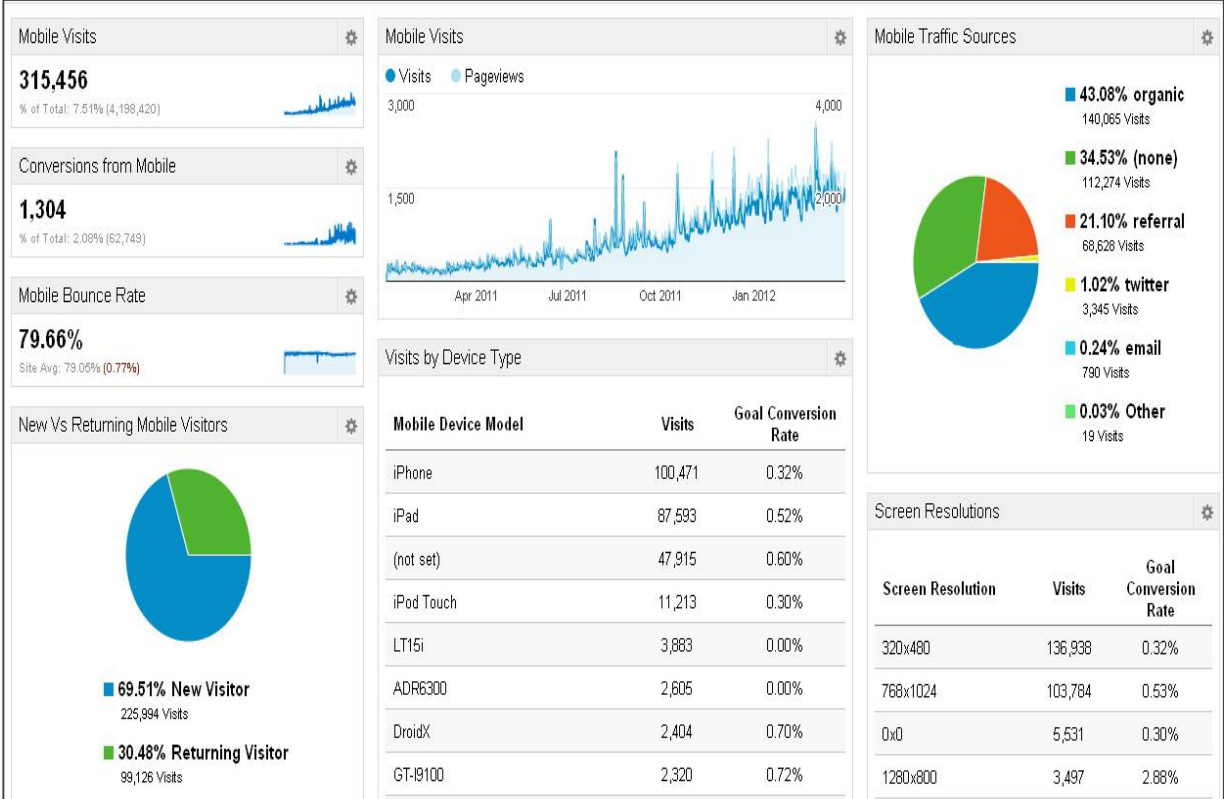
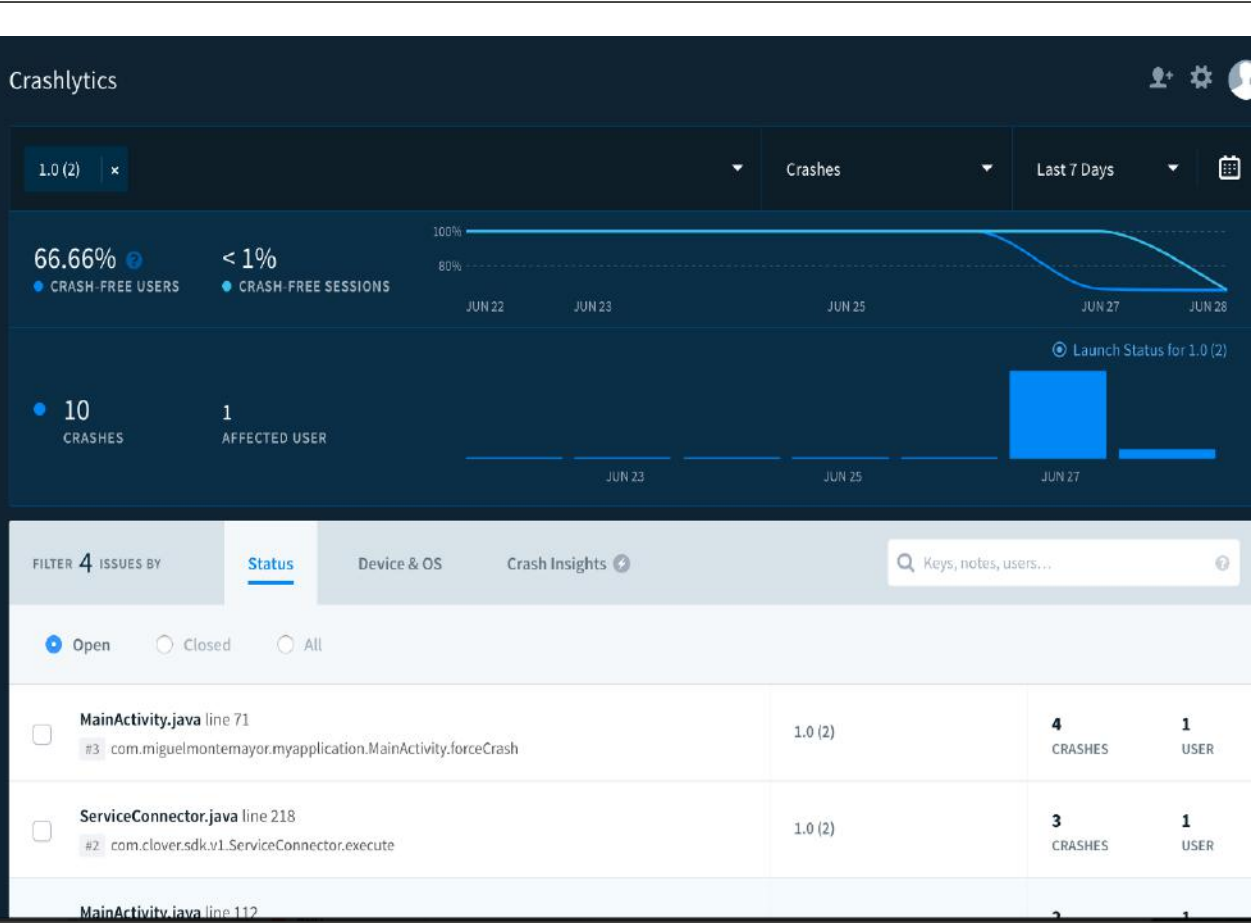
Why is there no edit profile selection? Had to go online to do so

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# Analytics and Data Sources

Analytics is a collection, reporting, and analysis of application's data. The focus is on identifying measures based on your organizational and user goals and using the data to determine the success or failure of those goals and to drive strategy and improve the user's experience.

And how track that?





Ask a question about the data on this dashboard

Unique Visitors	Mobile Visitors
79.67K	18.95K
Avg Time Spent	Bounce Percent
1.52	94.15%

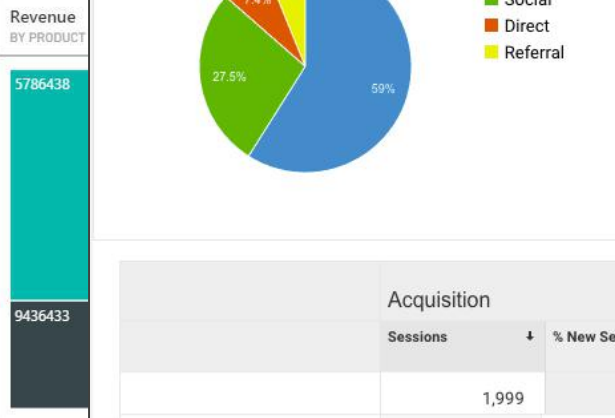


Page Views BY KEYWORDS

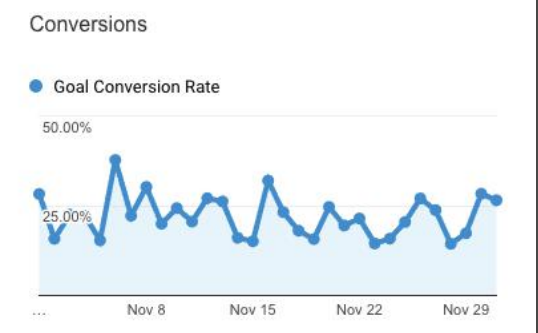
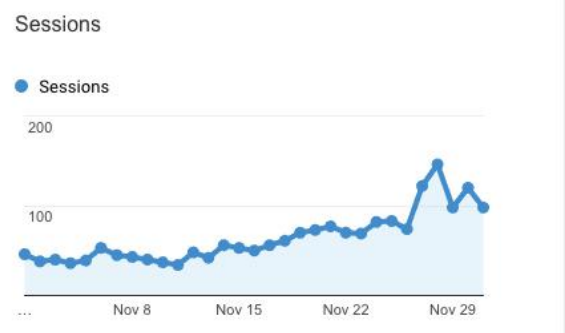
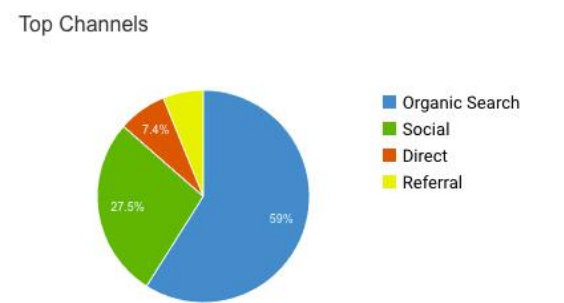
Adobe

Primary Dimension: Conversion: [Edit Channel Grouping](#)

Top Channels



All Users 100.00% Sessions

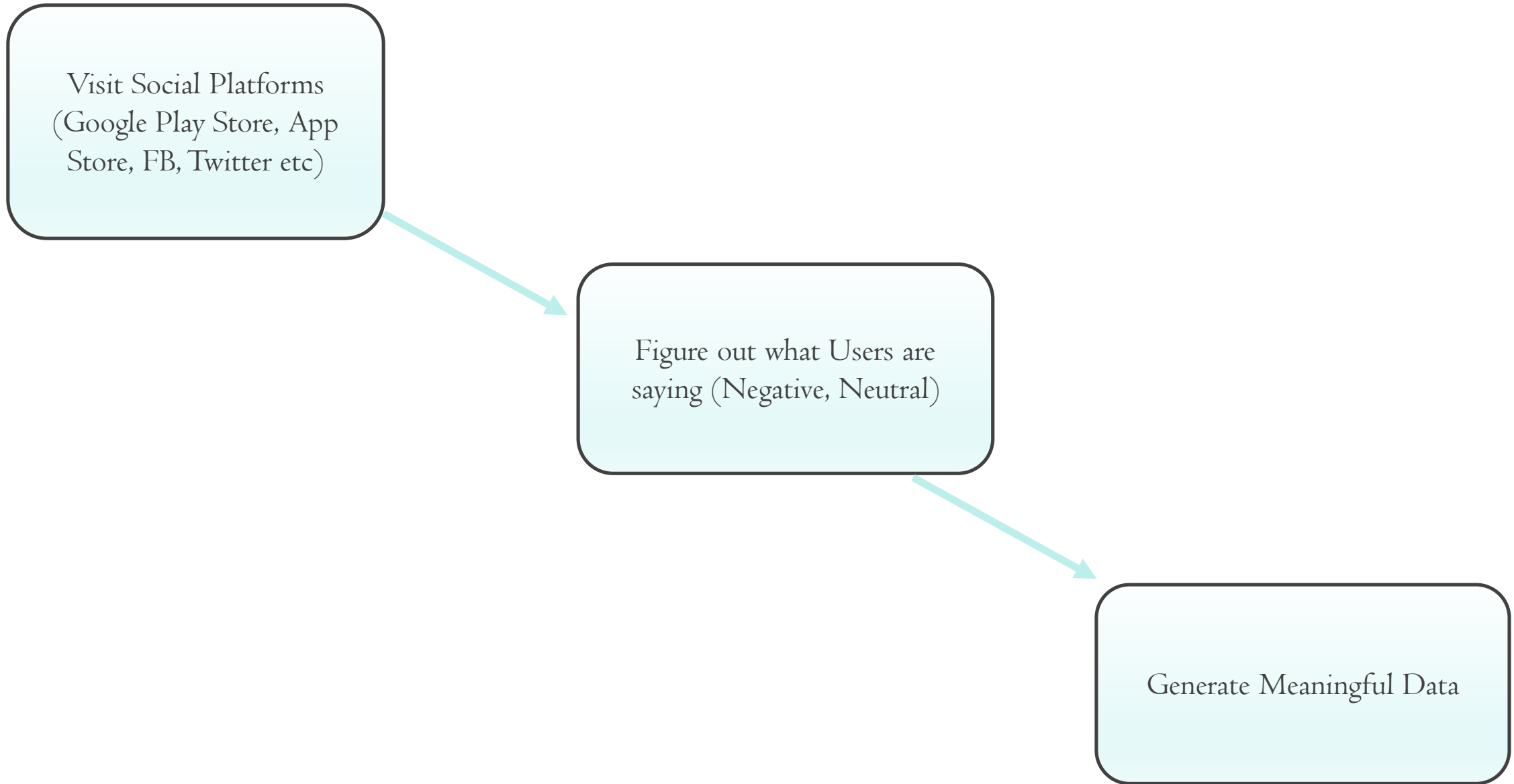


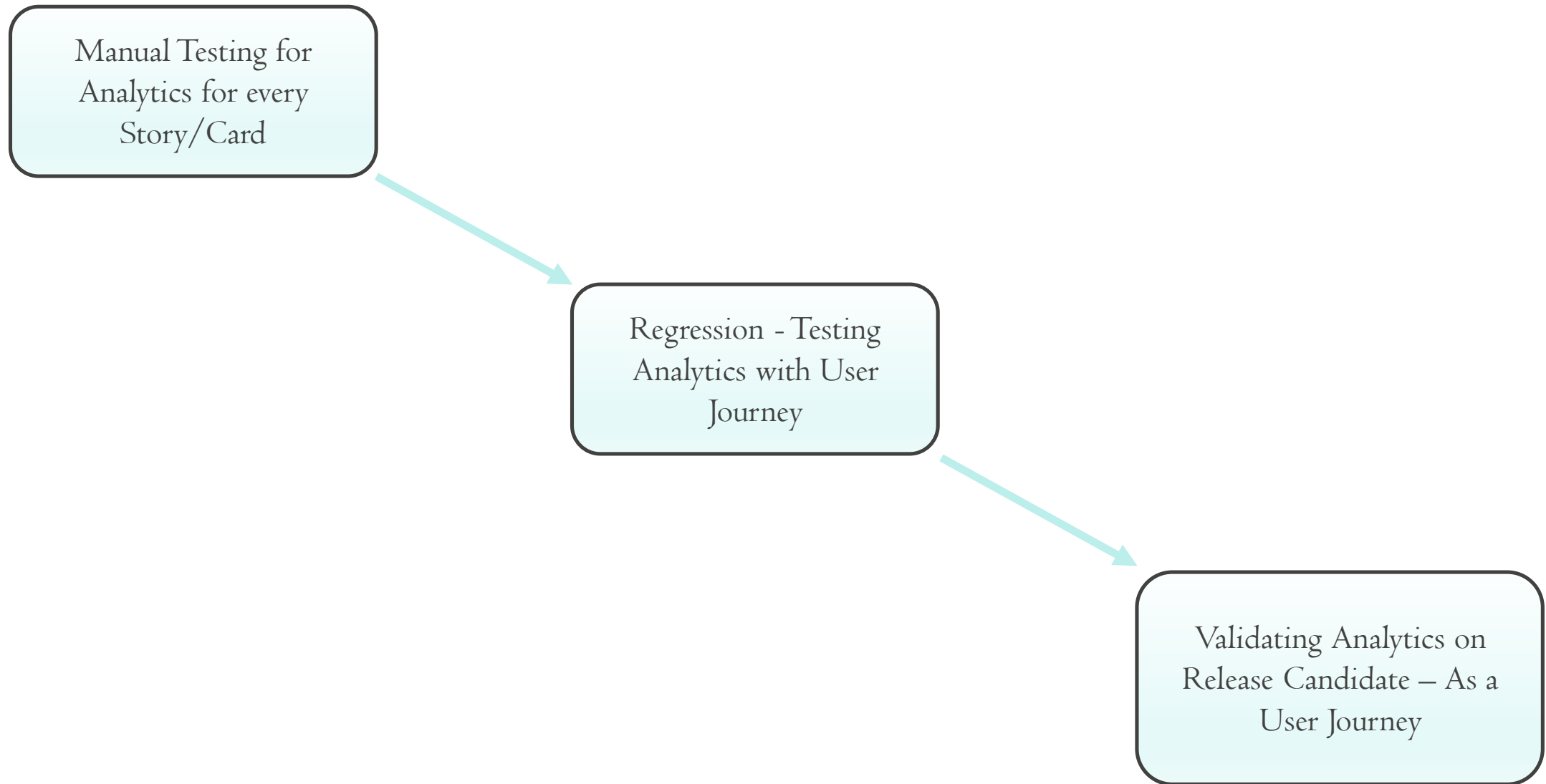
	Acquisition			Behavior			Conversions		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	1,999	88.39%	1,767	59.98%	1.59	00:01:17	21.81%	436	\$0.00
1 Organic Search	1,179			65.14%			20.61%		
2 Social	549			60.11%			27.50%		
3 Direct	148			58.11%			25.00%		
4 Referral	123			12.20%			4.07%		



# Manual Approach

PROBLEM STATEMENT - I



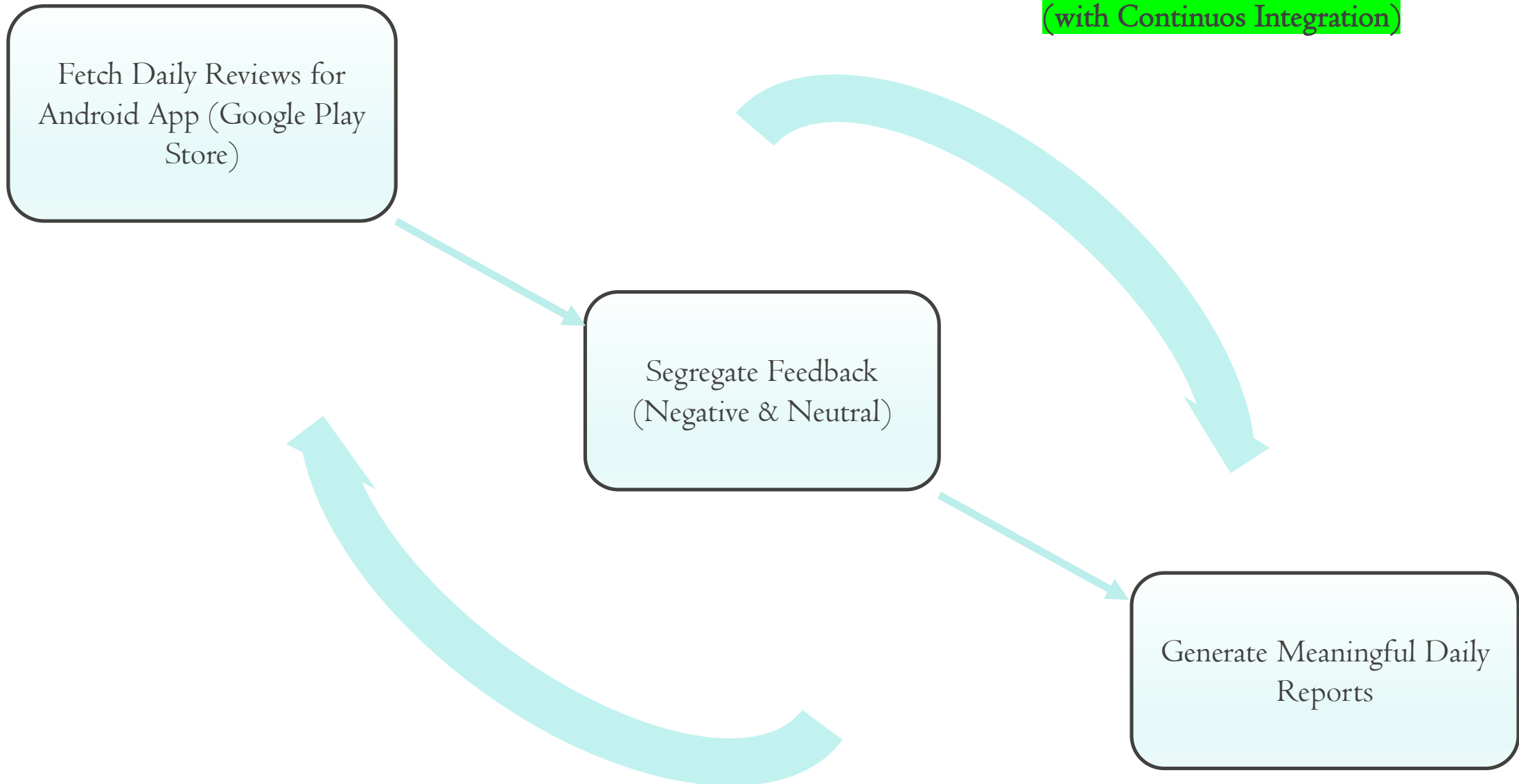


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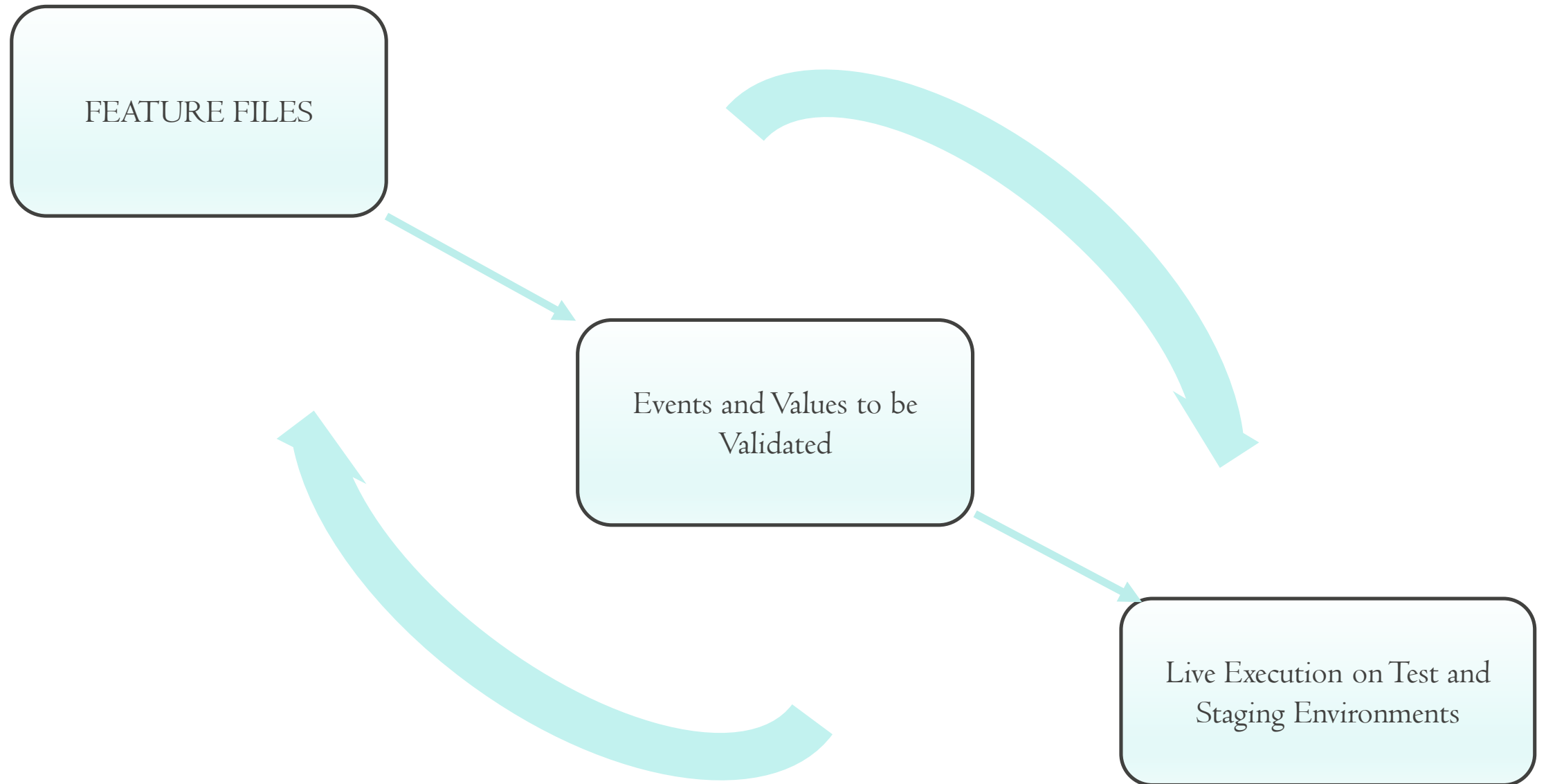
# Automated Approach

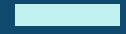
SOLUTION - I

Release → Generate → Repeat  
(with Continuous Integration)



SOLUTION - 2





De m o



```
→ Sentiment-Analysis-Play-Store-Reviews git:(master) X rake PACKAGE_NAME=com.ebay.mobile REVIEW_DATE=15 reviews:run:fetch

Project - Sentiment-Analysis-Play-Store-Reviews ~/perso
├── csv
├── features
│   └── app_features.rb
├── mac
├── rake-tasks
│   ├── fetch_analyse.rake
│   └── report
│       ├── html_generator.rb
│       └── output.tmp
├── reviews
│   ├── analyse_reviews.rb
│   ├── helpful_reviews.rb
│   ├── latest_reviews.rb
│   └── sentimental_process.rb
├── support
│   ├── data
│   │   └── credentials.yml
│   ├── ci.sh
│   ├── env.rb
│   ├── Gemfile
│   ├── Gemfile.lock
│   ├── Rakefile
│   ├── README.md
│   ├── Report_23rdNov.png
│   └── Report_28thNov.png
├── External Libraries
└── Scratches and Consoles

1 require 'watir'
2
3 $locator = {
4   see_more: "//*[text()='Read All Reviews']",
5   value_dropdown: "//*[text()='Most helpful first']",
6   new: "//*[@class='DA0qNb_ncFHed']/div[1]",
7   review_text: 'div.UD7Dzf',
8   review_date: "//*[@class='bAHLNe_kx8XBd']/div/span[@class='p2Tk0b']",
9   review_rating: "//*[@class='qC3s2c']/div/div"
10 }
11
12 class FetchResponse
13 def initialize(package)
14   @filtered = CSV.open('csv/filtered_reviews.csv', 'wb')
15   @newest = CSV.open('csv/newest_reviews.csv', 'wb')
16   @url = "https://play.google.com/store/apps/details?id=#{package}&hl=en"
17   @driver = create_driver
18   @driver.goto(@url)
19 end
20
21 def create_driver
22   driver_path = 'mac/chromedriver'
23   driver = Selenium::WebDriver.for :chrome, driver_path: driver_path
24   browser = Watir::Browser.new(driver)
25   at_exit do
26     sleep(*duration 2)
27     browser.quit
28   end
29   browser
30 end
31
32 def fetch_reviews(requested_date)
33   requested_date = requested_date.split(",")
34   is_get_reviews = true
35   puts "xxxxx Fetching Reviews for Date : " + requested_date.to_s + "-" + Date.today.strftime("%8").to_s
36   order_reviews_by_newest
37   while is_get_reviews
38     i, j, k = 0, 0, 0
39     list = []
40     scroll_down( count 5)
41     sleep(*duration 2)
42     review_text = @driver.elements(css: $locator[:review_text])
43     review_date = @driver.elements(xpath: $locator[:review_date])
44     puts "xxxxx Review: " + review_text[0].text + " Date: " + review_date[0].text
45   end
46 end
```

```
→ Sentiment-Analysis-Play-Store-Reviews git:(master) X rake PACKAGE_NAME=com.ebay.mobile reviews:run:analyze

Project - Sentiment-Analysis-Play-Store-Reviews ~/person
├── csv
│   ├── filtered_reviews.csv
│   ├── functionality_reviews.csv
│   ├── negative_reviews.csv
│   ├── newest_reviews.csv
│   └── README.md
├── features
│   └── app_features.rb
├── mac
├── rake-tasks
│   └── fetch_analyse.rake
├── report
│   ├── html_generator.rb
│   └── output.html
├── reviews
│   ├── analyse_reviews.rb
│   ├── helpful_reviews.rb
│   ├── latest_reviews.rb
│   └── sentimental_process.rb
├── support
│   └── data
│       └── credentials.yml
├── ci.sh
├── env.rb
├── Gemfile
├── Gemfile.lock
├── Rakefile
├── README.md
├── Report_23rdNov.png
├── Report_28thNov.png
├── External Libraries
└── Scratches and Consoles

1 require_relative '../reviews/latest_reviews'
2 require_relative '../reviews/sentimental_process'
3 require_relative '../reviews/analyse_reviews'
4 require_relative '../report/html_generator'
5
6
7 $PROJECT_ROOT = File.expand_path(File.join(File.dirname( file_name __FILE__ ), '../'))
8
9
10 namespace :reviews do
11   namespace :run do
12     desc "Run all"
13     task :all => [:fetch, :analyze]
14
15     desc "Fetch all latest reviews"
16     task :fetch do
17       cleanup
18       FetchResponse.new(ENV['PACKAGE_NAME']).fetch_reviews(ENV['REVIEW_DATE'])
19     end
20
21     desc "Analyze all reviews using AYLIEN API"
22     task :analyze do
23       configure_cred
24       AnalyzeReviews.new.analyze_each_review
25       AnalyzeReviews.new.close_files
26     end
27
28     desc "Process all reviews without using API"
29     task :process do
30       SentimentalProcess.new.process
31     end
32
33     desc "Generate HTML Report"
34     task :output do
35       ProduceHtml.new.generate_html
36     end
37   end
38 end
39
40 def cleanup
41   puts "Cleaned up previous CSV files"
42   `rm -rf #{$PROJECT_ROOT}/report/review_report.html`
43   `rm -rf #{$PROJECT_ROOT}/csv/*.csv`
44 end
45
```

Area	Review
Authentication	Continually times out/errors out after fingerprint authentication. Just use the browser instead, avoid the hassle.
Cart	After buying an item, I can't add that listing to my shopping cart to buy multiple items at once, can only "buy it now". I wanted to combine next orders to cut on shipping but EBay wont let me add to the cart once iv already made a purchase on that listing. Losing heaps in shipping.
Crash	I can't use this app for about a month now it just keeps crashing everytime I try to view a car listing. Sent multiple reports. So frustrating. Fix it.
Location	Closed my Ebay account and deleted this app. Got tired of sellers falsifying their locations or buyers being dishonest. I lost money and items, EBay didn't protect me at all .
Offers	Why are you sending me offers for things i don't need? Just because you've knocked 10% off something totally irrelevant to me doesn't mean I'm going to buy it! 2 or 3 spam messages a day!! Uninstalling!!!
Price	Selling on eBay is becoming a nightmare. EBay keeps changing my auctions to accept offers at half of my list price. I do not want to accept offers and I don't think eBay should change my settings without my knowledge. Contacting customer service about this issue was a waste of time. The person was c... Full Review
Price	I look for things at a decent price and I usually find what I'm looking for or something even better.
Search	Unfortunately the app no longer save my searches properly. It keeps forgetting my postcode, and instead just shows it as 'postalcode'. So this means whenever I click on a saved search eg sinks within 5 miles of my post code, it just shows new sinks within 5 miles of anywhere in the UK. This was my p... Full Review
Search	I'm rating eBay only 1 star cause it doesn't show any product after I search and says no product found
Search	App doesn't save my post code any more so all of my saved searches are pointless.
Update	this app has gone downhill for the past couple years. With every update comes more issues. I haven't been able to checkout a group of item, all at once, in a while now. There are no updates to fix this. I have to purchase each item separately or go to the website on Chrome to purchase. The app is st... Full Review
Update	Hate the new update. It used to take about 1 min to post an item. Now there are WAY TOO many clicks required. Doesnt keep my shipping pref, so I have to go through 4 clicks to do that. Then I dont want "smart pricing" so I am forced to click again. I also dont want to pay for it to be an ad, so I ha... Full Review
Update	I dislike any app that resets your notification settings on each update. An excuse to send you junk notifications!
Update	I don't like the new update much. A couple of decent changes and a whole lot of irritating ones. One really irritating issues is when I use the app to list an item for sale and apply free shipping, the app automatically reverts shipping costs back to their suggested rate. I just listed 4 items back ... Full Review
Update	The old app was amazing this new app is horrible I list thousands of things a year for my store thru the app. With thelatest update you can no longer list good until canceled. Almost every step of the listing process is longer now with this latest update. Costing me and ultimately eBay money.
Update	This app continues to get worse with each update. You now cannot change sales durations and modify existing listings durations. When buy it now or best offer listing are not sold, the app relists the posting as a good until canceled and cannot be modified. This wastes a free listing of the 50 free p... Full Review



Area	Review
Delete	Too many errors. Sometimes I can't download and I even can't delete the video. So it stuck and I can't do anything about it. Just appear at download section until i re-install this.
Download	I cant download the newest drama... Please fix it! Its annoying the drama cant download.
Download	Too many download error for running man
Download	Some episode unable to download and can't be watched too..
Download	What about the social episode_12 Its not downloading irritating ...
Download	Sometimes I can not download the newest episode of korean dramas which still airing in korea, also a week or two episodes I can not download it, even though I'm still have a lot of Viu internet quota. please fix it!!
Download	Saya udh pake Viu empat bulanan. Dan smkin ke sini Viu semakin buruk. Awalnya saya hanya kesulitan download Detective Yugami, setelah komplek katanya harus clear data. Eh setelah clear data malah ga bisa di donlot sama sekali. RUGI BANDAR GUE !!
Download	Semua drama baru ga bisa didownload..kl nonton langsung,ga ada pilihan kualitas videonya,ga kuat kuotanya...knpa skrg jadi gini ya??..
Premium	I have pay for premium subscriber 3 months but after 3 days recognized as basic plan. Very disappointed!!!
Premium	I was a subscribers, that pay with google account, but since I'm updating the apps, i lost my premium status, and i still need to pay another 60k with my providers' credit. Please solve this.
Premium	akses premium kena biaya...ga termasuk potongan kuota setiap nonton...tutup aja udah ni VIU...🙄
Subtitle	Why now i cant see any subtitles when playing dramas?
Subtitle	Pls upload Korean drama..I hear your voice with English subtitles....

## Feature: Validating Page View events

Scenario: Run a simple test

Given I launch travel magazine home page

When I wait for the page view event

Then I match following params for page view

page	event
travel Magazine	<u>pageview</u>

Analytics Feature

▼ base_line	2	<b>_gid:</b> '365281750.1539559204'
8_Romantic_Getaways_in_Texas_Couples_Messages,_Fine_Dining,_and_Suns	3	<b>_s:</b> '1'
8_Romantic_Getaways_in_Texas_Couples_Messages,_Fine_Dining,_and_Suns	4	<b>_u:</b> YGBAgUAB~
8_Romantic_Getaways_in_Texas_Couples_Messages,_Fine_Dining,_and_Suns	5	<b>_v:</b> j70
Magazine_hotel_inspiration_from_travel.com_pageview_c184d31fd486ea21b	6	<b>a:</b> '1532291574'
travel_Magazine_event_d6f978feb293411fc2612c0460289bb7.yml	7	<b>aip:</b> '1'
travel_Magazine_pageview_c184d31fd486ea21b71ff7f6fa884f01.yml	8	<b>cd2:</b> Pageload
▶ features	9	<b>cd3:</b> '1110000000003'
▶ test	10	<b>cd4:</b> (none)
.gitignore	11	<b>cd5:</b> http://magazine.travel.com/
.overcommit.yml	12	<b>cd7:</b> '0'
README.MD	13	<b>cd9:</b> '1'
requierments.txt	14	<b>cid:</b> '876775276.1539559204'
▶ External Libraries	15	<b>de:</b> UTF-8
▶ Scratches and Consoles	16	<b>dl:</b> http://magazine.travel.com/
	17	<b>dt:</b> travel Magazine
	18	<b>gjid:</b> '277321188'
	19	<b>gtm:</b> Ga1TCJR3GL
	20	<b>je:</b> '0'
	21	<b>jid:</b> '491254721'
	22	<b>sd:</b> 24-bit
	23	<b>sr:</b> 1440x900
	24	<b>t:</b> pageview
	25	<b>tid:</b> UA-75701628-4
	26	<b>ul:</b> en-gb
	27	<b>v:</b> '1'
	28	<b>vp:</b> 1200x719
	29	<b>z:</b> '1975857044'
	30	

## Baseline Events

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# Challenges Faced

- Integrating this complete process and running it daily on CI to generate meaningful reports
- Figuring out the language for the feedbacks as our mobile application is used in multiple regions (WIP)
- Storing and separating the feedback based on date range



# Tech Stack (Open Source)

- Cucumber
- Ruby, python
- Watir
- MITM Proxy
- AYLIEN Sentiment Analysis



Next Steps

- Introduce ML to make reporting more robust and more specific to an app's functionality
- Use Google APIs to fetch reviews rather than using Selenium
- Fetching reviews from other Social Platforms like Twitter, Facebook, etc.
- Running end-to-end BDD test for analytics on all platforms

# Thank You

<https://github.com/rohsin02/Sentiment-Analysis-Play-Store-Reviews>

 @rohsin29

 rohsin02



ebay