

Set Course for Notifications... Engage!

Eric Fung @gnufmuffin



DevFest DC • 2016-09-24

A close-up photograph of a man's face. He has short, light-colored hair and is smiling broadly, showing his teeth. His right hand is raised to his face, with his fingers resting near his eye and temple. The background is dark and out of focus.

Engage



ENTREPRENEUR'S DIGEST

POWERED BY



Entrepreneur's Digest

A screenshot of a smartphone displaying a news feed from Entrepreneur's Digest. The top navigation bar is green with the text "All articles" and a dropdown arrow, a magnifying glass icon for search, and three vertical dots for more options. The time "1:03" is shown in the top right corner. The main content area shows three article cards:

- This Home Décor Store Drives 93% of Its Social Traffic From Pinterest**
Elizabeth, Patrick, Nina and Kelsey are the owners of Walls Need Love, a company that designs, print...
by Felix Thea yesterday
- How to Create a Social Media Content Calendar in 4 Simple Steps**
Do you know what you're going to post on Facebook tomorrow? How about next week? Pla...
by Kevin Donnelly yesterday
- 13 Entrepreneurial Women and the**

The bottom of the screen features a black navigation bar with three icons: a triangle pointing left, a house shape, and a square.

A screenshot of a smartphone displaying a list of categories from Entrepreneur's Digest. The top navigation bar is green with the text "All articles" and a dropdown arrow, a magnifying glass icon for search, and three vertical dots for more options. The time "1:03" is shown in the top right corner. The main content area shows a list of categories under the heading "POPULAR":

- Conversion Rate Optimization
- Ecommerce Inspiration
- Ecommerce Trends
- Email Marketing
- Facebook Marketing
- How to Sell Online
- How to Start a Business
- Podcasts
- Shopify Updates

The bottom of the screen features a black navigation bar with three icons: a triangle pointing left, a house shape, and a square.

Case Studies

How I Imported Gaming Glasses With Alibaba and Made \$2,416.51 in 5 Weeks

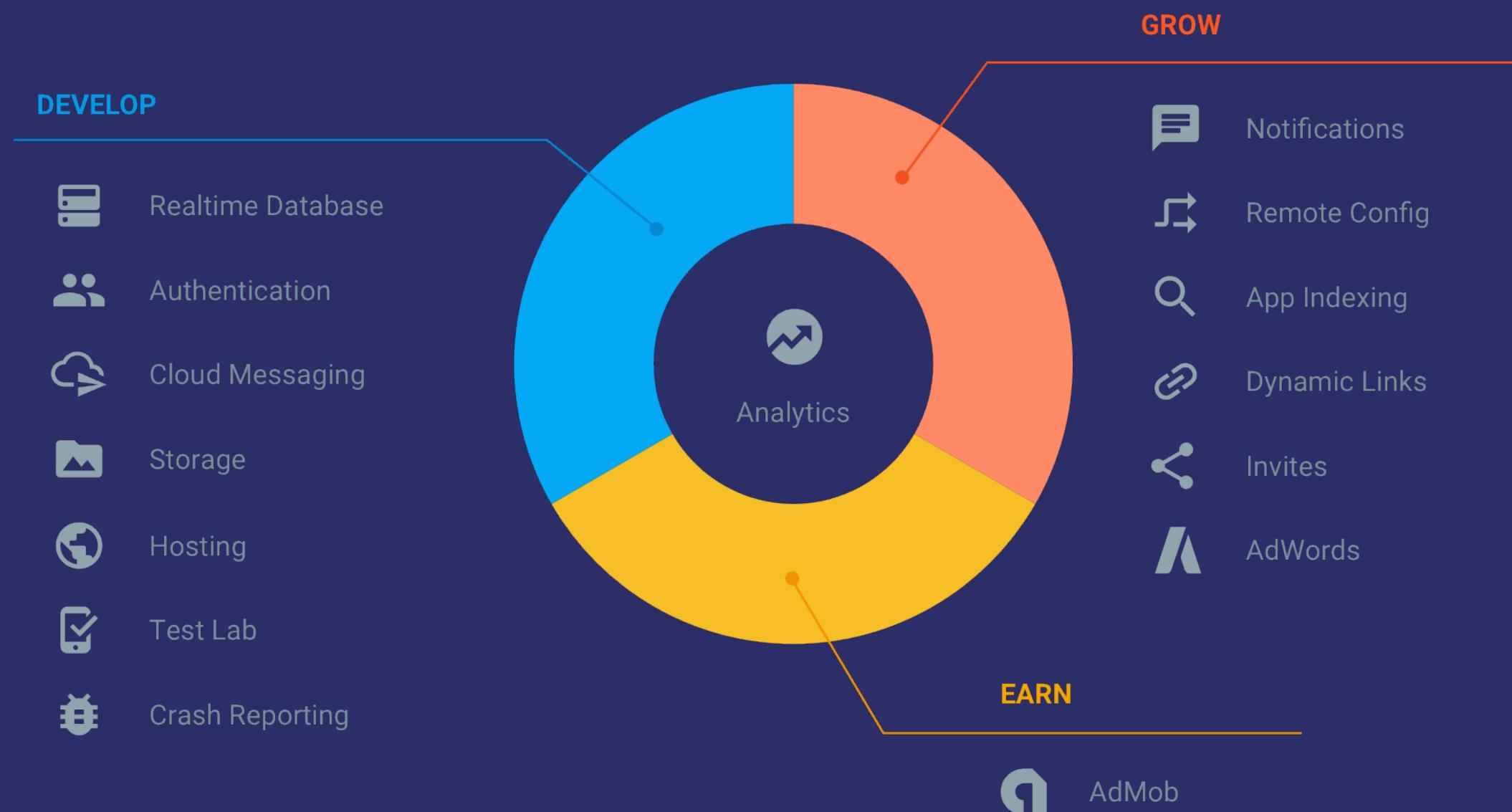
By Corey Ferreira • 47 minute read

syght GAMING GLASSES

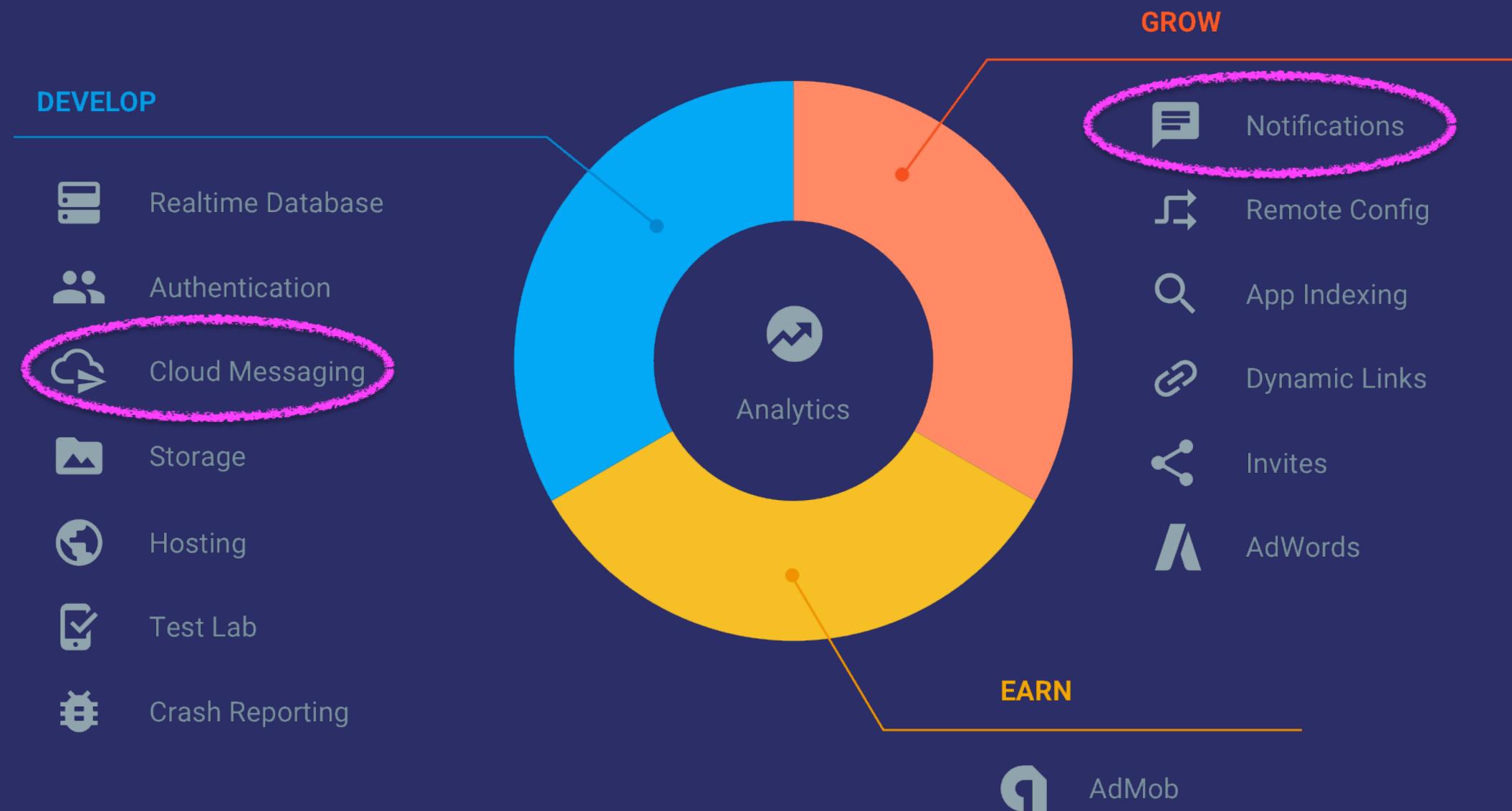
We've seen this economy and...

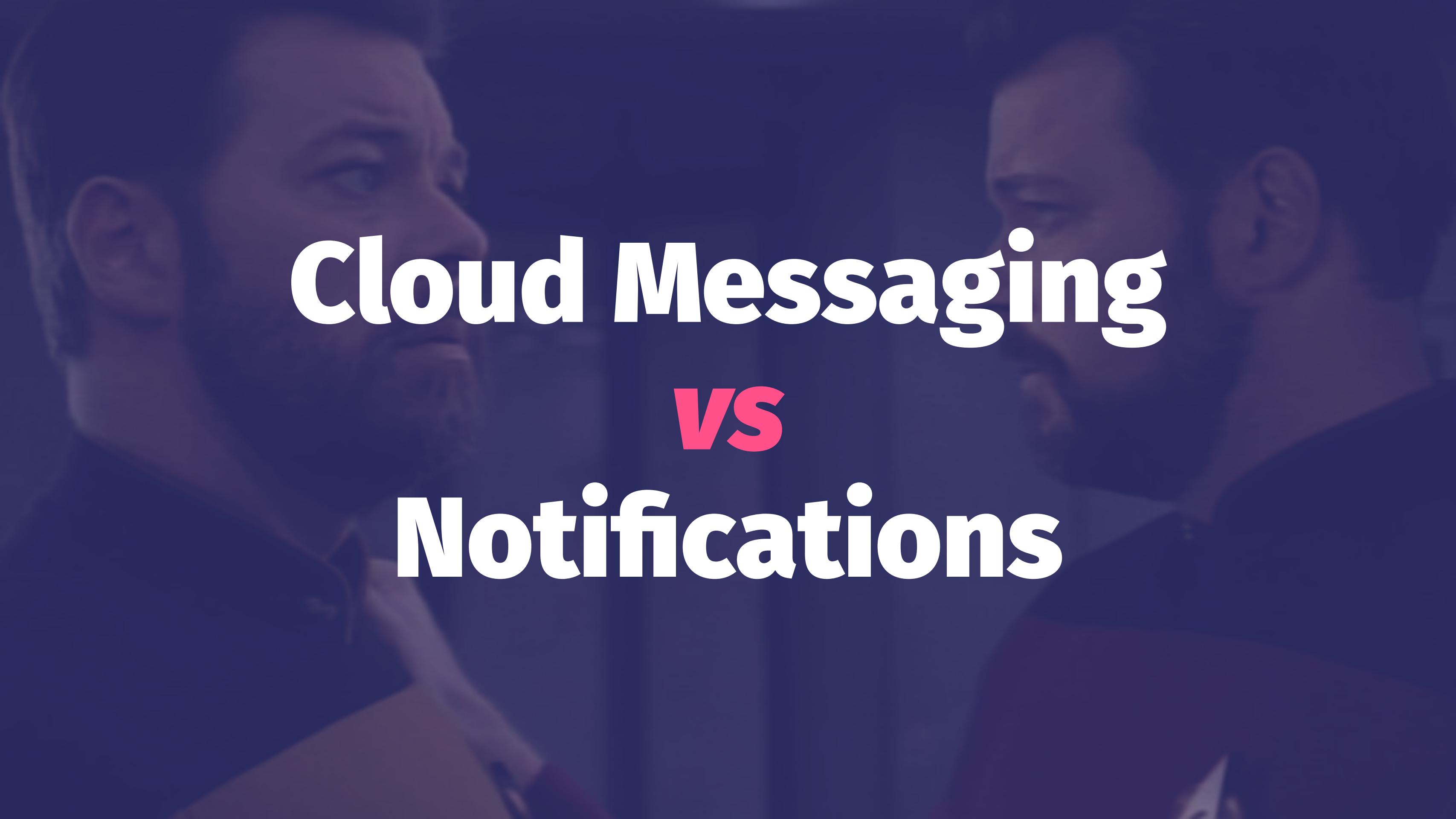
A screenshot of a case study article titled "How I Imported Gaming Glasses With Alibaba and Made \$2,416.51 in 5 Weeks" by Corey Ferreira. The article has a 47-minute read time. Below the title are social sharing icons for Facebook, Twitter, and LinkedIn. A banner for "syght GAMING GLASSES" is visible, featuring a person wearing the glasses. The text "We've seen this economy and..." is partially visible at the bottom.

Let's Try Firebase!



Let's Try Firebase!



A blurred background image of two people, a man and a woman, looking at a tablet screen together. The man is on the left, wearing glasses and a light-colored shirt. The woman is on the right, wearing a dark top. They are both looking towards the right side of the frame where the text is located.

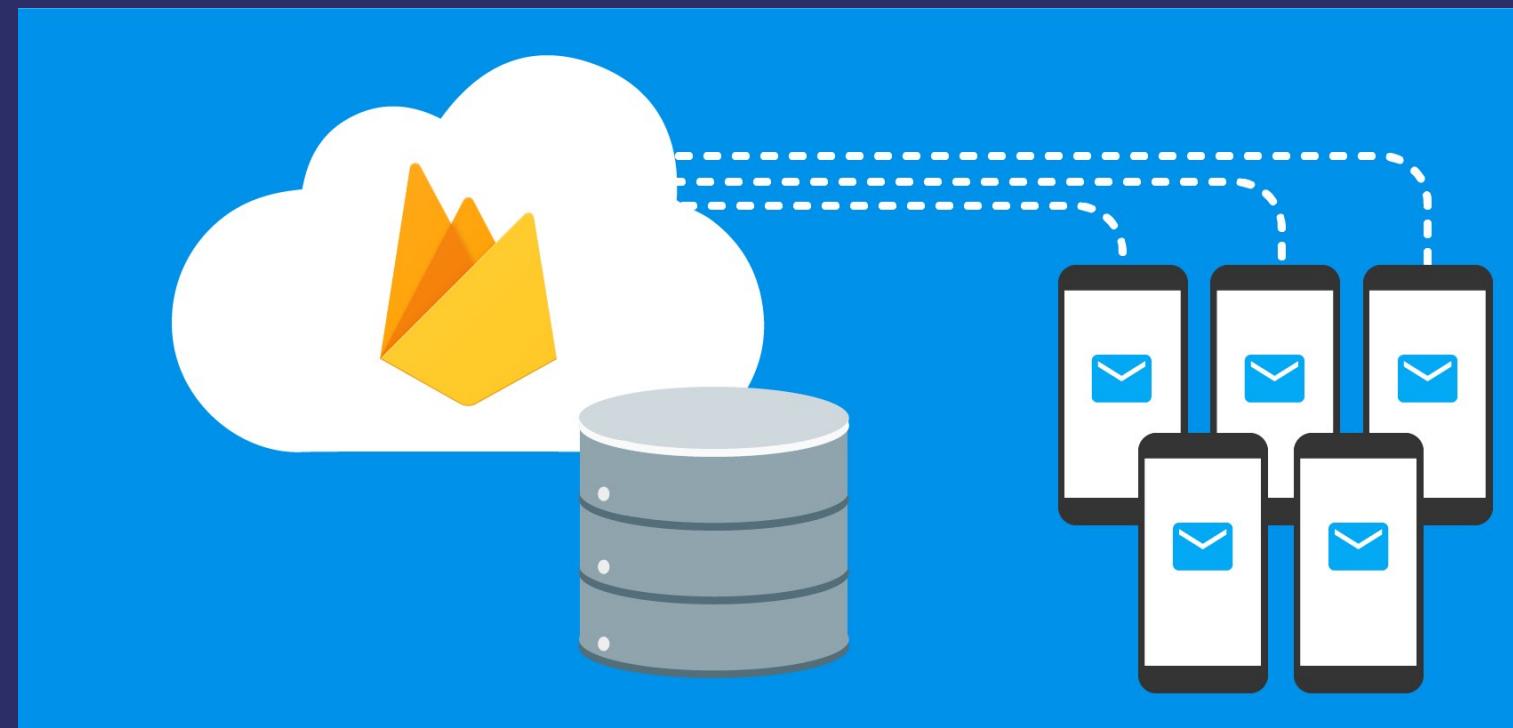
Cloud Messaging

VS

Notifications

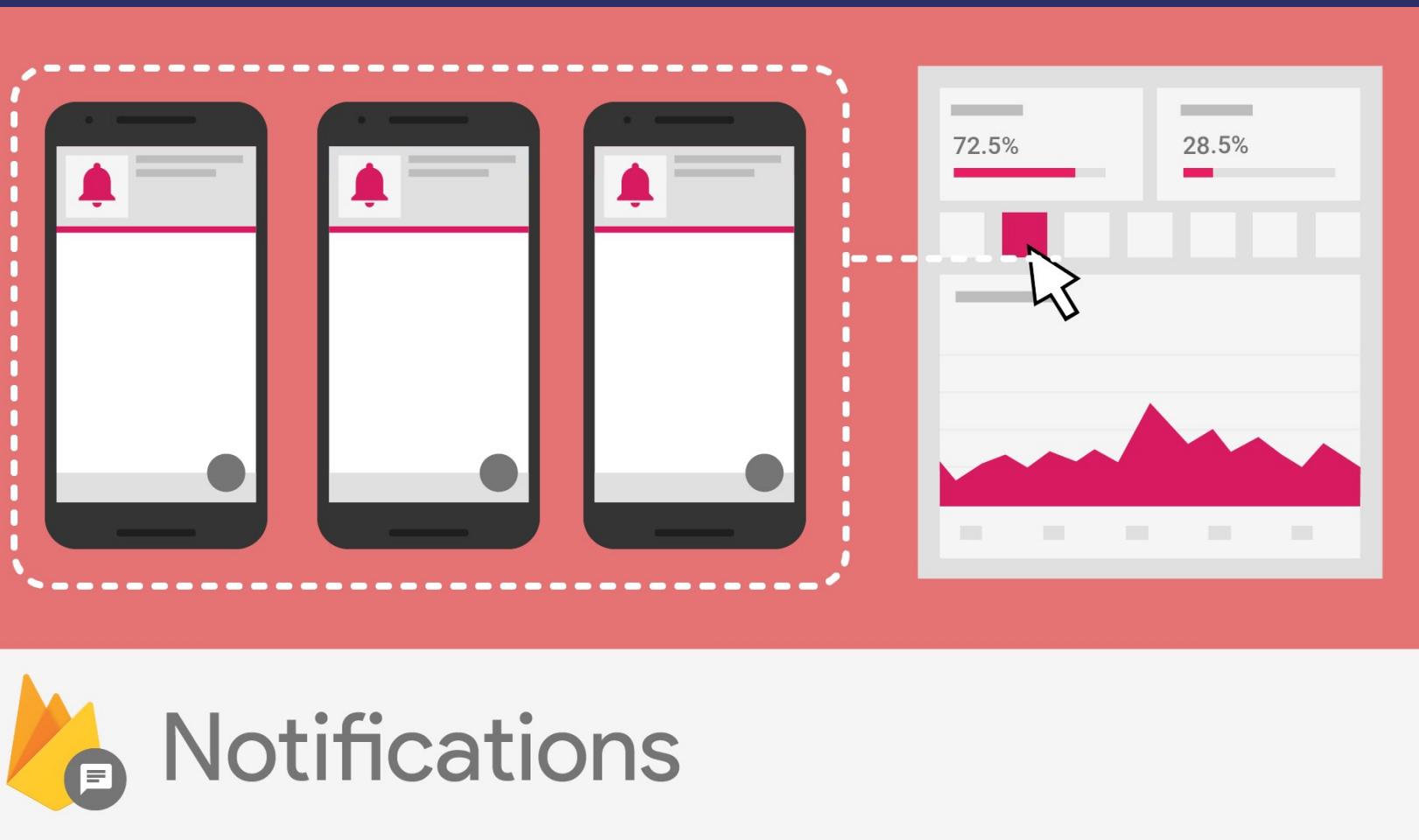
Cloud Messaging

- Reliably delivers messages
- Optional application server
- Multiplatform client SDKs



Notifications

- Graphical console for re-engagement
- No coding required
- Built-in analytics



 Notifications

Android Integration

```
compile "com.google.firebaseio:firebase-messaging:${FB_VERSION}"
```

What You Get

- Manifest permissions
- Registration token
- Broadcast receiver
- Display in notification area
- Topic subscription
- Analytics

Notifications Console

Message text
\$5 promo

Message label (optional) ?
Enter message nickname

Delivery date ? Time Time zone ?
Send Later 5/30/16 12:00 PM Recipient time zone
 Recipient time zone

Target
 User segment Topic Single device

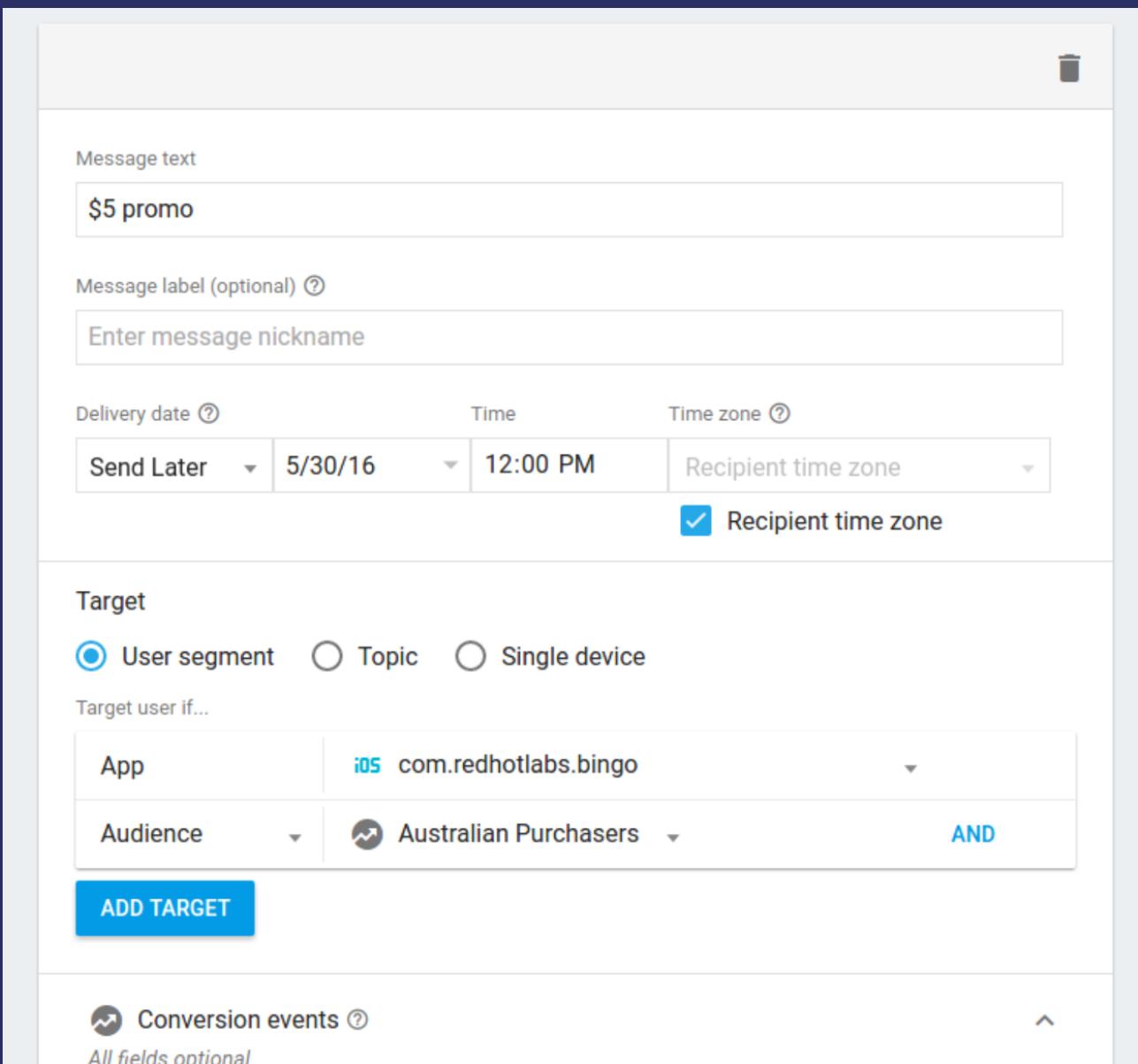
Target user if...

App

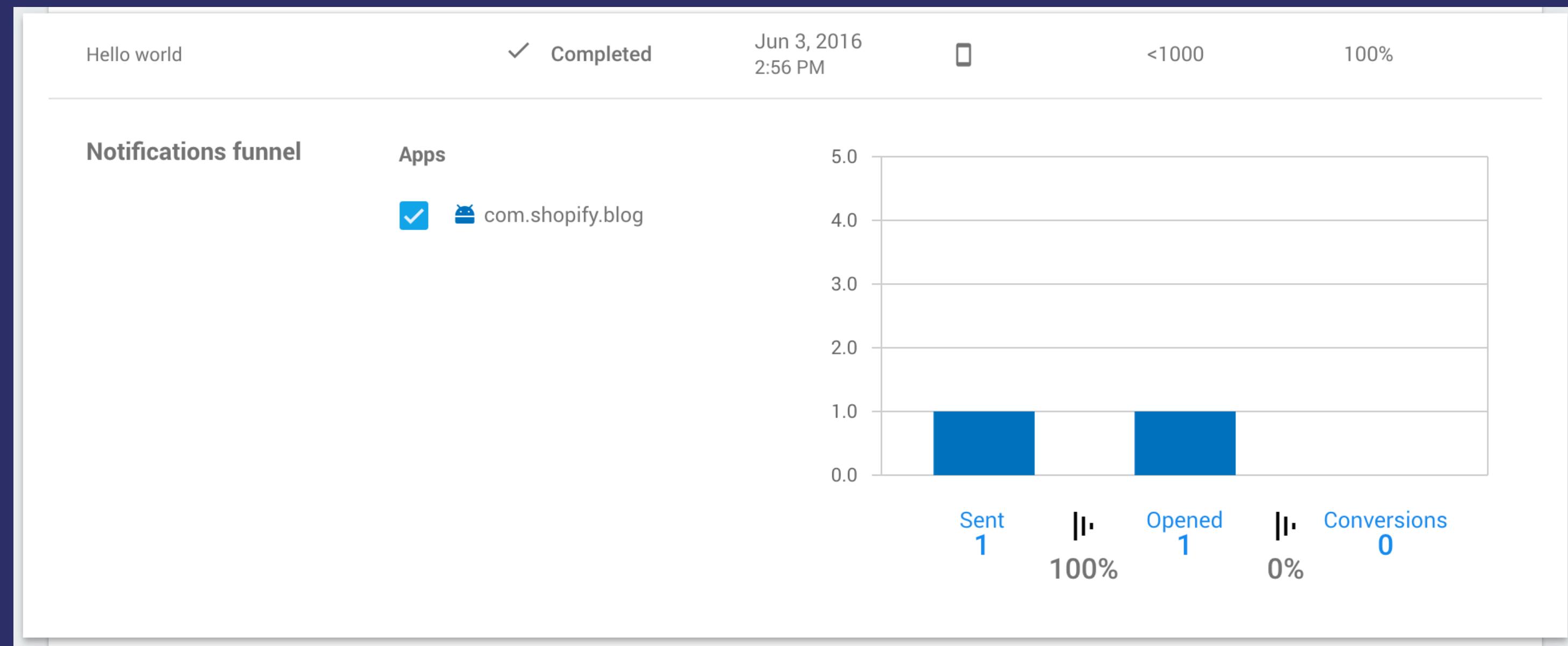
Audience

ADD TARGET

Conversion events ?
All fields optional



Funnel Analysis



A man with short brown hair, wearing a dark suit jacket over a white shirt and a patterned tie, is looking down at a laptop screen with a wide-eyed, surprised expression. His hands are clasped together on the keyboard. The background is a plain, light-colored wall.

Wow, amazing!

But...

What About...

- Different notification **style**?
- **Grouping** and **summary**?
- Not showing until **background sync** happens?
- **Analytics** and reporting?

**Let's
Dig
Deeper**

Notification Messages

```
{  
  "to" : "/topics/email_marketing",  
  "notification" : {  
    "body" : "How to Grow a Business with Email Marketing",  
    "title" : "New article available",  
  }  
}
```

- Predefined keys
- Shown automatically if app backgrounded
- Console only sends this type

Data Messages

```
{  
  "to" : "/topics/email_marketing",  
  "data" : {  
    "item_id" : 14142135,  
    "article_title" : "How to Grow a Business with Email Marketing"  
  }  
}
```

- Freeform keys and values
- App decides what to do on receive
- Console cannot send this kind

Notification **vs** Data Messages

App state	Notification	Data	Both
Foreground	<code>onMessageReceived</code>	<code>onMessageReceived</code>	<code>onMessageReceived</code>
Background	System tray	<code>onMessageReceived</code>	Notification: system tray Data: in extras of the intent.

Sending Data Messages

- Must use FCM
- Handle everything in onMessageReceived
 - No more analytics 😢
 - Or funnel analysis 😢 😢

The Best of Both Worlds?

- Custom Notifications
- Analytics + Reporting

Styling & Grouping Notifications

Styling & Grouping Notifications



2 new articles

14:26

7 Ways Kit Can Help You Make Your First...

Why the Creator of Qwerky Writer Says Yo...

Grouping Notifications

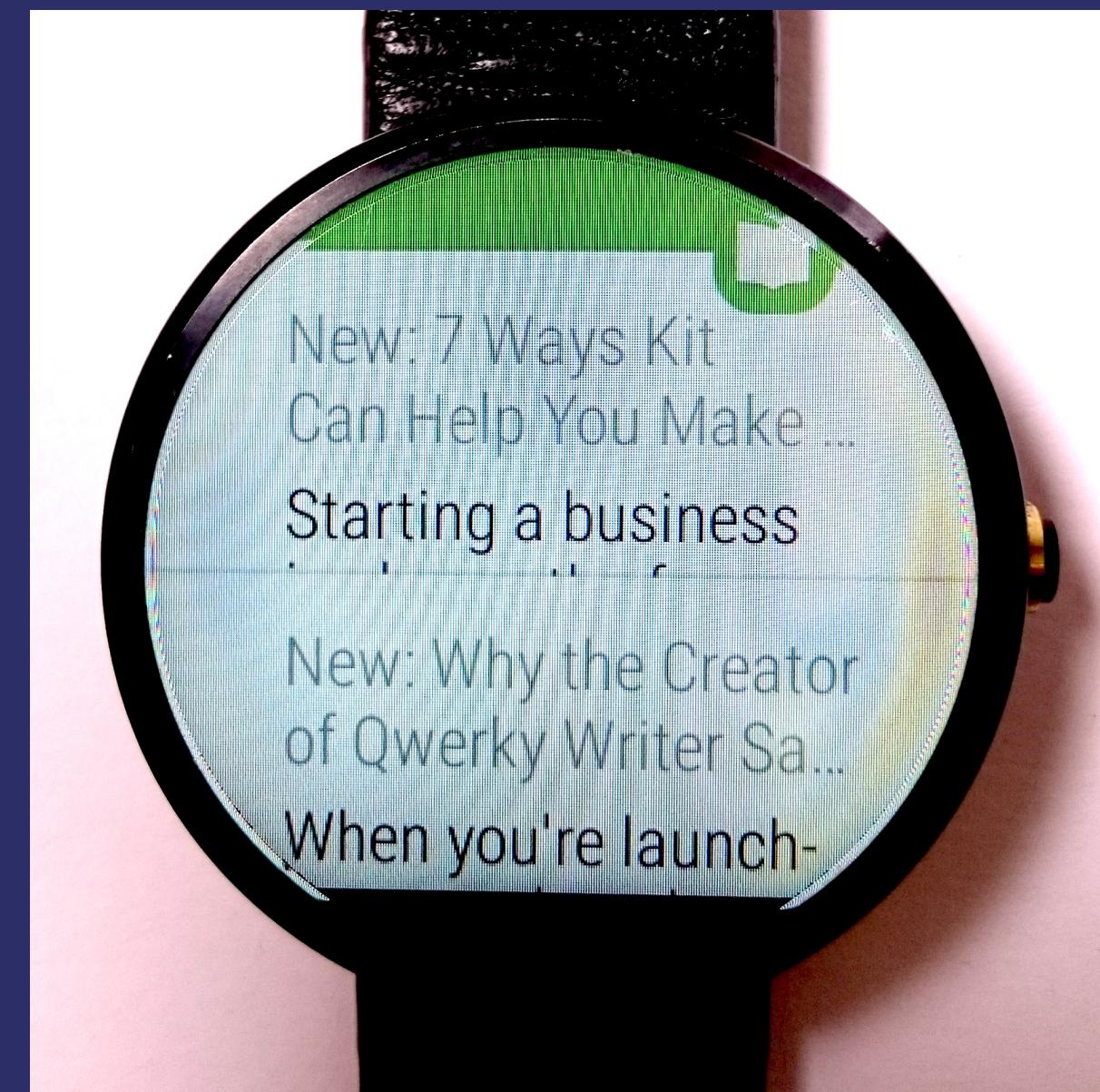
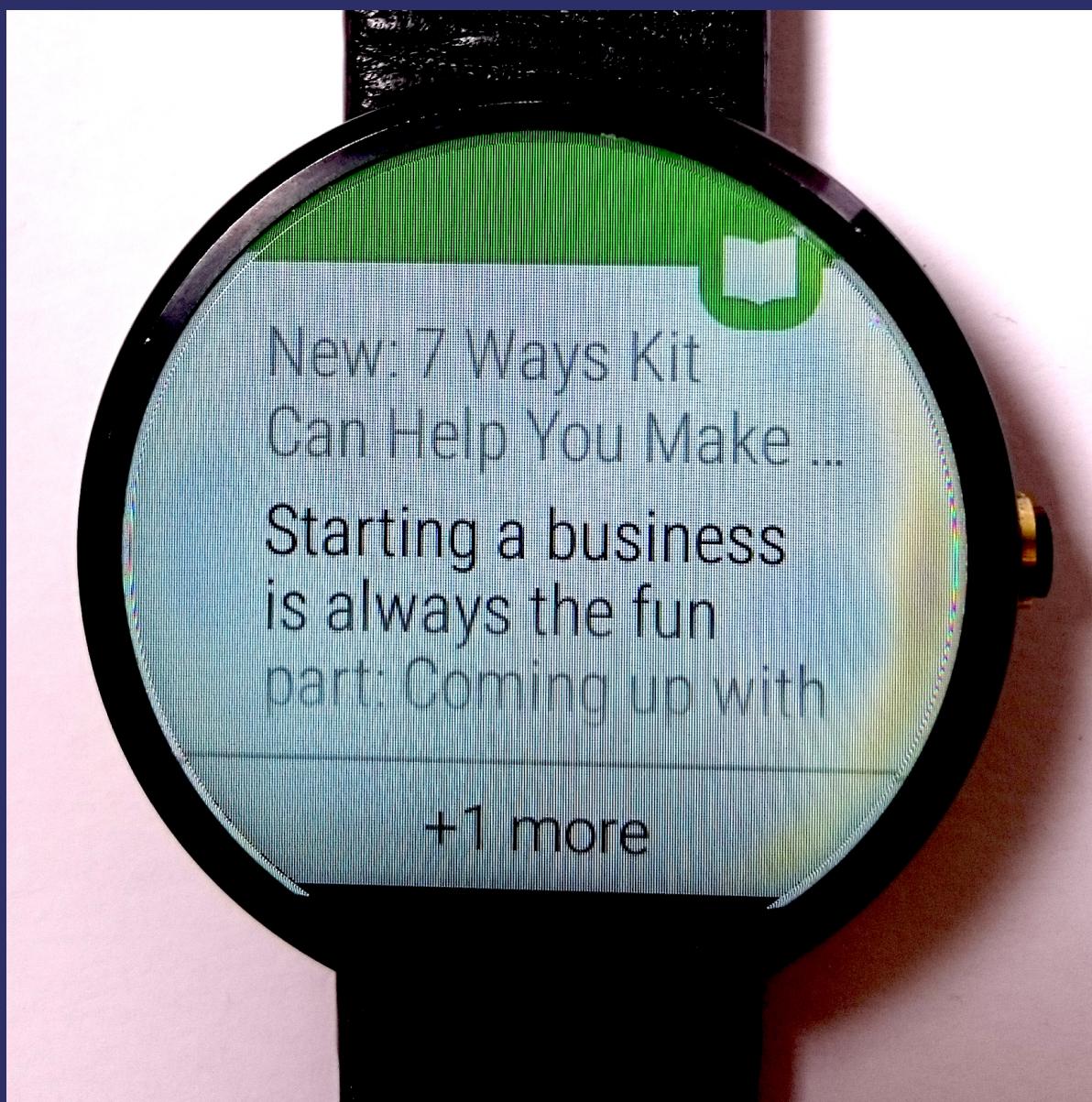
```
private static final String GROUP_NEW_ARTICLE = "new_article";  
  
new NotificationCompat.Builder(context)  
    .setContentTitle(title[0])  
    .setGroup(GROUP_NEW_ARTICLE) // <<<<<  
...  
  
new NotificationCompat.Builder(context)  
    .setContentTitle(title[1])  
    .setGroup(GROUP_NEW_ARTICLE) // <<<<<  
...
```

Summary Notification

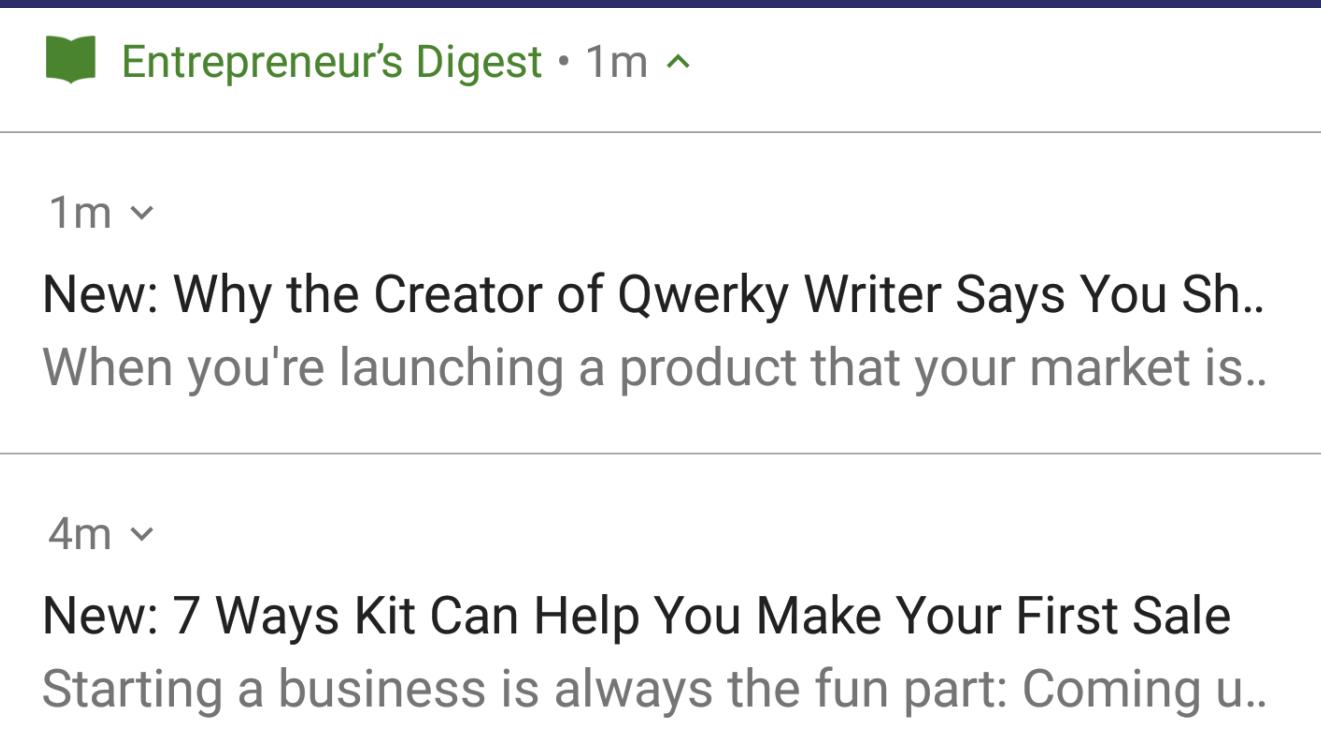
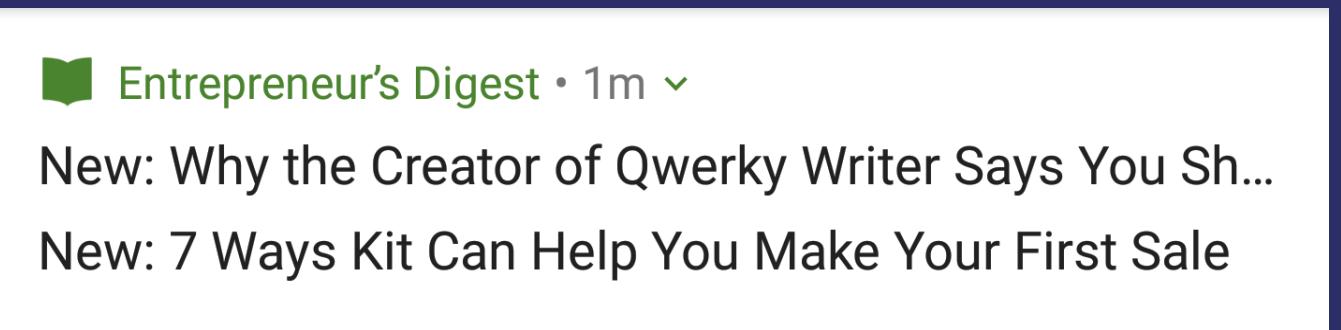
```
new NotificationCompat.Builder(context)
    .setContentTitle(n + " new articles")
    ..setStyle(inboxStyle)
    .setGroup(GROUP_NEW_ARTICLE) // <<<<<
    .setGroupSummary(true)      // <<<<<
```

...

Stacked Notifications in Wear



Bundled Notifications in Nougat



Notifications As Pings

When Not To Show

- During "Do Not Disturb" time
- Push data needs further processing
 - Send-to-sync messages

Being a Good App Citizen

- Push messages are delivered *very quickly*
- Consider server when client syncs
 - Stagger start time of sync
 - Minimize power usage

Scheduling Background Sync

[https://developer.android.com/topic/performance/
scheduling.html](https://developer.android.com/topic/performance/scheduling.html)

- JobScheduler (API 21)
- Firebase JobDispatcher?
- **GCMNetworkManager**

Jobs in GCMNetworkManager

- Specify network and scheduling requirements
- Scheduler tries to batch and defer as long as possible

build.gradle

```
compile "com.google.android.gms:play-services-gcm:${PLAY_VERSION}"
```

AndroidManifest.xml

```
<service
    android:name=".notifications.MyFirebaseMessagingService"
    android:exported="false">
    <intent-filter>
        <action android:name="com.google.firebase.MESSAGING_EVENT" />
    </intent-filter>
</service>
```

→ onMessageReceived is called in this service

MyFirebaseMessagingService.java

```
@Override  
public void onMessageReceived(RemoteMessage remoteMessage) {  
    Map<String, String> data = remoteMessage.getData();  
    long articleId = parseIdFromData(data);  
  
    // TBD: Remember we have a pending notification  
    scheduleArticleFetch(rng.nextInt(SYNC_MIN) + 1, SYNC_MAX);  
}
```

scheduleArticleFetch(min, max)

```
OneoffTask task = new OneoffTask.Builder()  
    .setService(MyGcmTaskService.class)  
    .setRequiredNetwork(Task.NETWORK_STATE_CONNECTED)  
    .setExecutionWindow(min, max)  
    .build();  
gcmNetworkManager.schedule(task);
```

AndroidManifest.xml

```
<service
    android:name=".service.MyGcmTaskService"
    android:exported="true"
    android:permission="com.google.android.gms.permission.BIND_NETWORK_TASK_SERVICE">
    <intent-filter>
        <action android:name="com.google.android.gms.gcm.ACTION_TASK_READY" />
    </intent-filter>
</service>
```

→ Background job will run in this service

MyGcmTaskService.java

```
@Override  
public int onRunTask(TaskParams taskParams) {  
    Bundle extras = taskParams.getExtras();  
  
    apiService.fetchLatest(...);  
  
    // TBD: Alert observers that sync has completed,  
    // then showing any notifications that were pending  
}
```

Analytics



Events

notification_foreground	when a notification sent by Firebase Notifications is received while the app is in the foreground.
notification_receive	when a notification sent by Firebase Notifications is received by a device when the app is in the background. Android apps only.
notification_open	when a user opens a notification sent by Firebase Notifications.
notification_dismiss	when a user dismisses a notification sent by Firebase Notifications. Android apps only.

- Automatically collected events are reserved
- Need to define your own names

Detect Foreground or Background Ordered Broadcast

<https://commonsware.com/blog/2010/08/11/activity-notification-ordered-broadcast.html>

Application and ActivityLifecycleCallbacks

<http://www.developerphil.com/no-you-can-not-override-the-home-button-but-you-dont-have-to/>

notif_receive, notif_foreground

```
@Override  
public void onMessageReceived(RemoteMessage remoteMessage) {  
    boolean isBackground =  
        ((MyApp) getApplication()).isBackground();  
    firebaseAnalytics.logEvent(isBackground  
        ? "notif_receive"  
        : "notif_foreground",  
        params);  
  
    ...  
}
```

notif_receive, notif_foreground

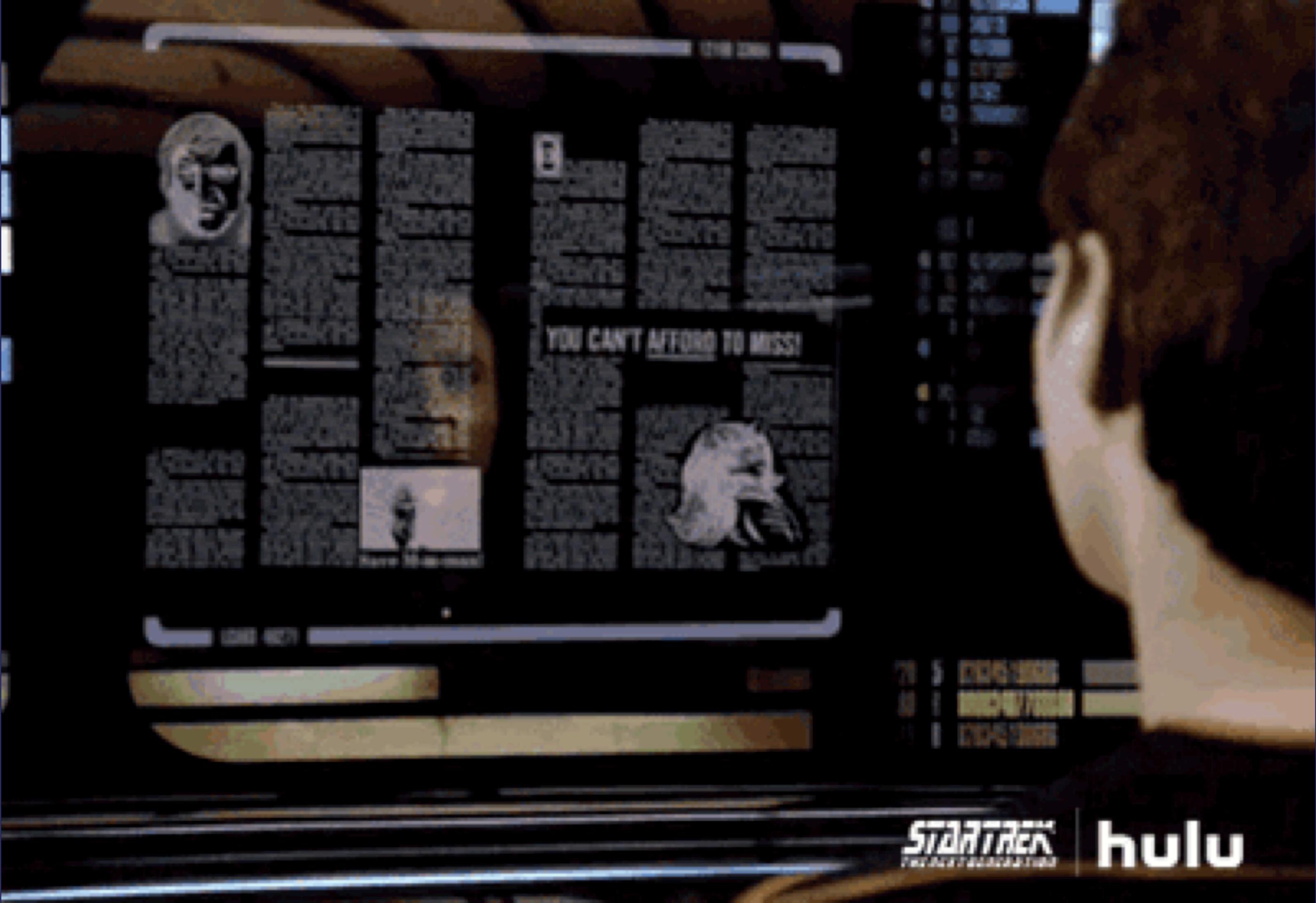
```
@Override  
public void onMessageReceived(RemoteMessage remoteMessage) {  
  
    // TBD: Extract any extra data and record in event, e.g. item ID  
  
    boolean isBackground =  
        ((MyApp)getApplication()).isBackground();  
    firebaseAnalytics.logEvent(isBackground  
        ? "notif_receive"  
        : "notif_foreground",  
        params);  
  
    ...  
}
```

Opening Notification

```
Intent serviceIntent = new Intent(NotificationActionService.ACTION_TAPPED,  
        null, context, NotificationActionService.class);  
  
...  
Intent intent = PendingIntent.getService(context.getApplicationContext(),  
        REQUEST_CODE_TAPPED,  
        serviceIntent,  
        PendingIntent.FLAG_UPDATE_CURRENT);  
  
NotificationCompat.Builder builder = new NotificationCompat.Builder(context)  
        .setContentIntent(intent)  
...  
...
```

NotificationActionService.java

```
public class NotificationActionService extends IntentService {  
    @Override  
    protected void onHandleIntent(Intent intent) {  
        switch (intent.getAction()) {  
            case ACTION_TAPPED:  
                firebaseAnalytics.logEvent("notif_open", params);  
  
            case ACTION_DISMISSED:  
                firebaseAnalytics.logEvent("notif_dismiss", params);  
        }  
    }  
}
```



STAR TREK
THE DISCOVERY

hulu

Code Snippets

<https://goo.gl/50tRcm>

Analytics Limitations

- **Can't** filter analytics by event parameters *
- Need parameters for per-notification funnel analysis
- Parameters **can** be specified in Audiences

Audiences

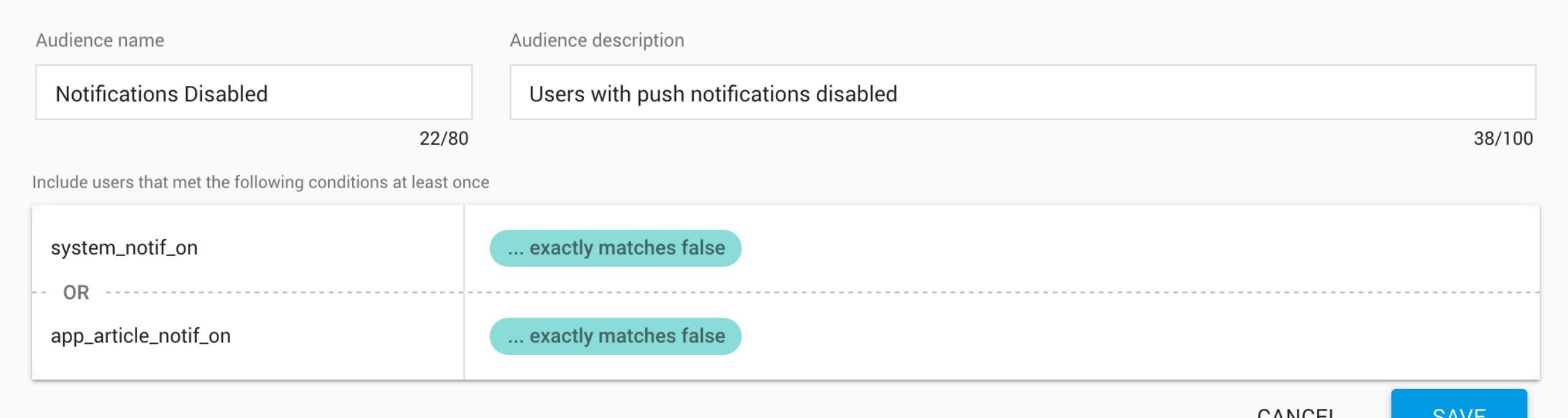
Audience name 22/80

Audience description 38/100

Include users that met the following conditions at least once

system_notif_on	... exactly matches false
OR	
app_article_notif_on	... exactly matches false

CANCEL **SAVE**



→ Segment user base by combining events, parameters and properties



Segment by Item ID

Audience name: Notif Recipients 199447433: "7 Way" (74/80)

Audience description: Users who received notification for article 199447433 and either opened or dismissed it (87/100)

Include users that met the following conditions at least once:

x_notification_receive	Count > 0	item_id = 199447433
------------------------	-----------	---------------------

AND

x_notification_open	Count > 0	item_id = 199447433
---------------------	-----------	---------------------

OR

x_notification_dismiss	Count > 0	item_id = 199447433
------------------------	-----------	---------------------

- Users who received a notification **AND**,
- Opened the notification, **OR**, dismissed it

Define Funnel

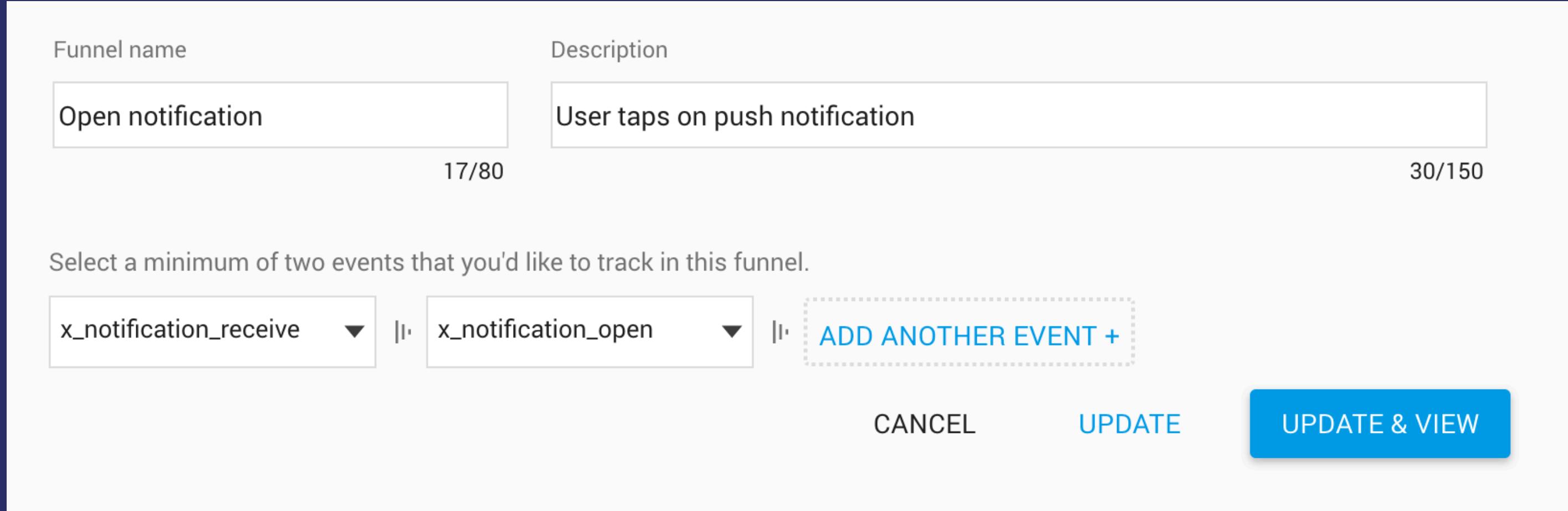
Funnel name Description

17/80 30/150

Select a minimum of two events that you'd like to track in this funnel.

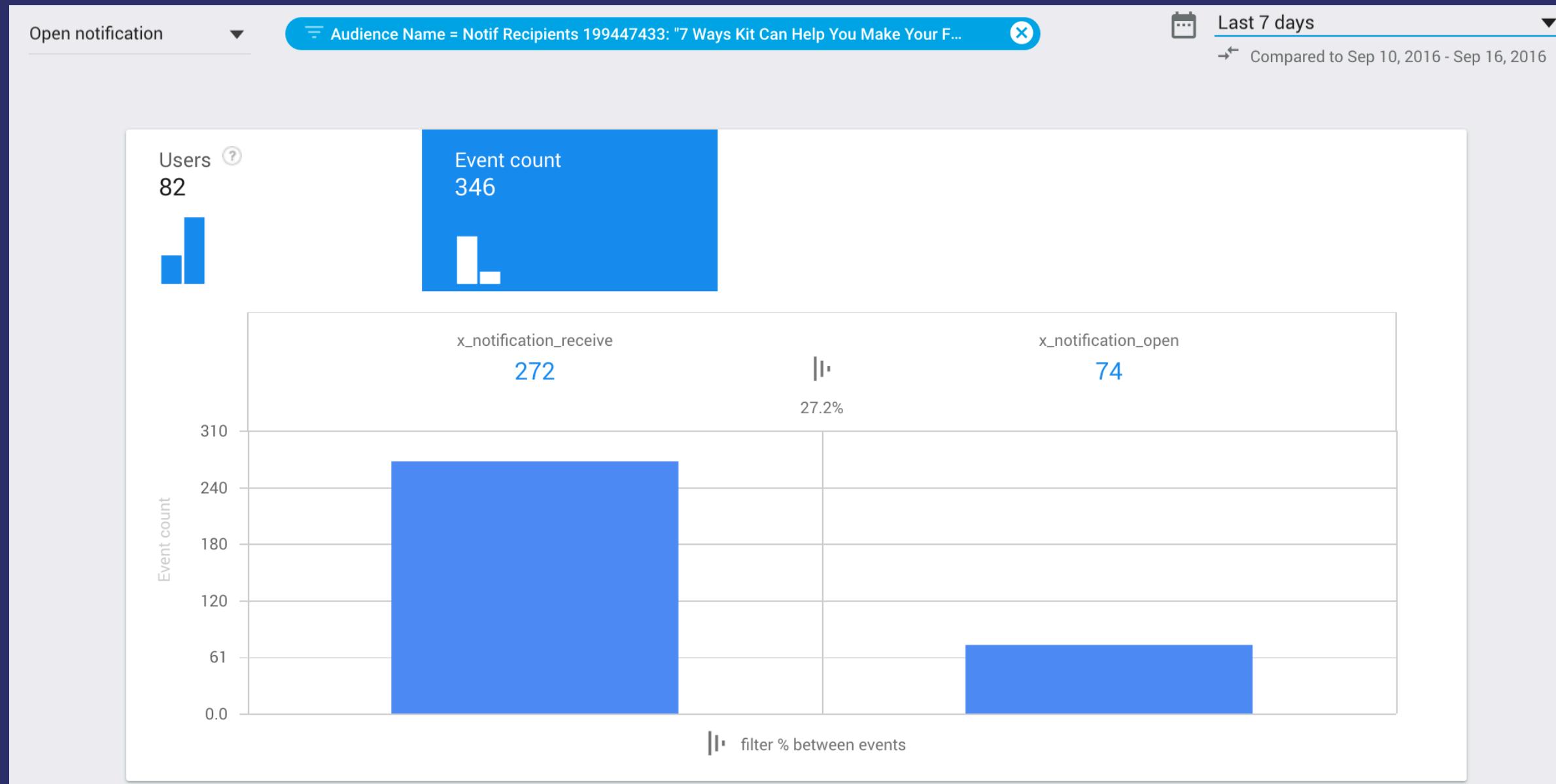
| | | |

[CANCEL](#) [UPDATE](#) [UPDATE & VIEW](#)



→ Then, view funnel with audience filter

Funnel Analysis





Beyond Analytics

- Filtering on event parameters is a popular feature request
- Can stream raw events + parameters into BigQuery

**Application
Server**

Topic Messaging

- Useful if you don't need to address individually
 - Topics don't have to be pre-defined
- For simple messaging, subscribe all clients to one topic

```
firebase.subscribeToTopic("all_new_articles");
```

Sending Notifications to FCM

- Don't need to integrate into your backend
- Anything that can send an HTTP request
 - Example using cURL in the Gist
 - Shell script useful for debugging

Resources

Learning

<https://github.com/firebase/quickstart-android>

<https://github.com/googlesamples/android-ActiveNotifications>

[Firebase YouTube channel](#)

[Firebase Blog](#)

Support

Stack Overflow, Google Group, Report Bug/Feature Request

<https://firebase.google.com/support/>

Status Page

<https://status.firebaseio.google.com/>

Firebase Slack

<https://firebase-community.appspot.com/>

Takeaway

- Firebase Notifications gives you a basic implementation
- For more complex needs, get to know FCM
 - For me, no reduction in lines of code
 - Lot of manual work to produce analytics

Let's have some questions!

Email eric.fung@shopify.com

Work www.shopify.com

Blog code.gnufmuffin.com 

Code github.com/efung

Social [@gnufmuffin](https://twitter.com/gnufmuffin)

Slides <https://speakerdeck.com/gnufmuffin/>