

Adevinta

Cha-Ching Chronicles

The journey of our Adv stack tech transformation

Who are we?

Fausto Napoli
Android Engineer @ Subito



Davide Lanza
Android Engineer @ Subito



Who are we?

Fausto Napoli
Android Engineer @ Subito



Davide Lanza
Android Engineer @ Subito



Who are we?

Fausto Napoli
Android Engineer @ Subito



Davide Lanza
Android Engineer @ Subito



Francesco Bonni
Substitute Talk Engineer @ Subito



Adevinta

France



leboncoin

Germany



mobile.de

kleinanzeigen

Benelux



2 Marktplaats

ememain
dehands

Spain



fotocasa **habitaclia**
coches.net motos.net
InfoJobs milanuncios

Italy



subito
InfoJobs
automobile.it

Other locations

Austria*



Brazil*



Canada



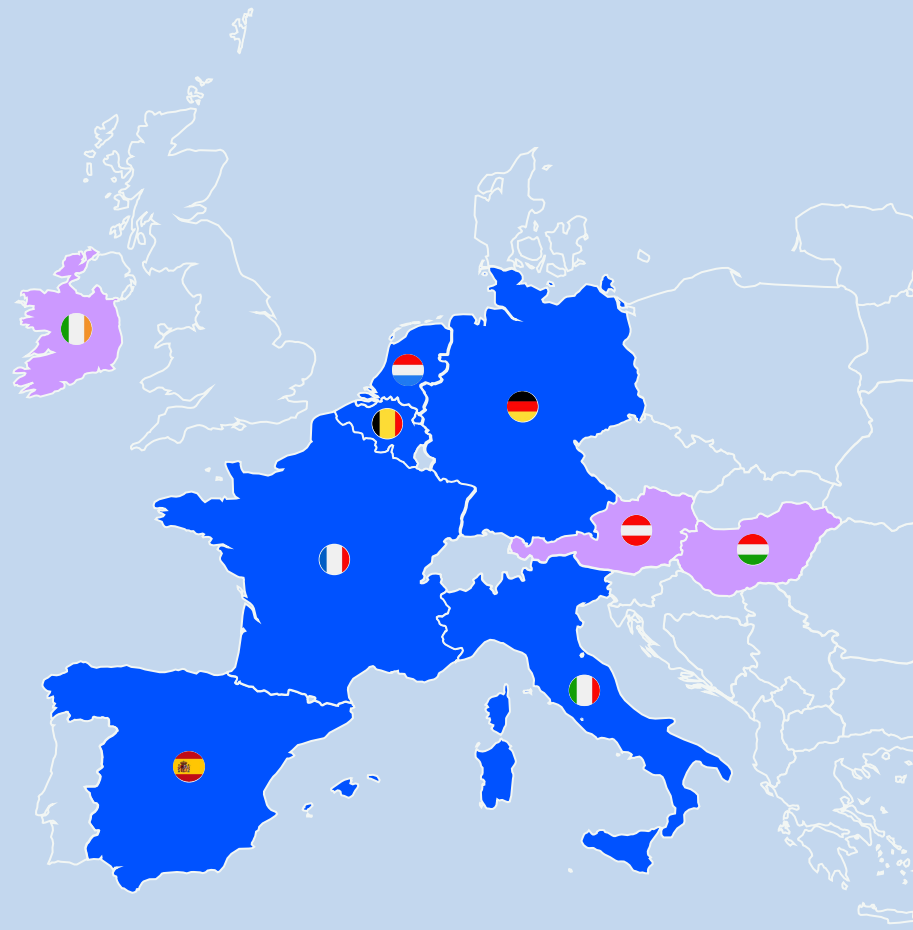
Hungary



Ireland*



**Jointly owned with
other companies*



Some Basic Terminology

ADV



Ad Server



Ad Unit



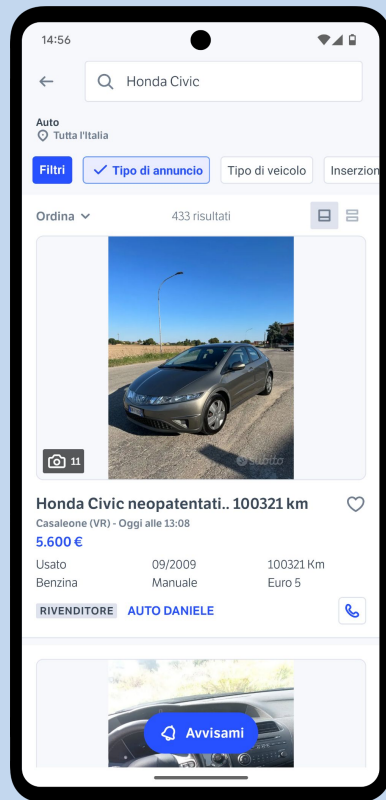
Fill Rate



RPM



The App



Search Results Page
referred as "Listing"



Result Detail Page
referred as "Detail"

Introduction

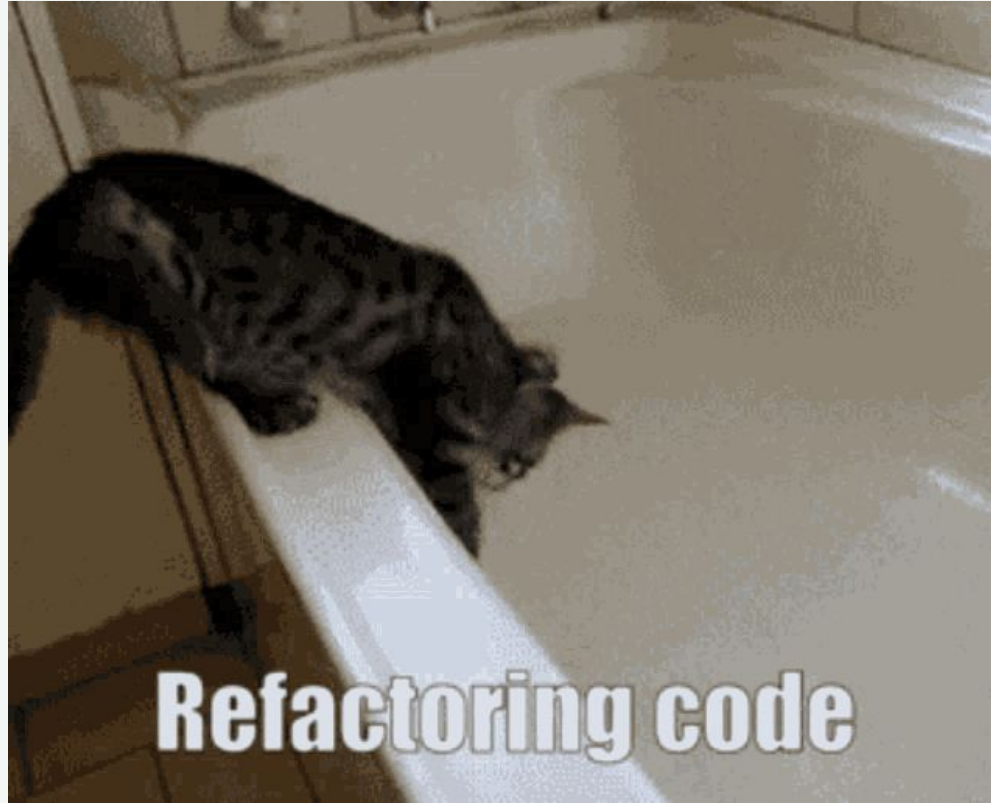
Where we started

We at Subito also use ADVs to sustain our business, but during an investigation of the **web** ADV stack implementation, we found out that there were:

1. Slow loading speed
2. Low fill rate

Introduction

What did we do?



Introduction

So what?

We started collecting data on the app side

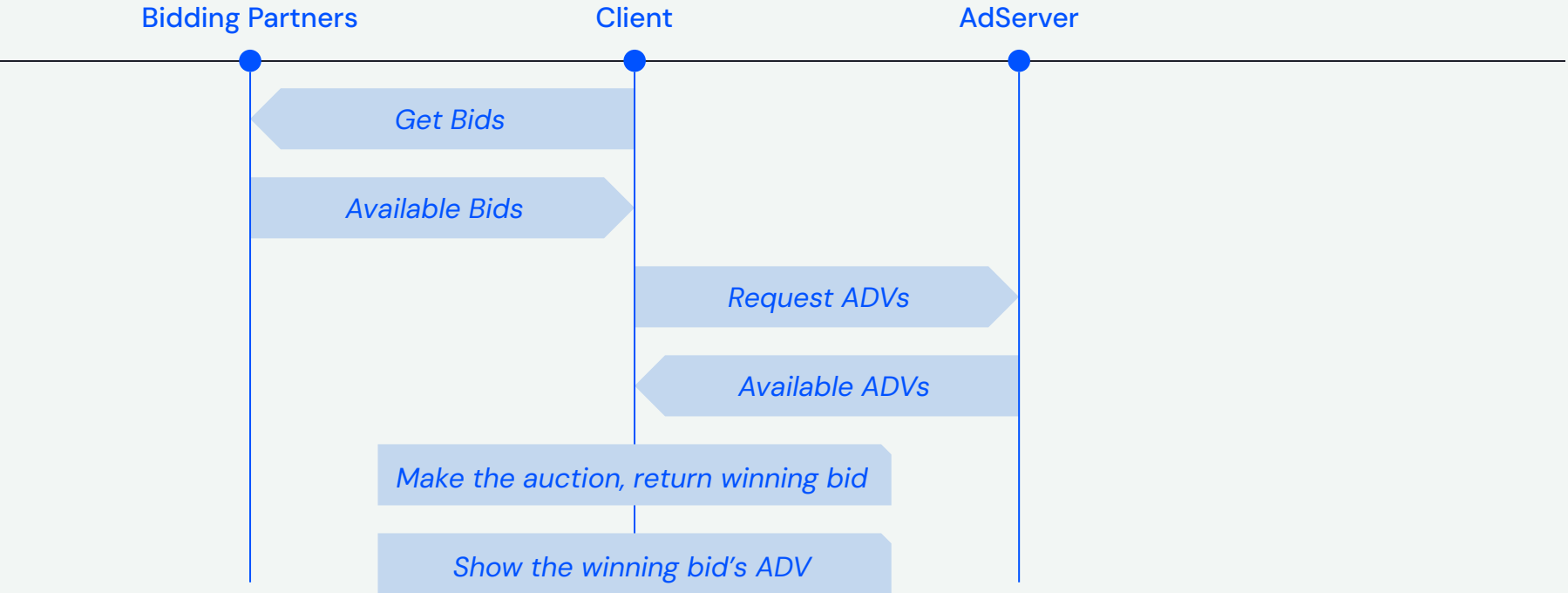
The Android



ADV stacks
ce data on
mentation

!

Our Stack



Our Issues

1

Missing Analytics

We had no technical, debug or performance data

2

Low Fill Rate

ADV spaces weren't being filled with ADVs, but we didn't know why

3

Old Code

We had old code that had been maintained by many different hands

First Things First: Collect Data

Analysis of our detail screen

Time between page landing and ADV shown



Time between ADV creation and ADV shown



Time to request and load an ADV



Event of success and failure (with reason)

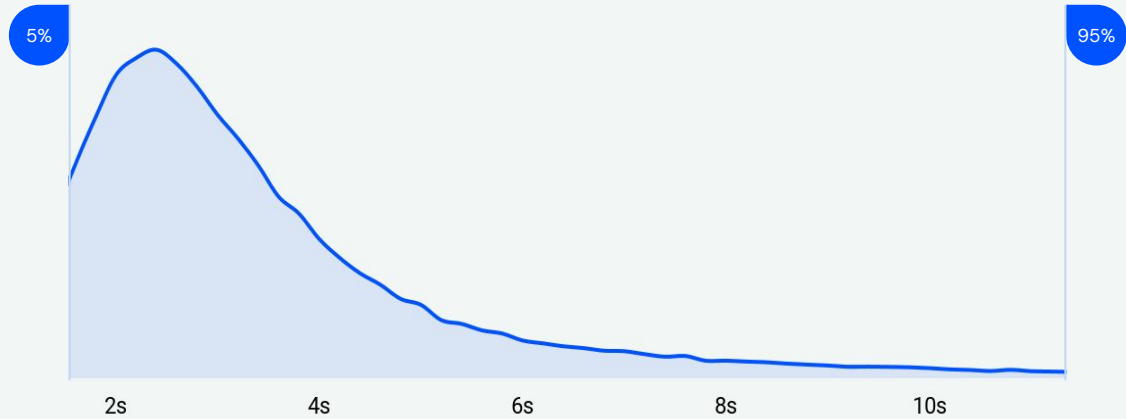


Event of ADV viewed



What We Saw

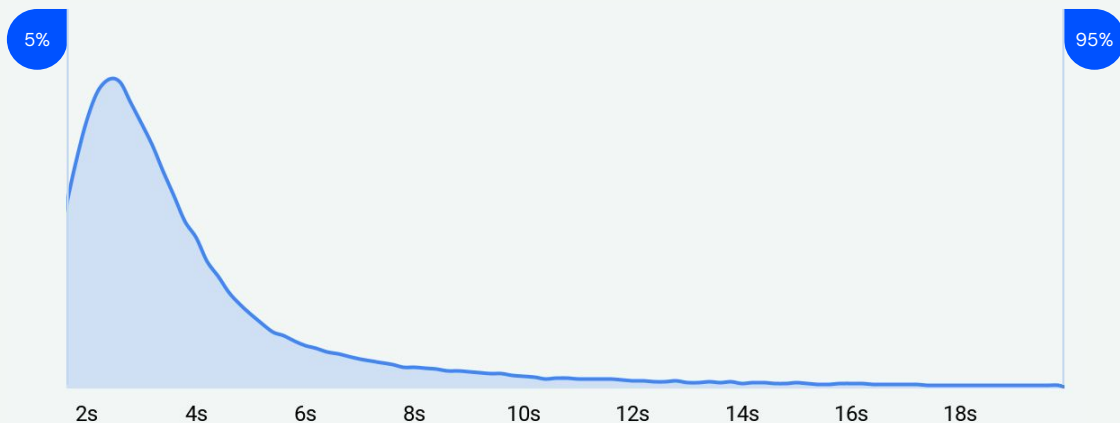
Slow loading times
ADV being loaded



On the 90th percentile, we had 7.52 seconds of loading, while the median was 3.10 seconds

What We Saw

Slow loading times
ADV being shown



On the 90th percentile, we had 10.82 seconds before the ADV was shown, while the median was 3.34 seconds

What We Saw

Top banner's
"landing-to-shown" time was
higher than the loading time

Event	Time
Landing To Shown Time	17s
Loading Time	7.5s

Even though the top banner on our Detail screen was loaded, the time to actually show it was much higher

detail_top_adv_landing_to_shown

detail_top_adv_load

What We Saw

View events were less than we expected

	Event Count
Views	48M
Load Success	68M

When the first visible banner in our Detail screen was being loaded successfully, users weren't always seeing it

What We Saw

Unable to fill errors

	Event Count	Total users
Total	198M	2.7M
Unable To Fill	195M	2.6M
Internal Error	1.5M	304K
Network Error	881K	405K

About 98% of adv loading errors were because spaces couldn't be filled

What Was Going On

Pinpoint The Actual Issues

What Was Going On

The top ADV wasn't being shown until a scroll gesture happened



What Was Going On

ADVs were being added and shown manually only after waiting for loading

```
private fun onAdvCreated(adv: BannerAdv) {  
    adv.eventsFlow()  
        .onEach { event ->  
            when (event) {  
                Loaded -> insertAdv(adv)  
                ...  
            }  
        }  
    ...  
}
```

What Was Going On

ADVs didn't start to load as soon as possible

```
override fun onCreate(savedInstanceState: Bundle?) {  
    ...  
    setContentView(binding.root)  
    ...  
    // Create all views to be associated to UI blocks.  
    //  
    // ADVs are also created here, together with the  
    // rest of the views, so they can start loading  
    // with a delay that depends on how many other  
    // views are being created before it.  
    renderBlocks()  
    ...  
}
```

What Was Going On

Layouting was a little slower than expected



What Was Going On

ADVs started to load all at once

Screen Landing

Top ADV Load

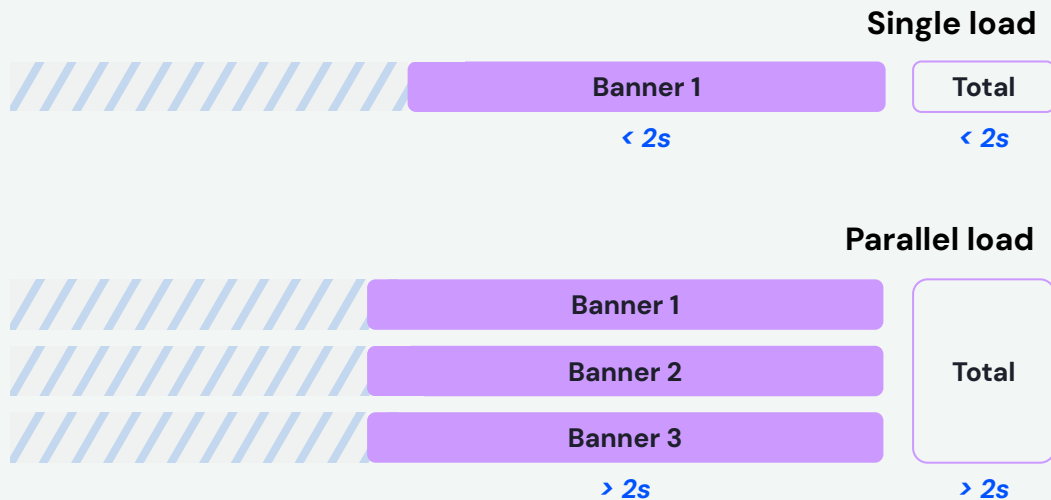
Middle ADV Load

Bottom ADV Load

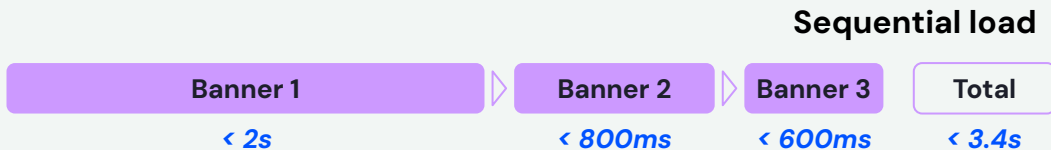
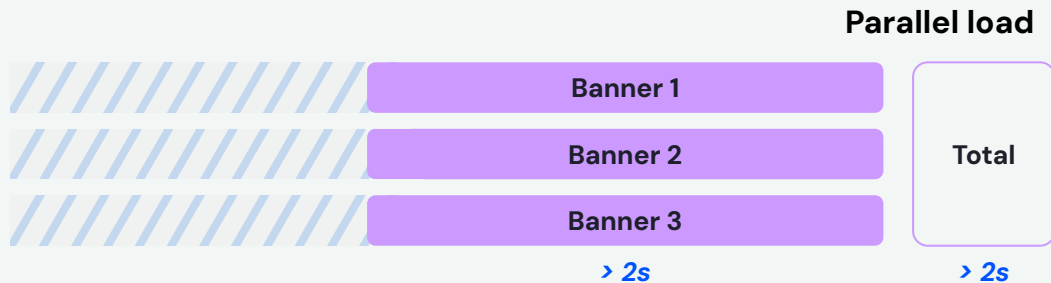
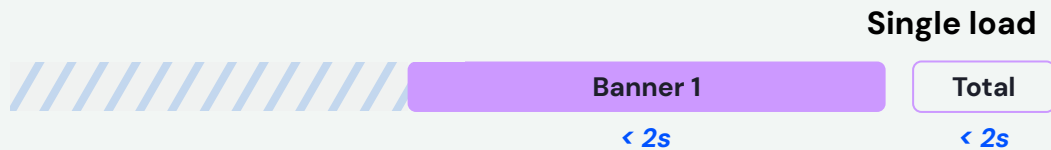
The Concurrency Issue



The Concurrency Issue



The Concurrency Issue



What We Did

Proof of Concept

The banner View got added immediately to the hierarchy and loaded



No more wrapping of views inside other views



Pooling and loading strategies

How we fixed the remaining issues

Pooling and Loading Strategies

```
interface AdvBannerPool {
```

Pooling and Loading Strategies



```
interface AdvBannerPool {  
    fun setup(maxBannersInMemory: Int, ..)  
  
}
```

Pooling and Loading Strategies



```
interface AdvBannerPool {  
    fun setup(maxBannersInMemory: Int, ..)  
    fun loadPlacements(placementsMapping: Map<Key, AdvPlacement>)  
  
}
```


Pooling and Loading Strategies



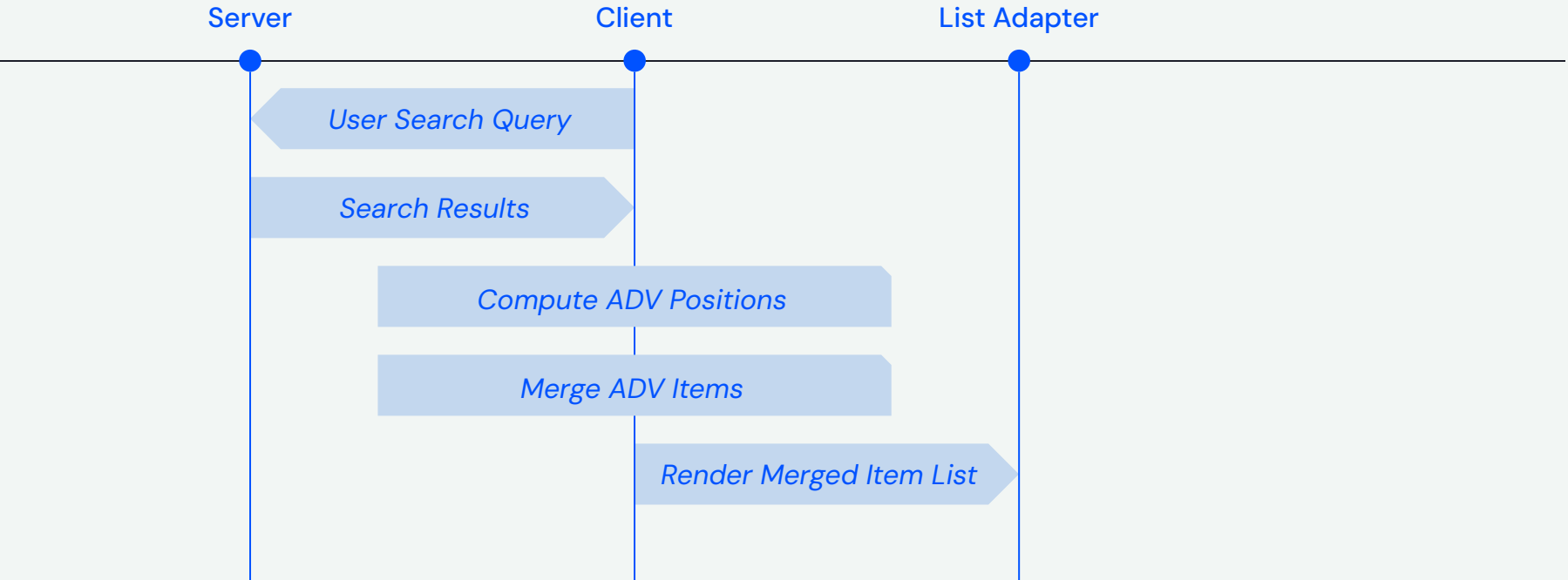
```
interface AdvBannerPool {  
    fun setup(maxBannersInMemory: Int, ..)  
    fun loadPlacements(placementsMapping: Map<Key, AdvPlacement>)  
    fun advBanner(key: Key): AdvBanner?  
  
}
```

Pooling and Loading Strategies



```
interface AdvBannerPool {  
    fun setup(maxBannersInMemory: Int, ..)  
    fun loadPlacements(placementsMapping: Map<Key, AdvPlacement>)  
    fun advBanner(key: Key): AdvBanner?  
    fun clear()  
}
```

Pooling and Loading Strategies in Listing

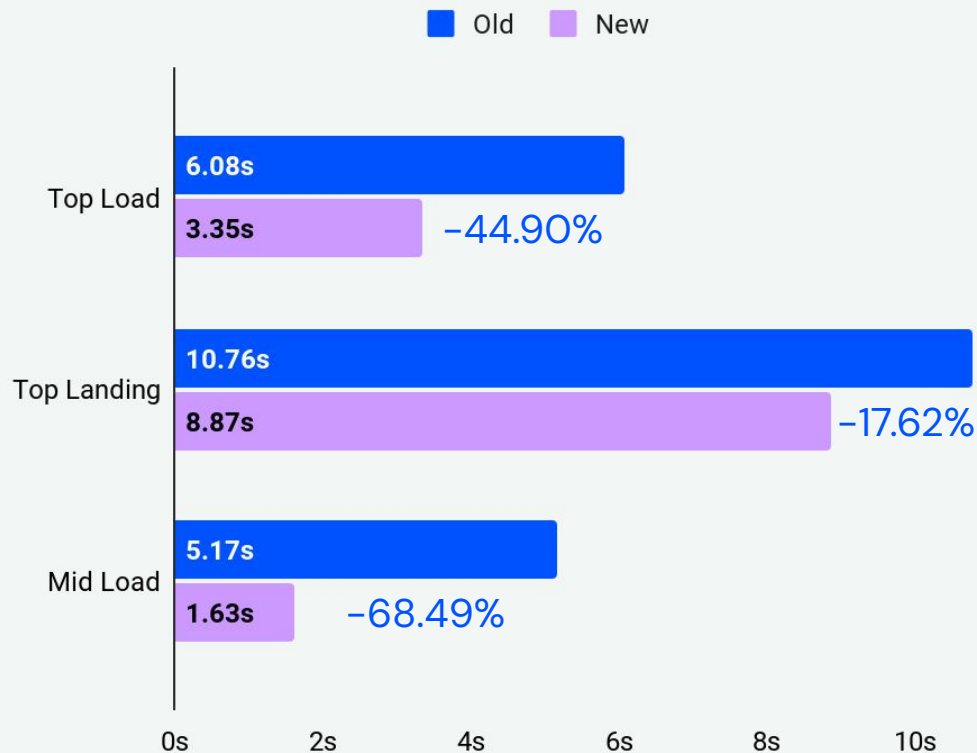


Cha-Ching!

The Results

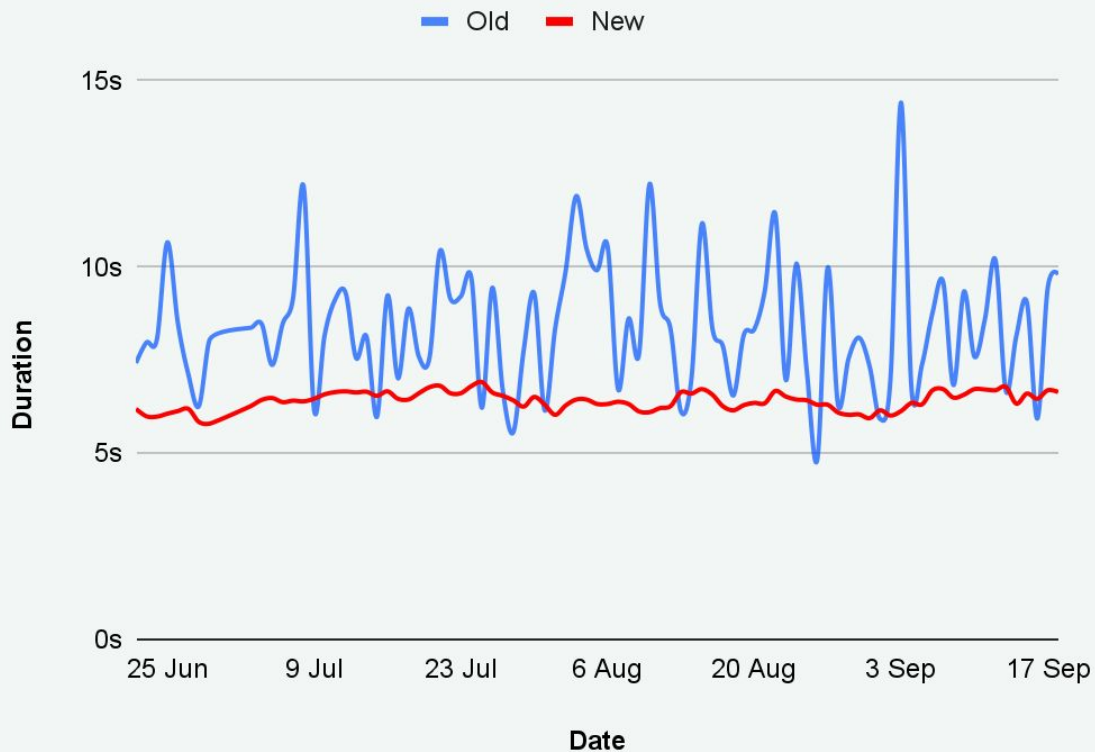
Performance Results

Ad Detail



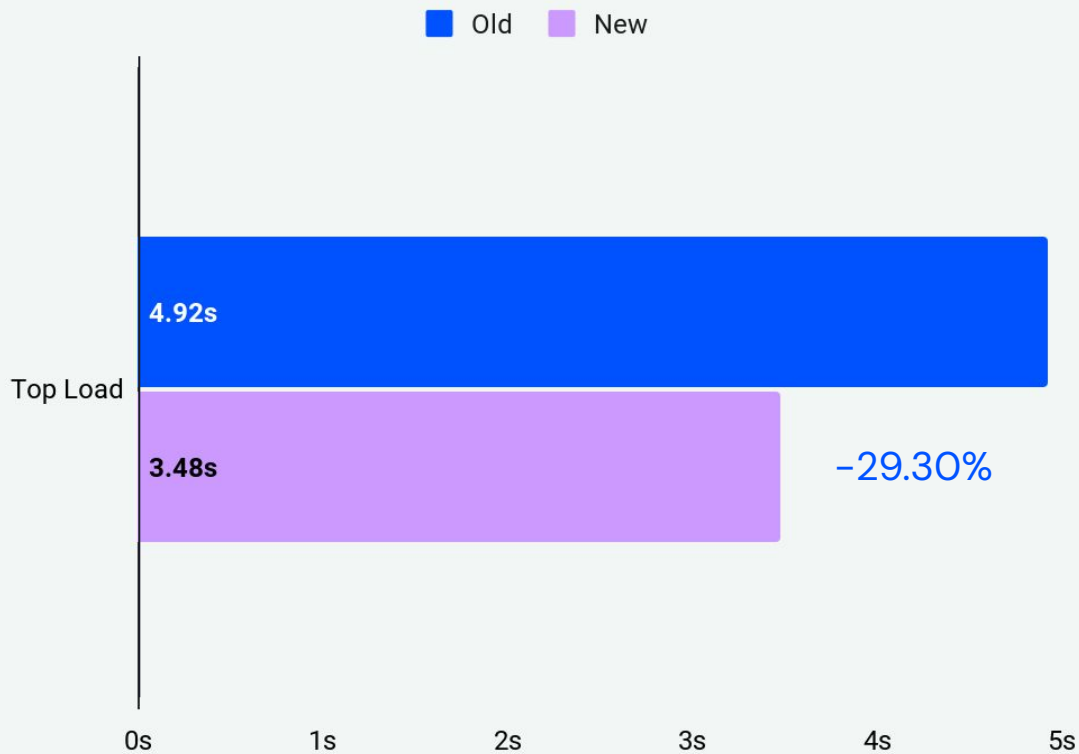
Performance Results

Average Loading Time
Ad Detail



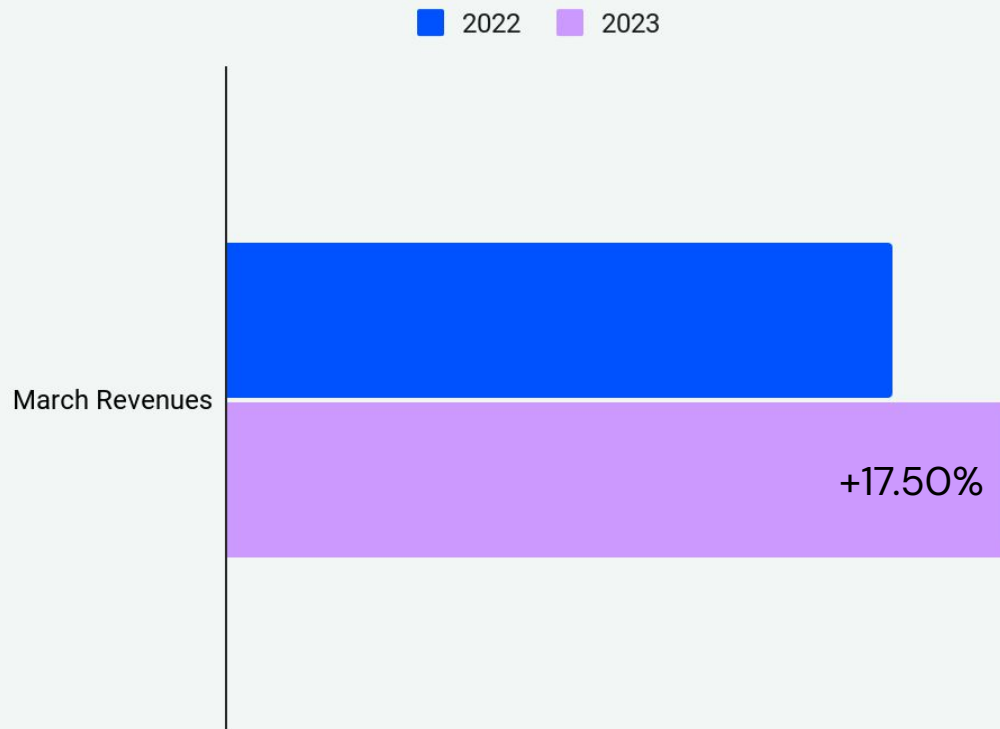
Performance Results

Listing



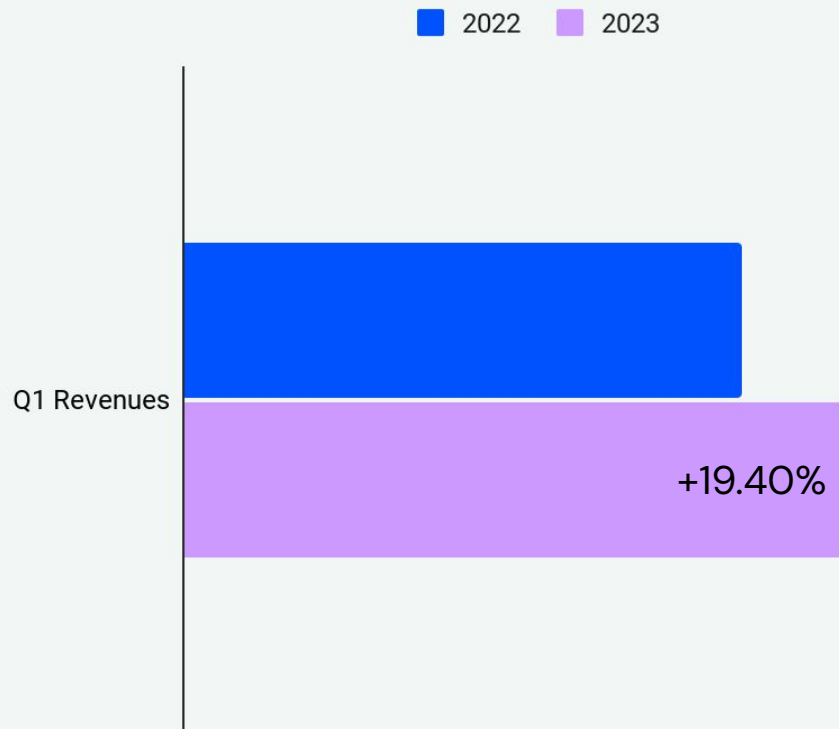
Business Results

Android
March YoY



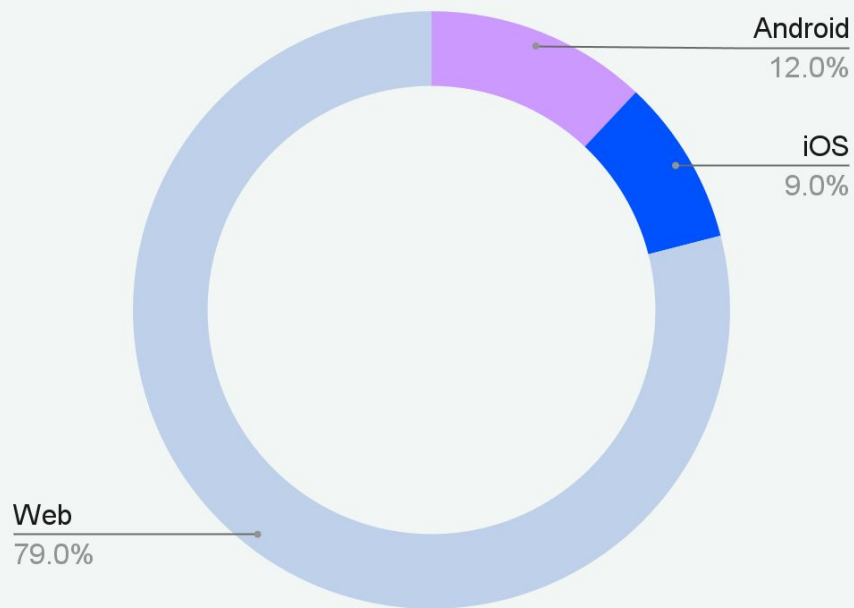
Business Results

Android
Q1 YoY

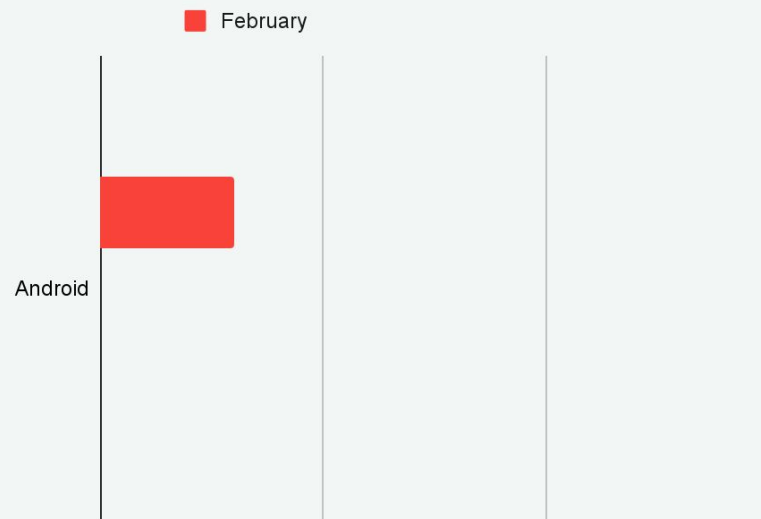


Business Results

Fill Rate and Share of Revenues
February 2023

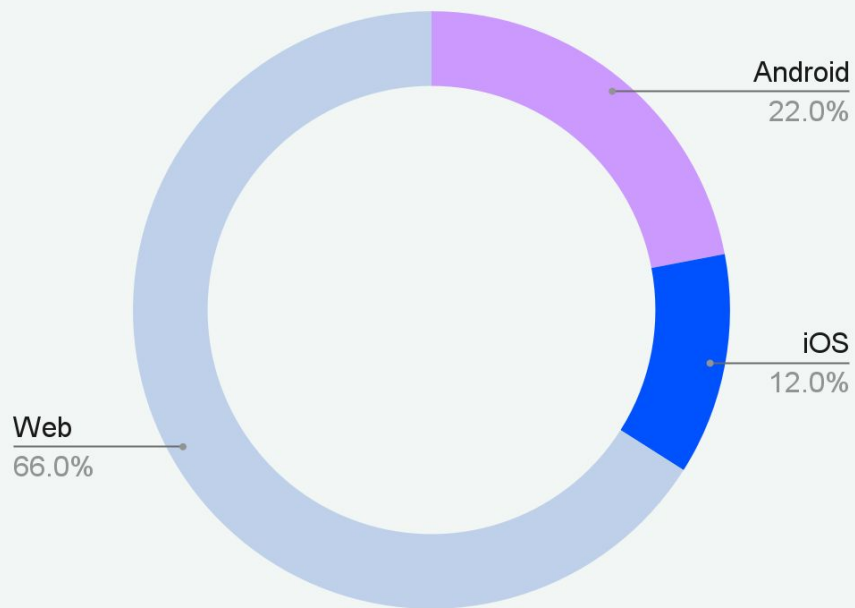


Fill Rate - February

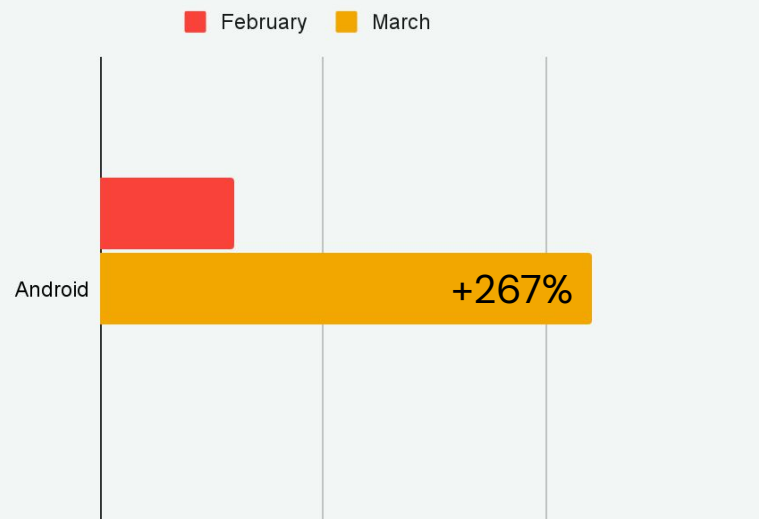


Business Results

Fill Rate and Share of Revenues
March 2023

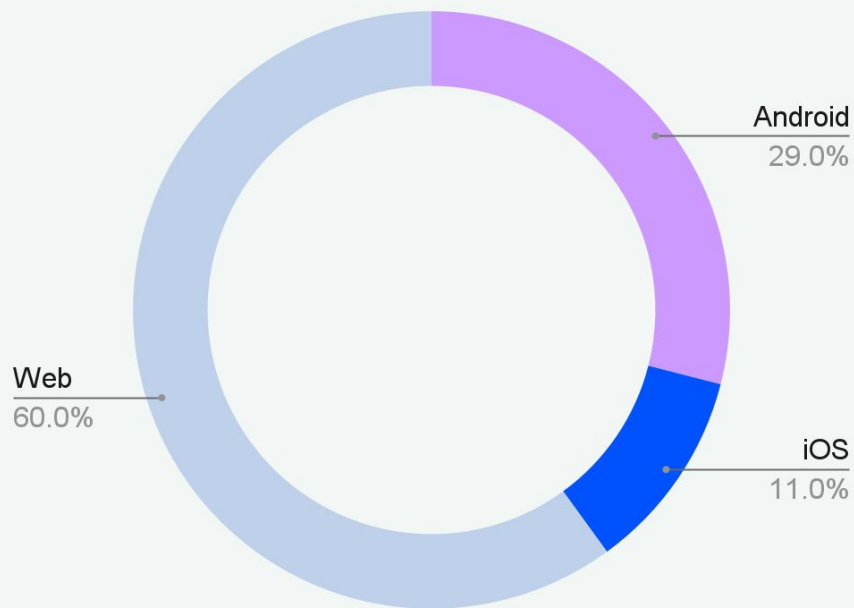


Fill Rate - February and March

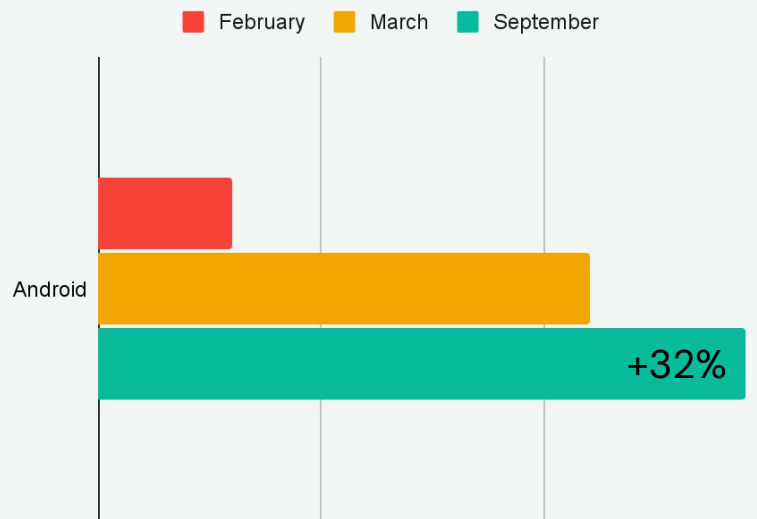


Business Results

Fill Rate and Share of Revenues
September 2023



Fill Rate - February, March and September



What We Learned

1

Missing Analytics

Always have data before
deciding to refactor

What We Learned

1

Missing Analytics

Always have data to backup
important decisions

2

Old Code


ALSO have internal people
that can keep track of such
delicate parts of the
business

Thank you / Gracias / Merci / Danke
Grazie / Dank u wel / Obrigado

Questions?




Fausto Napoli
Android Engineer @ Subito

 [linkedin.com/in/fausto-napoli-81643552](https://www.linkedin.com/in/fausto-napoli-81643552)

 [@movementspeed@mastodon.uno](https://mastodon.uno/@movementspeed)



Davide Lanza
Android Engineer @ Subito

 [linkedin.com/in/davide--lanza](https://www.linkedin.com/in/davide--lanza)

