

Metrics we should know - or not! but we are gonna learn it!



 @ddinorahtovar

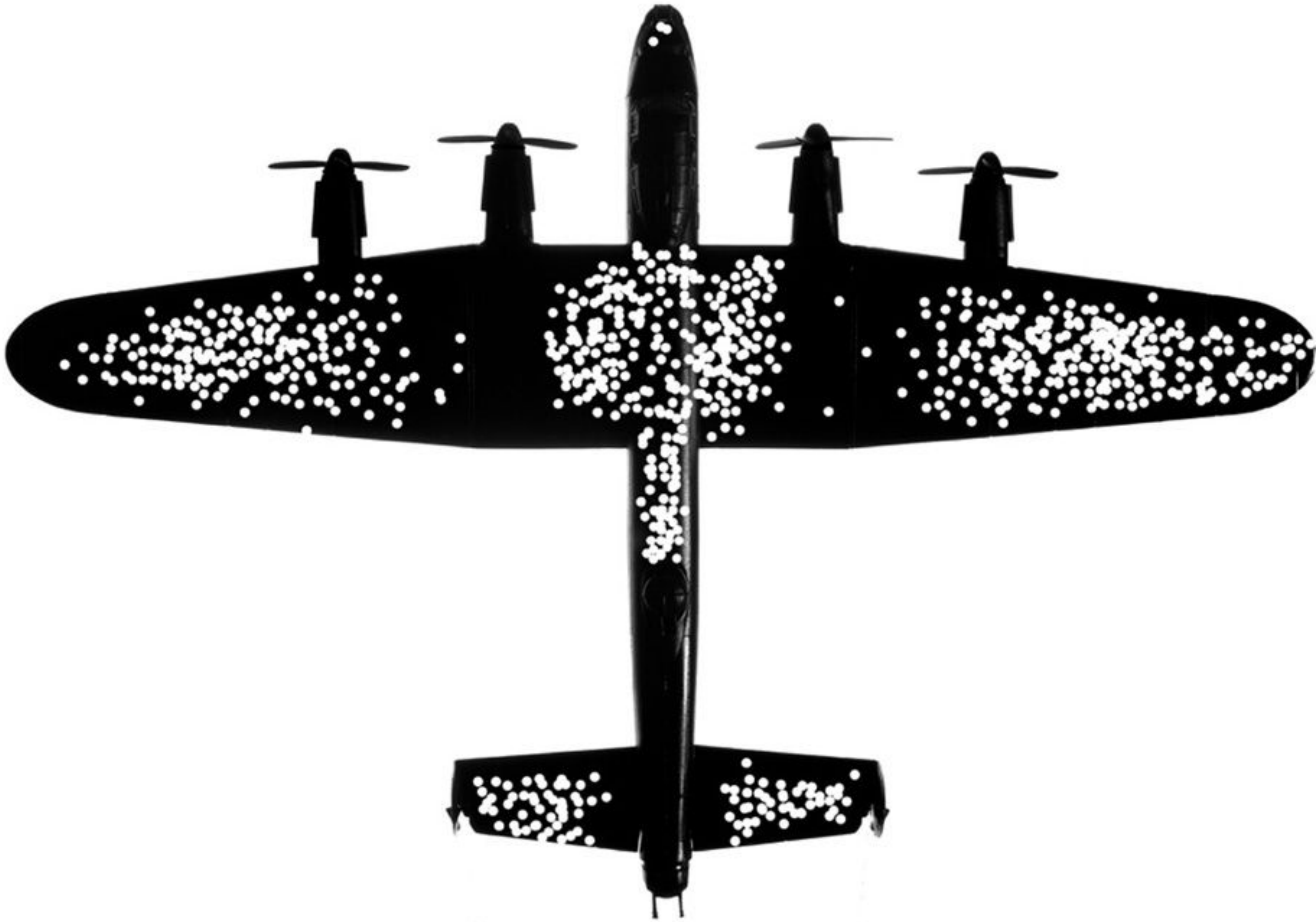
M @ddinorahtovar

Dinorah Tovar

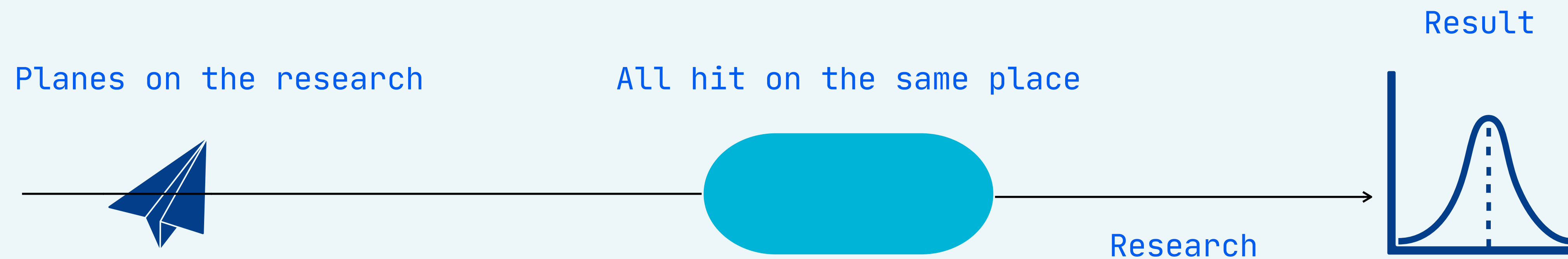
Google Developer Expert - Android

Disclaimer

**A *story* about
data**



Data gives the answer to the correct questions



Analytics

Data vs Metrics

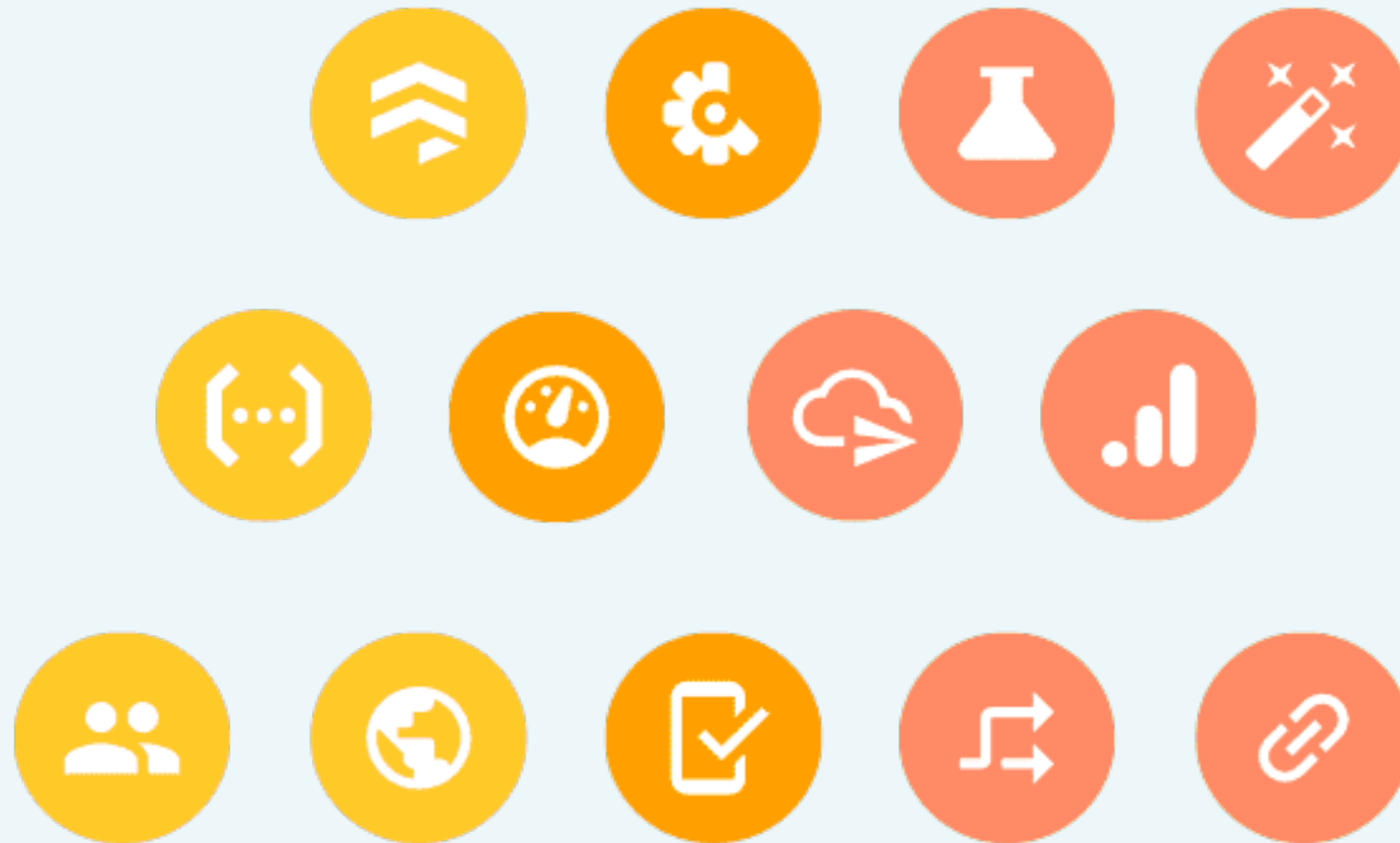
- They are not the same

| Metrics | Data |
|--|--|
| <ul style="list-style-type: none">• Metrics are what you measure• Consistent• Cheap• Quick to collect | <ul style="list-style-type: none">• Data is generated by metrics• You don't pick your data, you pick your metrics |

Analytics

- Analytics is the systematic computational analysis of data or statistics
 - Provides insight on app usage and user engagement.
 - Helps you understand how your users behave

Firebase has what you need and more



How does an analytic looks in Firebase

- On android

```
firebaseAnalytics.logEvent("SomeNameOfTheEvent") {  
    // Extra parameters if you need more info  
    param(FirebaseAnalytics.Param.ITEM_ID, id)  
    param(FirebaseAnalytics.Param.ITEM_NAME, name)  
    param(FirebaseAnalytics.Param.CONTENT_TYPE, "image")  
}
```


How does an analytic looks in Firebase

- On iOS

```
Analytics.logEvent(AnalyticsEventSelectContent, parameters: [  
  AnalyticsParameterItemID: "id-\(title!)",  
  AnalyticsParameterItemName: title!,  
  AnalyticsParameterContentType: "cont",  
])
```

Conversion

First, an example

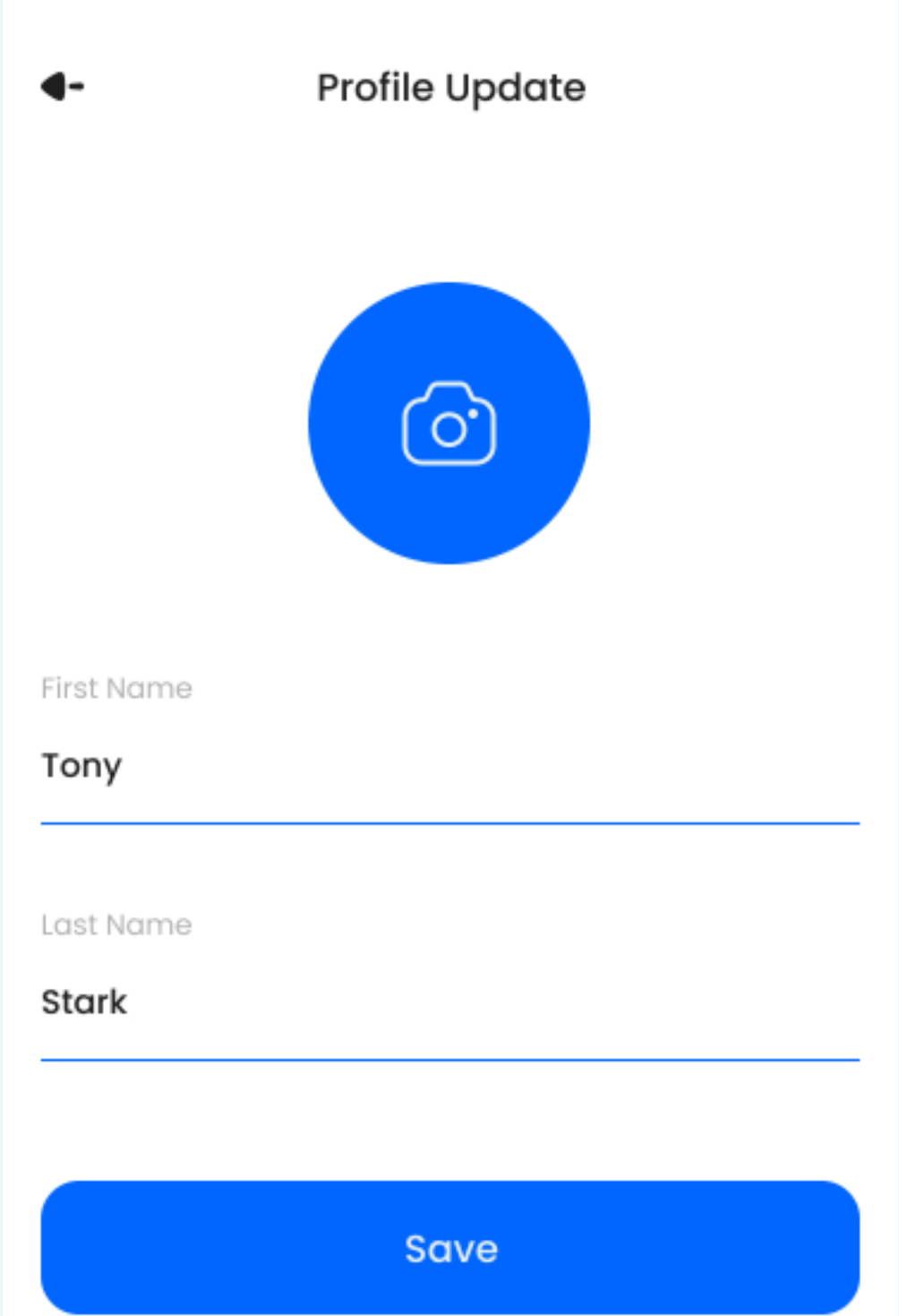


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app-ca




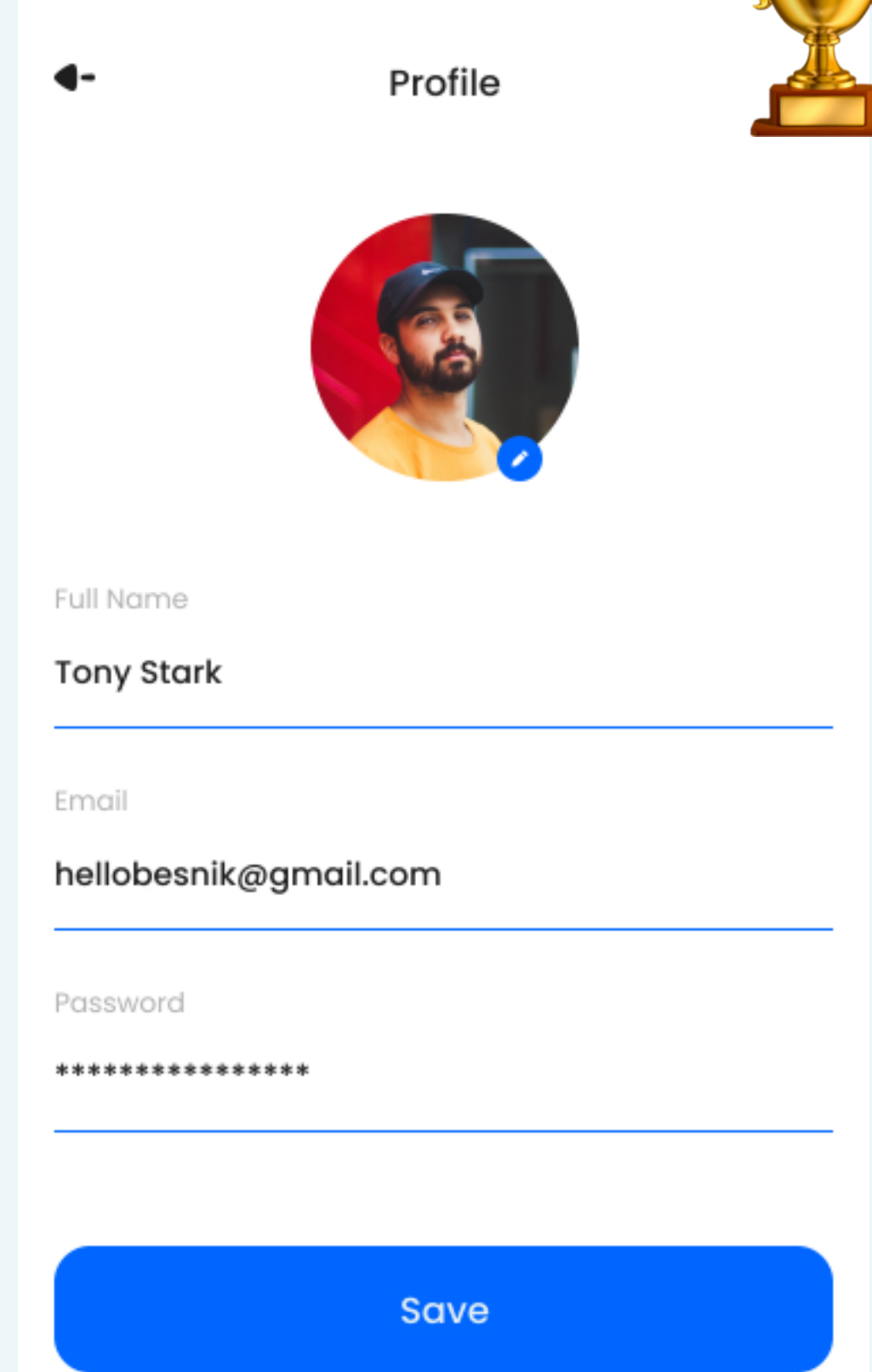
Profile Update

First Name
Tony

Last Name
Stark

Save

app-email



Profile

Full Name
Tony Stark

Email
hellobesnik@gmail.com

Password

Save

app-account

Conversion

- Conversion analysis is the process of analyzing data related to conversions
 - A conversion is defined as a specific, desirable action that's taken by a user
 - Depends on the analytics selected

Conversion

- Conversion rate can be calculated over a math func

$$coR = totalConversions / totalInteractions$$

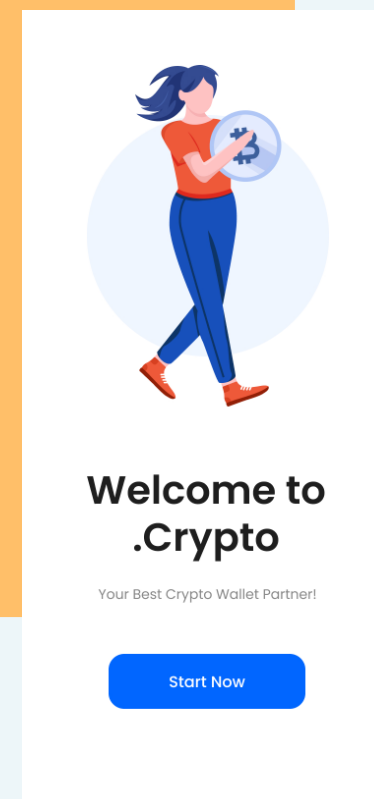
$$coR = 50 / 1000$$

$$coR = 5\%$$

Conversion

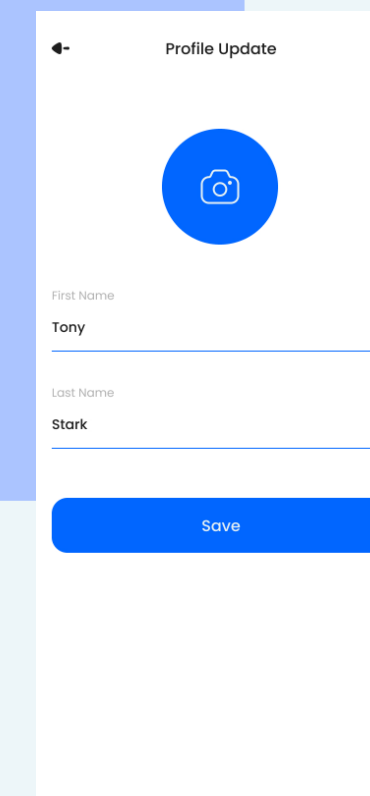
First Event

app-ca



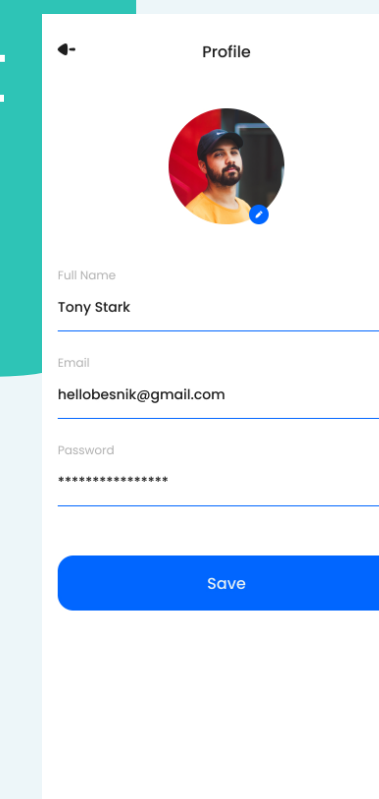
Second Event

app-email

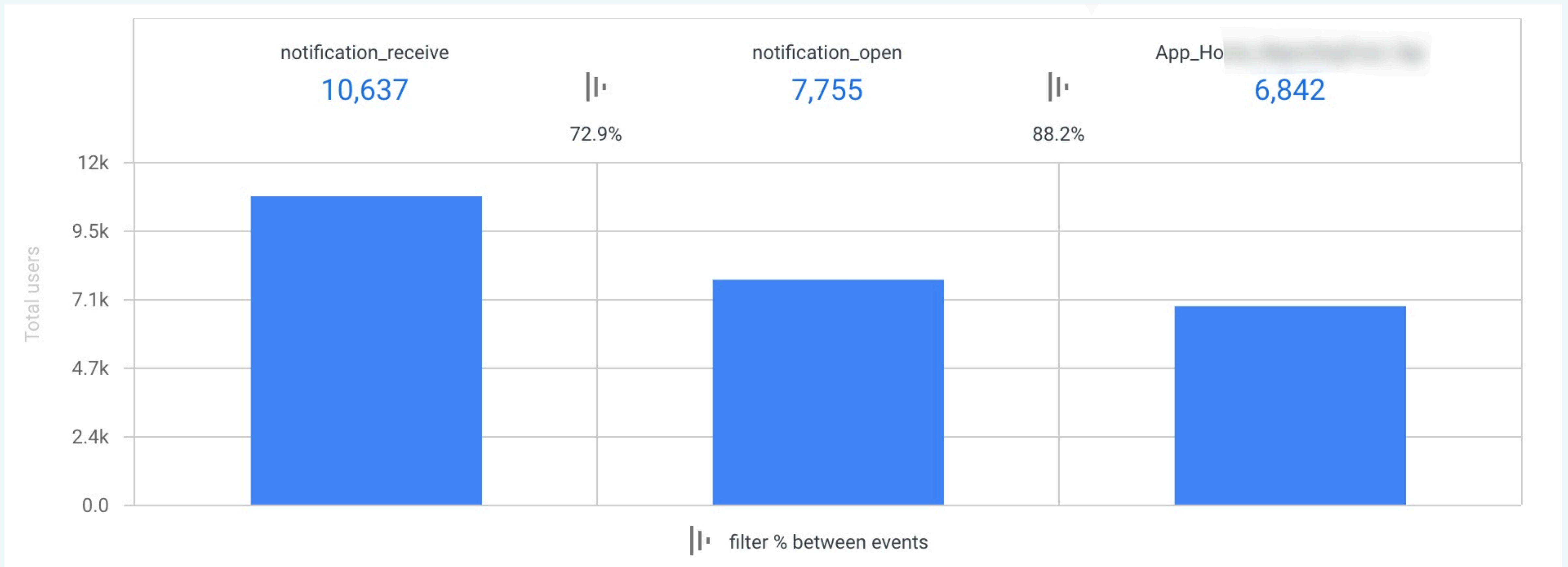


Conversion Event

app-account



Conversion



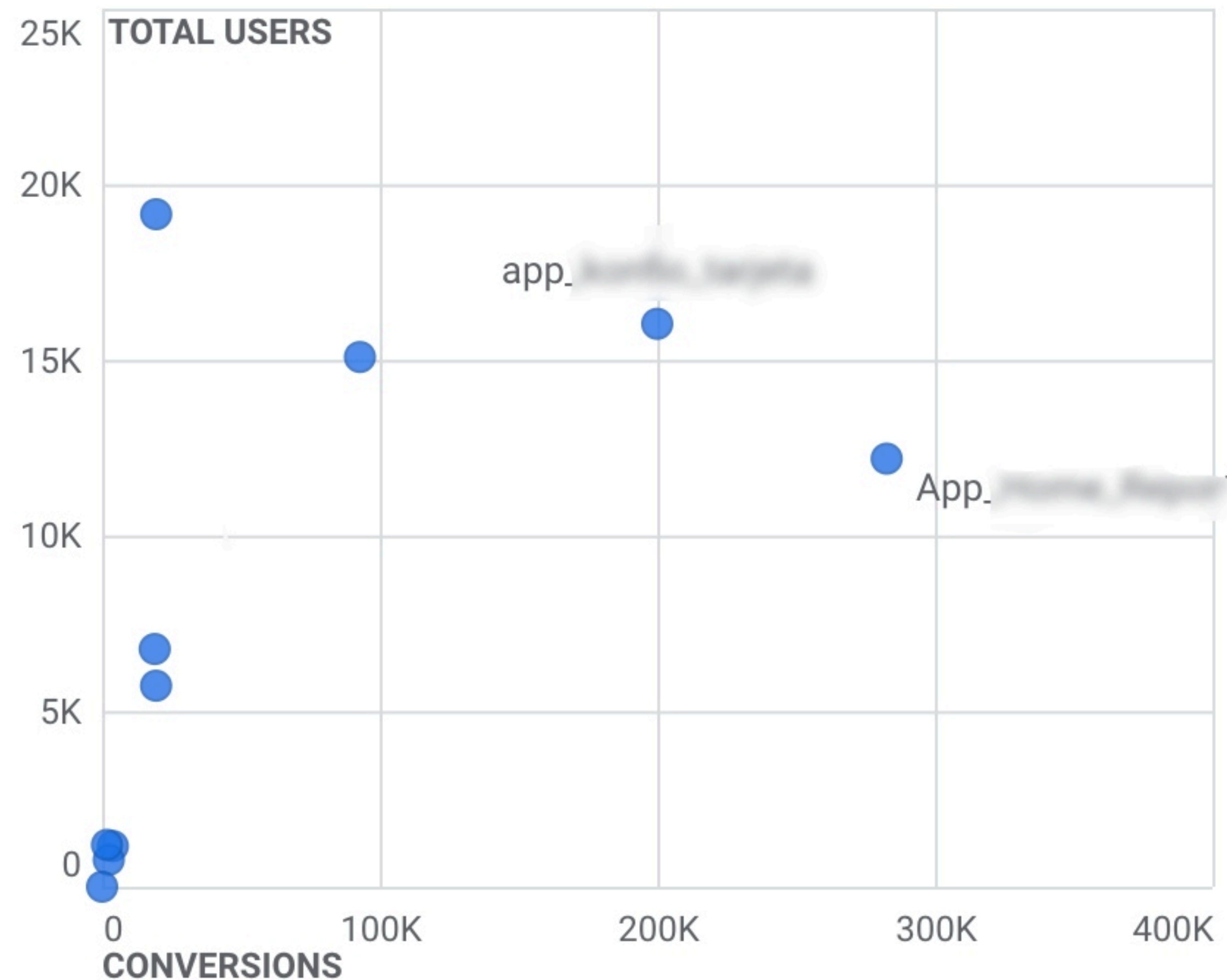
Conversion

| Event name | + | ↓ Conversions | Total users |
|------------|---|-----------------------------|-------------------------|
| Totals | | 641,444.00 100% of total | 30,997 100% of total |
| 1 App_H | | 282,637.00 | 12,188 |
| 2 app_k | | 199,982.00 | 16,027 |
| 3 App_L | | 92,880.00 | 15,082 |
| 4 first_c | | 19,477.00 | 19,147 |
| 5 App_L | | 19,443.00 | 5,724 |
| 6 App_L | | 18,974.00 | 6,769 |
| 7 App_L | | 3,874.00 | 1,159 |
| 8 App_L | | 2,409.00 | 767 |
| 9 App_L | | 1,767.00 | 1,193 |
| 10 app_k | | 1.00 | 1 |

- Conversions are related to multiple events
- We decide which is the event we are interested

Conversion

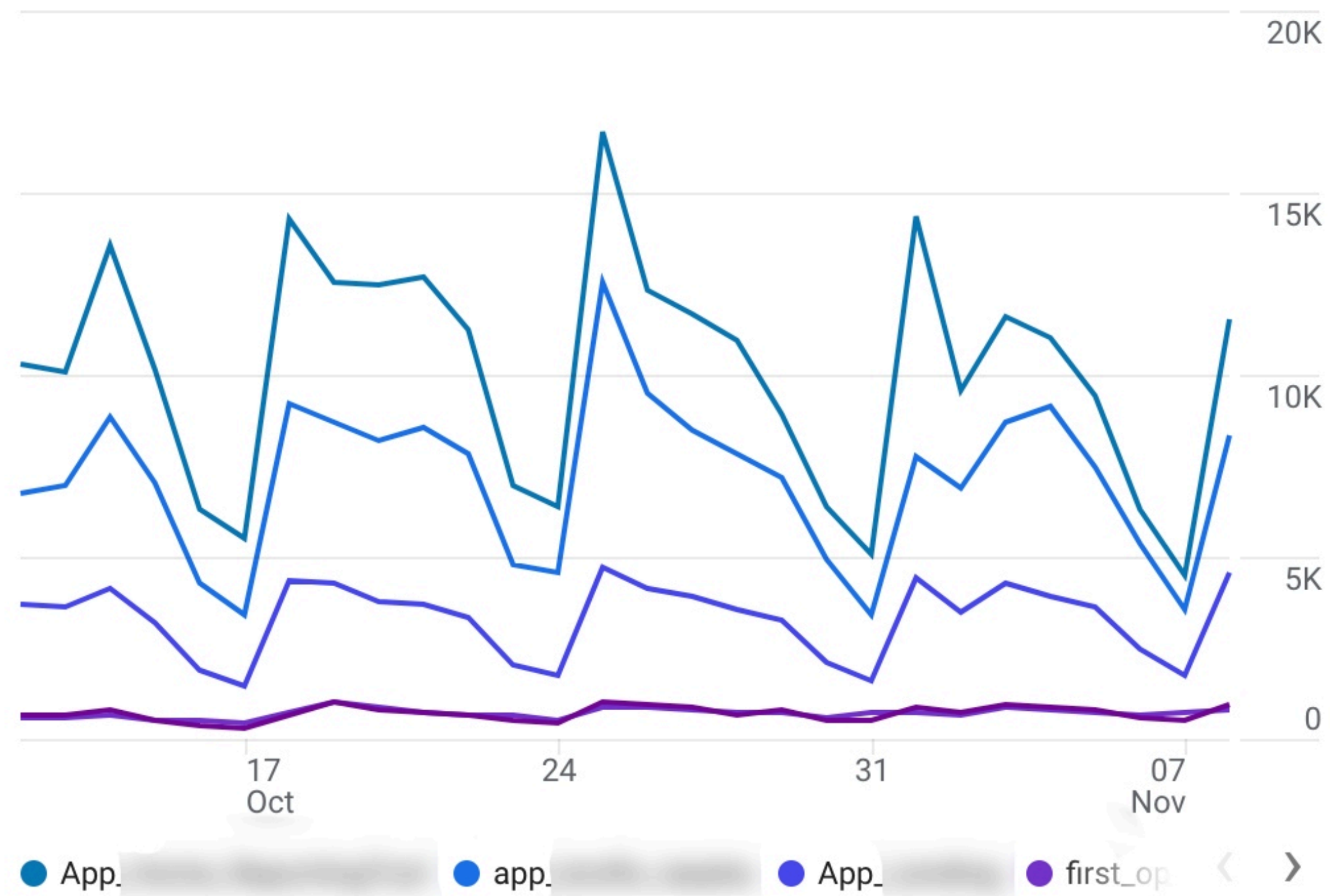
Conversions and Total users by Event name



- Conversions are directly related to the num of users and the number of clicks on the conversion
- But it also can be unique

Conversion

Conversions by Event name over time



- Conversions are directly related to time dimensions

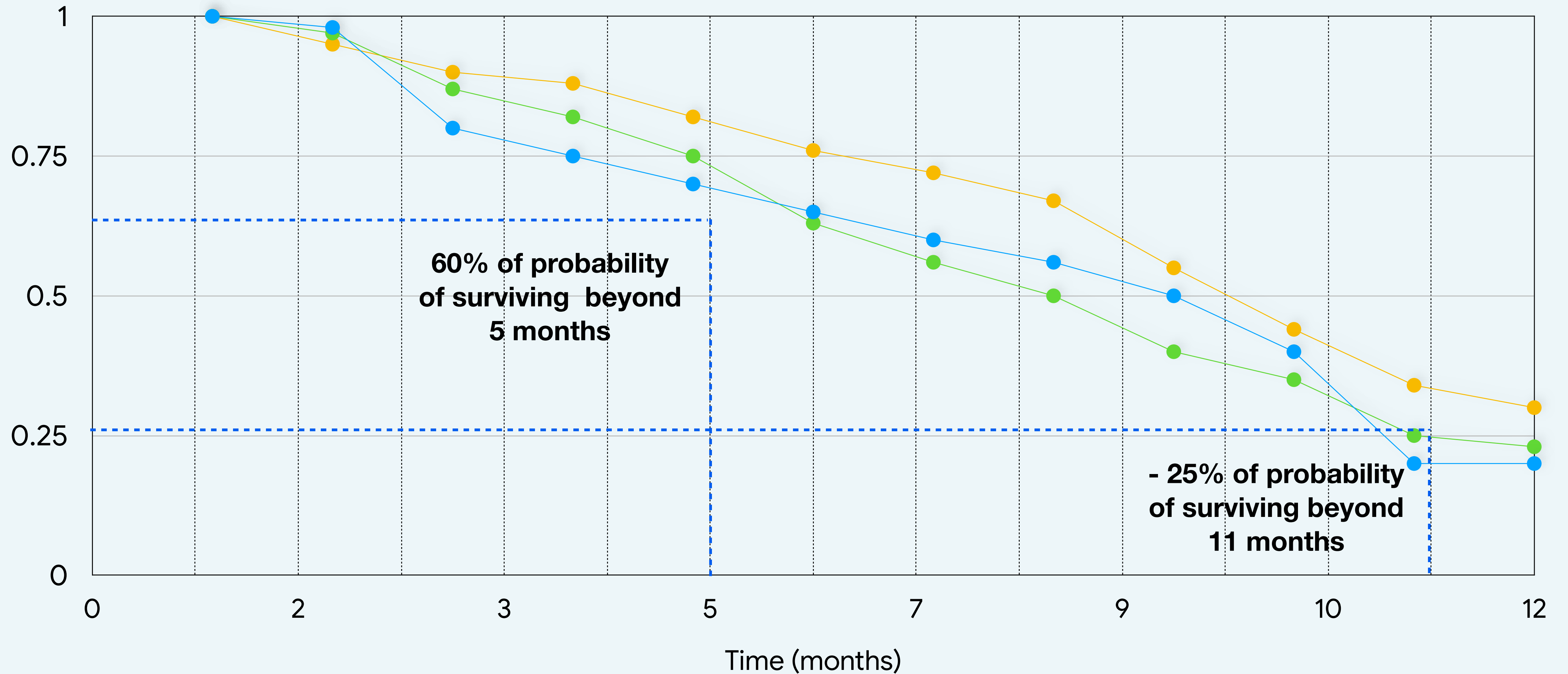
Retention

Retention

- Retention analysis (or survival analysis) is the process of analyzing user metrics to understand how and why customers churn
 - Retention analysis is key to gain insights on how to maintain a profitable customer base by improving retention and new user acquisition rates

Retention

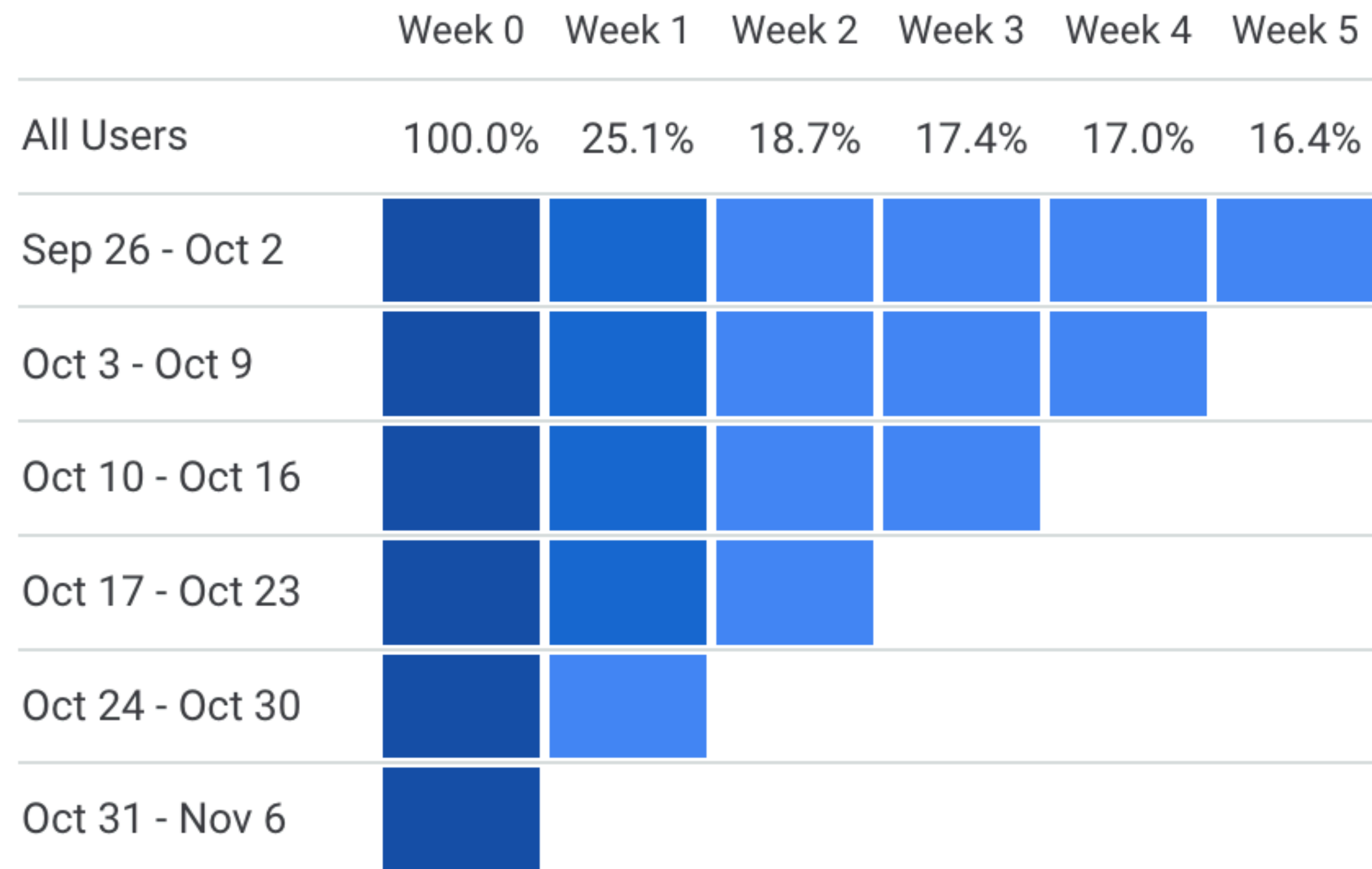
Time - Survival probability



Retention

User activity by cohort

Based on device data only



- Firebase - has this chart - you don't have to do anything just plug the dependencies in your app and you are ready to go

AB Testing

But first - what is an prediction model

- Frequentist vs Bayesian

| Frequentist | Bayesian |
|--|---|
| <ul style="list-style-type: none">• Assume the observed data is sampled from some distribution | <ul style="list-style-type: none">• Assume the probabilities for both data and hypotheses(parameters specifying the distribution of the data) |

Bayesian Models

- How does it look

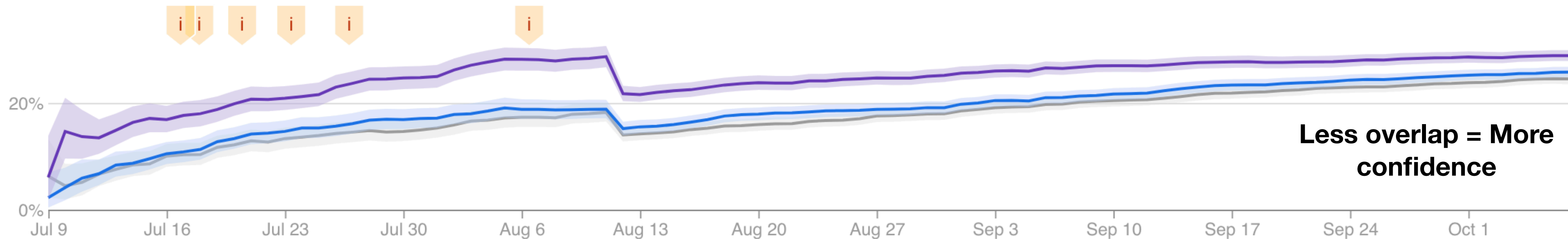
Modeled Conversion Rate



7 days

30 days

All time



Less overlap = More confidence

More overlap = Less confidence

Observed data

Modeled data

Bayesian Models

- How does it look

| Observed data | | | | Modeled data ? | | | |
|--|---|--------------------------------|----------------------------|------------------------------|-------------------------------|--------------------------------|--------------------|
| Variant | App_Home_ReportingTool_Tap ? | Conversion rate ? | % difference from baseline | Probability to beat baseline | % difference from baseline | Conversion rate ? | 2.5% 25% 75% 97.5% |
| <input checked="" type="checkbox"/> Baseline 7,398 users | 1,812 | 24% | Baseline | Baseline | Baseline | 24.49% | |
| <input checked="" type="checkbox"/> Variant A 7,708 users | 1,986 | 26% | +5.2% | 97% | +5.3% -0.4% to +11.2% | 25.76% | |
| <input checked="" type="checkbox"/> Variant B 7,774 users | 2,243 | 29% | +18% | >99.9% | +17.8% +11.8% to +24.4% | 28.85% | |

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