

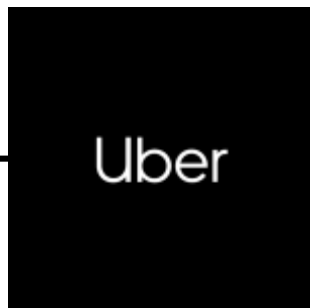
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*learning from ML failures:*  
a case study in large-scale  
business forecasting

Emily W. Bailey

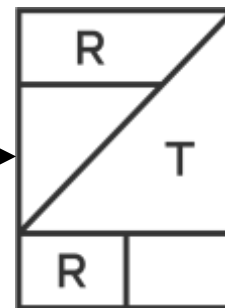
**July 2015 - August 2020**

*Data Science Manager*



**September 2020 - ??**

*Director of Data Products & ML*



# Uber



Eat



Ride



Earn



Freight



Business



Transit



Bike & scooter



Elevate

Uber operates in more than 900 cities around the globe.

## United States

Abilene

Akron

Albuquerque

Amarillo

Ames

Anchorage

Ann Arbor

Asheville, NC

Athens

Atlanta

Auburn

Augusta

Austin

Bakersfield

Baltimore-Maryland

Baton Rouge

Beaumont

Bellingham

Big Island

Lubbock

Macon

Madison

Manhattan

Mankato

Maui

Mayaguez

Memphis

Meridian

Miami

Midland-Odessa

Milwaukee

Minneapolis - St. Paul

Mississippi Delta

Missoula

Mobile, AL

Modesto

Monroe

Montgomery, AL

## United States

Bellingham

Big Island

Billings

Birmingham, AL

Bismarck

Bloomington, IN

Boise

Boone

Boston

Bowling Green, KY

Bozeman

Carbondale

Cedar Rapids

Central Atlantic Coast, FL

Central Oregon

Champaign

Charleston, SC

Charlotte

Charlottesville-Harrisonburg

Chattanooga

Chicago

Monroe

Montgomery, AL

Myrtle Beach

Nacogdoches

Nashville

New Hampshire

New Jersey

New Jersey (Shore)

New Orleans

New York City

North Georgia

Northern Missouri

Northwest IL

NW Indiana

NYC Suburbs

Ocala, FL

Oklahoma City

Olympia

Omaha

Orange County

Orlando

Uber operates in more than 900 cities around the globe.

## Failure #1: Scoping the problem

**Forecast the number of trips that will occur on Uber's platform**

→ *where? globally? for each city block?*

→ *when? per year? per second?*

## Failure #1: Scoping the problem

**Forecast the number of trips that will occur on Uber's platform**

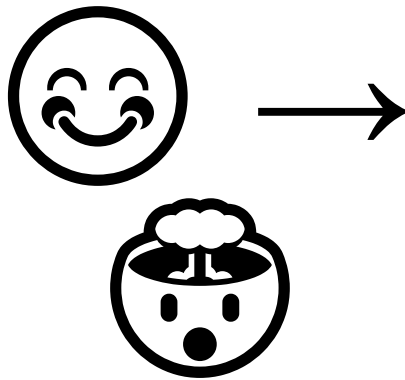
→ by city

→ by month

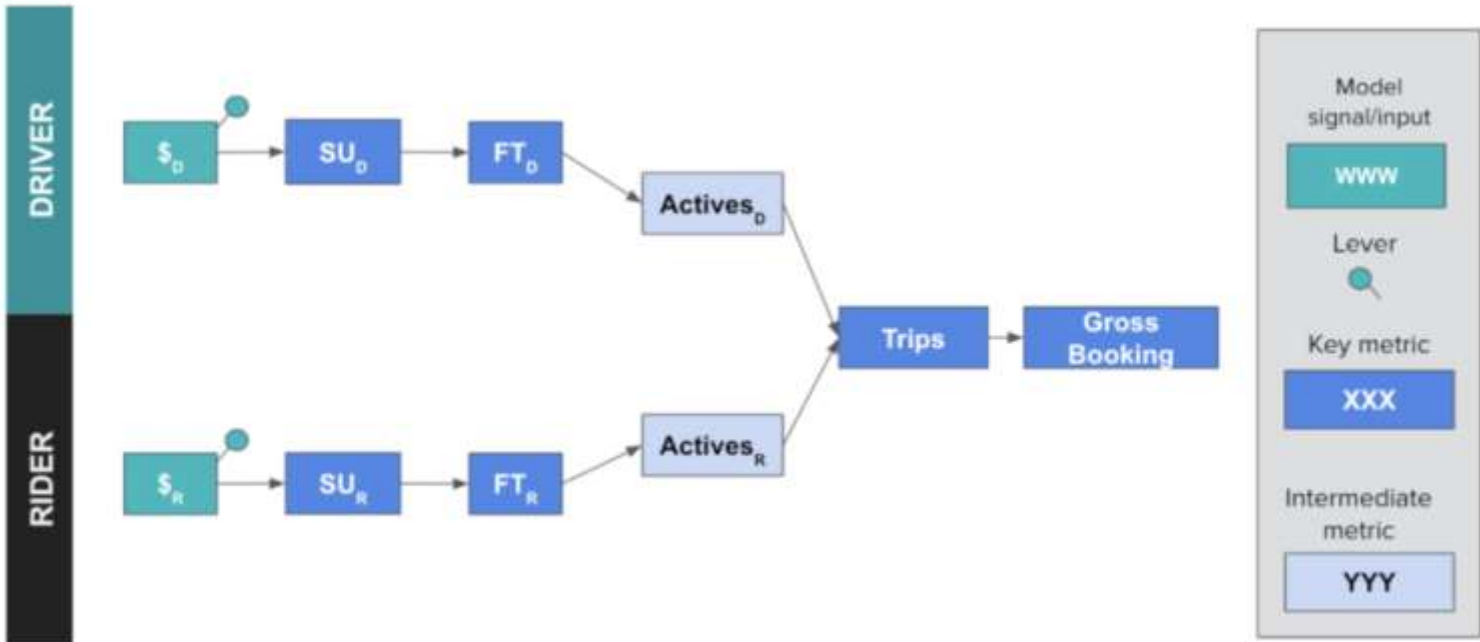
**... and use that forecast to optimize how Uber spends money**

→ to acquire new users

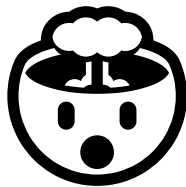
→ to incentivize existing users to engage more with the platform







Source: <https://eng.uber.com/financial-planning-for-data-scientist/>



## Failure #2: Effectively engaging stakeholders

### Who needs to be involved in optimizing our finances?

- Finance
- Operations
- Strategy & Planning
- Marketing
- Marketplace
- ...

What about when competitors  
change their strategy?

What about X other  
type of spend?

Shouldn't this be a  
weekly decision?

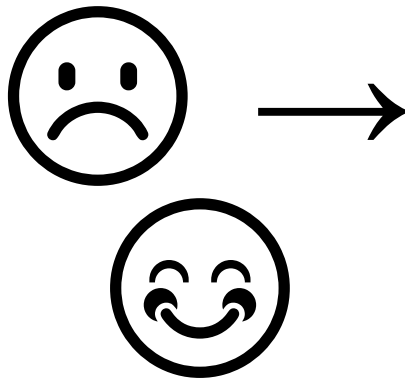
Shouldn't this be a  
quarterly decision?

## Failure #3: Inflexibility

### **Reasons to build flexible solutions**

- Fast-paced tech team
- Fast-changing business environment
- Fast-changing strategy & priorities
- ...





# Today at Rent The Runway

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SHOP THE UNLIMITED CLOSET

# Online Sample Sale up to 90% Off

3

To Y2111

Sizes 2, 4

4

Sort by Recommended

1



Suno  
White Cotton Bell Sleeve Tunic  
\$138 to buy | \$395 retail



MSGM Heritage  
Circle Totebag  
\$73 to buy | \$271 retail



Amarelle Uprichard  
Waldorf Top  
\$48 to buy | \$155 retail

2





**Thank you**

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