

# Turn Ideas Into Software (Data) Products

October 8, 2020

A presentation for MITRE

Karl Kwon, PhD

# Who am I?

01

Karl Kwon, NYC  
Software Engineer,  
researcher, data  
visualization  
expert in Finance,  
Insurance and  
Academia.

02

PhD in Computer  
Science – Univ of  
Houston, Texas  
  
Data Visualization  
Methods and  
Applications

IEEE Viz, Science  
Advances

03

BS in Software  
Engineering from  
South Korea  
  
Won two times  
Honor scholarship  
(In-major 3.9/4.0)

IT specialist in  
Korea Army

04

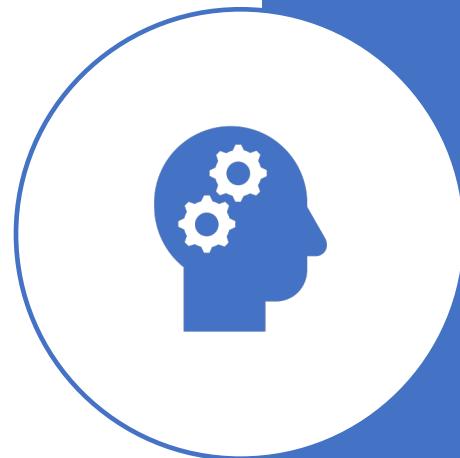
I love people and  
learning.  
Conferences,  
Meetups,  
Hackathons, and  
Volunteering  
  
Facebook,  
Amazon, MIT,  
Harvard. AI, Cloud,  
ML, Python, and  
Web

05

Social, Energetic,  
Travels  
Tennis,  
Backpacker, Bike  
Travelled to more  
than 70 cities  
Nepal and India for  
3 months  
Himalaya, 10 years  
ago

# Overview

1. Data Products by examples  
“How to turn idea/data into real products”
2. Dataset
3. Technical Challenging



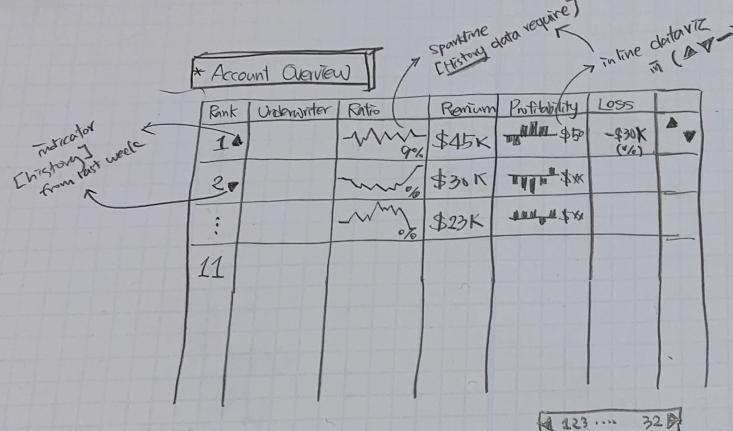
# Software Products

- MDES
  - Modern Data Eco System
- RPM.Mix4cast
  - Market research data analytics tool, interactive data visualization dashboard and a simulator for forecasting
  - Coke Japan, Coke Korea, Chick-Fil-A, and Hershey's
- AD.IQ Optimizer
  - Media Optimization Platform for healthcare research
  - From Idea into Production
  - IQVIA and Amgen

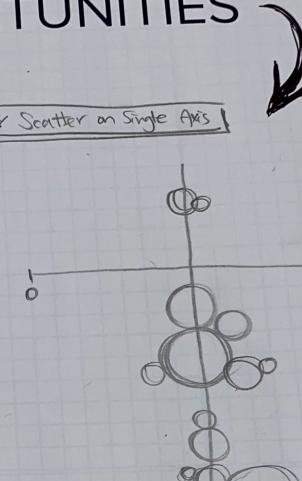


# UNCOVER OPPORTUNITIES

D3. Account (N) → (1) Underwriter.

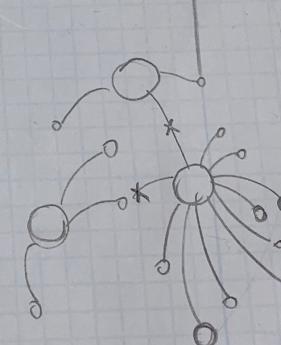
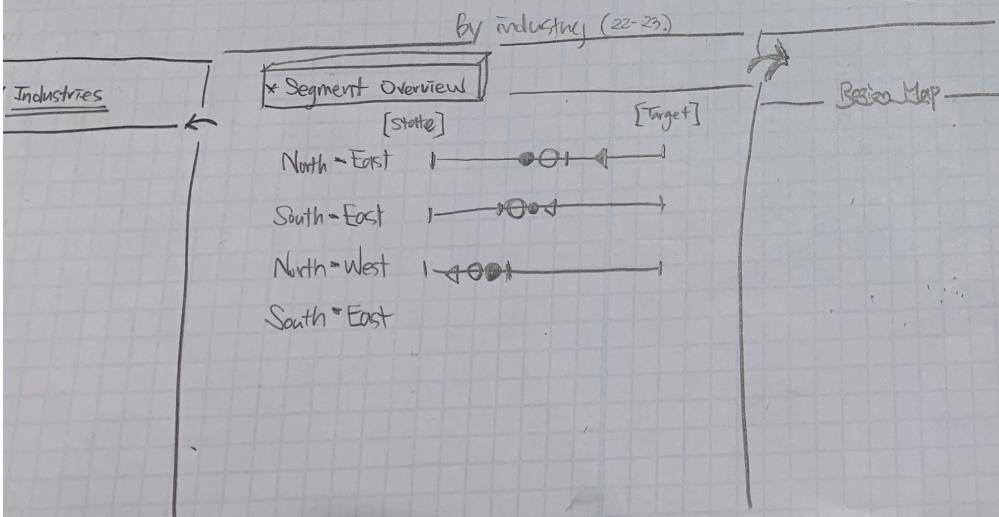


\* Scatter on Single Axis



Kave  
Size (Premium) • 0000  
color  
Scale 0 - 100% (single axis)

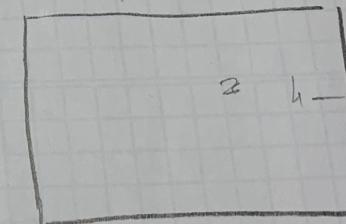
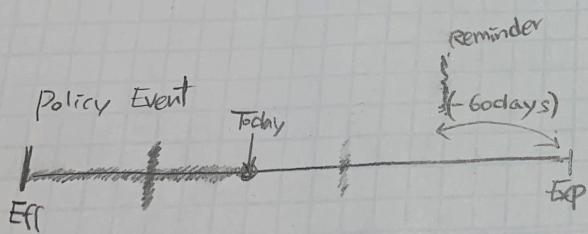
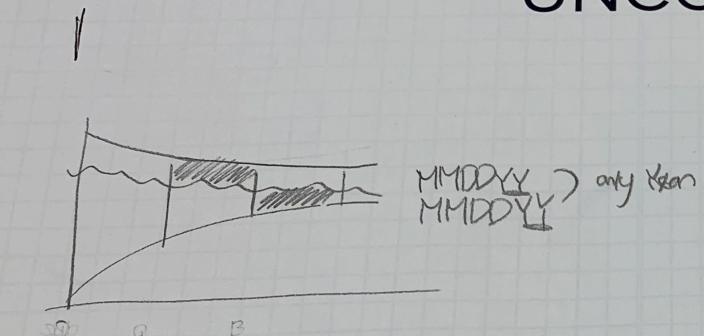
Focus // (Paid + unpaid) - P1



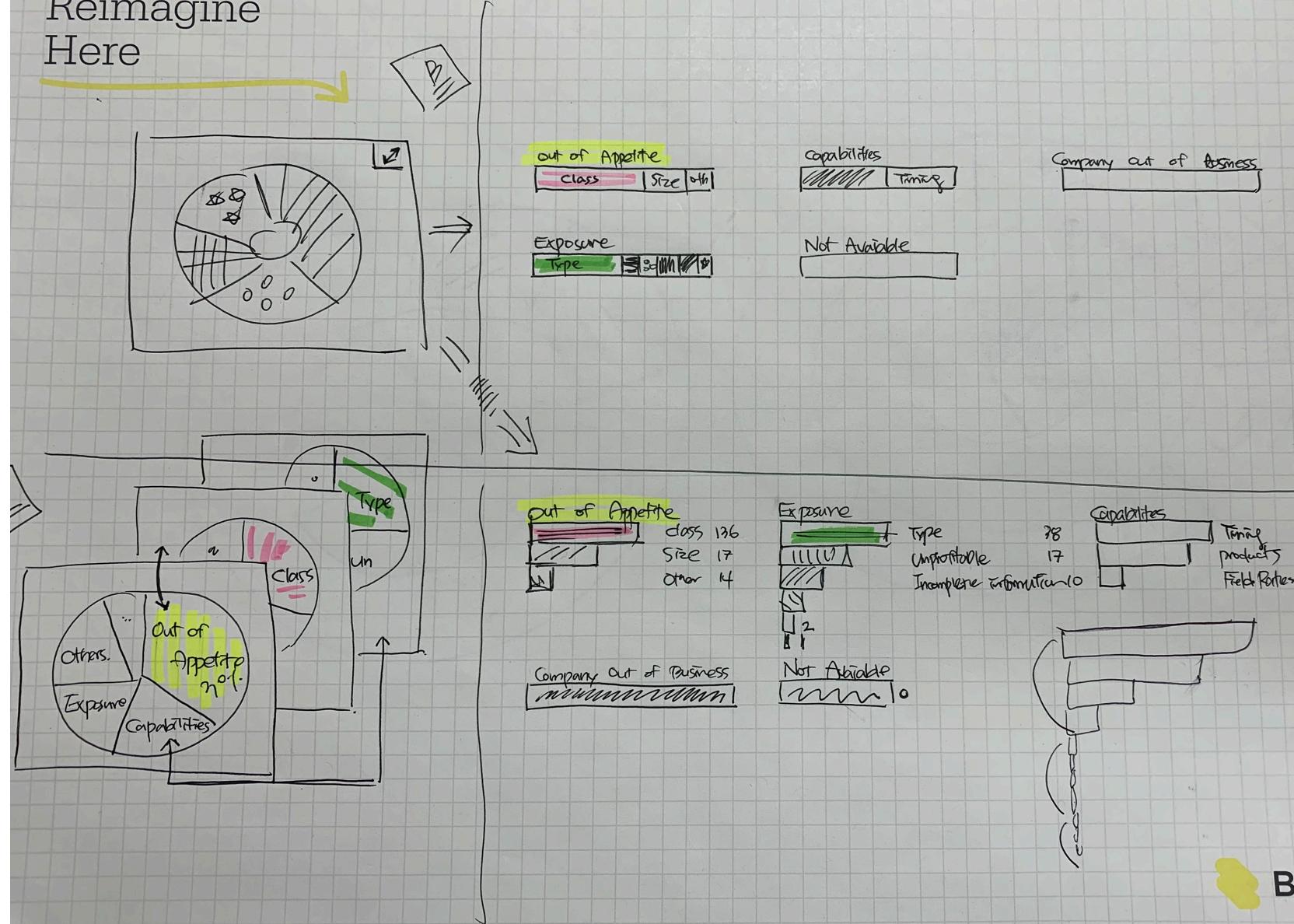
BLACKBO

# UNCOVER OPPORTUNITIES

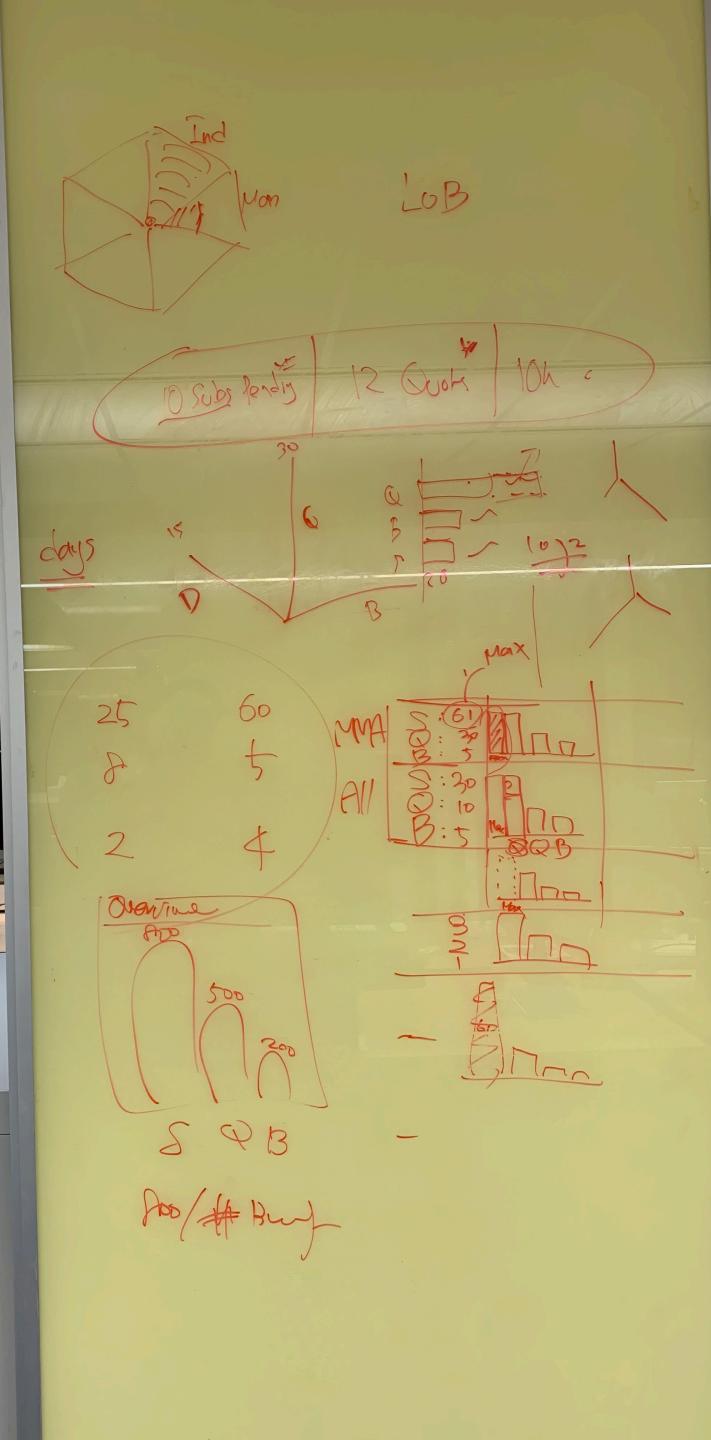
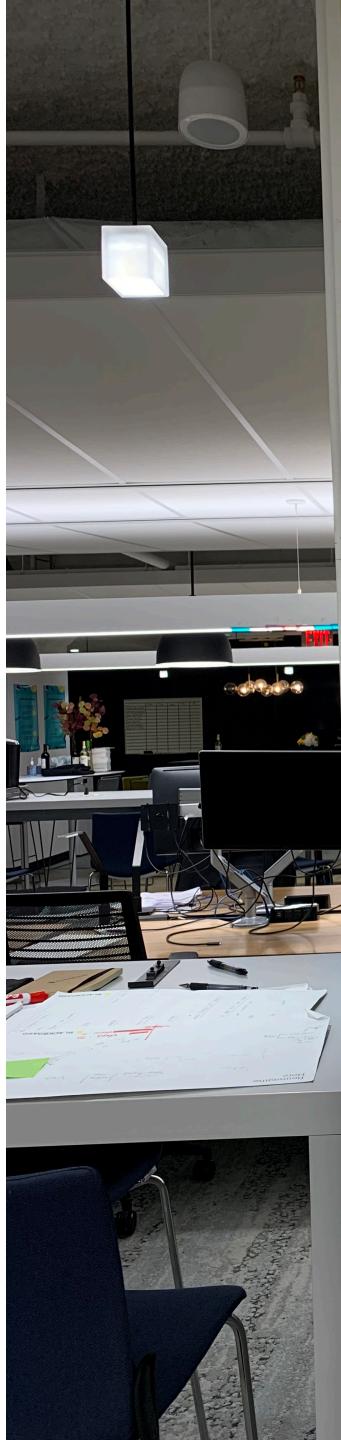
Submission ➡ Quote ➡ Bound



# Reimagine Here



BLACKBOARD

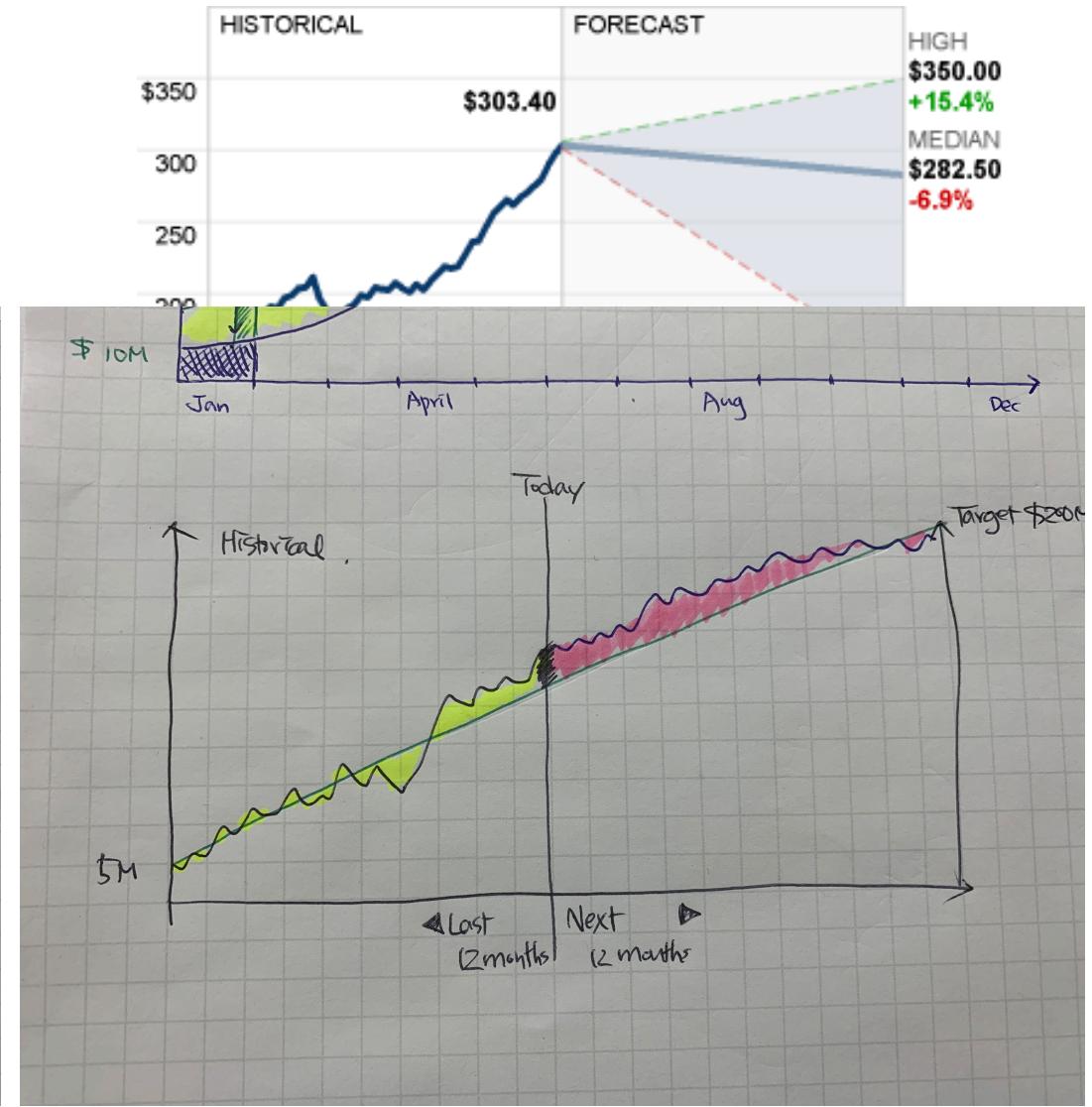
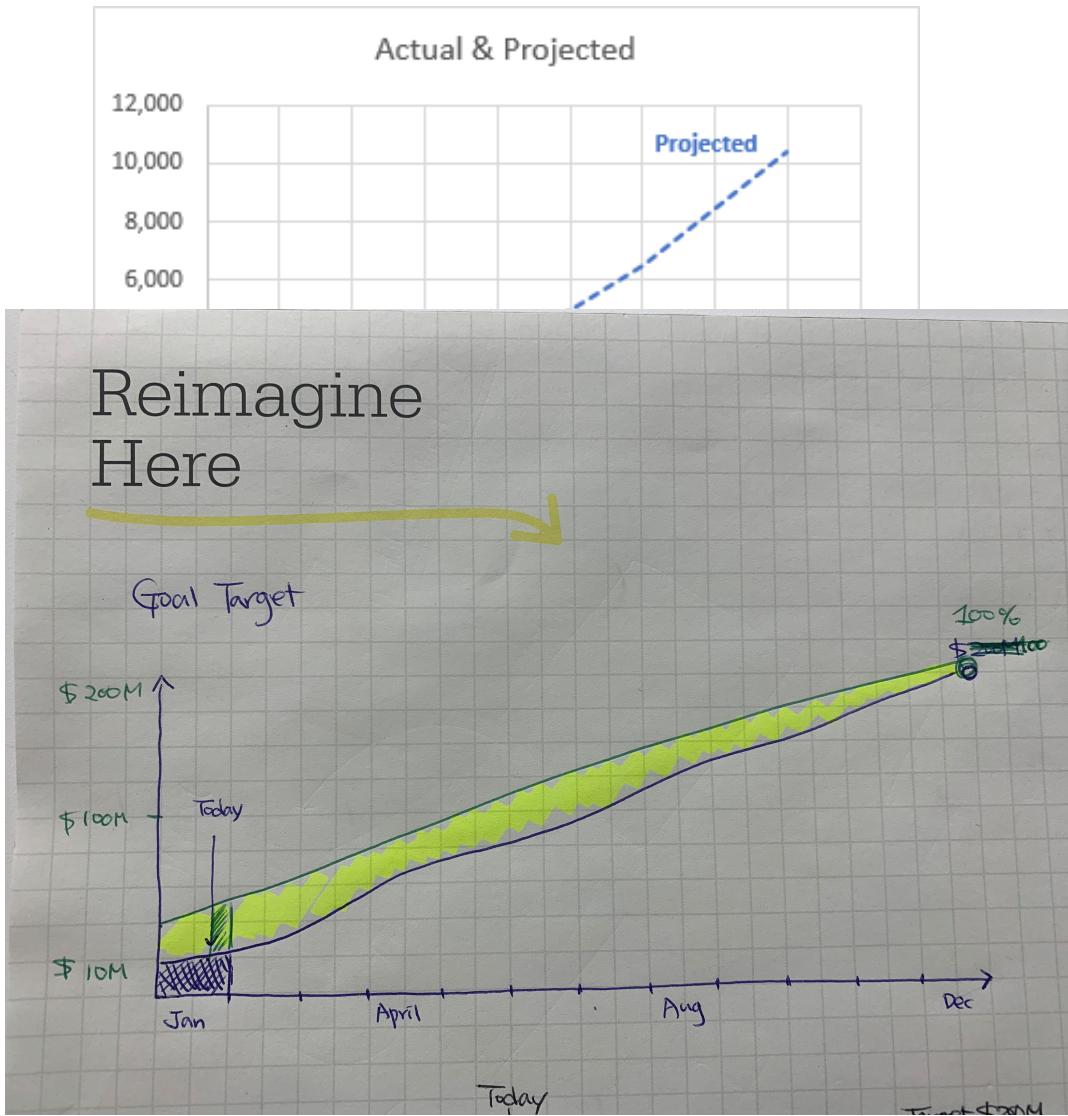


# Story: a cup cake social event

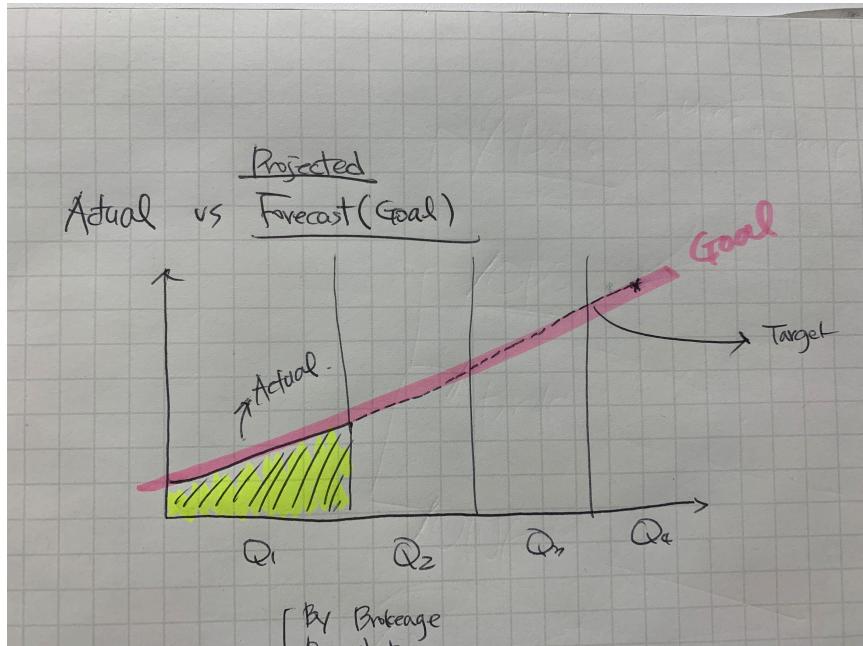


Q. Are we on the track toward a goal of 2020 by monthly/weekly premiums?

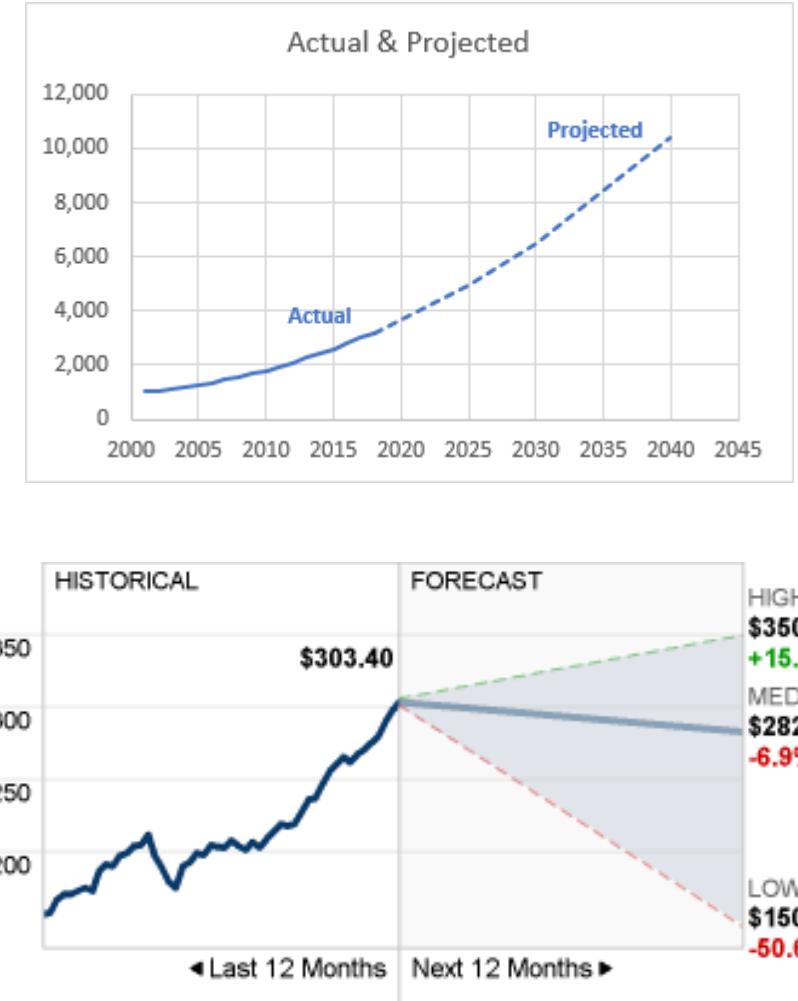
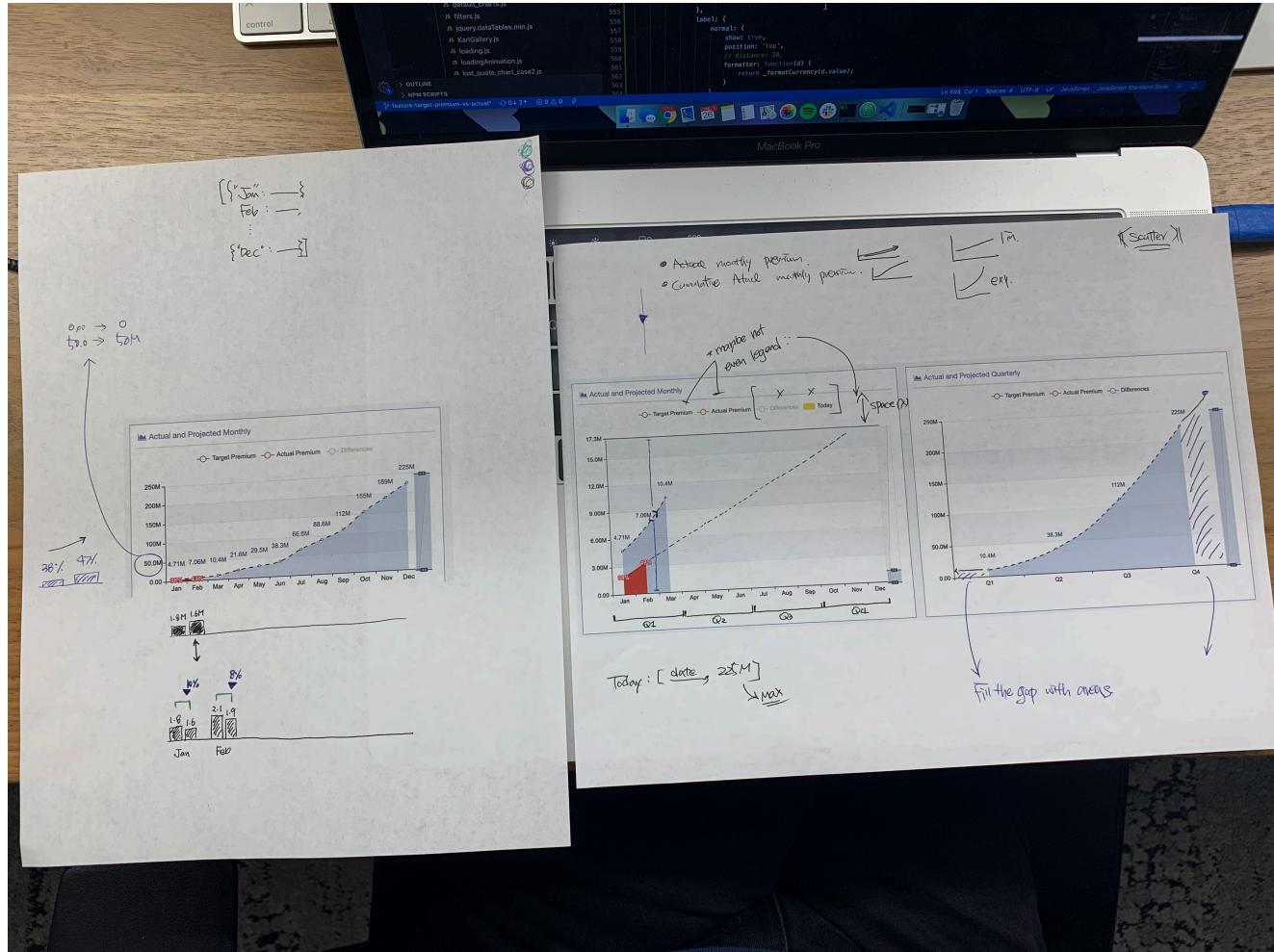
# Actual vs Target



# Actual vs Target



What about quarterly?

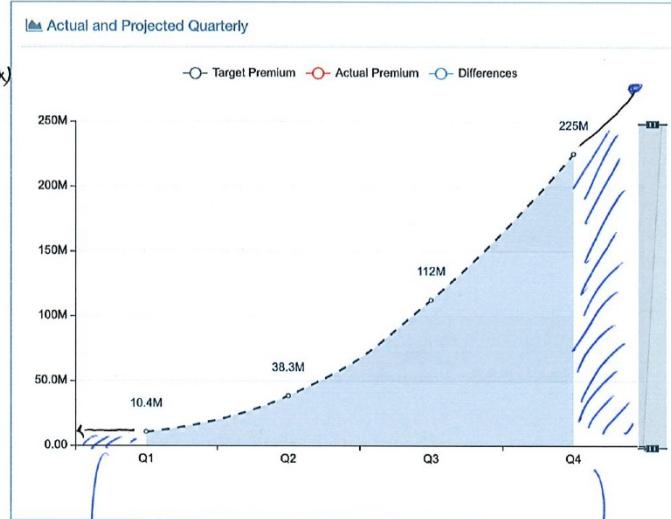
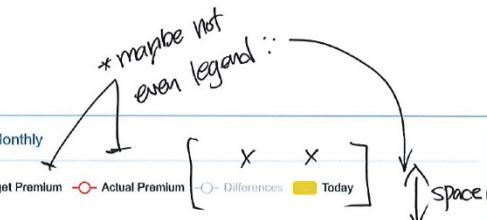




- Actual monthly premium.
- Cumulative Actual monthly premium.

$\text{Im.}$   
 $\text{exp.}$

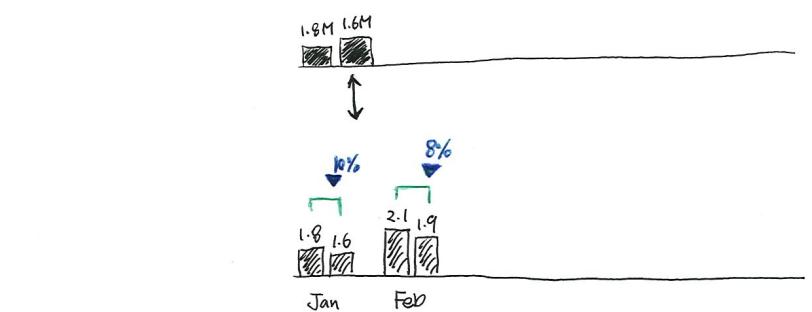
$\text{Scatter}$



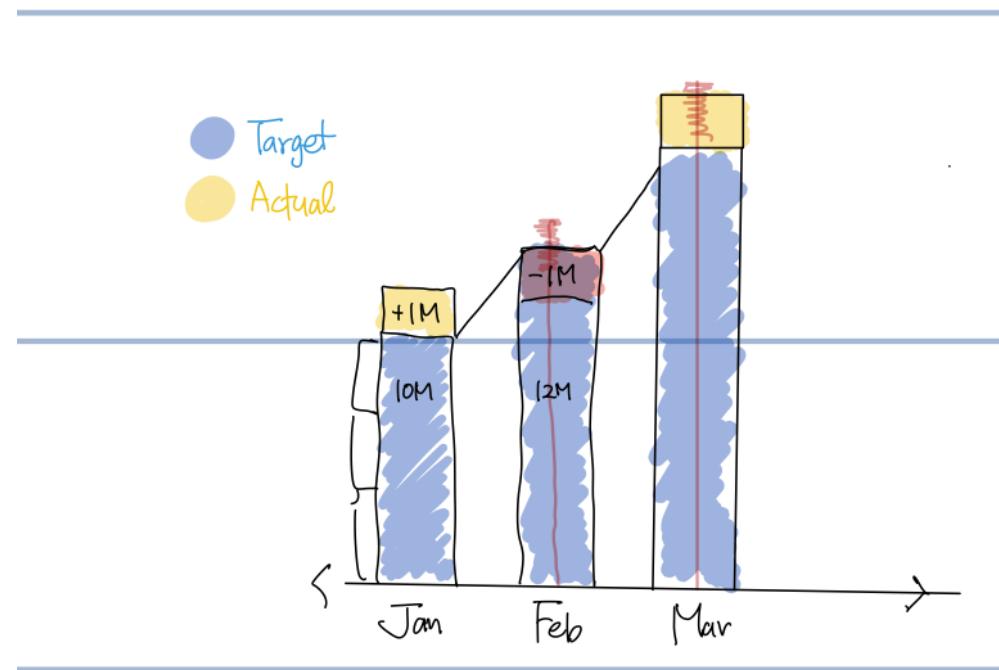
Today: [date, 225M]  
 $\searrow \underline{\max}$

Fill the gap with areas

$0.00 \rightarrow 0$   
 $50.0 \rightarrow 50M$



Would you like to see the difference between Actual and Target?



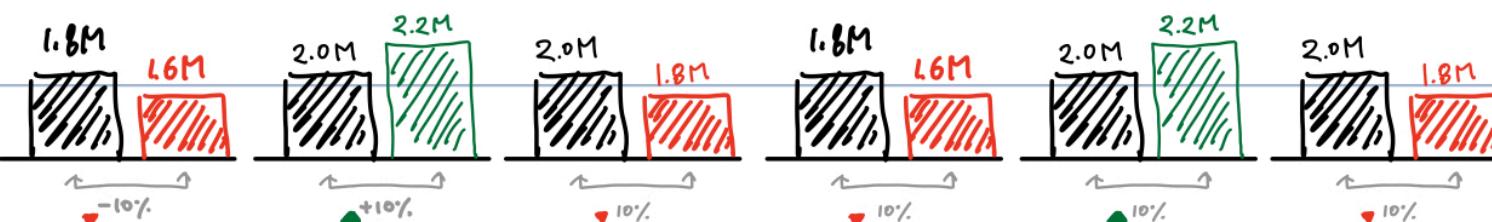
Side by side?

1. Coloring. Red - negative (?)

2. if % → all

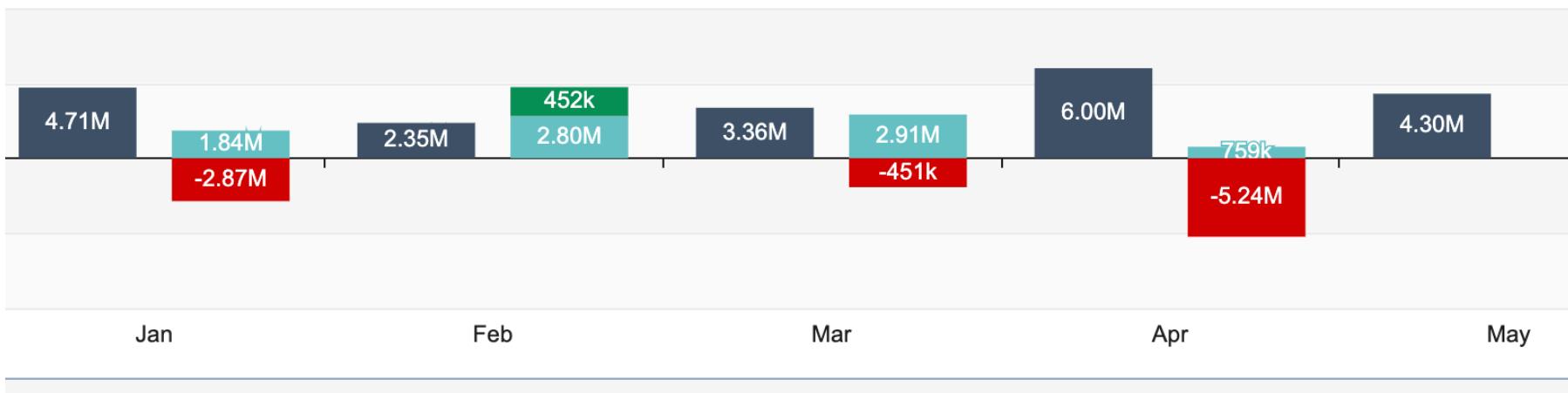
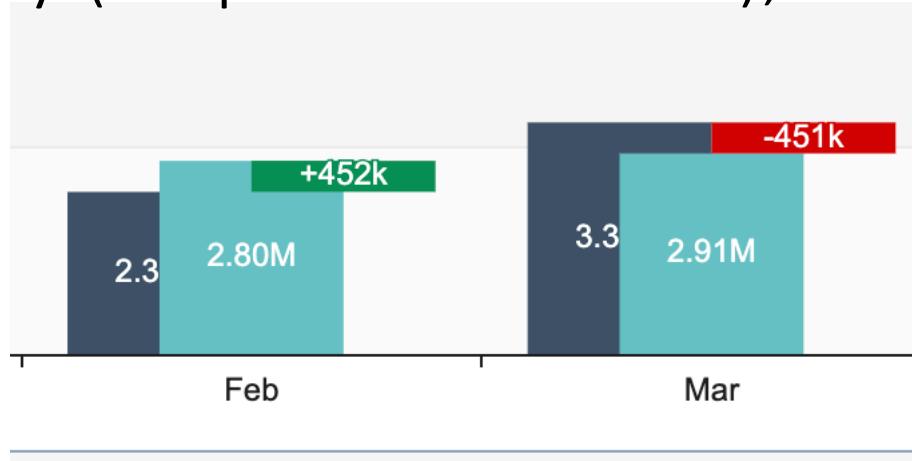
\$ → all

] consistency.



Open	286.53	Vol	41.02M	52W H	327.85
High	297.88	P/E	23.22	52W L	169.50
Low	286.50	Mkt Cap	1.279T	Avg Vol	31.21M

How about this way (surplus and deficit), then?

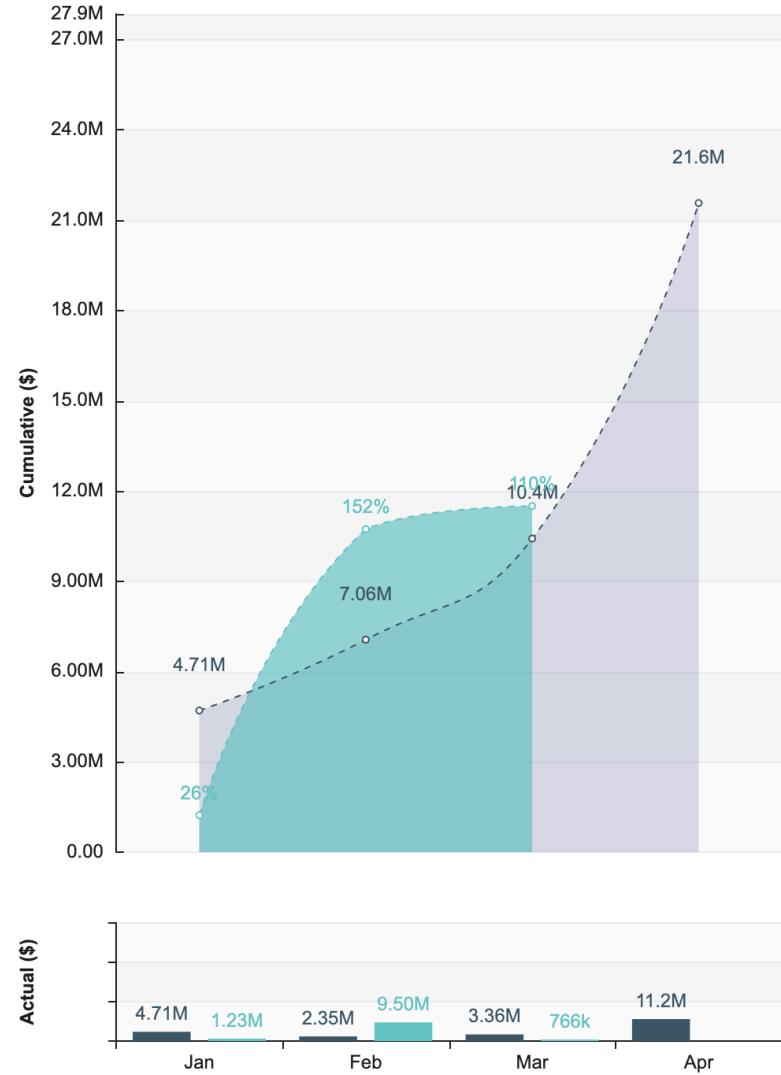




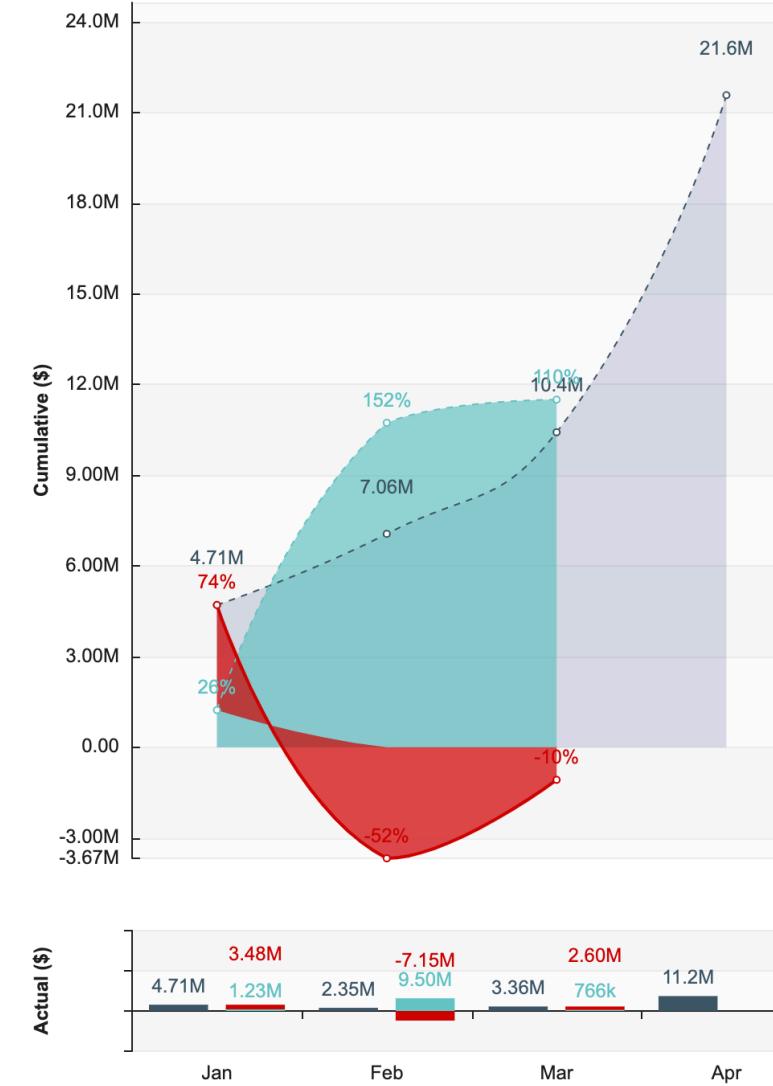
Discussion, communication, feedback, pros and cons, repeat...

Programming ... Rethinking ...

▲ 2020 Premium Plan - Actual vs Target



▲ 2020 Premium Plan - Actual vs Target



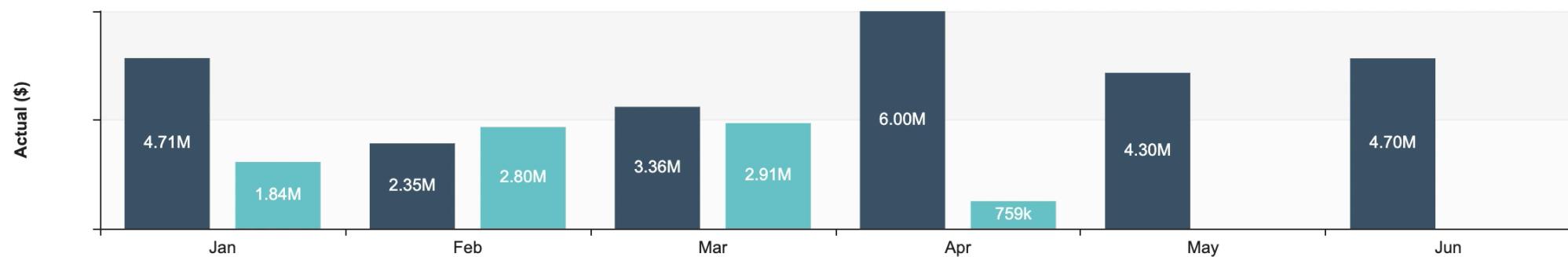
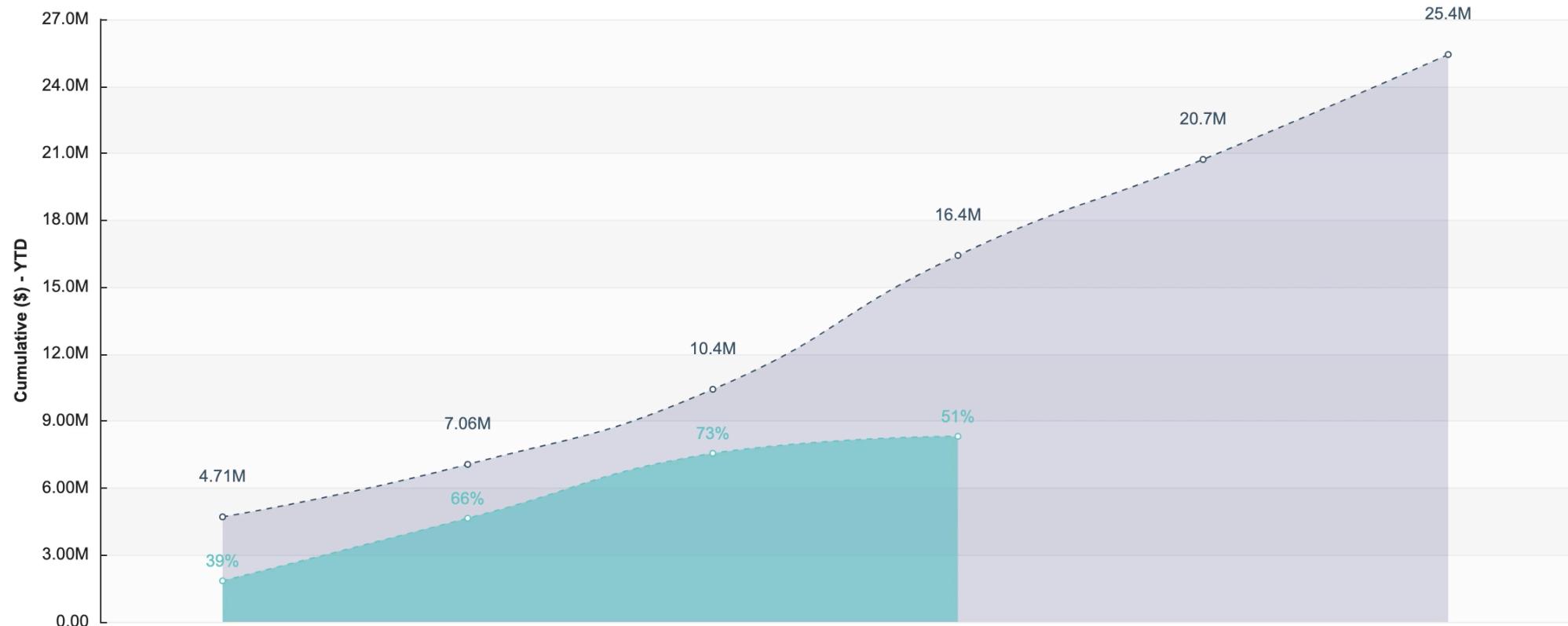
Woohoo! Not that easy  
Quite complicated?  
No worry!  
We can fix and improve it!

repeat...



## 2020 Premium Plan - Actual vs Target

—○— Target Premium —○— Actual Premium —○— Differences



## Operational Portfolio

Overview

Actual and Target

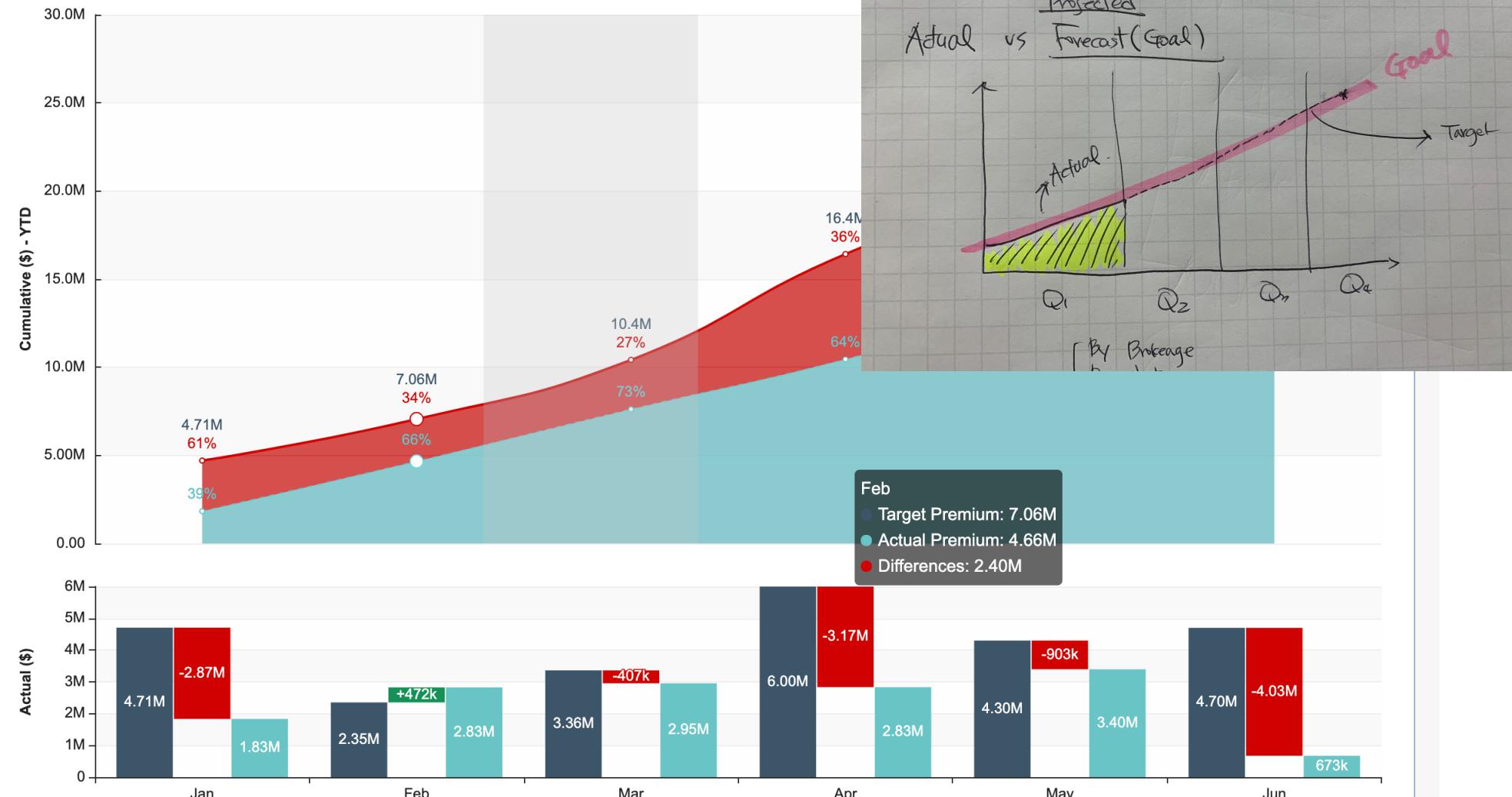
## Broker Portfolio

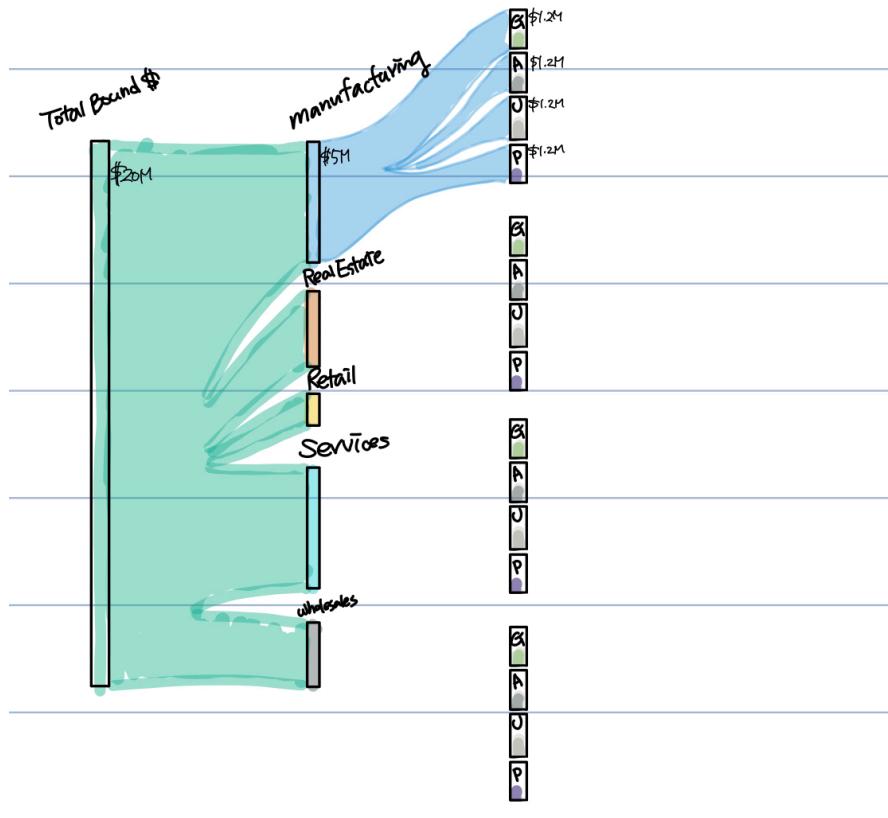
## Risk Portfolio

## Claim Portfolio

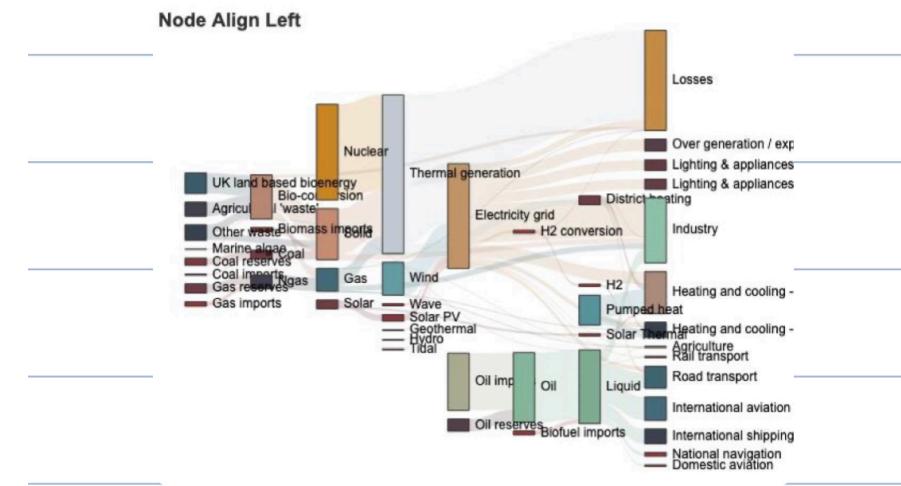
## 2020 Premium Plan - Actual vs Target

—○— Target Premium —○— Actual Premium —○— Difference





Idea



Prototyping

**Operational Portfolio**

Premium Business Report

Quote Bind Activity Report

Decline Reason Report

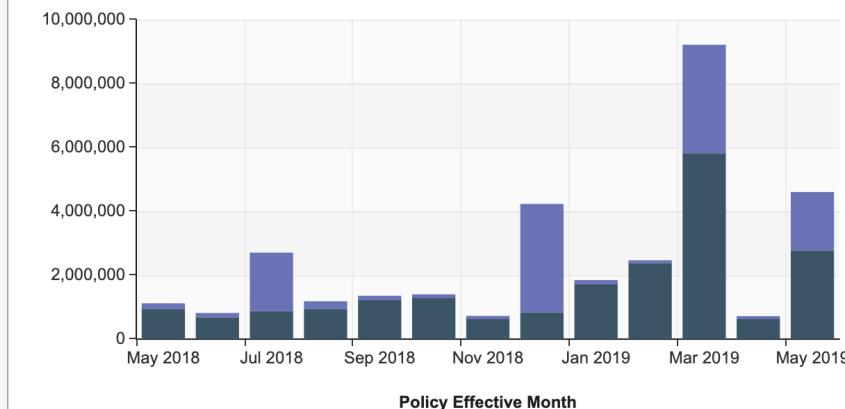
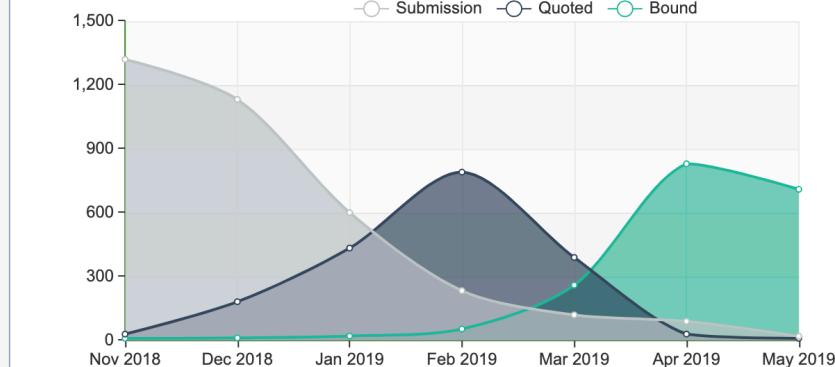
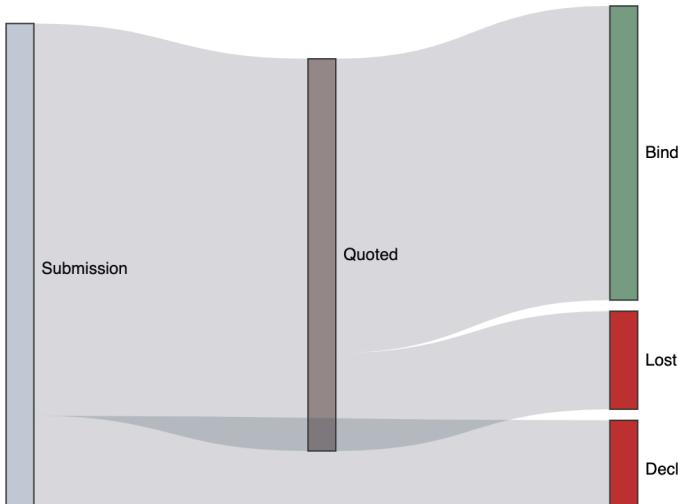
Total Written Premium Report

Total Insured Value Report

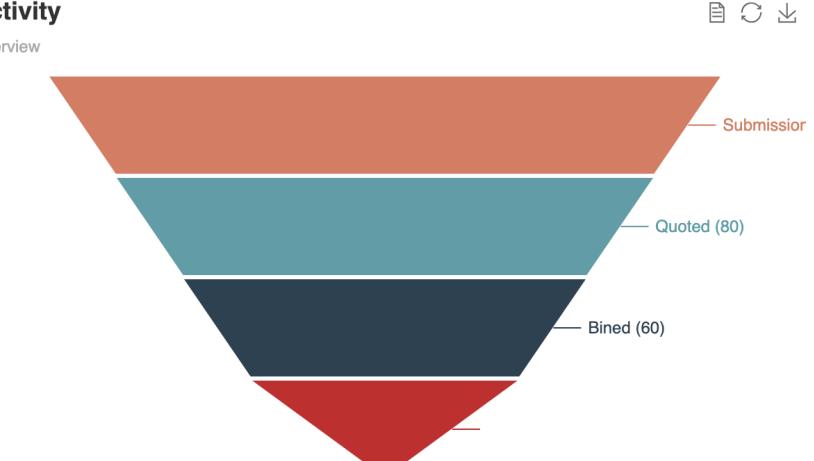
**Underwriter Portfolio****Producer Portfolio****Karl's Gallery!****Bound Premium Report**

Premium (\$)

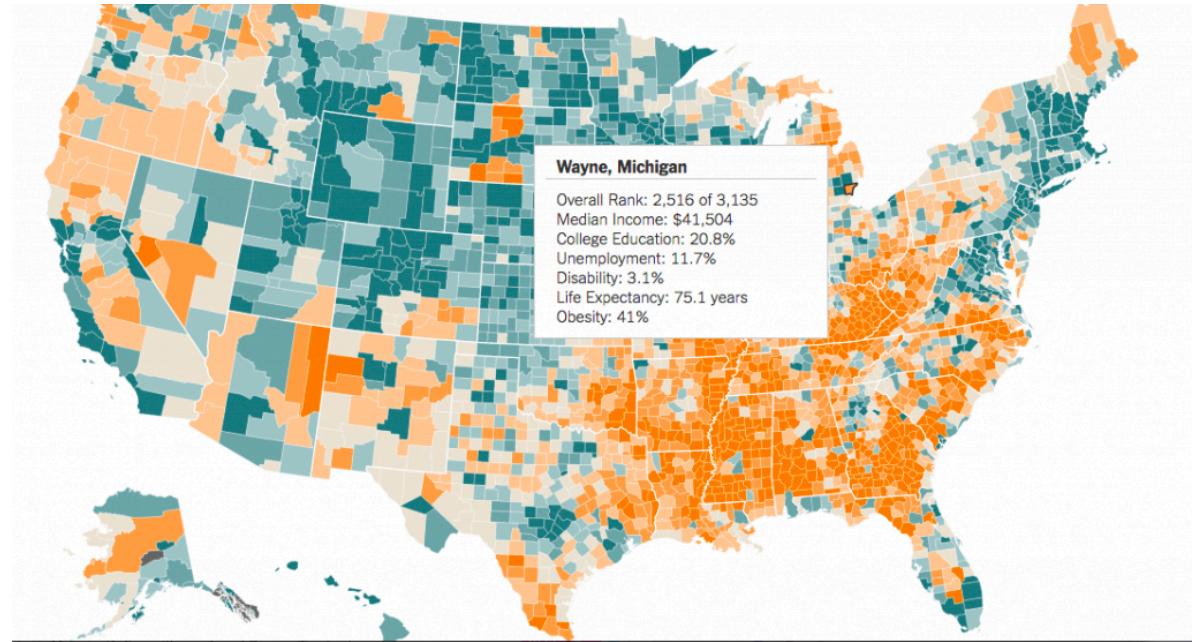
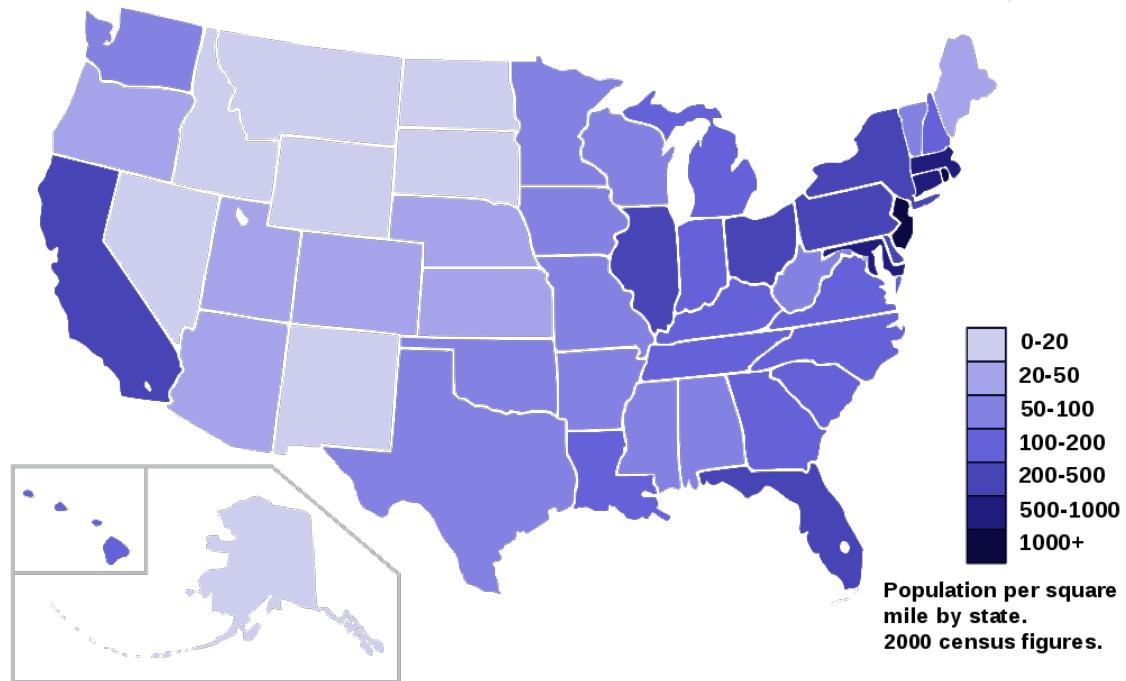
Bound Premium    Quote Premium

**Quote Premium Report****Quote Bind Activity Report****Quote Bind Activity Report****Activity**

Overview



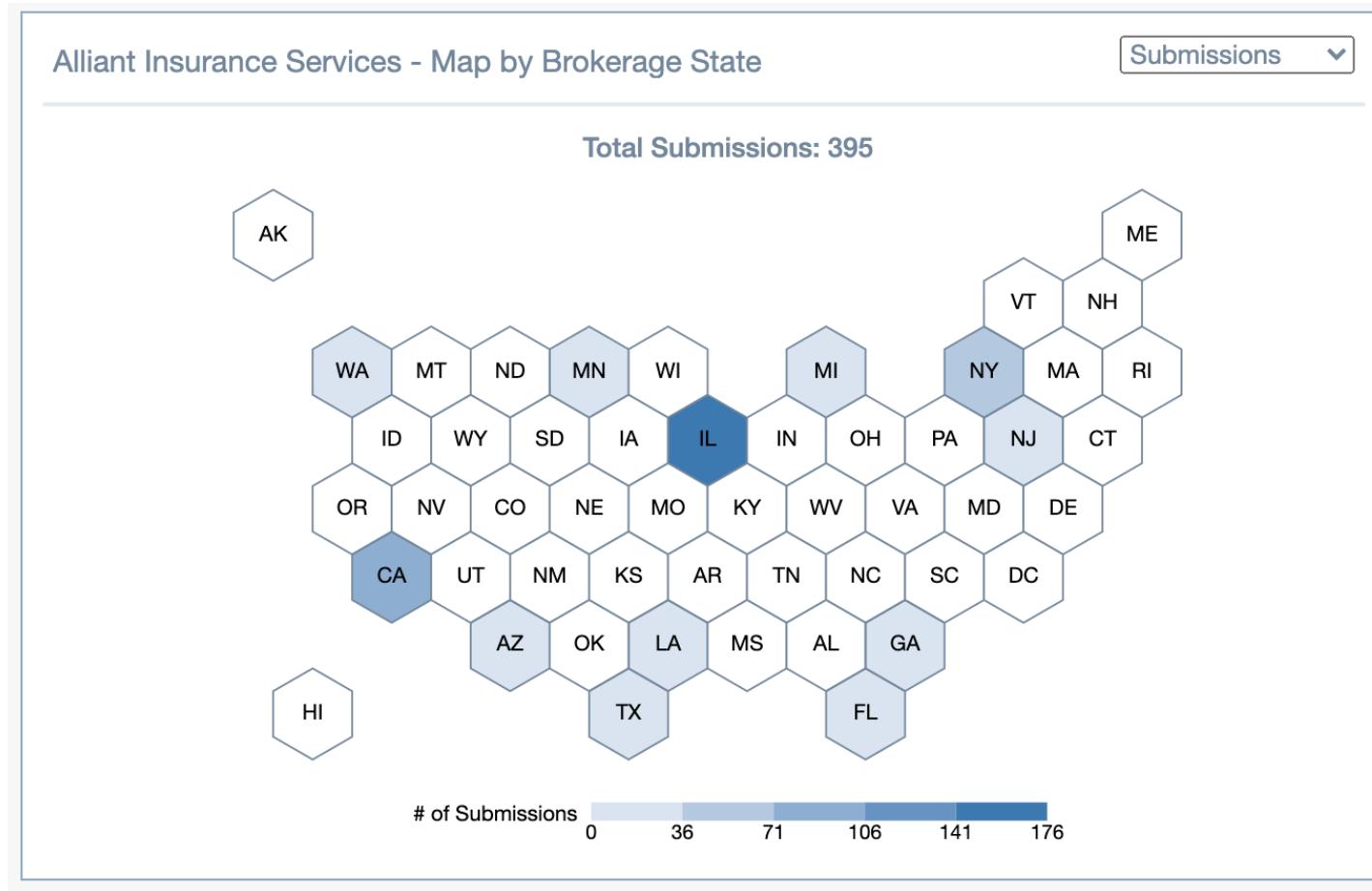
# Map of USA



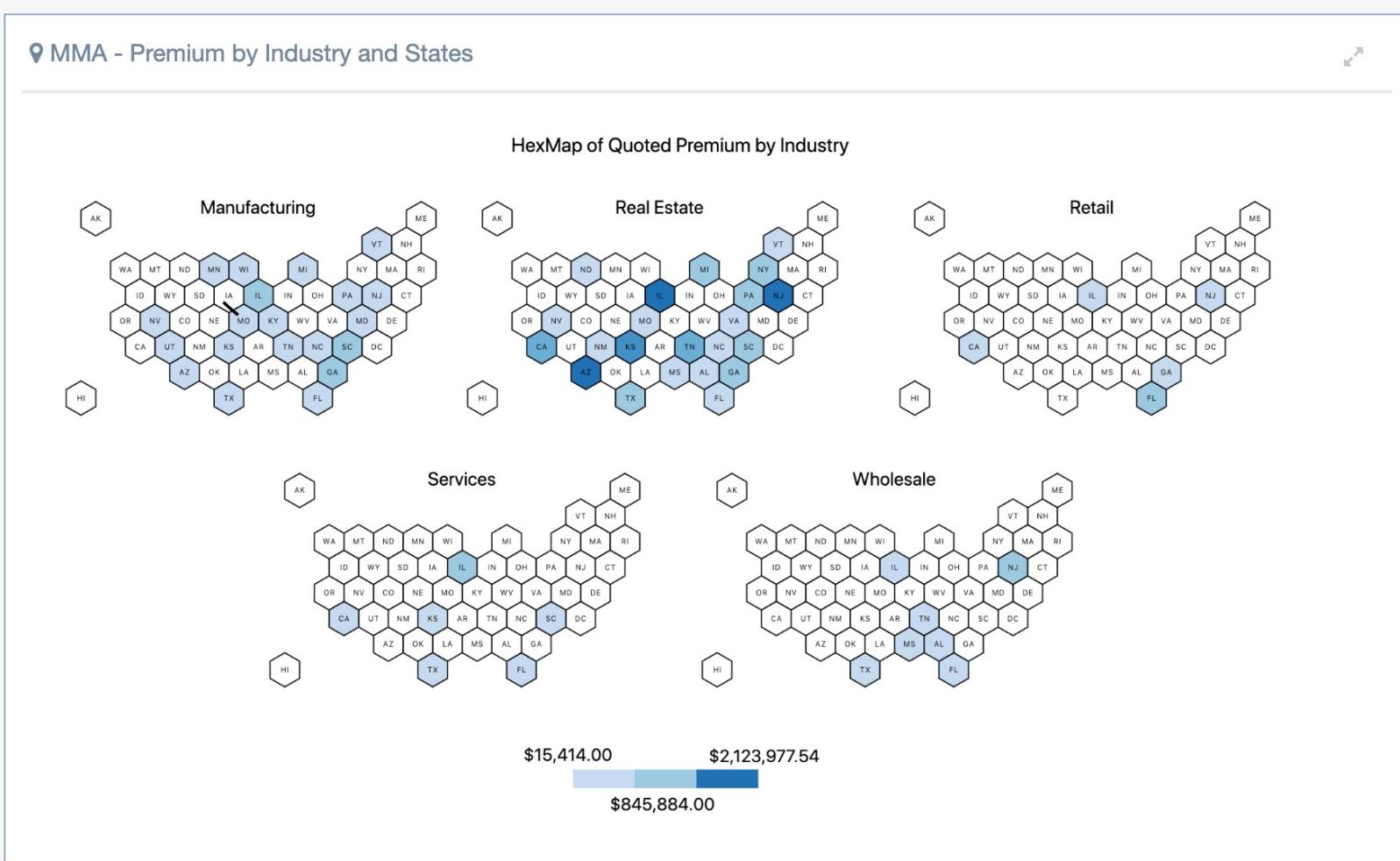
Good, but the users are confused and distracted by the size?

Any better ways?

# Hexagonal map of USA

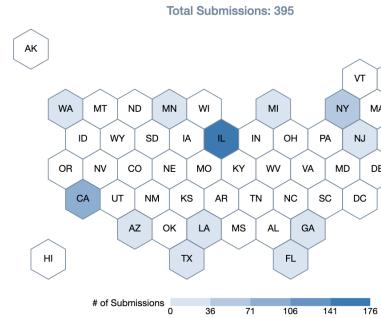


# Hexagonal map of USA

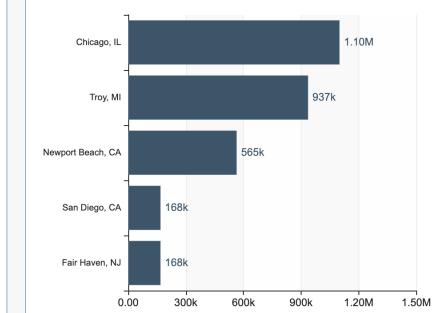


**\$3,564,287** Total Bound Premium      **\$10,166,193** Total Quoted Premium      **\$111,384** Average Policy Size

## Alliant Insurance Services - Map by Brokerage State



## Top Broker Offices (\$M)

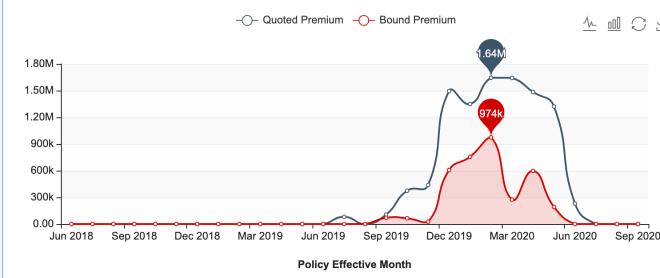


## Broker Office Lists

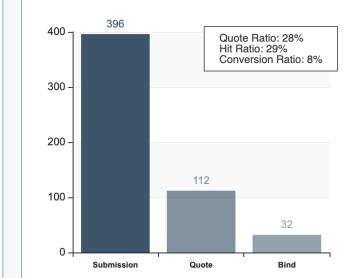
		Premiums		Activities		Ratios		Underwriter	
City	State	Bound Premium: \$1,100,409	Quote Premium: \$3,889,712	Avg. Policy Premium: \$91,701	Submission: 142	Quote: 57	Bind: 12	Quote Ratio: +40%	Christa Watts, Justin Rissolo, Rob Danneman, Scott Andrews
Troy	MI	Bound Premium: \$909,578	Quote Premium: \$1,202,559	Avg. Policy Premium: \$234,145	Submission: 31	Quote: 7	Bind: 4	Quote Ratio: +23%	Christa Watts, Scott Andrews, Shawn Young
Newport Beach	CA	Bound Premium: \$566,037	Quote Premium: \$1,201,842	Avg. Policy Premium: \$139,009	Submission: 35	Quote: 8	Bind: 4	Quote Ratio: +23%	Christa Watts, Christine Garza, Justin Rissolo, Scott Andrews, Shawn Young
San Diego	CA	Bound Premium: \$168,043	Quote Premium: \$520,293	Avg. Policy Premium: \$84,022	Submission: 20	Quote: 7	Bind: 2	Quote Ratio: +25%	Christa Watts, Christine Garza, Justin Rissolo
Fair Haven	NJ	Bound Premium: \$168,009	Quote Premium: \$498,566	Avg. Policy Premium: \$84,005	Submission: 29	Quote: 8	Bind: 2	Quote Ratio: +28%	Christa Watts, Shawn Young

Showing 1 to 5 of 26 entries

## Quoted / Bound Premium



## Submission / Quote / Bind



## Declined Submission Reasons

Effective Date: 06/30/2018 From: 06/30/2020 To: 06/30/2020 Apply

## Broker Portfolio

## Overview

## Filters

BRL Underwriter Brokerage

**\$2,223,024** Total Bound Premium

**\$5,170,535** Total Quoted Premium

**\$148,202** Average Policy Size

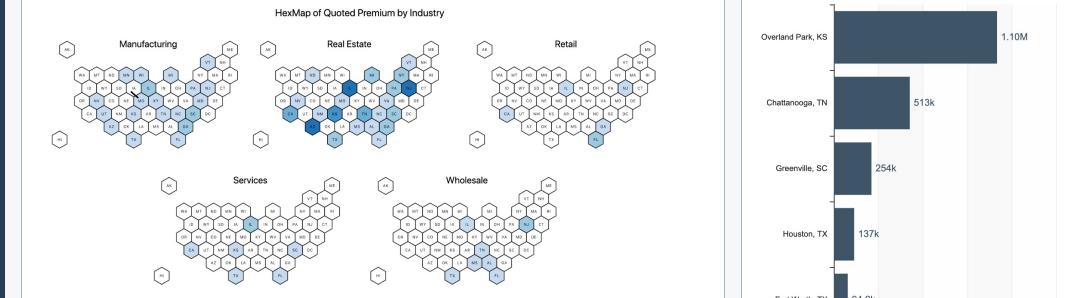
## Days

Avg. Time To Decline

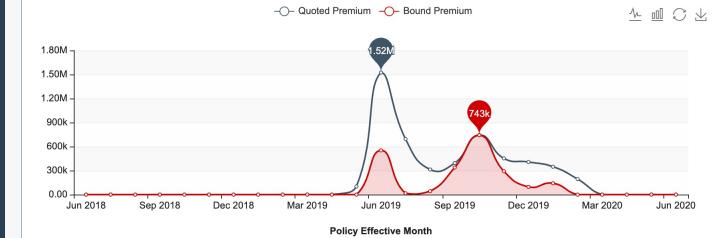
## 40.1 Days

Avg. Time To Quote

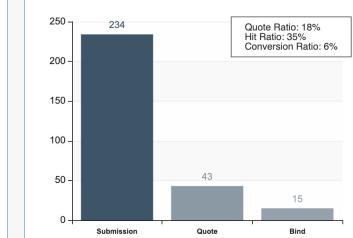
## MMA - Premium by Industry and States



## Quoted / Bound Premium



## Submission / Quote / Bind



## Declined Submission Reasons

Out Of Appetite

Total # of Declined: 175 Total Declined Ratio: 75%

Exposure

Coverage / Capacity

Stayed With Incumbent Carrier

Broker Lost Rfp

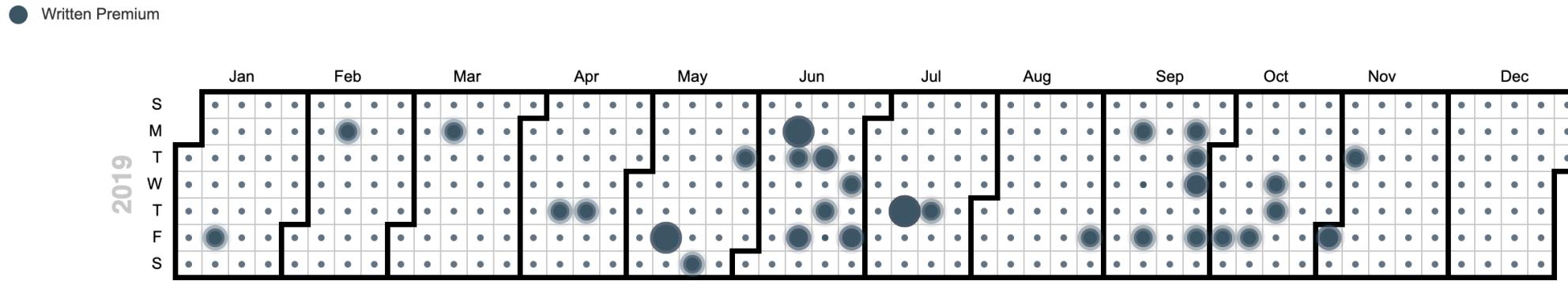
Timing

Uncertainty With Blackboard



## Lost Quote Reasons

# Calendar (Skip)

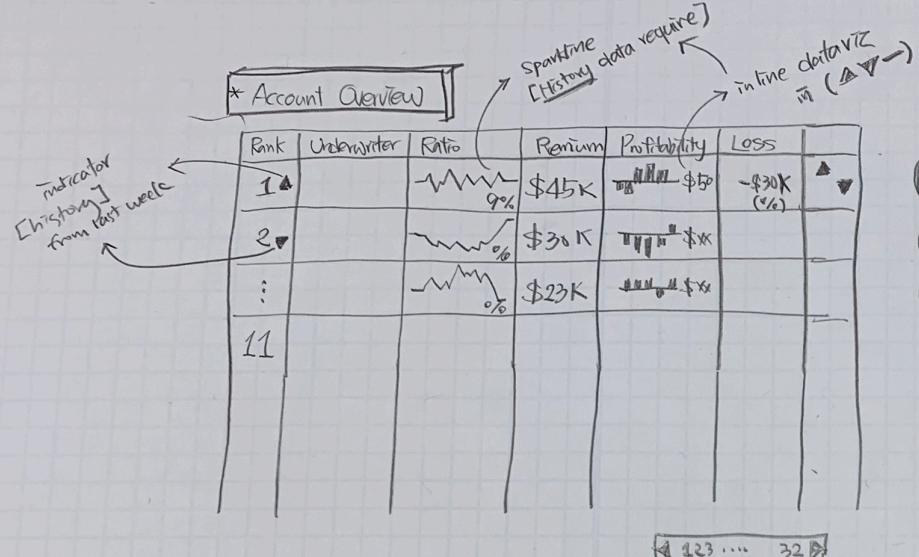


D3.

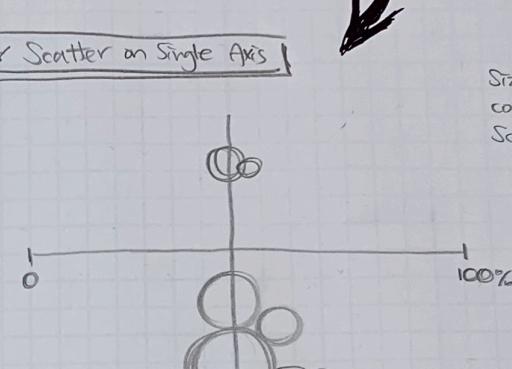
Account (n) → (1) Underwriter.

# UNCOVER OPPORTUNITIES

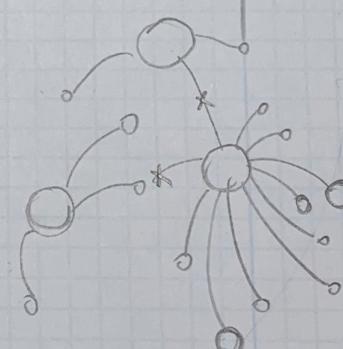
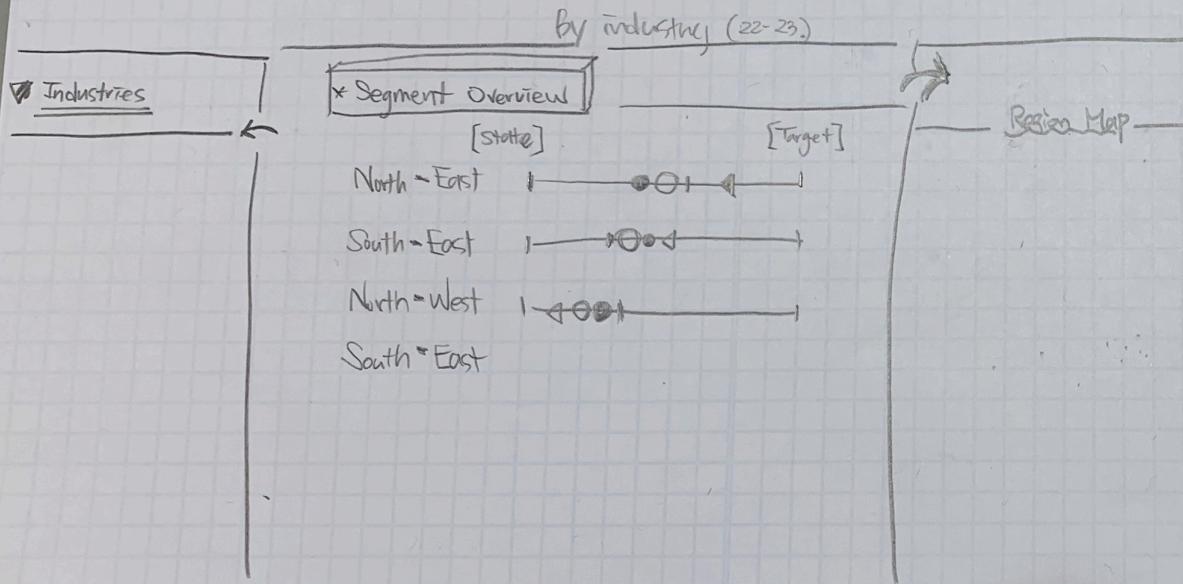
Kave



\* Scatter on Single Axis

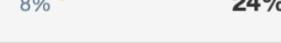
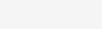
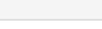
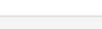


Size (Premium) • OOOO  
color [ ]  
Scale [0 - 100] {x or y axis}



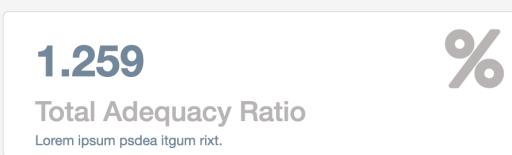
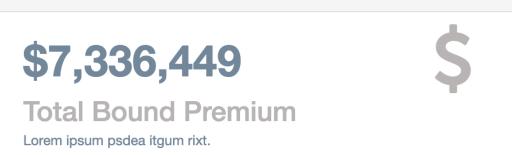
Title - Placeholder Johnson & Sons

^ 🔍 ✖

Rank	Name	Adequacy score	Premium t.d.	Profitability	Loss t.d.	Emergence
1	Tires inc.	21%  9%	\$38k	 -\$50k	-\$8k	#
2	Johnson & Sons	14%  12%	\$38k	 -\$50k	-\$8k	#
3	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
4	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
5	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
6	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
7	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
8	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
9	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
10	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
11	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#
12	Bingham Ltd.	8%  24%	\$27k	 -\$58k	-\$54k	#

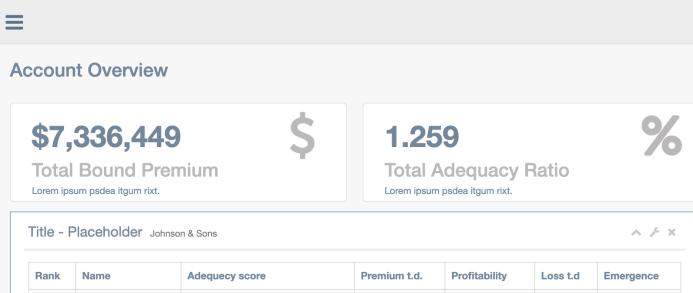
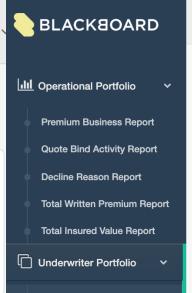
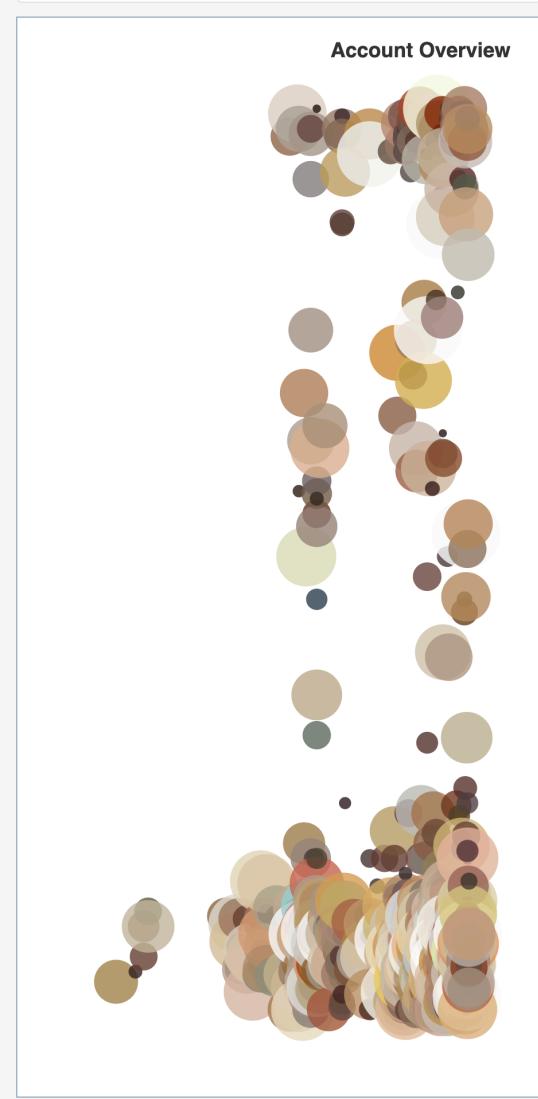
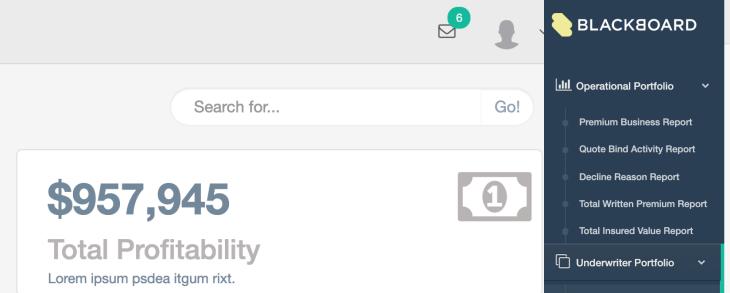


## Account Overview



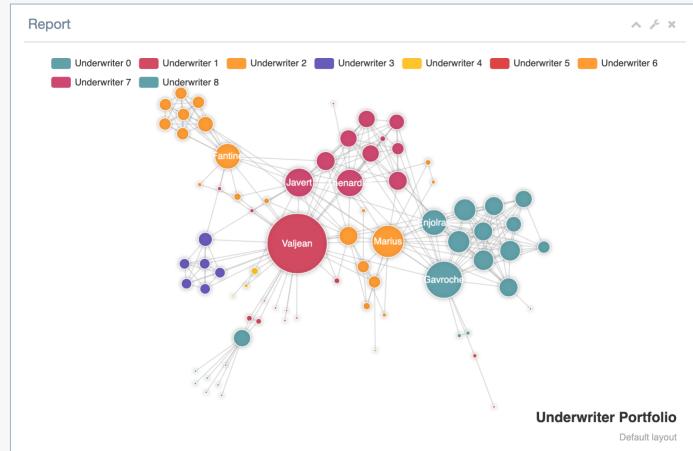
Title - Placeholder Johnson & Sons

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4	Bingham Ltd.	8%	\$27k		-\$54k	#
5	Bingham Ltd.	8%	\$27k		-\$54k	#
6	Bingham Ltd.	8%	\$27k		-\$54k	#
7	Bingham Ltd.	8%	\$27k		-\$54k	#
8	Bingham Ltd.	8%	\$27k		-\$54k	#
9	Bingham Ltd.	8%	\$27k		-\$54k	#
10	Bingham Ltd.	8%	\$27k		-\$54k	#
11	Bingham Ltd.	8%	\$27k		-\$54k	#
12	Bingham Ltd.	8%	\$27k		-\$54k	#
13	Bingham Ltd.	8%	\$27k		-\$54k	#
14	Bingham Ltd.	8%	\$27k		-\$54k	#
15	Bingham Ltd.	8%	\$27k		-\$54k	#
16	Bingham Ltd.	8%	\$27k		-\$54k	#
17	Bingham Ltd.	8%	\$27k		-\$54k	#
18	Bingham Ltd.	8%	\$27k		-\$54k	#

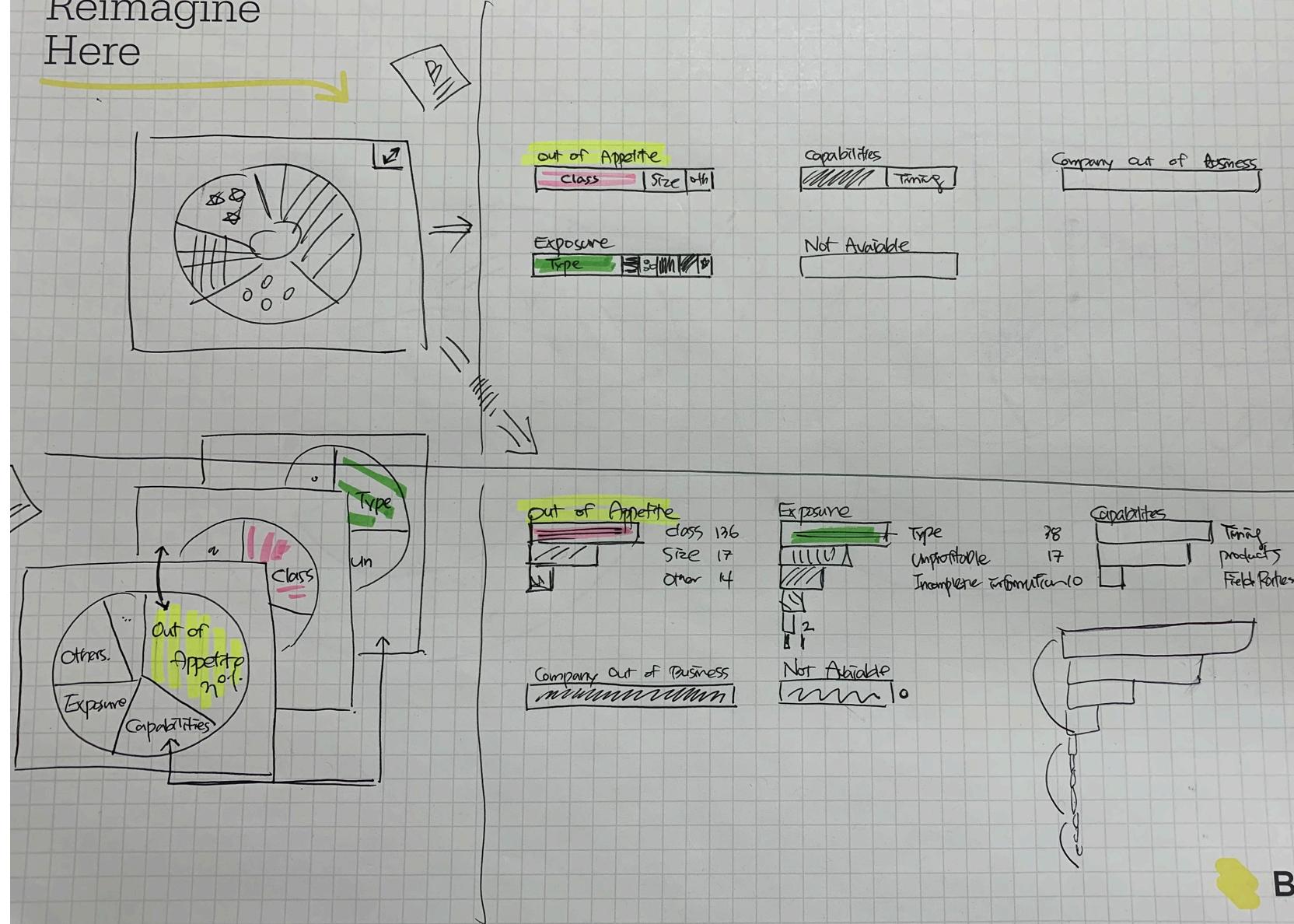


Title - Placeholder Johnson & Sons

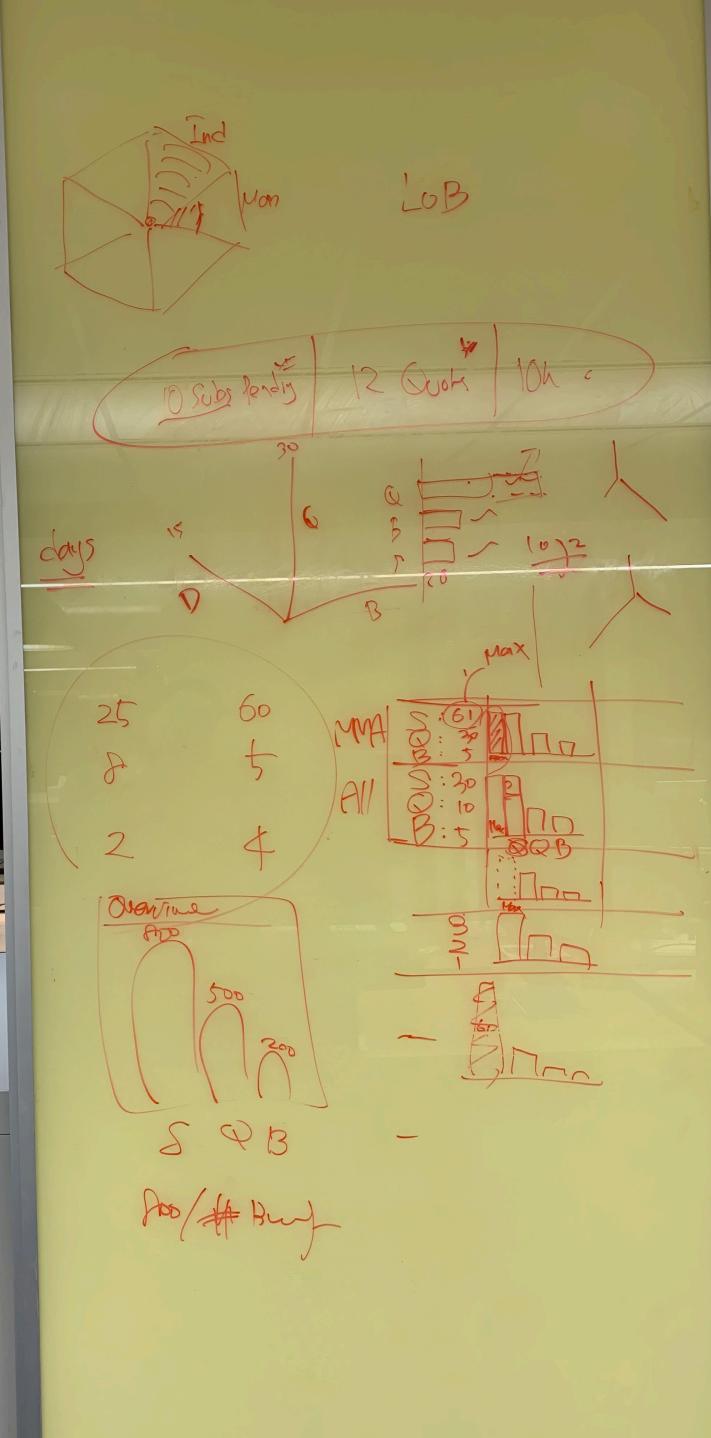
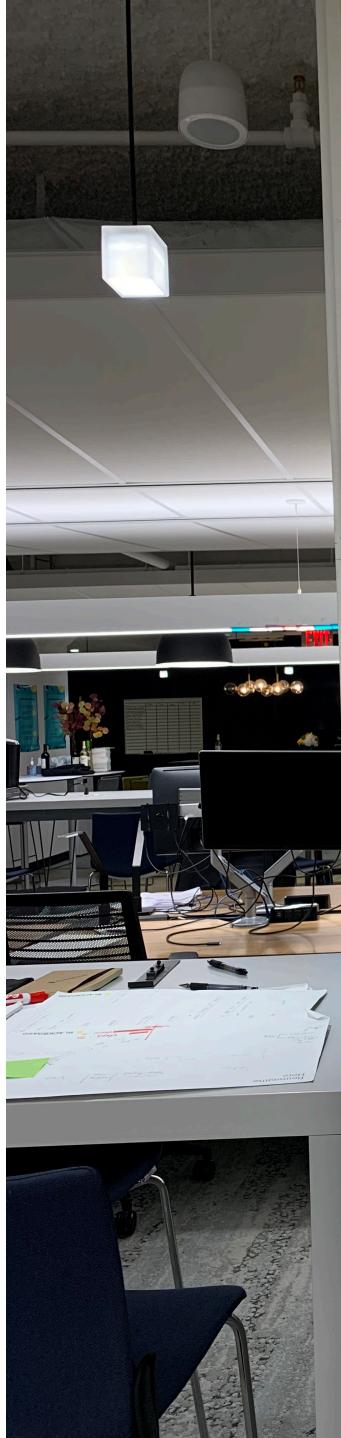
Rank	Name	Adequacy score	Premium t.d.	Profitability	Loss t.d.	Emergence
1	Tires inc.	21%	\$38k		-\$50k	-\$8k
2	Johnson & Sons	14%	\$38k		-\$50k	-\$8k
3	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
4	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
5	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
6	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
7	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
8	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
9	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
10	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
11	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
12	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
13	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
14	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
15	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
16	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
17	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k
18	Bingham Ltd.	8%	\$27k		-\$58k	-\$54k



# Reimagine Here



BLACKBOARD



Operational Portfolio

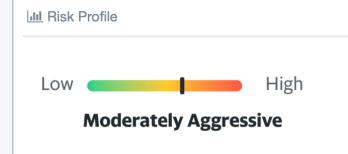
Broker Portfolio

Risk Portfolio

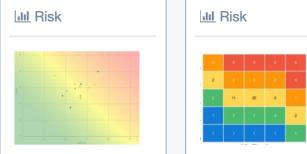
Overview

Claim Portfolio

## Risk Portfolio Overview



Kyeongan Kwon (Karl.Kwon@blackboardinsurance.com)

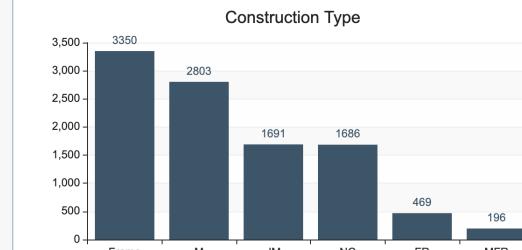
**Structures**

Total Structures

Avg. Sqft

Avg. TIV

\$

**Distribution of Structures by TIV**

TIV Category	Count
200k-300k	1325
300k-600k	702
600k-900k	602
900k-1.2M	453
1.2M-1.5M	463
1.5M-1.8M	502
1.8M-2.0M	396
2.0M+	357
Total	346

**Breakdown by Auto Make**

Auto Make	Percentage
Toyota	17%
Honda	11%
Ford	8%
Hyundai	6%
Subaru	6%
Chevrolet	6%
Nissan	6%
Jeep	6%
Mazda	6%
Lexus	4%
Acura	4%
Dodge	2%

**Breakdown by Line of Business**

Line of Business	Percentage
Property	69%
General Liability	20%
Umbrella	6%
Auto	5%

**Breakdown Share by Industry**

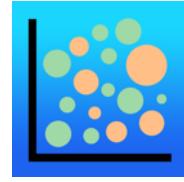
Industry	Share
Real Estate	76%
Manufacturing	17%
Wholesale	3%
Services	3%
Retail	1%

**Drivers**

Total Drivers

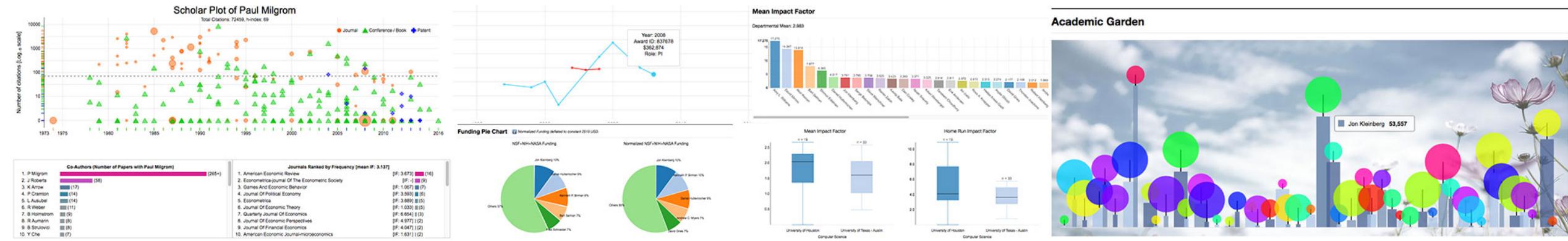
**Distribution of Driver Scores**

Driver Score	Count
0.00	5000
1.00	2000
2.00	1500
3.00	500
4.00	400

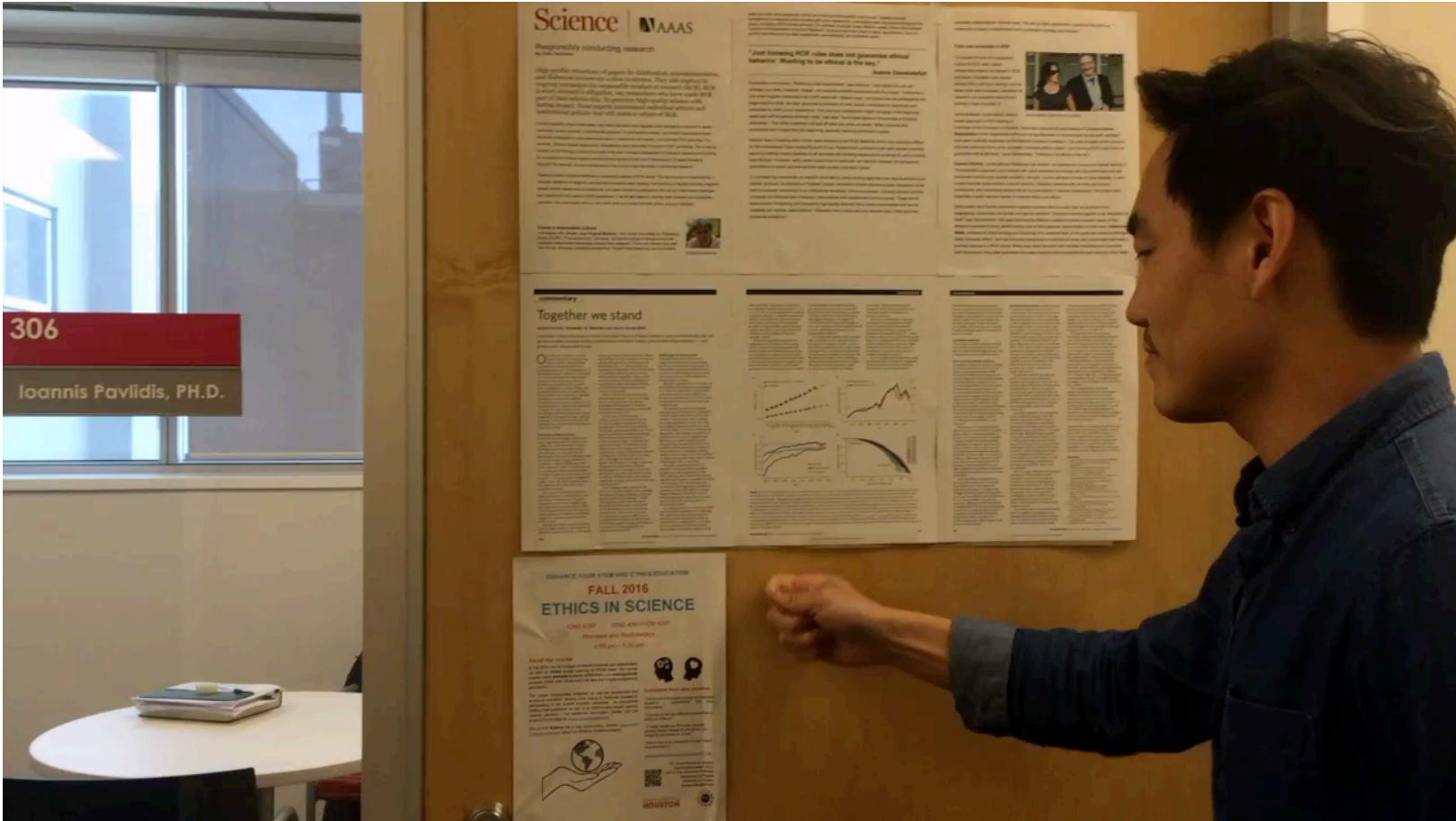


# Scholar Plot

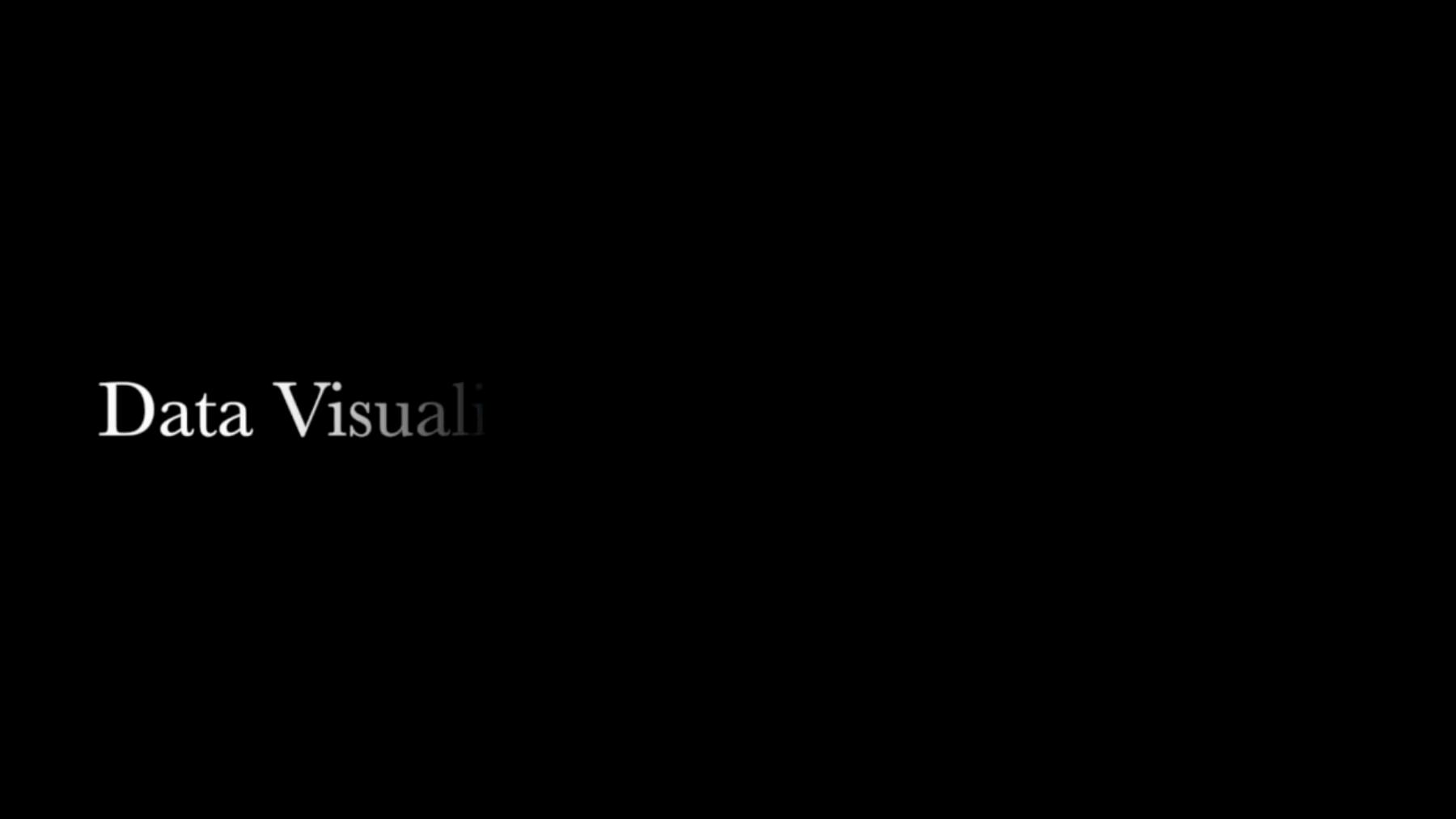
A Compact and Scalable Visualization Method for Academic Careers



# Problem: “Do you really believe it?”



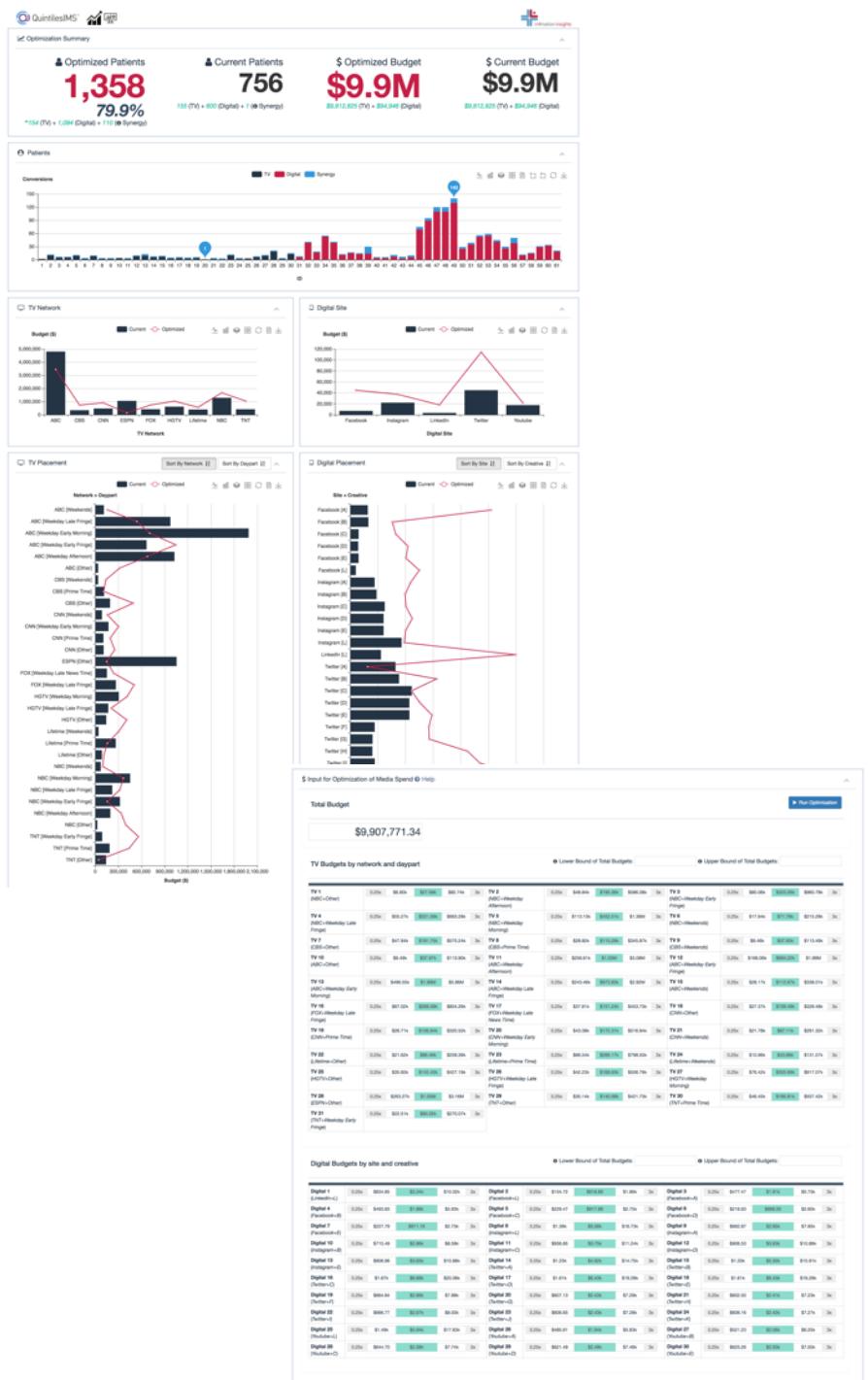
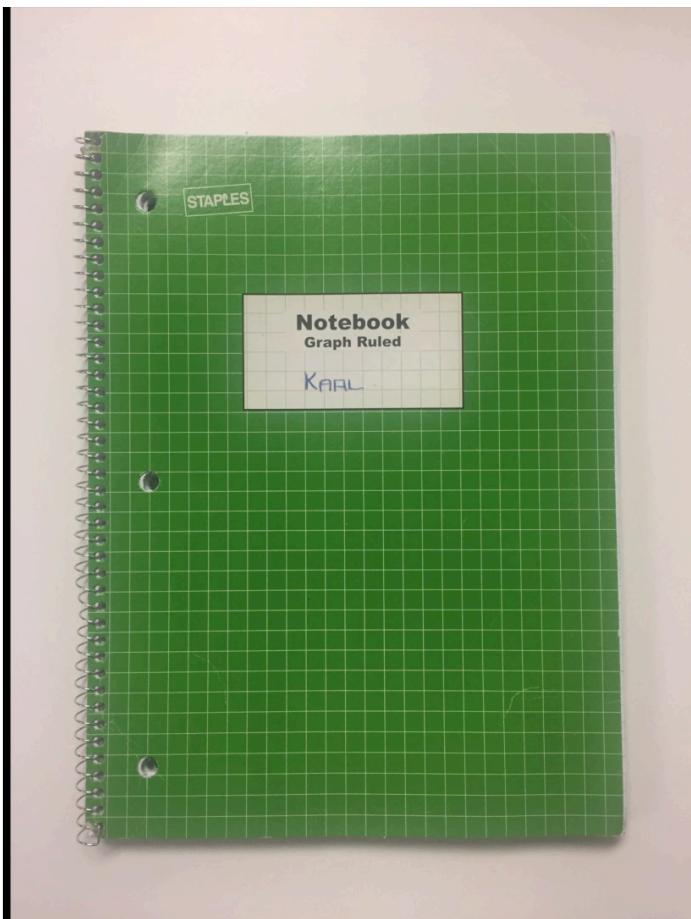
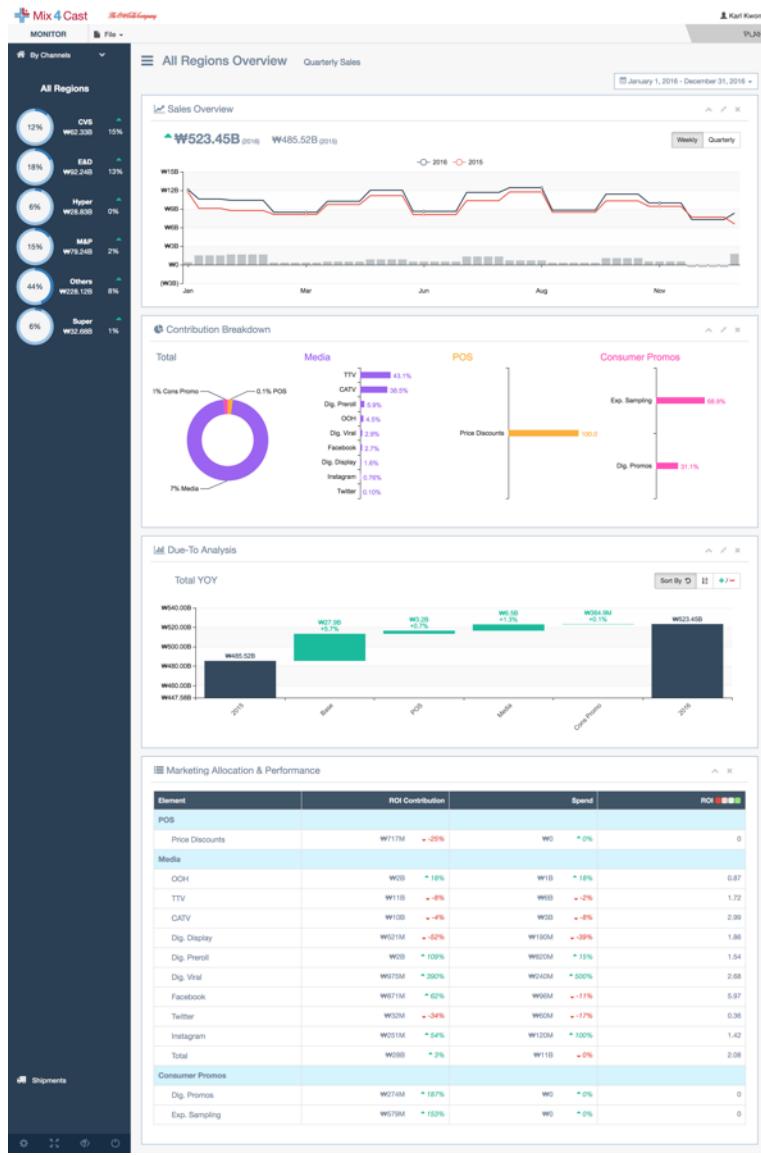
# Solution: ScholarPlot!



Data Visuali

# Final Comments

- Learning
- Team Player
- Turning ideas into a product



Thank you!

# Q&A