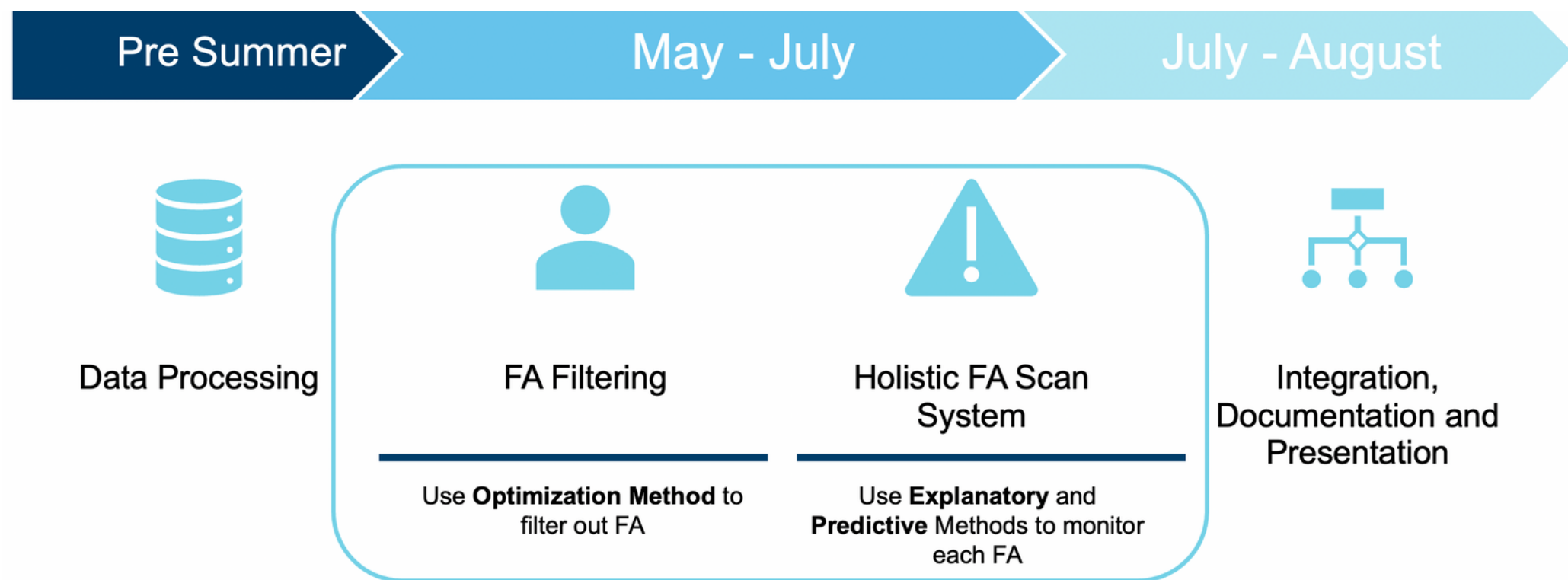


Holistic Financial Advisor Scan

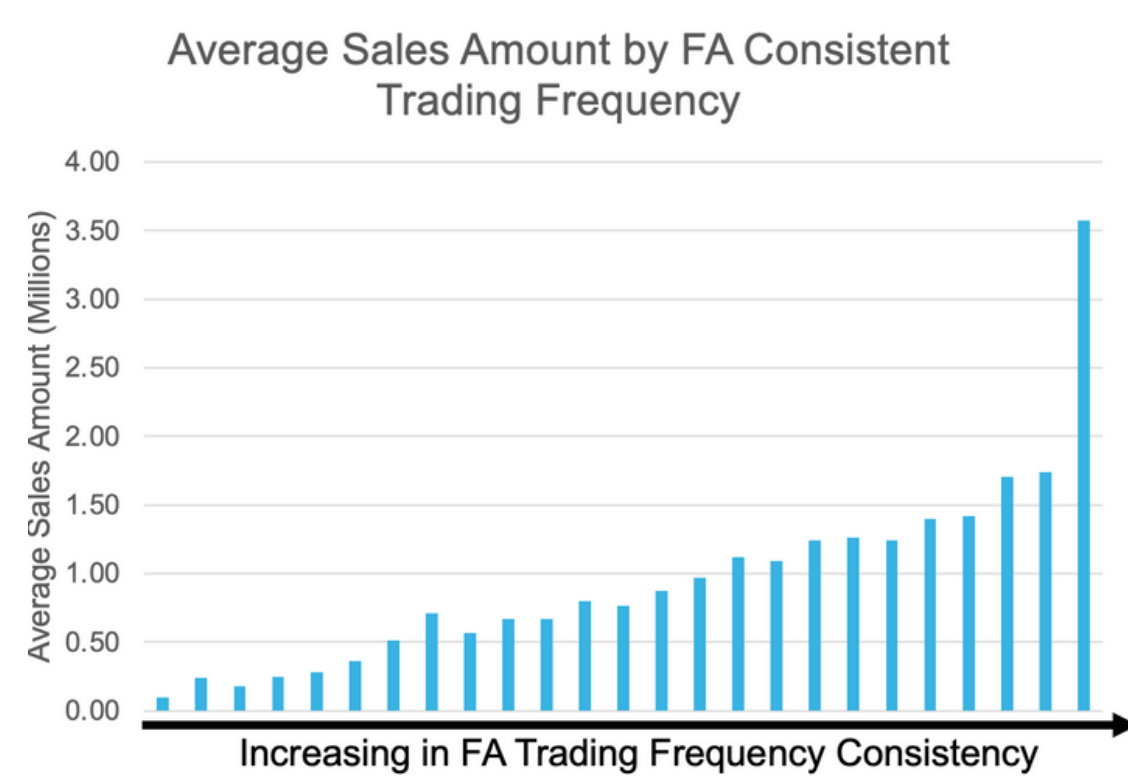
1. Introduction

- CTI has numerous core segment financial advisors (FA) who buy financial products from CTI every year
- CTI's objective is to maximize the purchases made by those FA
- CTI and MIT aim to create a holistic FA scan system that monitors the transaction activity of the FA and sends alarms when anomalies are detected
- Our approach is summarized as:

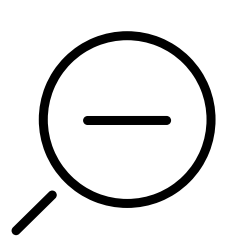


2. Data

- Each FA has a distinct trading pattern
- FA with consistent trading pattern has better performance
- Feasible to filter out FA with consistent trading pattern and business significance
- Feasible to build personalized Health Scan for each FA



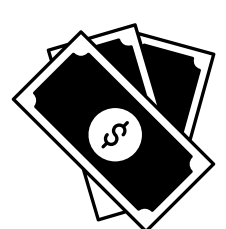
3. FA Filtering - Optimization



Objective: Selecting FA with the least abnormal transaction pattern

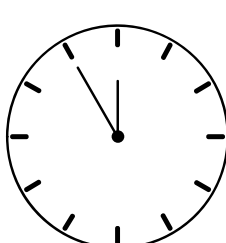
$$\min \sum_i z_i \cdot \frac{\sigma_i}{\mu_i}$$

Coefficients of Variation for Days Between Purchase



Business Constraints:

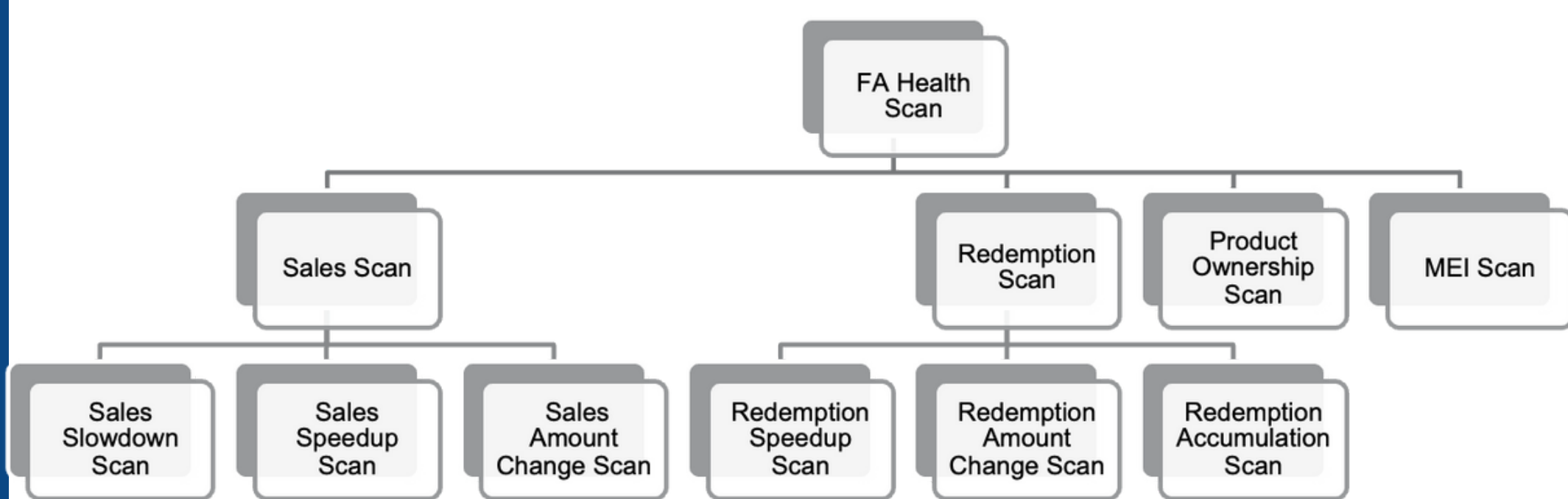
- Each FA must have certain amount of Sales over the past 2 years
- Total purchase amount by all selected FA should >80% of total sales



Technical Constraints:

- Each FA must have more than 12 months where they have made at least 1 sale over the past 2 years

4. FA Health Scan Overview



Methodology Overview:

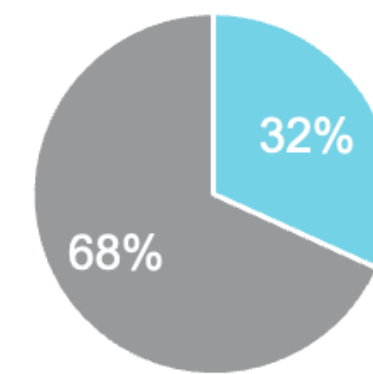
Scan System	Methodology	Detailed Method
Sales Amount Change Scan	Descriptive	Decile Analysis
Redemps. Amount Change Scan		Redemps./AUM percentage
Redemps. Accumulation Scan		Decile Analysis
Sales Speedup Scan	Predictive	Exponential Smoothing + Z-score
Sales Slowdown Scan		Exponential Smoothing + Z-score
Redemps. Speedup Scan		Exponential Smoothing + Z-score
New Product Scan	Causal	Statistical Inference + Regression Analysis

5. Model Results and Implications:

FA Filtering ---- Optimization

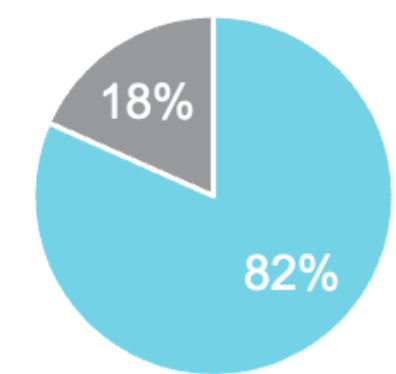
- Optimization model selected **32%** of advisors
- All 32% of advisors have adequate predictability
- Those predictable FA accounts for **82%** of the sales

Number of FA Distribution



■ Predictable FA ■ Non Predictable FA

FA Sales Amount Distribution



■ Predictable FA ■ Non Predictable FA

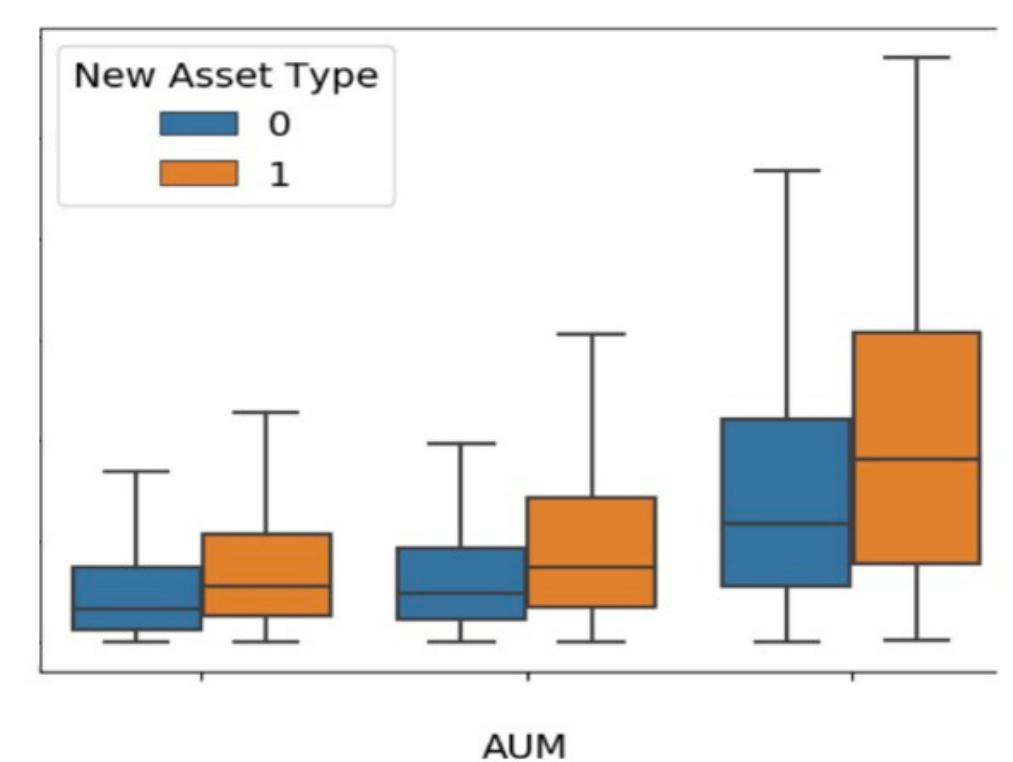
FA Health Scan ---- Predicting Next Transaction Date

- Moving average outperforms the baseline model by **68%**
- Exponential smoothing outperforms the Moving Average by **13%**

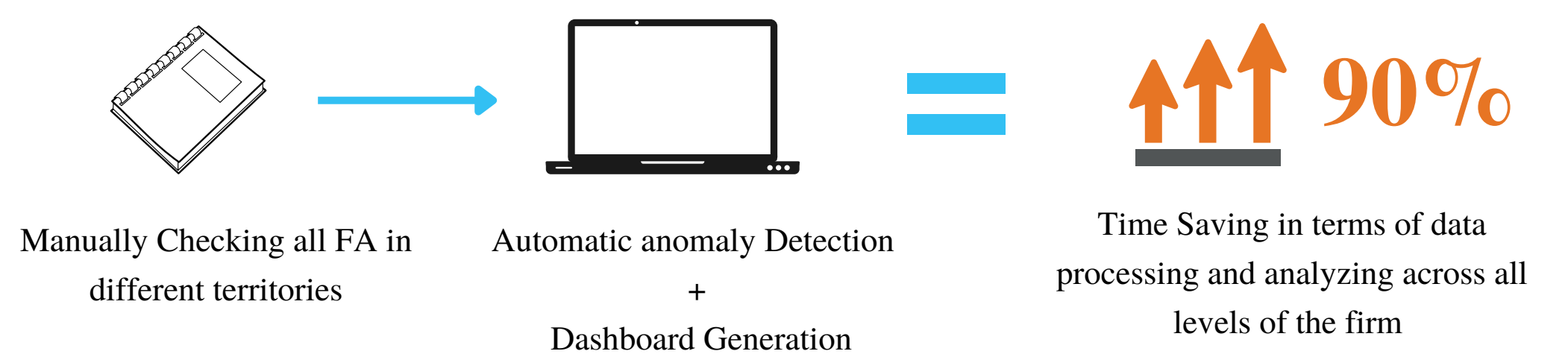
	MAE
Baseline Model	6.025
Moving Average	5.764
Exponential Smoothing	5.025

FA Health Scan ---- Causal Analysis

- Causal Analysis establishes that purchasing a **new product type** could lead to an **increasing purchase amount** in future
- Statistical Inference and regression analysis to provide personalized recommendations for the number of distinct asset types held given FA's AUM



Overall Business Implications



6. Use Cases

Use Case	Detail Description	FA Health																		
FA Health	For each predictable FA, show transactional health by incorporating all alerts together	<table border="1"> <thead> <tr> <th>Sales</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Sales Slowdown</td> <td>10 days since last trade, typically trades every 2 days</td> </tr> <tr> <td>Sales Amount Change</td> <td>Last purchase amount lower than 90% of historical purchase</td> </tr> <tr> <th>Redemptions</th> <td></td> </tr> <tr> <td>Redemption Amount Change</td> <td>Last Transaction Redeemed 25% of AUM</td> </tr> <tr> <th>MEI Scan</th> <td></td> </tr> <tr> <td>MEI Score Change</td> <td>MEI Score increased from Medium to Very High</td> </tr> </tbody> </table>	Sales	Description	Sales Slowdown	10 days since last trade, typically trades every 2 days	Sales Amount Change	Last purchase amount lower than 90% of historical purchase	Redemptions		Redemption Amount Change	Last Transaction Redeemed 25% of AUM	MEI Scan		MEI Score Change	MEI Score increased from Medium to Very High				
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Territory Health	For each territory, show scoreboard by aggregating FAs in the territory together	<table border="1"> <thead> <tr> <th>Territory</th> <th>% advisors with slowing sales</th> <th>% advisors with speeding up sales</th> <th>% advisors decreasing sales amount</th> <th>% advisors increasing redemption amount</th> <th>...</th> </tr> </thead> <tbody> <tr> <td>Terr_01</td> <td>10%</td> <td>30%</td> <td>50%</td> <td>30%</td> <td>...</td> </tr> <tr> <td>Terr_02</td> <td>10%</td> <td>5%</td> <td>5%</td> <td>5%</td> <td>...</td> </tr> </tbody> </table>	Territory	% advisors with slowing sales	% advisors with speeding up sales	% advisors decreasing sales amount	% advisors increasing redemption amount	...	Terr_01	10%	30%	50%	30%	...	Terr_02	10%	5%	5%	5%	...
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Terr_02	10%	5%	5%	5%	...															
Channel Health	For each channel, show overall business health by aggregating all territories and advisors together	<table border="1"> <thead> <tr> <th>Channel</th> <th>% advisors with slowing sales</th> <th>% advisors with speeding up sales</th> <th>% advisors decreasing sales amount</th> <th>% advisors increasing redemption amount</th> </tr> </thead> <tbody> <tr> <td>BD</td> <td>15%</td> <td>50%</td> <td>30%</td> <td>15%</td> </tr> <tr> <td>IAD</td> <td>10%</td> <td>40%</td> <td>10%</td> <td>5%</td> </tr> </tbody> </table>	Channel	% advisors with slowing sales	% advisors with speeding up sales	% advisors decreasing sales amount	% advisors increasing redemption amount	BD	15%	50%	30%	15%	IAD	10%	40%	10%	5%			
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Predictable Targeting	"Predictable" FAs can be placed on Digital Marketing Maintenance																			

7. Future Steps

- Feedback loop:** Establish a way to interact with the system and for the sales team to provide feedback when they intervene
- Pilot Project**
- Full Integration to Salesforce**