**Product Recommendation System Proposal**

# Issue

* **Customer Overload with Choices**: As securities and investment choices abound, most customers feel overwhelmed and find it difficult to determine which stocks, bonds, or portfolios are best for their financial goals and risk tolerance.
* **Missed Up-Selling Opportunities**: Without discovering or making suggestions about suitable or related products, it is difficult for investors to find other opportunities or other stocks that they might be interested in and then make investment decisions. This led to the failure to improve the total transaction value and market share of the company.
* **Low Customer Engagement Post-Transaction**: There are no follow-up recommendations after a transaction for the customer on related stocks, portfolios, or even news. This forbids continued engagement and might make repeat transactions or prolonged use of services less likely.
* **Limited Awareness of Alternative Investment Product Securities (Cross-Selling)**: Unless informed otherwise, clients may never know about other products or investment vehicles that might help them maximize their portfolios: margin accounts, derivatives, and high-yield portfolios could all help diversify what might otherwise be a stodgy portfolio.
* **Loss of Customer Loyalty and Satisfaction**: Without personalized recommendations, customers may feel that the company's services do not align with their personal preferences or are not helpful in their investment behavior, which can lead to dissatisfaction and affect customer loyalty.
* **Lack of Timely and Relevant Information**: Customers need timely and relevant news and updates related to stocks, bonds, and industries of interest. Without a system to evaluate and filter news that is tailored to each customer based on interest, it can lead to a lack of personalization and reduced time spent using the service platform.

# Solution

* We are writing to propose a comprehensive project to address these issues. This project is in line with our commitment to customer-centricity and seeking to enhance the customer experience, while supporting our clients to explore and find investment opportunities that suit their financial goals and risk tolerance.
* We will prepare the necessary data, build, and deploy a recommendation workflow on GCP using BigQuery, Vertex AI, and Dataflow to achieve high scalability and real-time performance. Recommendation results are categorized according to each context of use.
* We will classify customers by account status (for example: active customers, new customers, inactive customers...) to use model recommendation accordingly, while optimizing operating costs without still ensures accuracy.
* We will integrate four key recommendation features in the AlphaTrading app in the initial stages:
  + Cross-Sell Recommendations
  + Upsell Recommendations
  + Related Securities Recommendations
  + Personalized News Recommendation
* We will create a new section on the "Your Recommendations" page that shows the recommended stocks that appear in groups (e.g., "by industry", "by performance", "you might like"), a suitable bond portfolio, or other services that you have not explored yet.
* We will Implement a personalized notification system to publish news and recommendations relevant to the customer's interests and market events.
* We will monitor user engagement metrics (e.g., click-through rates, conversion rates, notification click rates...), track system performance and recommendation effectiveness and tune recommendation algorithms continuously.

# Business Objectives

* **Improved Customer Experience:**
  + Deliver intuitive, personalized investment guidance to support confident decision-making.
  + Simplify investment choices so that the user experience is seamless.
  + Boost platform engagement and interactivity through tailored features.
  + Timely and relevant investment information, in-line with the interests of users.
* **Higher Product Adoption:**
  + Increase awareness and usage of key products, PineBonds and PineFolio.
  + Promote portfolio diversification to support balanced investment strategies.
  + Cross-sell and upsell with targeted recommendations.
* **Data-Driven Personalization:**
  + Build advanced recommendation algorithms to provide precise investment suggestions.
  + Continuously adapt to individual investor behaviors, in near real-time personalization.
* **Business Growth:**
  + Increase average transaction values and grow market share with relevant recommendations.
  + Enhance customer retention through added-value services.
  + Generate new revenue streams with strategic, data-driven recommendations.
  + Differentiate the platform with features that are a competitive advantage.

# Proposed Feature

## **4.1. Cross-Selling Recommendations**

**Objective**: To encourage customers to explore additional services and investment products, such as bonds and curated portfolios, by providing relevant suggestions following key user action (placing order or withdraw fund).

### **Feature 4.1.1: Optimize Idle Cash with PineB Suggestion**

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| --- | --- |
| **Description** | Suggesting customers instead of withdrawing idle money to invest in safe products such as bonds  Notes: Follow-up email sent at day-end if idle cash remains |
| **Location** | * Withdraw Money Screen |
| **Trigger Event** | Initiated when the customer attempts to withdraw funds or succeeds in withdrawing funds |
| **Display Type** | * Pop-up * Email * Call-to-action hint button * Notification |
| **Messaging** | "Instead of withdrawing, optimize your idle cash with our PineB product to earn up to \_\_% per annum. Click here to explore." |

### **Feature 4.1.2: Pinefolio Recommendation**

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| --- | --- |
| **Description** | Suggesting customers to evaluate Pinefolio products to ensure performance and optimize diversification strategies  Notes: If stock is in multiple portfolios, recommend the higher performing one. Email sent after order completion. |
| **Location** | * Order Confirmation Screen |
| **Trigger Event** | After purchasing a stock in Pinefolio |
| **Display Type** | * Pop-up * Email * Call-to-action hint button * Notification |
| **Messaging** | "Our Pinefolio, which outperforms VN-Index by \_\_%, includes stock \_\_\_. Click here to learn more about Pinefolio and other portfolios." |

### **Feature 4.1.3: Margin Account Prompt**

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| --- | --- |
| **Description** | Suggesting customers register margin account |
| **Location** | * Order Confirmation Screen |
| **Trigger Event** | After purchasing a marginable stock without using margin account & Customer has not yet opened a margin account |
| **Display Type** | * Call-to-action hint button * Email |
| **Messaging** | "Join \_\_% of investors who use margin to maximize returns on stock \_\_\_. Learn more about our margin program here." |

### **Feature 4.1.4: Derivatives Account Prompt**

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| --- | --- |
| **Description** | Suggesting customers register derivative account |
| **Location** | * CW Order Screen * Margin Registration Screen |
| **Trigger Event** | After successful margin registration or CW purchase |
| **Display Type** | * Email |
| **Messaging** | "\_\_% of margin investors also trade derivatives for enhanced returns. Learn more about our derivatives program here." |

### **Feature 4.1.5: Dependence Securities Recommendations**

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| **Description** | Suggesting other investment products related to the stock such as CW or bonds. |
| **Location** | * Stock Details Screen * Research screen |
| **Trigger Event** | When the client searches for a stock or view at Stock Details Screen. |
| **Display Type** | * Call-to-action hint button * Scrolling Text (fixed at top) |
| **Messaging** | * "Check out related CWs" * "Check out related Bonds" |

## **4.2. Upselling Recommendations**

**Objective**: To present alternative stocks for consideration based on investment patterns or based on user profile and recent interactions (e.g., portfolio, action viewing assets or placing orders). These recommendations will appear following a customer’s stock purchase or attempt to purchase, to prompt exploration of similar opportunities.

* Identify alternative stocks like those recently purchased.
* Use language like “Investors who bought this stock also bought…” to encourage further investments.
* Display suggestions on the order confirmation screen, recommendation pages and within the app’s main feed.

### **Feature 4.2.1: Investment Pattern Recommendations**

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| **Description** | Recommend similar stocks based on investment patterns or similar user profile |
| **Location** | * Recommendation page * Reseach screen |
| **Trigger Event** | When the client searches for a stock or in research screen. |
| **Display Type** | * Call-to-action hint button * Recommendation page |
| **Messaging** | "Check out the Investors like you..." |

### **Feature 4.2.2: Advanced Stock Recommendation**

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| **Description** | Recommend stocks based on user profile and recent behaviors |
| **Location** | * Recommendation page * Reseach screen |
| **Trigger Event** | When the client searches for a stock or in research screen. |
| **Display Type** | * Call-to-action hint button * Recommendation page * Pop-up * Email * Notification |
| **Messaging** | "Check out list stocks that maybe you like..." |

## **4.3. Related Securities Suggestions**

**Objective**: To provide insight into related stocks or securities that may align with the customer's current investment focus when viewing stock details, encouraging further engagement with related options.

### **Feature 4.3.1: Performance-Based Recommendations**

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| **Description** | List stocks that meet several criteria for technical and fundamental analysis, could increase in price, high volume, high performance or have the same sector. |
| **Location** | * Research Screen |
| **Trigger Event** | Always |
| **Display Type** | * Screen tab |
| **Messaging** | * "Check the list of stock recommendations that are likely to perform well or be popular" * "Check the list of stock that are the same \_\_\_ sector" |

### **Feature 4.3.2: Relative-Based Recommendations**

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| --- | --- |
| **Description** | List of stocks with the highest relevance to a specific stock, influenced by factors such as stock profile, recent price fluctuations, and correlation that appear together in investors' portfolios  *Note: This recommendation answers the question "Which stocks that investor often bought together with?"* |
| **Location** | * Order screen * Stock Details Screen * Research screen |
| **Trigger Event** | When the client searches for a stock or view at Stock Details Screen. |
| **Display Type** | * Call-to-action hint button * Scrolling Text (fixed at top) |
| **Messaging** | * "Investors often bought together with... " |

## **4.4. Personalized News Recommendations**

**Objective**: To deliver timely, relevant news articles tailored to customers' investment interests, based on their transaction history, watchlist, and portfolio or recent read articles category.

### **Feature 4.4.1: Interest-Based News Suggestions**

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| **Description** | Suggest news that users may like based on their stock portfolio, watchlist, or recently read news |
| **Location** | * Price Board * News Section – “Recommendation for you” tab * Stock Details Screen * Research screen |
| **Trigger Event** | Upon login to Price Board |
| **Display Type** | * Scrolling Text * Notifications * “Recommendation for you” tab |
| **Messaging** | [news content summary] |

### **Feature 4.4.2: Feedback for News Relevance**

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| **Description** | Allow customers to provide feedback (e.g., like, dislike) to improve future news recommendations.  *Notes: Feedback option appears upon response submission.* |
| **Location** | * Price Board |
| **Trigger Event** | Upon login to Price Board |
| **Display Type** | * Like/Dislike Button |
| **Messaging** | "Thank you for your feedback! Your input helps us refine future recommendations." |

# Anticipated Resources & Action Steps

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Task** | **PIC** | **Estimated Completion** |
| 1 | Develop recommendation algorithm | DA | 15/11/2024 |
| 2 | Design recommendation UI/UX | DX | 10/12/2024 |
| 3 | Develop backend recommendation engine | DP | 20/12/2024 |
| 4 | Integrate with existing platforms (WTS, AlphaTrading, PineX) | DP, Core | 30/12/2024 |
| 5 | Testing and tracking event | DP, DA | 15/01/2025 |
| 6 | Launch recommendation system | DP, MKT | 05/02/2025 |

# Expected Outcomes

The new product recommendation system will be applied to make improved customer engagement for better cross-selling and upselling opportunities, thus improving customer experiences. What is expected from this implementation includes the following:

* **5% Increase in Cross-Product Sales**: Focused cross-sell and upsell activities to achieve a 5% incremental increase in the trading value of other product categories, which include bonds, derivatives, and curated investment portfolios.
* **10% Improvement in Customer Engagement**: The display of relevant and personalized recommendations on key screens is expected to improve engagement metrics—time spent on screens and click-throughs—by at least 10%.
* **Increased Customer Satisfaction Scores**: With the addition of intuitive investment suggestions and tailor-made news content, we expect customer satisfaction scores to improve even further.
* **Increased Efficiency in Investment Decision-Making**: By curating recommendations and insights, customers can make the most informed decision concerning their investments much faster and more in line with individual goals.

# Future Iterations

To further advance the recommendation system and adapt to evolving customer needs, we shall concentrate on the following focus areas for future development:

* **Model Refinement**: More data about customer preferences and interactions will continue to refine the recommendation system's underlying machine-learning algorithms, rendering predictions with ever-increasing accuracy and leading to ever-better recommendations.
* **Expanded Recommendation Criteria**: In the future, more criteria will be added, including real-time market conditions, global economic indicators, and news sentiment analysis, to further expand the range of factors that influence recommendations and make them even more holistic.
* **Enhanced Personalization Capabilities**: The DA team will continue to enhance personalization using customer feedback and engagement data, making the system more dynamic to individual preferences and providing a more intuitive and responsive user experience.