P2 Abstract Slide Narrative

Cryvesto 2.0: Machine Learning Sentiment Trading Bot(ML\_STB)

**S1: Opening Presentation-**

Hello Class, My name is Dana Hayes, Chief Product Officer, and would like to introduce Cryvesto 2.0.

**S2: Agenda-**

(talking pts outlined on slide)

**S3: Intro & Proposal-**

In this Project, team Cryvesto 2.0 constructs a Machine Learning Sentiment Trade Bot(ML\_STB) that utilizes market expressions news and social media sources that responds to ‘Bullish’ or ‘Bearish’ signals. We believe that positive and negative sentiment sets market trends. By encoding these sentiment trends as ‘Bullish’ or ‘Bearish’ signals we can trigger entry or exit points to trade targeted securities or assets.

Have you heard of popular trading industry phrases, such as the "The trend is your friend." or "Buy on the rumor, sell on the news?" These phrases can't be ignored as they are among many other expressions like “Diamond hands” being encapsulated on the internet in popular social media sites like "Twitter” and, "Reddit’s Wall Street Bets". Today with newer sites focused on block chain and cryptocurrency, such as ‘Bitcointalks’, ‘Mamby’, and e-mag’s ‘Medium’ the sentiment is proliferating. (considered the best source for crypto investor education according to CriticalHit.net).

**S4: Executive Summary-**

With the growth of high frequency trading(HFT) rising to 80% of market trading today, it gives cause to seek a different approach from automated ML algorithm modeling based on traditional technical indicator inputs that trigger entry and exit points. We aim to capture investor sentiment to get an early advantage to place trades before traditional HFT trade signals.

As such, our *hypothesis* is when the 'Bullish' sentiment is higher than 'Bearish' sentiment the asset price will likely rise, and when 'Bearish' sentiment is higher than 'Bullish' sentiment the opposite will be true with declining prices. Our research of sentiment comparisons highlights the influential market forces of ‘fear’ and ‘greed’ as leading indicators for trade points on specified assets.

We specifically program our system on Sentiment from different media sources like business news, and internet social media sites to adapt and utilize newly sourced data. We're planning to improve traditional algorithmic trading systems by adding 'Sentiment' as leading indicators to get a competitive advantage in the market. We identify existing buy, sell or hold trading signals with key words and phrases that express 'Bullish' or 'Bearish' sentiment emanating from 'fear and 'greed' language. We then enhance these logic encoded signals into a sentiment indicator in order to identify with machine learning algorithms that can adapt this new data.

We will then compare the ML\_STB with traditional technical indicators using SMAs for DMAC signals as inputs for automated ML algorithms.

A common mantra in the investment industry is that past performance doesn’t guarantee future results.

**S5: Team Cryvesto-**

Now to introduce the Cryvesto Team…

**S6: Data Analysis-**

Now I leave you with our Chief R & D Officer, Anna Joltaya… We specifically source our data from business news & internet social media to utilize it for our program. API’s considered and actually used for our research and development are TextBlob, NLTK, Augmento, Twitter and NewsAPI.

**S7: Augmento’s “Sentiment Polarity Indicator”-**

As illustrated, Augmento’s AI quantifies more than 100 sentiment relating to topics of discussion with key words and phrases about crypto currencies on social media- Twitter, Bitcointalk, and Reddit. In observation some sentiments are visualized as opposites.

**S8: Sentiments Tracked from Augmento**

Here we narrowed down Augmento’s 100 sentiments to a list of 15 from the Augmento API for our data base to serve our purpose for research in building our program.

**S9: The Models**

Good evening folks. After receiving the crypto sentiment data drawn from AUGMENTO we created the FEATURE and TARGET sets for our models.

The FEATURE set included 15 sentiments you just saw, drawn from Twitter and Reddit. The Target was kept at the simple strategy of **change in DAILY\_RETURNS**,

We tested the data for BITCOIN and ETHEREUM sentiments on FOUR Models- Logistic Regression, SVC, Adaboost and Random Forest with the results shown in the next slide.

**S10: Algo Model Classification Reports**

This is a sample of numerous tests we ran on our models. As you can see the performance of Adaboost is at around 60% accuracy with similar recall values for both BUY AND SELL indicators. Adaboost outperformed all the models tested even in CUMULATIVE RETURNS.

**S11 & 12: Actual Returns vs Strategy Returns**

With Adaboost model The Cumulative Returns have been consistently better than Actual Returns. As you can see across the four models for Bitcoin and Ethereum from both twitter and reddit data feeds. Next slide and then NEXT Slide.

**S13: WSJ Sentiments wSMA Chart**

With Adaboost model The Cumulative Returns have been consistently better than Actual Returns as you can see across the four models for Bitcoin and Ethereum from both twitter as well as reddit data feeds. NEXT Slide Please.

**S14: Cryvesto Approach to Achieve Goals**

During the research and development we encountered many issues relating to different Signal strategies. Found out that the best strategy was the simplest one we chose.

We had to conduct over 50 runs of tests using different model configurations, including Neural networks which gave a lot issues with loss functions. Finally settled on regular classification models.

With so many reports and charts, it was becoming very cumbersome to track so we developed Pandas functions to save and track reports and charts.

**We folded the results of this research in our Cryvesto App, which Scott will speak more about.. Handing over to Scott please**..

**S15: Cryvesto 2.0 Sentiment Meter**

The Machine Learning Sentiment Meter (ML-STB) is embedded in our trading application for crypto currency account holders. This gives the latest signal indicating bullish or bearish sentiment along with their current account information prior to entering a trade. This assist them with the latest market conditions of the asset or security of interest prior to entering a trade.

**S16: Cryvesto 2.0 ML-STB GUI w/Streamlit**

A Machine Learning to Trade with Captured Sentiments! Is the Cryvesto 2.0 Machine Learning Sentiment Trade Bot(ML\_STB) interfaced with Streamlit application. The Streamlit application framework enables our python code to be interactive with the user on a local computer. When Streamlit is activated, with `run my\_app.py` a web server from the Streamlit cloud runs the app on a local computer. This allows the user to get account information and place trades over a secure network hosted and managed within the Google Cloud Platform.

**S17: Summary-**

(Rensley Ramos speaks)

**S18: Future Direction-**

(Talking points are on the screen)

**S19: Closing-**

“Thank You for listening”; and now we’re available for any questions

Summary

Benefits:

* Trades are executed at the best possible prices by getting ahead of trends before they occur on the market.
* Trades are timed correctly and instantly to avoid significant price changes before volatility increases in the marketplace for a targeted security.
* Trade order placement is instant and accurate reducing risk of manual errors when placing trades.
* Sentiment based Algo-trading can be back-tested using available historical and real-time datato see if it is a viable strategy.
* Reduces the possibility of mistakes by human traders based on emotional and psychological factors, during a emotional and volatile market climate.

In the future we will research neural networks(NN) to evaluate price data and reveal opportunities for making trade decisions based on the analysis. The networks(NN) can distinguish subtle nonlinear interdependencies and patterns other methods of [technical analysis](https://www.investopedia.com/terms/t/technicalanalysis.asp) cannot.

According to independent research, the accuracy of neural networks in making price predictions for stocks differs. Some models predict the correct stock prices 50 to 60 percent of the time, while others are accurate in 70 percent of all instances. Some have posited that a 10 percent improvement in efficiency is all an investor can ask for from a neural network. (Springer Link. "[An Innovative Neural Network Approach for Stock Market Prediction](https://link.springer.com/article/10.1007/s11227-017-2228-y)." Accessed Sept. 23, 2020.)

Ashoks Slide Bullets:

<https://files.slack.com/files-pri/T0346E0RFPH-F03N4FRV16K/image.png>

THE MODELS SLIDE  
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ALGO MODEL CLASSIFICATION RESULTS SLIDE  
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ACTUAL VS CUMULATIVE RETURNS SLIDE – 2 SLIDES  
-======  
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than Actual Returns as you can see across the four models for Bitcoin and   
Ethereum from both twitter as well as reddit data feeds. Next slide and then   
NEXT Slide  
SMA chart SLIDE  
This is an interesting chart with our PROPRIETARY Simple Moving Average   
of Sentiments Strategy with short window of 7 and long window of 100   
days. It also showed over 50% accuracy in predicting BUY and SELL signals   
for CRYPTOs. The only difference here is that we used WSJ data and not   
necessarily any CRYPTO data. This is indicating that the general news   
sentiment also has a tendency to track the crypto prices. Still more research   
needed here.  
+++++  
Approach/Problems Slide  
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to different Signal strategies. Found out that the best strategy was the   
simplest one we chose.  
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including Neural networks which gave a lot issues with loss functions. Finally   
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Anna Joltaya:

We pulled our data for Cryvesto trading app from various sources ---- like Yahoo Finance for crypto prices and WSJ, Newsapi and Augmento AI for our sentiment data. To analyze WSJ and Newsapi we used NLTK Vader text analyzer.

Our other sentiment source, Augmento AI, provided data for Twitter, Reddit and Bitcointalk. This source evaluated the three social media sites for up to 93 various topics. Out of those 93, we selected 15 that we believed were the closest to the topics sentiments that we were looking for. (& they were literally called sentiments of Augmento.

The 15 topics included (FOMO, Uncertain, Bearish, Angry, Bullish, Happy).  
Our only issue with Augmento AI is the data that we get for free (the historical) is behind 30 days. To get the current data we would need to get to sign up with a subscription. Why should we stick with Augmento AI with a delay?

They provided the analysis of the social medias that without having the need for us to do it.

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