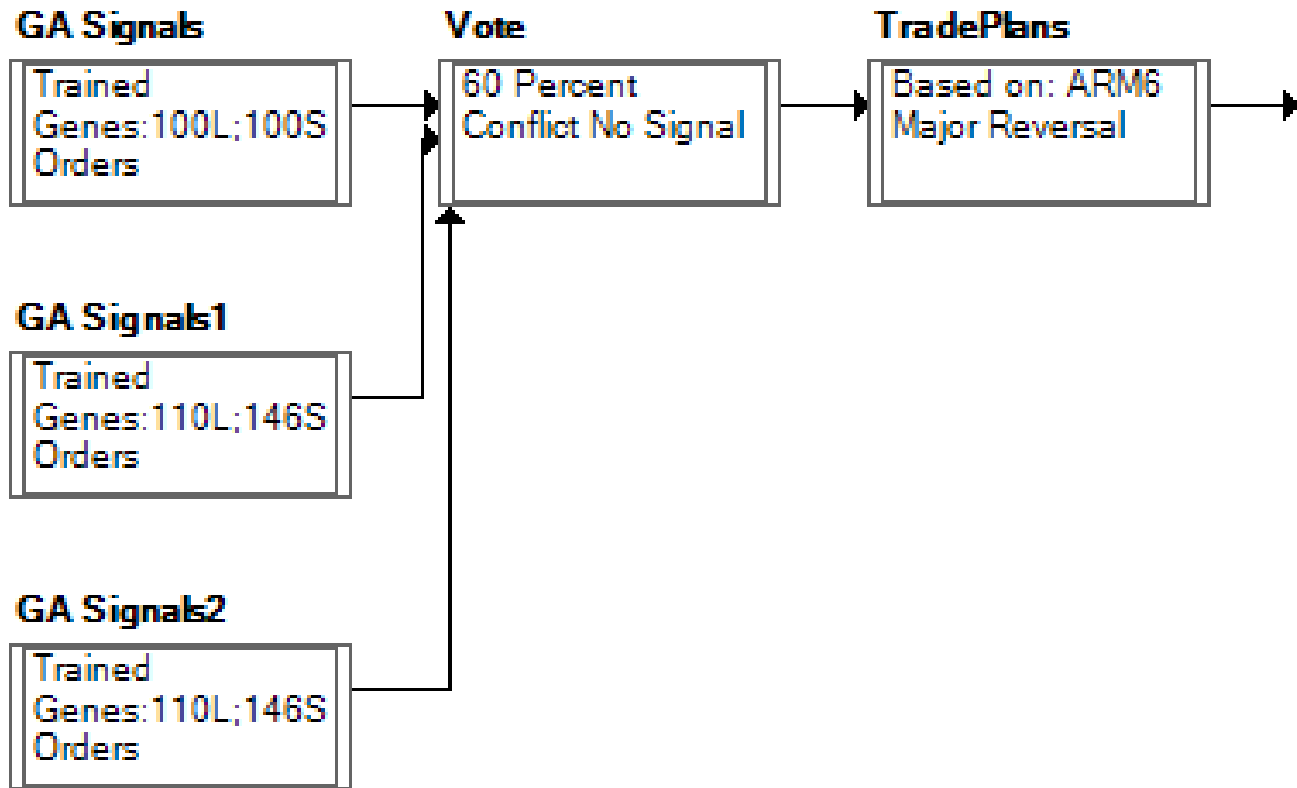


TRADEnosis

Harnessing the Power of Modern AI
to Trade the Stock Market

Nirvana A.I.



#	Gene	Symbol
⊕ 2	RelMom(31,"SPY") > 0	
⊕ 3	RelMom(21,"SPY") > 0	
⊕ 4	RelMom(14,"SPY") > 0	
⊕ 5	TRII(60,15) > 80	
⊕ 6	TRII(60,7) > 80	
⊕ 7	EMA(21)>EMA(55)	
⊕ 8	EMA(14)>EMA(21)	
⊕ 9	EMA(21)>EMA(31)	
⊕ 10	EMA(31)>EMA(55)	
⊕ 11	C > 20	\$VIX
⊕ 12	C > 25	\$VIX
⊕ 15	C < 0	\$VIX
⊕ 16	C[1] < O[1]	\$VIX
⊕ 17	C[2] < O[2]	\$VIX
⊕ 18	C[3] < O[3]	
⊕ 20	V[2] < V[3]	
⊕ 21	RSI(6) < 30	
⊕ 22	RSI(14) < 30	
⊕ 24	RSI(6) > RSI(6)[3]	

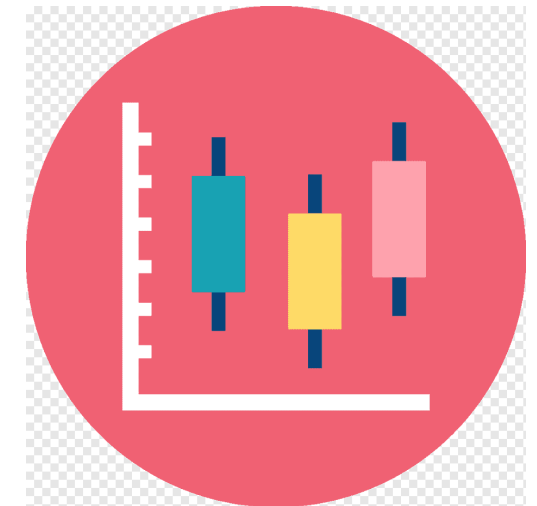
Technical Inputs

Great Implementations going back to 1998 (NN) and 2000 (GA), and the DL Block (based on the original NN) in 2022.

A New ERA in A.I. Technology

With the advent of “**The Cloud**”, Modern A.I. has dramatically advanced in the last 10 years.

The availability of Econometric, Corporate, and Global Financial Data in the Cloud makes it easier for the A.I. to generate great predictions!



The Birth of TRADEnosis

Steve Mayo bought OmniTrader in 1996, and attributes his early retirement to the software.

I have been meeting with Steve and others in a “Mastermind” group every week since 2014.

In 2 years since his retirement, Steve created a Cloud A.I. Trading System called *TRADEnosis*.

His video explains what he built and how we are collaborating...



TRADEnosis

AI-Powered Stock Prognosis

TRADEnosis

Harnessing the Power of Modern AI
to Trade the Stock Market

Steven W. Mayo, PharmD, CCRA, PMP



Background

- Retired CEO of Emissary Int'l, a clinical research company
- Neurology faculty member at Johns Hopkins, 15 publications
- Project manager, data scientist, quality assurance, consulting.

Accomplishments

- New drugs for diabetes, CHF, stroke, MS, migraine, Covid
- New devices for cardiac arrest, CHF, stroke, orthopedics
- Clients: Johns Hopkins/NIH, Pfizer, Merck, P&G, 100's of smaller.

Nirvana Experience

- Nirvana Customer since 1996
- Customer Advisory Panel for 10 years
- Software Developer and AI Advocate

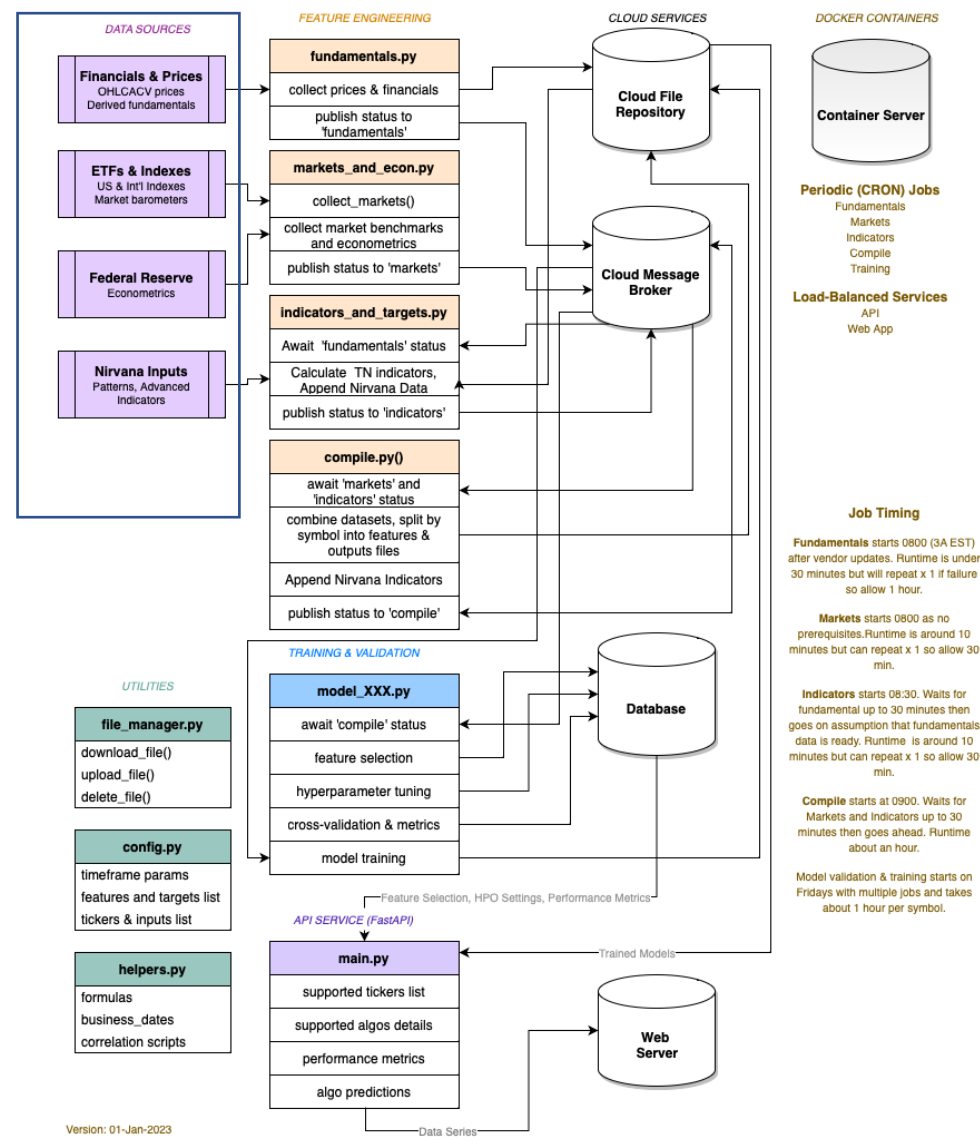


TRADEnosis

AI-Powered Stock Prognosis

System Design Summary:

- Cloud-based microservices architecture
- Multiple source inputs (“features”)
- Can run multiple AI algorithms
- Can process thousands of tickers

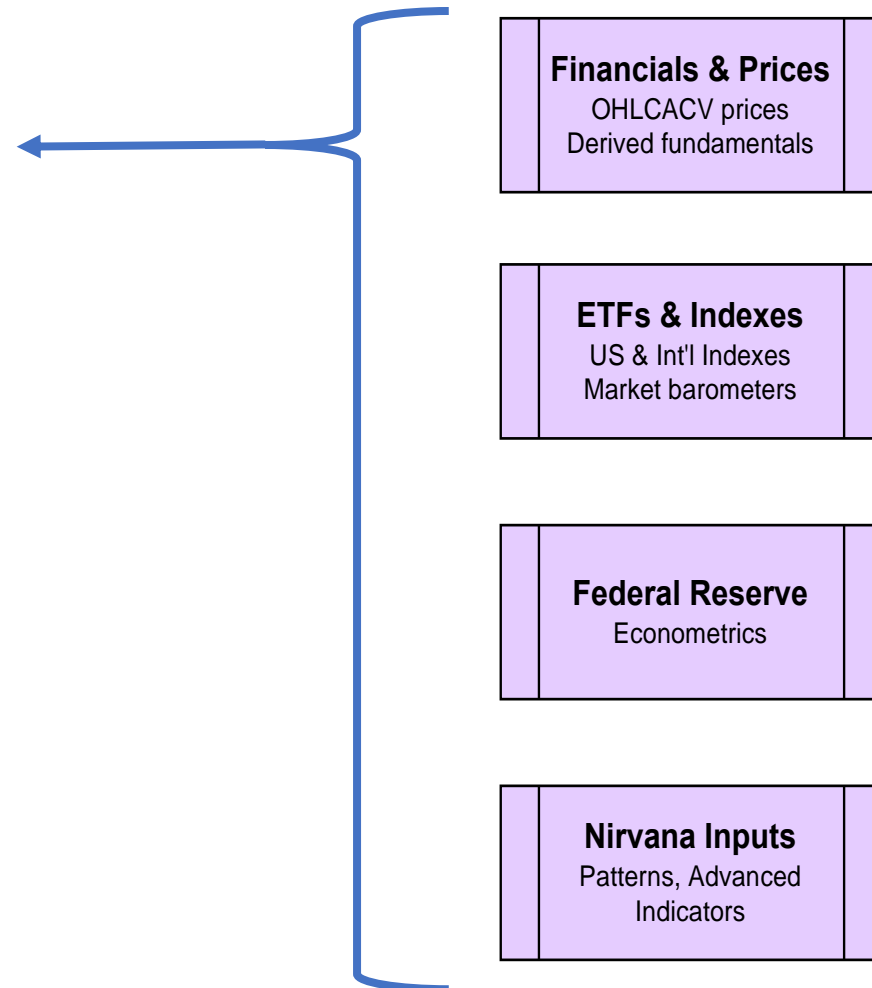


Financial, Economic & Technical Features



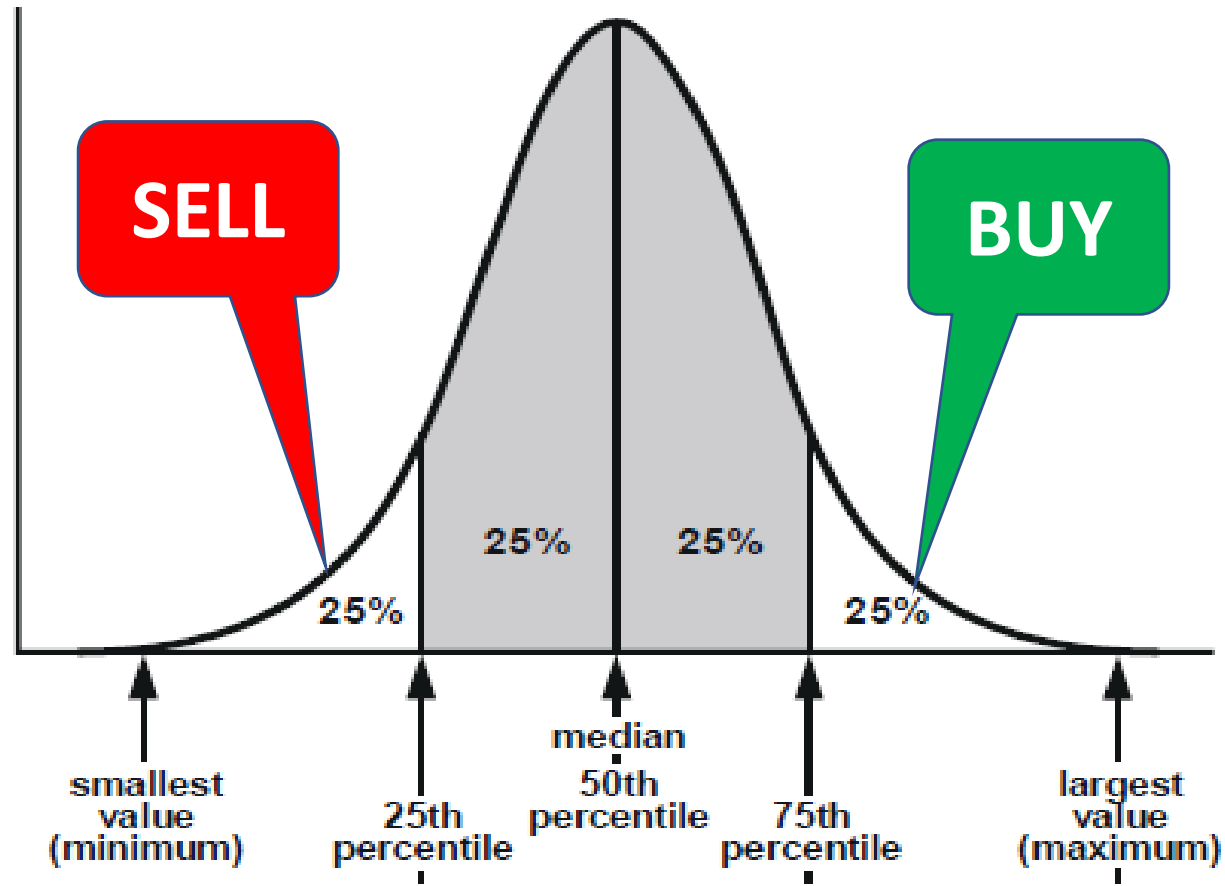
Years of Historical Data:

Financials (Earnings, FCF, PE, etc.)
Analyst Up/Downgrades, Surprises
Global Stock Markets
Commodity Prices
Econometrics (CPI, Fed Funds Rate)
Currency & Crypto
Industry Metrics
Sentiment & Company News
Technical Analytics



The Q-Score Target

```
Category.delete_all;
Shoulda.configure do |config|
  config.integrate_with_test_framework
end
```



The Initial 15 Stocks

A set of 15 stocks were chosen for their popularity and as key representatives of various industry groups.

Symbol	Name	IndSubGrp
ADM	Archer-Daniels-Midland Company	AGRICULTURAL OPERATIONS
TSLA	Tesla, Inc.	AUTO MFRS-DOMESTIC
F	Ford Motor Company	AUTO MFRS-DOMESTIC
AAPL	Apple Inc.	COMPUTER-MINI
ADBE	Adobe Inc.	COMPUTER-SOFTWARE
AMZN	Amazon.com, Inc.	INTERNET COMMERCE
PFE	Pfizer, Inc.	LARGE CAP PHARMA
CAT	Caterpillar, Inc.	MACHINERY-CONST/MINING
AMGN	Amgen Inc.	MEDICAL-BIOMED/GENETICS
UNH	UnitedHealth Group Incorporated	MEDICAL-HLTH MAINT ORG
COST	Costco Wholesale Corporation	RETAIL-DISCOUNT & VARIETY
MCD	McDonald's Corporation	RETAIL-FOOD & RESTAURANTS
AAL	American Airlines Group, Inc.	TRANSPORTATION-AIRLINE
DUK	Duke Energy Corporation	UTILITY-ELECTRIC POWER
T	AT&T Inc.	WIRELESS NATIONAL

Raw Signal Performance

```
Category.delete_all;
Shoulda::Matchers.configure do |config|
  config.integrate do |test|
    with.test_framework :rails
  end
end
```

Precision & Recall

Profit/Trade

XS Return

Days_Ahead: 10

Stock	Prec-Q1	Prec-Q4	Recall-Q1	Recall_Q4	PPT	xsRtn	NT	HR
AAL	81.9%	81.5%	89.4%	89.4%	5.90% (8.40%)	-0.1	1727	80.4%
AAPL	72.8%	71.2%	77.8%	77.8%	1.28% (5.46%)	0.6	1469	56.6%
ADBE	78.4%	79.1%	82.4%	82.4%	2.85% (5.08%)	1.1	1580	72.4%
ADM	80.1%	80.8%	87.7%	87.7%	2.40% (4.46%)	0.2	1658	71.6%
AMGN	82.3%	81.9%	87.5%	87.5%	2.88% (3.64%)	0.4	1691	78.7%
AMZN	79.7%	76.3%	82.9%	82.9%	1.61% (6.22%)	0.1	1350	59.2%
CAT	80.3%	77.5%	75.7%	75.7%	2.03% (5.88%)	1.2	1428	63.0%
COST	74.5%	76.4%	76.3%	76.3%	1.53% (4.08%)	1.6	1492	66.4%
DUK	75.5%	77.5%	83.1%	83.1%	1.75% (3.49%)	0.1	1511	69.6%
F	82.8%	81.7%	91.1%	91.1%	3.93% (6.35%)	0.0	1703	76.6%
MCD	76.3%	75.8%	79.9%	79.9%	1.05% (3.87%)	0.9	1415	59.5%
PFE	77.9%	79.6%	83.9%	83.9%	2.62% (3.97%)	0.1	1600	76.1%
TSLA	80.3%	79.6%	88.2%	88.2%	7.44% (9.78%)	0.6	1766	80.9%
UNH	74.0%	74.0%	79.0%	79.0%	1.52% (4.56%)	1.9	1502	62.6%
WMT	76.1%	77.7%	81.1%	81.1%	1.57% (3.74%)	0.3	1497	67.2%

Average PPT: 2.69%, Winsorized: 2.64% (sans top/bottom 5%)

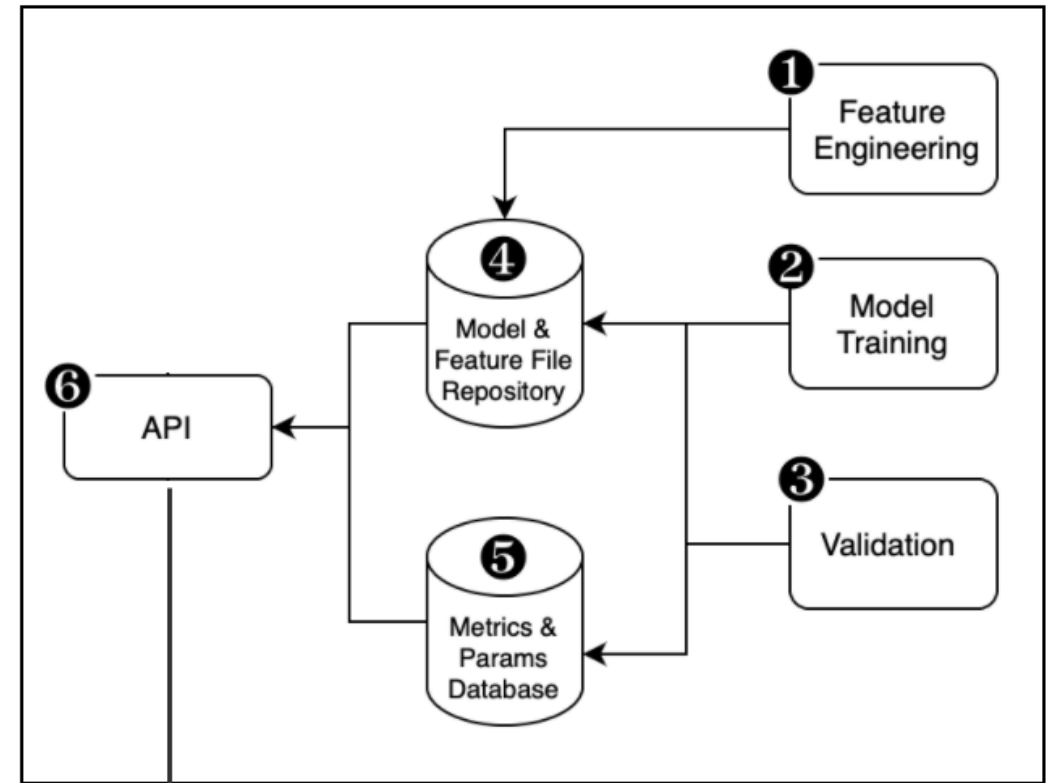
Avg Excess Return: 0.60% (GT/LT PPT vs every potential 10p trade)

Average #Trades: 1,559

All Metrics on "Out of Sample" Trades

TRADEnosis + OmniTrader Integration

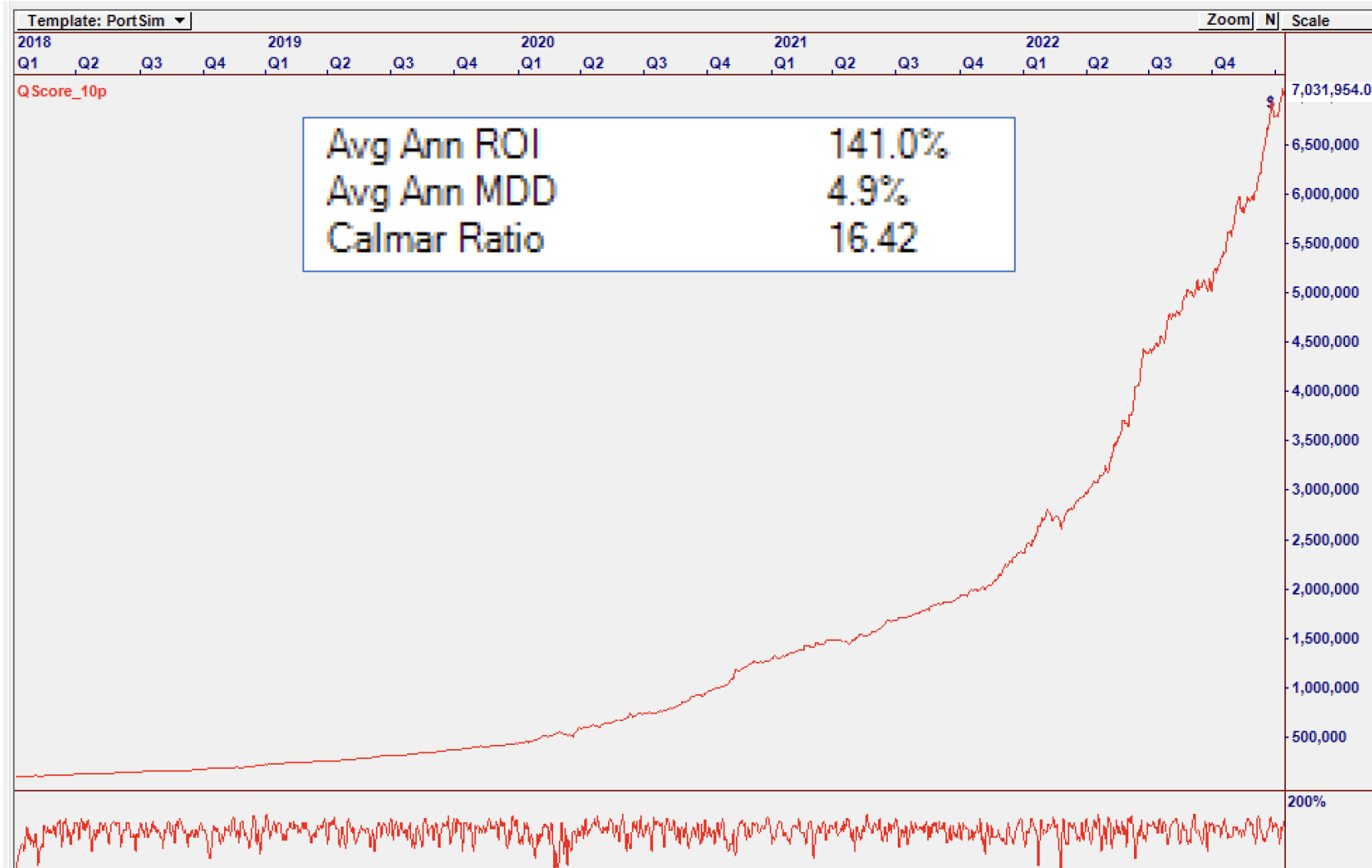
```
Category.delete_all;  
Shoulda :Matchers.configure & using  
config.integrate do |test|  
  with.test_framework
```



A

TRADEnosis provides Signals to OmniTrader through a Proprietary API In the Cloud Environment

Simulated Results



Equity Analysis

Net Profit	\$6931954
ROI	6931.95%
Max Drawdown	\$206965
Max Drawdown %	8.6%
Max Drawdown % Date	3/23/2020 7
Largest Loss On Equity	1.10%
Profit Factor	2.32
Return-Drawdown Ratio	807.21
Modified Sharpe Ratio	0.32

Avg Ann ROI	141.0%
Avg Ann MDD	4.9%
Calmar Ratio	16.42

Position Size

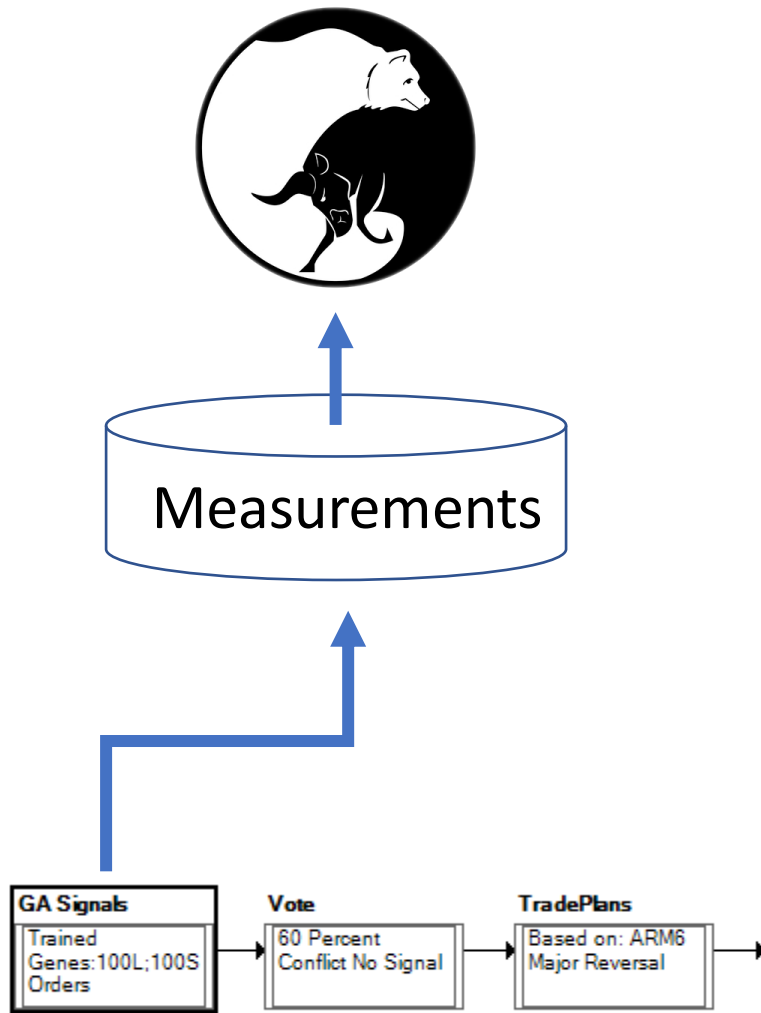
Max Size	56938
Max Size \$	\$706523
Min Size	42
Min Size \$	\$9824
Avg Size	2348
Avg Size \$	\$143696

Trades

Number of Trades	2489
Percent Profitable	66.2%
Win-Loss ratio	1.1
Largest Win	\$104657
Largest Win %	33.3%
Average Win	\$7348
Average Win %	4.8%
Max Consecutive Wins	17
Largest Loss	\$77326
Largest Loss %	56.7%
Average Loss	\$6199
Average Loss %	4.3%
Max Consecutive Losses	7
Average Profit	\$2785
Average Profit %	1.75%
Average Invested %	102.6%
Profit Standard Deviation	5.52%

Technical Features

```
Category.delete_all;
Shoulda.configure do |config|
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end
```



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⊕ 9	EMA(21)>EMA(31)	
⊕ 10	EMA(31)>EMA(55)	
⊕ 11	C > 20	\$VIX
⊕ 12	C > 25	\$VIX
⊕ 15	C < 0	\$VIX
⊕ 16	C[1] < O[1]	\$VIX
⊕ 17	C[2] < O[2]	\$VIX
⊕ 18	C[3] < O[3]	
⊕ 20	V[2] < V[3]	
⊕ 21	RSI(6) < 30	
⊕ 22	RSI(14) < 30	
⊕ 24	RSI(6) > RSI(6)[3]	

⊕ 24	RSI(6) > RSI(6)[3]	
⊕ 25	RSI(14) > RSI(14)[3]	
⊕ 26	RSI(21) > RSI(21)[3]	
⊕ 27	Inreg_slope(20)[40] < 0	
⊕ 28	Inreg_slope(20)[20] < 0	
⊕ 29	Inreg_slope(20) < 0	
⊕ 30	Inreg_slope(10)[20] < 0	
⊕ 31	Inreg_slope(10)[10] < 0	
⊕ 32	Inreg_slope(10) < 0	
⊕ 33	Inreg_slope(50)[100] < 0	
⊕ 34	Inreg_slope(50)[50] < 0	
⊕ 35	Inreg_slope(50) < 0	
⊕ 37	EMA(21)>EMA(31)	SPY
⊕ 38	ABS(H-L) > AVG(H-L,10)	
⊕ 39	ABS(H-L) > 1.2 * AVG(H-L,1)	
⊕ 40	ABS(H-L) > 1.4 * AVG(H-L,1)	
⊕ 41	V > Avg(V,10)	
⊕ 42	V > 1.5*avg(v,10)	

Nirvana A.I. Technical Inputs (GA, NN, DL)

Correlation Studies

After uploading the technical features (“genes” from the Genetic Algorithm) to the server, an Anti-Correlation test was used to eliminate features that were too highly correlated to any other feature.

Gene159	Gene50	-1.000000
Gene87	Gene2	-0.985087
Gene39	Gene97	-0.961922
Gene39	Gene45	-0.940904
Gene93	Gene39	-0.921711
Gene137	Gene2	-0.917577
Gene73	Gene134	0.900070
Gene74	Gene34	0.900081
Gene137	Gene87	0.900723
Gene106	Gene117	0.901150
Gene157	Gene156	0.901362
Gene116	Gene47	0.901496
Gene3	Gene157	0.901836
Gene32	Gene147	0.904746
Gene8	Gene77	0.905401
Gene156	Gene3	0.906795
Gene49	Gene156	0.907220
Gene3	Gene104	0.907368
Gene31	Gene138	0.908481

Performance Improvements

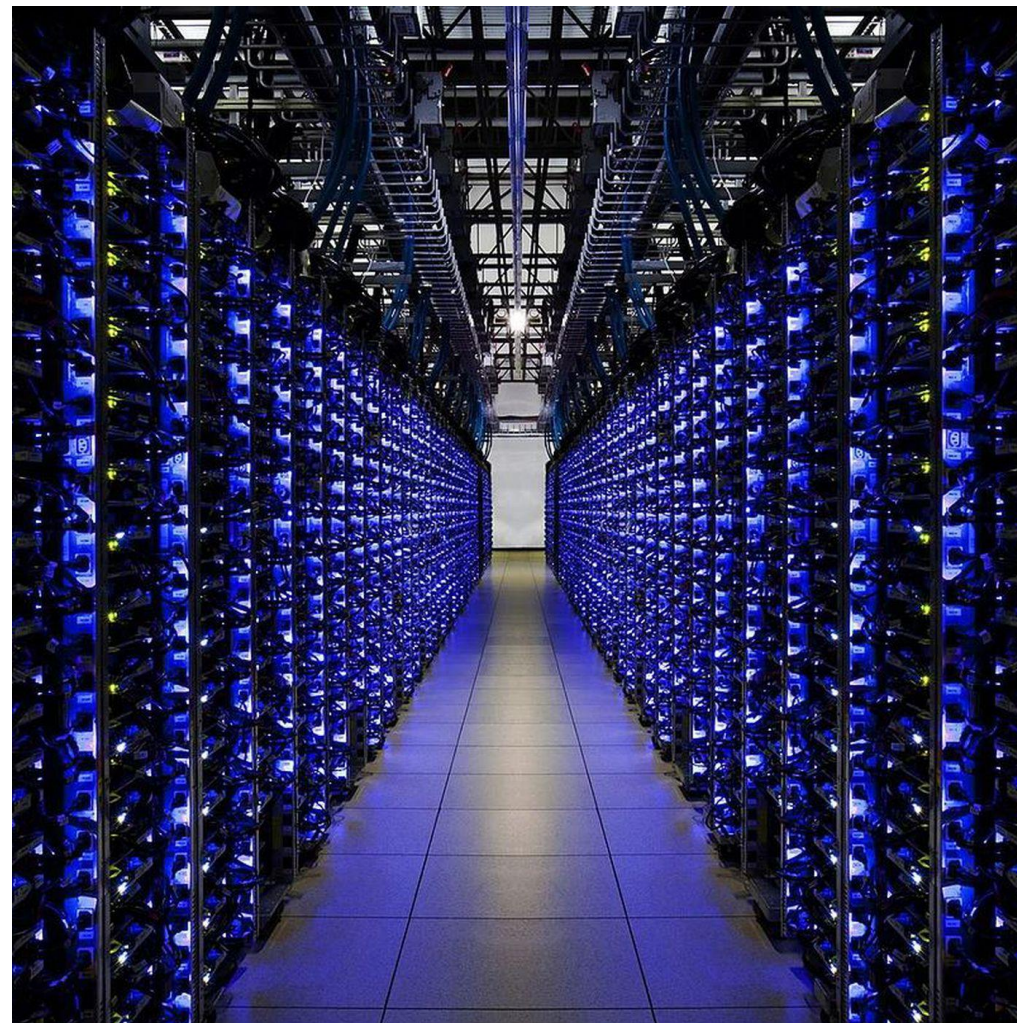
```
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Shoulda.configure do |config|
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end
```

5p Horizon	Q-Score		Q-Score + Nirvana Inputs		
	TICKER	PPT (St. Dev)	Hit Rate	PPT (St. Dev)	Hit Rate
	AAL	3.35% (6.81%)	72.8%	3.44% (6.77%)	73.8%
	AAPL	0.66% (3.72%)	56.1%	0.55% (3.77%)	54.9%
	ADBE	1.50% (3.92%)	67.2%	1.50% (3.94%)	66.7%
	ADM	1.16% (3.26%)	65.7%	1.36% (3.14%)	67.5%
	AMGN	1.33% (3.00%)	67.5%	1.52% (2.90%)	69.8%
	AMZN	1.72% (4.12%)	67.5%	1.08% (4.41%)	60.2%
	CAT	0.96% (4.18%)	57.8%	1.00% (4.19%)	58.4%
	COST	0.89% (2.87%)	63.9%	0.76% (2.88%)	61.6%
	DUK	0.86% (2.43%)	64.5%	0.94% (2.57%)	64.4%
	F	1.44% (4.96%)	63.3%	1.87% (4.75%)	66.1%
	MCD	0.56% (2.72%)	57.2%	0.55% (2.66%)	56.9%
	PFE	1.01% (3.02%)	63.9%	1.47% (2.87%)	70.0%
	TSLA	3.47% (7.65%)	69.9%	3.93% (7.29%)	71.4%
	UNH	0.73% (3.36%)	59.0%	0.64% (3.42%)	57.4%
	WMT	0.71% (2.86%)	61.1%	0.96% (2.76%)	65.5%
	Average 1.36% Avg Excess Return: 0.27%		Average #Trades: 1,627	Average 1.44% Avg Excess Return: 0.28%	Average #Trades: 1,663

TRADEnosis + Nirvana

Next Steps

- Move TRADEnosis to a production environment -> Deploy to Users.
- Train on 1,700 stocks now (more later)
- Add Improved Technical Features
- Use Zacks Fundamentals with Analyst Upgrades, etc.
- Test Additional A.I. Models



```
Category.delete_all;
Shoulda :Matchers.configure do |config|
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```

TRADEnosis

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to Trade the Stock Market

Q: How were these stocks selected?

The initial 15 Stocks were selected based on popularity and industry group representation.

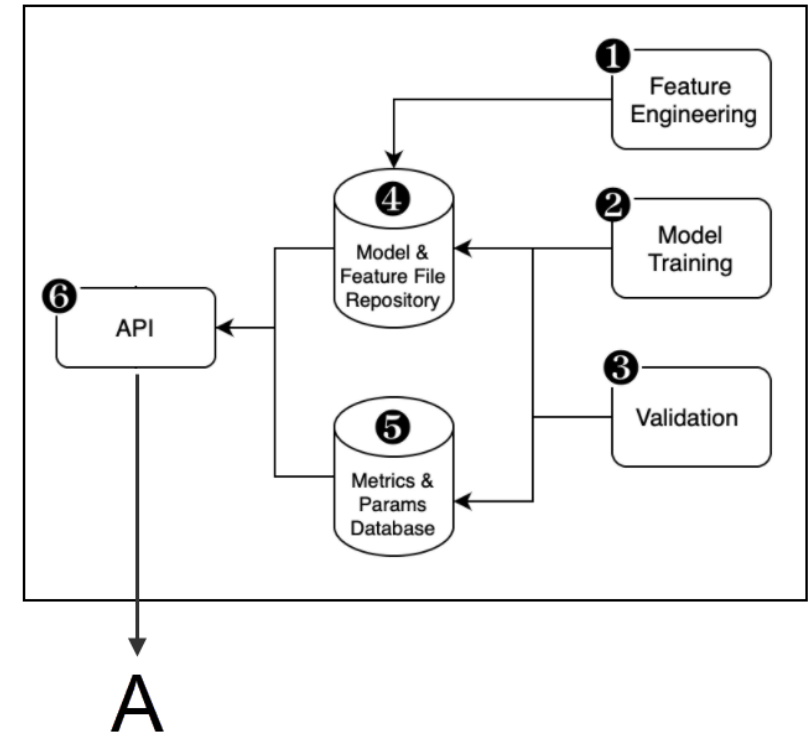
They were the **FIRST** 15 stocks, not the best performers after testing.

Symbol	Name	IndSubGrp
ADM	Archer-Daniels-Midland Company	AGRICULTURAL OPERATIONS
TSLA	Tesla, Inc.	AUTO MFRS-DOMESTIC
F	Ford Motor Company	AUTO MFRS-DOMESTIC
AAPL	Apple Inc.	COMPUTER-MINI
ADBE	Adobe Inc.	COMPUTER-SOFTWARE
AMZN	Amazon.com, Inc.	INTERNET COMMERCE
PFE	Pfizer, Inc.	LARGE CAP PHARMA
CAT	Caterpillar, Inc.	MACHINERY-CONST/MINING
AMGN	Amgen Inc.	MEDICAL-BIOMED/GENETICS
UNH	UnitedHealth Group Incorporated	MEDICAL-HLTH MAINT ORG
COST	Costco Wholesale Corporation	RETAIL-DISCOUNT & VARIETY
MCD	McDonald's Corporation	RETAIL-FOOD & RESTAURANTS
AAL	American Airlines Group, Inc.	TRANSPORTATION-AIRLINE
DUK	Duke Energy Corporation	UTILITY-ELECTRIC POWER
T	AT&T Inc.	WIRELESS NATIONAL

Preparing to Launch

Our developers have done the work to create a System that talks to the A.I. Servers in the cloud.

The Strategy will be delivered to all licensees within the next 2 weeks.



Training starts on the 1,700 population next Monday, Jan 30.

20 Licenses Now Available.


Nirvana is Turning “the Ship” towards Cloud A.I. ... *Full Steam Ahead!*

TRADEnosis will be available for subscription in as little as 2-3 weeks. Expected subscription cost: \$300-\$500/month.

In order to finance this phase, we are opening up 20 Licenses at \$5k each. After it is launched to the public, there will be a small recurring (20% of the public cost) - \$100 Maximum.

Licensees get early access to TRADEnosis in their OmniTrader, and receive new Stocks as they are trained – AND follow along in the journey with us.


Nirvana's Cloud A.I. Initiative Featuring *TRADEnosis*




Nirvana has been providing Artificial Intelligence apps in *OmniTrader* since 1998. But we all know a lot has changed in A.I. over these past 25 years.

Every day, we see more and more A.I. Systems being deployed for things like self-driving cars, medical diagnosis, and more. None of this would be possible without massive, advanced A.I. processes running on servers in the Cloud.

We are fortunate to have Nirvana Club Member Steve Mayo on our team. I have known Steve since he first got *OmniTrader* in 1996. He's an amazing scientist and gifted developer. Watch this 15-minute video to learn about Steve's



Watch this 15-minute video to learn about *TRADEnosis*.



www.nirvanasystems.com/tradenosis

TRADEnosis

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