

# VR Machine - Suite of patent pending products

*Advanced Analytics for the Volcker Rule Compliance*

- *RENTD Calculation (Inventory Control)*
- *Independent Testing (Vulnerability Scan)*
- *Preventive System (Filtering Mechanism)*

*Nominated for Best Regulatory Compliance Solution*






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**BIG DATA | BIG PICTURE | BIG OPPORTUNITIES**



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## VR Machine

Suite of Patent Pending Products

RENTD Calculation

Independent Testing

Preventive System



# Volcker's 3 Challenges

Determine

“reasonableness” in securities inventory

Distinguish

trade intents

- Hint: see [CFGS No.52](#)



Defend

against rogue traders bypassing the controls



# Banks' 3 Responses

Documents

Brag about policies and procedures, governance documents ...

Divest

Already shrunk, not a threat...



Digress

Point elsewhere:  
CCAR/DFAST, TLAC, Basel III,  
Living Wills, ERM appetite...



# Industry's 3 Myths

Risk appetite  
statement  $\neq$  RENTD

***Lack understanding*** of Volcker's  
instrument approach to inventory

Shutdown, shrink  
 $\neq$  Qualify for  
Exemptions

***Lack confidence*** to  
remain profitable



Difficult to enforce  
 $\neq$  Backburner

***Lack priority***: too hard, too busy,  
not a problem "if" \$ can settle...



# 3 Weaknesses - OLD

OLD Risk Practices	Served Purpose	<b>Shortfall</b>
Integrate risk controls into <b>product design</b>	Strong message to tell traders that I am watching you right from the get-go	<b>Not</b> able to detect possible bypass of controls that use synthetically created trades, because product reviews are often done on a case-by-case basis
<b>Risk Limits</b>	Contain certain situations	<b>Not</b> able to catch intraday issues, and huge losses can be accumulated in a split second
<b>Value-at-Risk (VaR)</b> including other coherent risk measurements	Predict magnitude and probability of losses	<b>Not</b> able to tell when, <b>not</b> situational, <b>not</b> picking up insights from the field, VaR is too normalized/ over-fit model



# 3 Advantages - NEW

NEW Risk Practices (optimization, filter, and speed)	Benefits
Use a <b>“reasonableness” calculator</b>	Offers a simple Web-based application for generating comprehensive RENTD/ Securities Inventory Plan
<b>Automate trade surveillance</b> , rigorous tests to qualify for appropriate exemptions	Enable middle-office to matchup against front-office, enhance checks + balances
<b>Machine learning, crowd computing/ field experiments</b>	Adaptive system that leverages crowd collective intelligence to win the race over rogue traders

## Problems Addressed

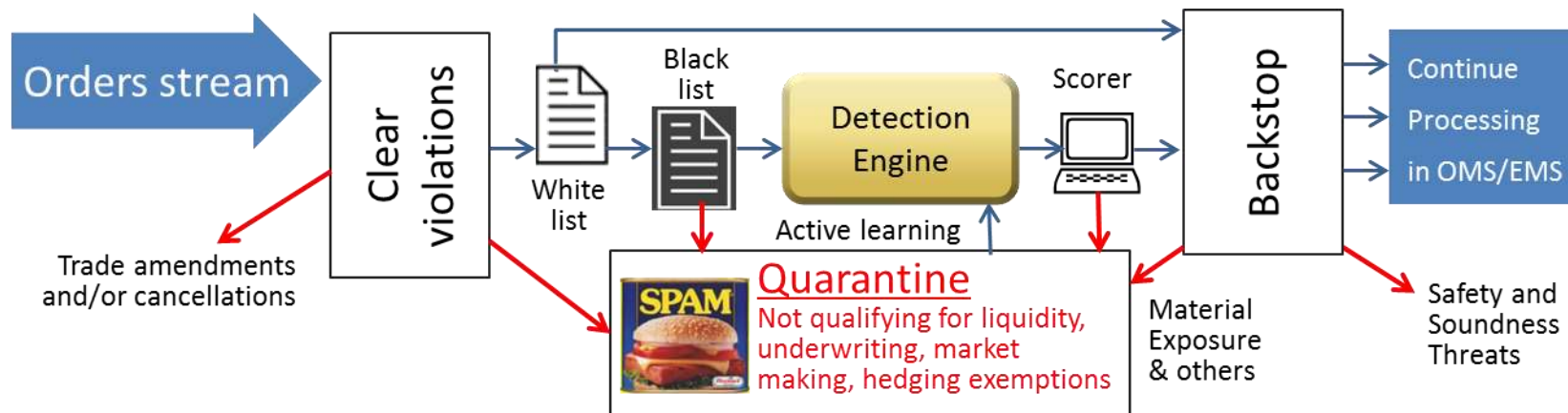
Determine reasonableness

Distinguish trade intents

Defend against violations



# 3 Offers



**VR Machine**  
Suite of Patent  
Pending Products

RENTD Calculation

Easy

Independent Testing

Fast

Preventive System

Smart





# RENTD Calculation $\Rightarrow$ Easy

Pick a combination	<b>Assumptions and Feeds</b>
<b>Markets Scenarios</b>	Risk management policy Appetite and Tolerance Levels
<b>Client Segments</b>	Liquidity management plan Bayesian model, statistics Demand and Supply factors
<b>Instruments</b> Fixed Income Equity Derivatives & Others	Order imbalances and more

## Inventory Control

Historical projection  
and justify outliers

Scholastic models that  
don't follow historical  
projection

Customize parameters  
to fit different trading  
desk natures



# Independent Testing ⇒ Fast

Type of Tests	Process
<b>Rule-based checking</b> Clear Violation White/ Black List	<pre> graph TD     A[RENTD/Securities Inventory Plan] --&gt; C[Run tests]     B[Load &amp; desk specific parameters] --&gt; C     D[Trade Data] --&gt; C     C --&gt; E[Tag captured signals]     E --&gt; F(Affirm)     E --&gt; G(Flag)           </pre>
<b>Scoring Model</b> ABC analysis Timing + Size Consistency Magnitude Measures	
<b>Limited Backstop QA</b> Synthetic short/ forward Total return swap Related party thresholds Asset class/ instrument thresholds (by desk)	

## Vulnerability Scan

Quick pulse check for potential violations

Audit trails of captured signals

Independent testing to contest possible abuses

Control effectiveness assurance

Pinpoint areas where compliance program needs enhancements



# Preventive System ⇒ Smart

Features	Spec
<b>Machine Learning</b> Pattern recognition CEP Lessons	<b>Full audit trails</b> Market making, Risk-mitigating hedge, Underwriting, Liquidity management
<b>Field experiments</b> Spot market changes to fine tune predictions	<b>Low latency</b> ~ 50 milliseconds
<b>Crowd Intelligence</b> Diversity of experience yield smarter filtering algorithms than silo effort to catch violators	<b>Workflow</b> Track RENTD/Inventory Plan changes, approval justifications, metric reports
	<b>Full backstop QA</b> Recognize synthetically created trade patterns, control material exposure, + manipulation detection (add-ons)

## Filtering Mechanism

Quarantine the prohibited  
 Qualify for exemptions

**Active learning**  
 The more data the better it gets

Share Costs, Aligned  
 Actions for the Best  
 Collective Response



# 3 Takeaways

Minors

*Governance Documents, Value-at-Risk,  
and Metric Reports*

Majors

**Enforcement**

*(An engineering approach to address  
the financial engineering problems)*

- RENTD calculation ⇒ Easy
- Independent Testing ⇒ Fast
- Preventive System ⇒ Smart



Contact

[kelvin.to@databoiler.com](mailto:kelvin.to@databoiler.com)