

# The New Race

In Financial Markets Infrastructure

Feb 2020

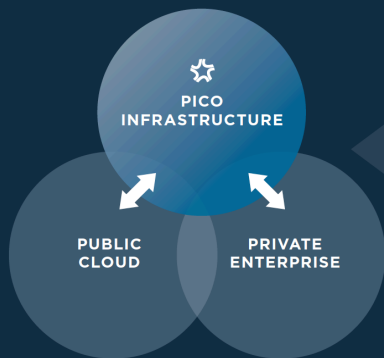
Trading Tech Summit - London 2020

# **PICO** Intelligence Infrastructure For Financial Markets



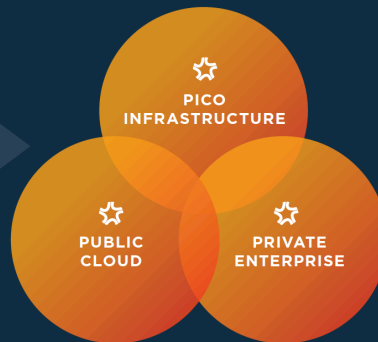
## Our Vision

One integrated view of the business  
across all three infrastructures



### Pico Infrastructure as a Service

We are building the Pico Technology Platform to seamlessly integrate with all three infrastructure environments from a procurement, provisioning, operating, and management perspective.



### Corvil Analytics as a Service

We will provide Corvil as a Service (CaaS) across all three environments starting with Pico managed infrastructure delivering a single integrated analytic view of the business. No other company can provide this.




# Servicing A New Player

THE AI TRADER

# PICO The Rise Of AI & Machine Learning

## The Latest Views on AI / ML in Trading



**Through automation, we can capture more data - a problem previously unsolvable by algorithms. Machine learning allows us to improve the quality of services in our trading ecosystem, which also should gradually improve over time.**

**Chi Nzelu**  
Head of Macro e-Trading

**J.P.Morgan**

**71%**

of traders believe that artificial intelligence and machine learning provide deep data analytics for their daily trading activity.

**66%**

of traders believe that artificial intelligence and machine learning optimizes trade execution.

**58%**

of traders believe that artificial intelligence and machine learning represents an opportunity to hone their trading decisions.

e-Trading Survey 2020



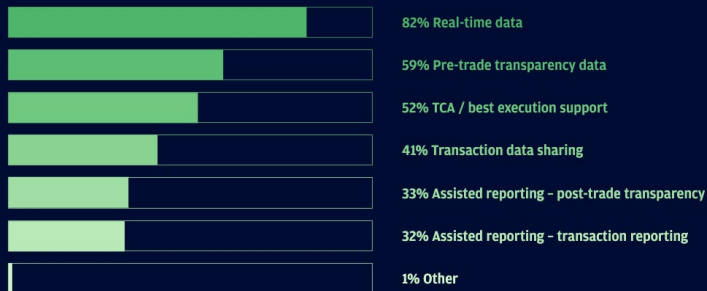
With the proliferation of data and amount of information we are collecting across various digitized channels, the ability to digest that information using the new AI tools will be transformational.

**Eddie Wen**

Global Head of Digital Markets

**J.P.Morgan**

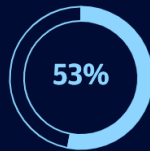
## What is the most important data?



e-Trading Survey 2020

What are the  
most important  
data tools?

J.P.Morgan



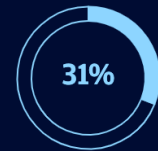
Predicted and real-time market conditions



Pre-trade optimizer



Pre-trade expectations versus outcome of order



Venue performance



Trade type historical data



Key performance benchmarks



Trade type performance comparison

e-Trading Survey 2020

## OUR EXPERIENCE

“We now realize just how valuable the Corvil data and analytics from timestamped PCAPs is to the business. It is now the lifeblood for our application development and data science teams. The insights we are able to provide our business are incredible and continue to surprise everyone.”

*MD Trading Technology, Global Bank*



# PICO Why is Corvil Data so valuable?

- It's machine-time data consisting of the underlying messages sent between trading parties in order to place, acknowledge, update and cancel orders and quotes, and to confirm trades.
- It includes accurate timestamps for every message sent or received. Unlike order data, machine-time data shows the sequence of actions that systems took leading to a particular outcome.
- It captures actions that failed or were rejected, as well as those that were successful, and the sequence in which they occurred.
- Provides a consolidated, normalized view into messaging activity across multiple markets and systems, regardless of underlying protocols.

## STREAMING REAL-TIME MESSAGE RECORDS

- Full order flow messages – logons, logouts, orders, modifies, cancels, fills, rejects, heartbeats, quotes, admin messages
- Full market-data messages – symbology, order book incremental updates, top of book, depth of book, time beacons
- All fields – order IDs, sequence numbers, location IDs
- Accurate Hardware Timestamps, per-message UTC sync flags
- Record fields normalized across all markets and asset classes
- Value add fields: latency metrics per message, order-tracking, fill-rate, order completion flag, sequence gap flags, congestion detection flags, symbology conversions, normalized application timestamps for latency calculations.

## STREAMING REAL-TIME METRICS DATA

- Order flow: Fill Rate, Order/Cancel Ratios, Counts of orders/replaces/cancels, Response time latency, microburst
- Market Data: sequence gaps, sequence counts, AvB latency, one-way upstream latency, microburst
- Latency metrics – full percentile support, including summaries and timeseries. Accurate aggregation by time.
- Network Layer: Packet and byte counts, TCP roundtrip times, out of sequence, zero-window, packet microburst
- Alert history: timeseries of threshold violations

# **PICO** Corvil as a Data Source for trade outcome prediction

## DATA CAPTURE

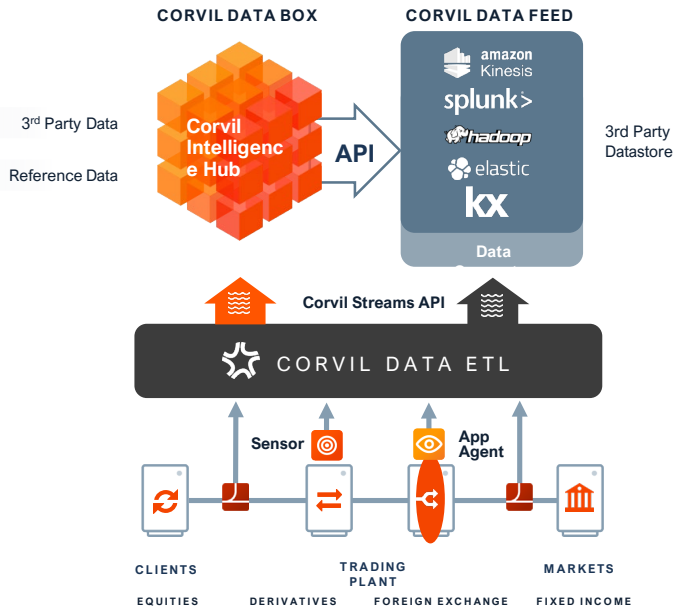
- Non-intrusive, out-of-band, independent capture approach
- Does not require re-architecture or normalization of source objects

## DATA FEED

- Streaming machine-time data feed for all messages involved in a trade execution for real-time intraday analysis
- Records are UTC time-stamped, location tagged, filtered, cleansed and normalized across all client and market protocols
- All order- and trade-related messages are covered – orders, acknowledgments, updates cancels, quotes, trades, rejects.
- Enriched with business-level metrics and analytics using data fields such as latency, symbols, prices, and filled quantities.

## DATA BOX

- **Intelligence Hub** - Multi-dimensional streaming big data cube that ingests Corvil Data Feeds
- **Message Datastore** - further enriched machine-time trade messages
- **Metric Datastore** - comprehensive pre-computed set of trade metrics
- **Data visualization** tools, interactive data query, data export



## Using Corvil Data To Predict Financial Impact Of Trading On Stale Quotes In FX Markets

It's not uncommon for FX brokers to honor client orders against quotes that have just gone out-of-date, recognizing that clients with slower systems may need a little time to ingest the latest updates. This raises the question though of exactly how much leeway can be offered without exposing the broker to potentially adverse trading?

<https://www.pico.net/blog>

timestamp	client	symbol	side	value_delta	quote_delay
1554182297434840791	BGMN	EUR/USD	Sell	-1	24169001
1554183172429787813	BGMN	USD/JPY	Sell	-600	99665999
1554183584411116819	FXBRK	EUR/USD	Buy	69	30401001
1554181655233753823	BGMN	USD/JPY	Sell	-1200	20282000
1554182989266126844	BGMN	EUR/USD	Sell	0	3339118034
1554660895002804402	BGMN	USD/JPY	Sell	-79	1558549919

- Stream Corvil data into external database
- Search for orders that cite quotes older than the most up-to-date quotes
- Calculate delta in trading value, and just how out-of-date they actually
- Provide End of Day report on total financial loss

## CONCLUSION

As we head to an AI driven world of trading, competitive advantage will go to those who can access and operationalize machine-time datasets.



THANK YOU

The content provided in this presentation or in any other information, data or content (whether written or oral), notice or document supplied or otherwise made available to you or your agents and/or advisors in connection with this presentation contains confidential and proprietary information of Pico. Please see the Legal Notice at the end of this presentation for more information.

© Pico 2020. All rights reserved. The Pico symbols and word marks are among the registered and unregistered trademarks of Pico. All other trademarks are the property of their respective owners.