MDH

## Market Data Hub for Commodities

## brisken\*

## Content









### A B O U T B R I S K E N

## PIONEERING A NEW ERA OF MARKET DATA GOVERNANCE

- Lack of integrated solutions for market data ingestion and distribution.
- Siloed solutions with barriers to integration and limited sharing of data across user groups and apps.
- Inflexible solutions, that are hard to change and adjust to the changing requirements and challenges of today's financial markets.
- Solutions based on old technology unable to take advantage of technological advances such as AI, in-memory computing, cloud.

### Offices

Brisken Headquarter, Houston, TX Brisken Labs, Alphaville, SP, Brazil Brisken Europe, Karlsruhe, Germany

### **Products**

Brisken Market Data Hub Brisken Trader+ (Co-Innovation with SAP)

### **Partnerships**

SAP Partner Edge Member SAP Co-Innovation Partner Refinitiv Bloomberg

### Customers

Google/Alphabet, Equinor, Southwire, Sulzer, Barry Callebaut, Zespri, IMAX, Sotheby's, Zalora, Weyerhaeuser, Supreme, Global Brands, Moura, Beauty Counter, Kaust

## Challenges of Market Data Management

## Siloed Data

- Hard to share relevant data.
- Inconsistencies across departments
- Silos getting out of sync
- Waste of resources

## Poor Quality Data

- Lack of uniformity and standardization.
- Decisions based on bad data are risky and good strategies become worthless.
- Low transparency on data sourcing, processing and delivery.

## Low Flexibility

- Hard to create new commodity price curves and curve types.
- Complex to adjust the commodity price matrix.
- Expensive adaptations to new regulatory requirements.



## WHAT IS BRISKEN MARKET DATA HUB?

## Highly Flexible

The definition of tasks such as ingestion, cleansing, derivation and distribution are highly configurable simplifying the implementation of new processes

## Single Source of Truth

By centralizing processes and data repositories, fragmented systems and data silos can be eliminated ensuring data consistency across all organization

> High Performance Powered by SAP HANA, MDH was designed to support the most intensive processes plus providing a high available and scalable solution

### MARKET DATA HUB

## **SOLUTION OVERVIEW**



# MARKET DATA HUB

- Break down data silos and barriers to integration, significantly reducing data cost.
- Reduce spending on data acquisition.
- Save time and cost on finding and preparing data.
- More timely, transparent and trustworthy data .
- Build your commodity price curves with a few clicks.
- Make continuous adjustments to your price matrix.
- Selectively, give data access to internal and external customers.
- Remove burden from data consumers.
- Reduce costs on the framework maintenance.
- Share your data assets across the entire system landscape.
- Increase velocity of the product innovation.
- Supports evolving processes, new processes may be driven by the opportunity, not the obligation.

### MARKET DATA HUB

## **Technical Overview**

### MARKET DATA HUB

INTERFACES



- MDH Application Auto-Scaling
- MDH Application Redundancy
- SAP HANA High Availability
- System Recovery



## **High Level Architecture Market Data Hub**



## DATA TRANSFORMATION

## MAP

Data transformation from a source data structure to a target data structure, eg: DataScope structure to SAP structure.

Support usage of math library, statistics, logical, date and text functions.

Row based and hierarchical data structures supported

## JOIN

Join two or more entities into one dataset. Could be used for joining different sources or even to lookup configuration rules defined for the process.

## AGGREGATION

Supports a series of aggregation methods for a dataset, including median absolute deviation, maximum values, mean value, median, minimum value, product, standard deviation, sum, variance.

## INTERPOLATION AND EXTRAPOLATION

Supports linear, step and polynomial methods.

### **FILTER**

Filters an entity set using functions.

## **FREE TRANSFORMATION**

Supports free data transformation using Javascript.

## **PYTHON CALCULATION ENGINE**

Could be used for more advanced calculations, data derivation, pricing and risk key figure calculation allowing direct database access and the usage of libraries whitelisted by the customer. Eg. quantlib, pandas, numpy.

## CALCULATION ENGINE

Use Python as scripting language to create models for data preparation, cleansing and derivation.

import quantlib as ql import hana as db standard\_deviation = db.execute("select STDDEV( 'price') from options")



Python Libraries

Supports creating models using opensource libraries.



Model Reuse

After activated the model can be used in any data flow.

### SAP HANA Data Access

With direct access to the data stored in MDH, it is possible to execute database intensive processes using SAP Hana built-in functions.

### CALCULATION ENGINE

## **SAP HANA FUNCTIONS LIBRARY**

## **Classification Analysis**

- CART, C4.5 and CHAID Decision Tree Analysis
- K Nearest Neighbor
- Logistic Regression Elastic Net
- Back-Propagation (Neural Network)
- Naïve Bayes
- Support Vector Machine
- Random Decision Trees
- Gradient Boosting Decision Tree (GBDT)
- Linear Discriminant Analysis (LDA)
- Confusion Matrix
- Area Under Curve (AUC)
- Parameter Selection/Model Evaluation

## Regression

- Multiple Linear Regression Elastic Net
- Polynomial, Exponential, Bi-Variate Geometric, Bi-Variate Logarithmic Regression
- Generalized Linear Model (GLM)
- Cox Proportional Hazards Model
- Random Decision Trees
- Gradient Boosting Decision Tree (GBDT)

## **Cluster Analysis**

- ABC Classification
- DBSCAN, K-Means/Accelerated K-Means\*\*, K-Medoid Clustering, K-Medians
- Kohonen Self Organized Maps
- Agglomerate Hierarchical
- Affinity Propagation
- Latent Dirichlet Allocation (LDA)
- Gaussian Mixture Model (GMM)
- Cluster Assignment

## **Time Series Analysis**

- Single/Double/ Brown/Triple Exp. Smoothing
- Forecast Smoothing
- Auto ARIMA/Seasonal ARIMA
- Croston Method
- Forecast Accuracy Measure
- Linear Regression with Damped Trend and Seasonal Adjust
- Test for White Noise, Trend, Seasonality
- Fast Fourier Transform (FFT)
- Hierarchical Forecasting

## **Association Analysis**

- Apriori, Apriori Lite
- FP-Growth
- KORD Top K Rule Discovery
- Sequential Pattern Mining

## Probability Distribution

- Distribution Fit/ Weibull analysis
- Cumulative Distribution Function
- Quantile Function
- Kaplan-Meier Survival Analysis

## **Outlier Detection**

- Inter-Quartile Range Test (Tukey's Test)
- Variance Test
- Anomaly Detection
- Grubbs Outlier Test

## Recommender Systems

- Factorized Polynomial Regression Models
- Alternating least squares
- Field-aware Factorization Machines (FFM)

## **Link Prediction**

 Common Neighbors, Jaccard's Coefficient, Adamic/Adar, Katzβ

## **Statistical Functions**

- Mean, Median, Variance, Standard Deviation, Kurtosis, Skewness
- Covariance Matrix
- Pearson Correlations Matrix
- Chi-squared Tests: Quality of Fit, Test of Independence
- F-test (variance equal test)
- Data Summary
- Correlation Function
- ANOVA
- One-sample Median Test
- T Test
- Wilcox Signed Rank Test

## **Data Preparation**

- Sampling, Binning, Scaling, Partitioning
- Principal Component Analysis (PCA)/PCA Projection
- Factor Analysis
- Multi dimensional scaling

## Other

- Weighted Scores Table
- Substitute Missing Values

## DATA GOVERNANCE

Supports out-of-the-box data governance controls including:

- Anomaly detection
- Anomaly approval
- User manual changes approval
- 4-eyes principle
- Maker-checker
- Audit logs
- Integration logs

## **ANOMALY DETECTION METHODS**

- Standard Deviation
- Cross Source
- Expected Rows

*Custom methods can be designed using the Python Calculation Engine.* 

## DATA DISTRIBUTION

The MDH distributes market data to any target system, SAP and non-SAP, on premise, cloud, and hybrid. A growing library of target systems is constantly enlarged to include non-SAP systems commonly used in the market. The MDH also integrates data to customer internal or home-grown systems using the available protocols and formats.

## SUPPORTED PROTOCOLS

- soap (including SAP standard function modules)
- REST
- odata (including SAP OData services)
- http
- sftp
- amqp
- e-mail

## SUPPORTED FORMATS

- json
- xml
- CSV
- excel
- protocol buffers
- text files

## SUPPORTED DATABASES

- SAP HANA
- Microsoft SQL Server
- mySQL
- postgreSQL

## CLIENTS

- ADO.Net
- Python
- Node
- JAVA

## Contact

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We always stay on the cutting edge of digital and finance

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