

# QUANTx

Transparency attracts investments



The network of excellence

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## Transparency attracts investments

The primary measures of success in most businesses in today's market are the frequent computation of instrument prices and the ability to respond to market changes in real time.

Modelling data and price relationships under these performance criteria is a common challenge, especially with complex pricing requirements.

QUANTx has been designed to help organizations rise to this challenge. It enables users to create the most accurate financial product pricing and it combines the full flexibility and openness of a spreadsheet with the robust, high-performance attributes of a trading system.

### Share the data across desks

Interaction between desks is a key concept for QUANTx.

Market Makers, Traders and Sales can work together using same or different term structures.

Pricing parameters can be stored as templates, and traders can simulate pricing – with multiple yield curve or volatility scenarios - to compare different models.

Instrument pricing is monitored in real time, including yields, risk indicators and Greeks sensitivities all in a user-friendly GUI.

### Key features

- :: The industry's most comprehensive independent library of market-validated models and optimized methods.
- :: Transparent structuring and pricing, allowing full control over term structures and pricing inputs, including choice of model and method for each instrument.
- :: Rapid structuring tools, including hundreds of instrument templates, help to reduce time-to-market for new products.
- :: Flexible Data Management supports any type of proprietary or third-party data, with integrated data adapters for several leading data vendors, allowing users to compare valuations from multiple data sources.

### Advanced data model

The storage and representation of highly structured products requires an equally flexible data model, both in terms of data fields needed to represent exotic features, and in terms of hierarchical depth to manage nested structures with complex data types.

The QUANTx modelling approach ensures that new structured products can be developed and implemented in a short time frame.

### Reference Data

A reference database for market-derived static data is provided to store information such as: security IDs and their terms; exchange traded futures and options and their terms; equity or credit derivative indexes and their components; issuers, ratings and rating sources; industry sectors; currencies with their quotation conventions and codes; country names and their codes.

### Historic Market Data

Database stores historic data captured directly from external systems.

Typical examples are: historic prices and rates for traded series products, vanilla or exotic, as sourced from the major data vendors; prices and rates extracted from the trading room's internal records on a daily basis; traded volumes.

### **Data Aggregator**

The module manages all data sources both in terms of static data and real-time data and publishes them based on user-defined priorities.

### **Access real-time market prices**

Real-time market prices are available from external price providers such as Reuters and Bloomberg or from direct access to several trading venues. Values can also be fed from Excel.

### **Advanced curve management**

Yield curves can be built with multiple instrument types and displayed simultaneously as zero rates and forward rates to ensure that the yield curve is arbitrage free when pricing instruments.

Volatility values can either be fed directly from an external source such as an information provider or calculated automatically as implied volatility of OTC or listed options.

### **Simple curve set up**

The QUANTx curve builder GUI simplifies the complex process of defining curves, guiding users step-by-step to set up a new curve, ensuring input data validation at the same time.

### **Fast curve generation**

QUANTx provides users with an extensive range of ready-to-use curves. The definition curve manages a full set of parameters for a very wide range of individual customization.

The QUANTx curve includes the following types: Bond Curve, Zero-coupon Swap Curve, Forward Curve, Spread Curve, Equity Volatility Surface, Volatility Smile, Synthetic FX Options Volatility Smile, Correlation Matrix, Var-Covar Matrix and Commodity Forward Curve.

### **Rapid new curves creation and library extension**

In addition to embedded financial calculations and models, which are best practices in the market, QUANTx presents a unique interface that enables users to define new types of interpolation algorithms and fitting methods rapidly.

### **Readily manipulate curves**

QUANTx incorporates features to help users to manipulate curves in a variety of ways. These features include:

- :: capacity to create curves based on historic data and daily information
- :: ability to overlay indicator functions such as spread, volatility or correlation on a calculated curve.

### **Enhance accuracy and obtain a clear audit trail**

Quality analysis begins with quality data. QUANTx includes a number of validation rules that operate on compound structures.

### **Seamlessly export curves into other applications**

QUANTx data can be easily exported downstream or retrieved from Microsoft Excel. Curve data storage is independent from data access and is fully accessible by external users and applications.

## Valuation methods

QUANTx implements several valuation methods to meet different needs of Market Makers, Sales or Risk Managers.

Methods include: Analytical models, Tree models, Finite Difference, Monte Carlo. Calibration of the models is also available.

## Technical specifications:

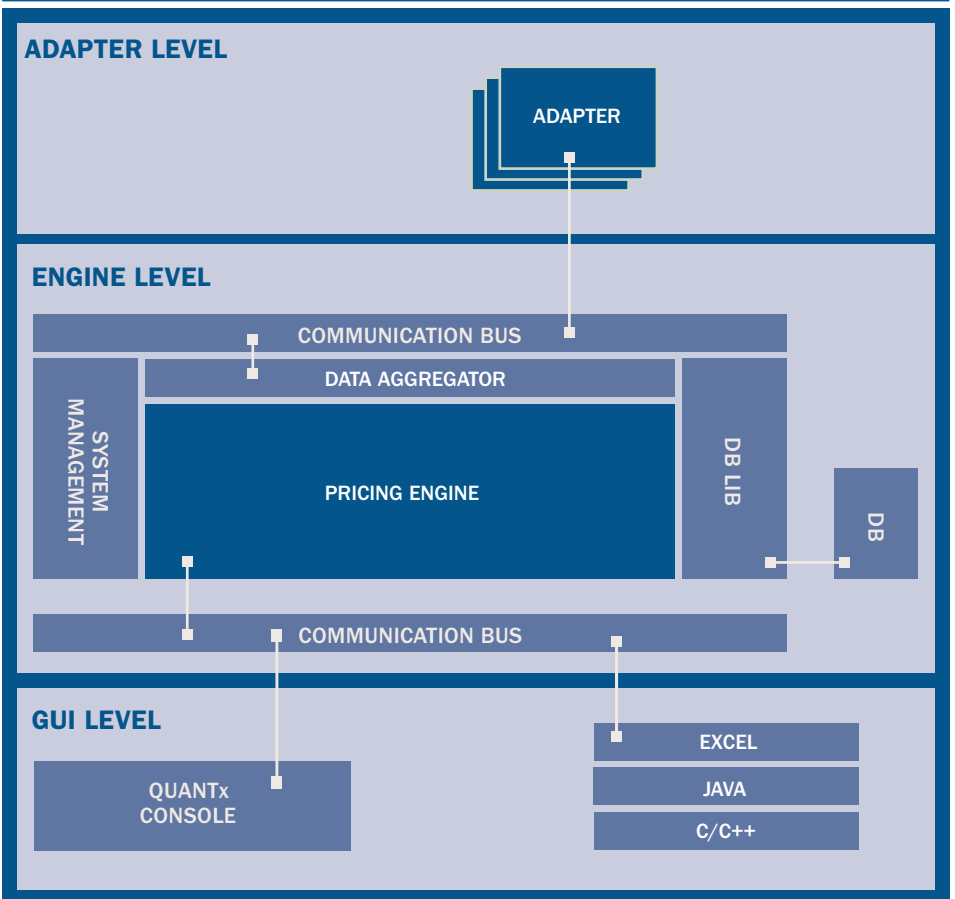
**fast calculation is really important!**

QUANTx is divided into three tiers: the application tier consists of front-end GUI; the service tier contains computing engines and data loading utilities; and the adapter tier consists of the database server, the QUANTx aggregator and the adapter to third party data.

QUANTx implements a service-oriented architecture allowing various components of the system to be run on separate machines, facilitating scalability and performances.

Open Application Interfaces (APIs) enable easy integration with in-house system.

## QUANTx - Software Architecture



QUANTx uses proprietary bus for Distributed Dynamic Caching. This ensures a split-second response time for large installations without adversely impacting on network bandwidth.

## Fixed Income

### Examples of instruments

Fixed income instruments include the following bonds with various interests and redemption feature mixing:

- :: Zero coupon, Fixed rate, Stepped & Fixed-to-floater coupon bonds; floating rate limits & barriers (cap, floor, corridor); digital and ratchet coupon; knock in and lookback barrier; FX linked bonds
- :: Amortizing bonds
- :: Callable and Puttable bonds (early termination and auto-callable included)
- :: Convertible bonds
- :: Inflation linked bonds, zero coupon included

- :: CMS (constant maturity swap) bonds; spread, amortizing and reverse included
- :: Basket and Index linked bonds; coupon based on simple / average, weighted average & double average / best & worst / bounded-performance; cap / floor, digital, Asian, rainbow, lock in, galaxy, Himalayan reload features included
- :: ABS (asset-backed securities) bonds, MBS (mortgage-backed securities) & CDO (collateralized debt obligations); amortizing & callable included.

## Credit

### Examples of instruments

- :: Credit Default Swaps
- :: Credit Spread Options
- :: CDS Indices
- :: Options on CDS Indices
- :: CDO
- :: Synthetic CDO
- :: Nth-to-Default Baskets
- :: Quoted CDO equity tranche
- :: Quoted CDO mezzanine tranche.

## Fixed Income Derivatives

### Examples of instruments

- :: Plain vanilla swap
- :: Cross Currency swap
- :: Forward starting swap
- :: Zero-coupon inflation swap
- :: Swaptions
- :: Asset Swaps
- :: CMS Caplets and Floorlets
- :: Cross Currency Swaptions
- :: Interest Rate Caps and Floors
- :: Quanto Swaps
- :: Quanto Swaptions
- :: Total Return Swaps
- :: Cross currency not resetting
- :: Equity swap
- :: First-to-default.



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