

DIGITAL ASSET TRADE ORCHESTRATION

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With ever more banks offering their clients exposure to crypto and digital assets, solid technical infrastructure is required to help master the challenges faced when establishing end-to-end digital asset trading operations. From liquidity and technology fragmentation to consistent best execution; trading platforms not only need to cover the entire digital asset trade lifecycle but also orchestrate all involved components.

Unlike FX markets, crypto-asset liquidity is highly fragmented across hundreds of centralized and decentralized exchanges, over-the-counter (OTC) desks and brokers. In addition, most of the trading volume happens OTC. This regularly leads to large differences in liquidity and price between different venues. As a result, banks can only offer reliable best execution if they do not rely on a single counterparty to execute client orders. Instead, they need

multiple access points to the market to benefit from price differences through smart order routing, as well as ensure execution reliability if one or several counterparties become temporarily unresponsive during times of increased volatility.

FROM FOREX TO CRYPTO

When talking about best execution, there's a vast difference between traditional FX and the digital assets world. In the traditional world, trading lifecycles are extremely optimized and trading infrastructure is trimmed to the brim through so-called straight-through-processing, which automates the entire value chain. Because trading infrastructure was inherently built for financial institutions, in FX, trading value chains are so automated, latencies so minimized and execution capabilities so sophisticated, that "best

execution" only refers to the very last part in the value chain where there are differences in performance: The execution of orders at the very best possible prices available in the market.

Financial institutions like banks are used to these highly developed and streamlined workflows from the Forex world and have been using them for decades. However, when entering the crypto asset space, they are facing a highly fragmented and almost rudimentary trading infrastructure that was built for retail first and has only just begun to get optimized for institutional trading. For their standards, banks must therefore deal with an extremely underdeveloped institutional trading infrastructure that is leapfrogging 60 years of FX trading infrastructure development in just a few years.

BEST EXECUTION IN CRYPTO ASSET TRADING

As a result, the term “best execution” needs to be redefined in the context of institutional crypto trading. Of course, due to the excessive fragmentation of liquidity, there are vast inefficiencies in terms of price and liquidity which can be taken advantage of. Especially for less liquid crypto assets, it is not rare to observe price differences of up to several hundred basis points across different liquidity venues. A professional execution management system which uses smart order routing and execution algorithms can already make a huge impact on the profitability of a bank that routes client orders to secondary markets and charges a volume-based commission.

However, talking about best execution in crypto trading solely in the context of actual order execution would only scratch the surface of the substantial optimization potential a straight-through-processing full trade lifecycle would offer. Not only is liquidity highly fragmented in the crypto space. But so is technology. Thus, an orchestration layer that connects and coordinates the entire technology stack involved in the digital asset trade lifecycle achieves true best execution beyond the traditional sense.

ORCHESTRATING THE DIGITAL ASSET TRADE LIFECYCLE

Generally, banks will try to optimize the following metrics when offering crypto assets to their clients:

- Minimize working capital and counterparty risks by preventing holding capital on multiple pre-funded exchange accounts.
- Eliminate human error from the manual handling of asset transfers and wallet addresses during order funding and settlement processes.
- Optimize settlement cadences by reducing network fees incurred by on-chain transfers between the bank's custody and a liquidity venue.
- Minimize execution latency through instant order funding and execution.
- Prevent having to deal with APIs that are not built for institutional order and market data transmission, such as REST or WebSocket.

In order to optimize these key performance metrics in line with straight-through-processing, the best bank-level OEMS



orchestrates the entire trade lifecycle.

Since every bank has different needs, it is essential for an orchestration tech provider to offer flexibility. This is achieved through a modular architecture and a wide range of standardized adapters to auxiliary technology components such as custody solutions, core banking services and liquidity venues. While most banks may start with a simple target architecture, it is crucial to plan ahead by ensuring the technology stack supports the continuous extension and scaling of their digital asset offerings and business strategies.

DIGITAL ASSET BANKING WORKFLOW

Here is how a simple end-to-end workflow, enabled by a digital asset orchestration OEMS, can look like for a bank:

1) A bank client wants to buy 1 BTC. He uses an e-banking app and navigates to the integrated crypto asset trading service. He sees various crypto assets and prices to choose from. The average BTC

price is currently USD36,950. All tradable assets and corresponding market prices are streamed from the OEMS which relays the data from connected brokers and exchanges.

2) The client submits a buy order for 1 BTC as a smart market order that will split up the order and fill it across several execution venues that offer the lowest market price at that point in time. The e-banking system forwards the order to the OEMS via the core banking system. The Smart Order Router in the OEMS sends child orders to 2 different brokers and 1 exchange, all of them offering credit lines. Once the child orders get filled, the liquidity venues send back execution reports to the OEMS which relays the order confirmations to the client's e-banking via the core banking system. The client is now shown a fully filled buy order as well as an updated balance of +1 BTC and -USD37,050 (including USD50 bank fees). But the coin currently still sits in the bank's exchange and broker accounts, waiting to be settled to the bank's own custody solution.



3) In order to withdraw the total 1 BTC from these accounts, the bank must first send USD37,000 worth of FIAT money or stablecoins it owes to the liquidity venues since the 1 BTC purchase was executed against a credit line. Based on a predetermined settlement cadence, say once a day, the OEMS therefore instructs the bank's custody service via API call to transfer USD37,000 to the liquidity venues either via on-chain stablecoin transfer or off-chain wire transfer. To minimize network fees from on-chain transactions, these settlements should be done in bulk and include a large amount of client transactions at once. Upon clearing of the credit line at the two brokers and the exchange, the OEMS triggers the custody solution to withdraw the total of 1 BTC from these accounts via an on-chain transaction. As soon as the 1 BTC has securely arrived in the bank's custody, the OEMS registers the updated BTC balance for the client and informs the core banking system about the successful settlement into the bank's own custody.

Of course, this is a drastically simplified workflow description, but it highlights the key role an OEMS plays as the central orchestrating piece between e-banking, core banking, liquidity venue, and custody.

KEY DIGITAL ASSET TRADING REQUIREMENTS FOR BANKS

Even if banks have different requirements and no single architectural setup is the same for two banks, certain patterns can be identified when helping an increasing number of banks to establish digital asset trading functionality. Here are some of the key takeaways.

Basic requirements

- It is self-evident for every bank that it will only deal with standardized FIX APIs when dealing with liquidity venues. Building their own REST/WebSocket-to-FIX adapters is not an option.
- Most banks will start with establishing connectivity to a few brokers and OTC desks to get their base covered first with reliable execution, low counterparty risks and coverage of the most popular assets. Full automation of the entire trade lifecycle is not yet a key requirement although client order reconciliation with the core banking system is necessary from day one.
- Most banks perform agency trading for their clients. This means they act as a broker without their own balance sheet

and pass on client orders to liquidity venues one-to-one.

- All banks settle executed client orders in bulk to reduce on-chain fees instead of a per trade basis.
- Opening vostro accounts for counterparties such as brokers and OTC desks to instantaneously clear credit and settle client balances.

Advanced optimization potential

- Establishing direct market access to exchanges to maximize commissions through smart order routing and execution algorithms which allows to take advantage of market inefficiencies and low fees when counterparties are exchanges rather than just brokers or OTC desks.
- Some banks perform principal trading by netting client orders against their own balance sheet and inventory. While extremely efficient in terms of execution fees and settlement, this requires the bank to deploy automated quant trading logic to hedge its own exposure, as well as to regularly re-stock or off-load its own liquidity as part of its internal warehousing.
- End-to-end workflow automation across e-banking, core banking, order execution, settlement, and custody to minimize the amount of required human interaction and operational effort.

A FLEXIBLE AND MODULAR OEMS ADAPTS TO FUTURE NEED

To serve such a wide range of requirements, a modern OEMS built for institutional-grade digital asset trading needs to offer sufficient flexibility. Given the integral role this technology component plays in the digital asset trade lifecycle of a bank, it is crucial that it not only meets those diverse demands, but constantly adapts to a bank's evolving needs which inevitably emerge once its digital asset strategy matures and the bank learns how to refine and optimize its offering over time.

Starting off with a technology vendor that offers a rigid tech stack that just covers the basics and offers limited modularity, flexibility, and adaptability, on the other hand, is a one-way road to frustrated clients, employees, and shareholders. A lack of flexibility in terms of technology and strategy is a guarantee to fall behind and miss significant market potential when it comes to institutional digital asset trading.

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Jason Blum is responsible for AlgoTrader's strategic partnerships, business and corporate strategy development. He identifies synergies between crypto custody, core banking, and liquidity venues by coordinating the development of streamlined and risk-optimized institutional trading lifecycles for asset managers and banks that seek digital asset exposure. His background as a decentralized tech entrepreneur and years working with crypto assets have led to a lucid understanding of the strategic and technological challenges and opportunities various market participants face.



AlgoTrader is the global leader in institutional trading technology for digital assets that covers the entire trade lifecycle from pre-trade risk checks to order generation, automated settlement and custody reconciliation – offering best-in-class infrastructure for financial institutions. By supporting direct market access, seamless custody and core banking integration as well as full trade lifecycle automation, the AlgoTrader platform streamlines digital asset trading. Developed by a team of trading system veterans and crypto asset experts, AlgoTrader offers integrated infrastructure solutions that meet the highest institutional needs. To learn more, visit www.algotrader.com.

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