KEEPING UP WITH CRYPTO

FROM A RECORD-KEEPING PERSPECTIVE

This article covers the less glamourous but very necessary part of this new digital asset class – the record keeping. It takes a look at the technology needed to keep up with crypto. It is written by the CEO of the Titan Platform, a fund administrator-turned-technology provider, and is for fund managers doing their own back office, fund administrators, and anyone curious as to what the challenges are with crypto and why not all fund administrators/software platforms offer crypto functionality.

What prevents legacy systems from keeping up with crypto?

VOLUME, VOLUME, VOLUME!!

Volume Challenge # 1 – Increase in Daily Trades

Legacy systems were originally built to support 30,000 trades per day. To clarify, what this means from a fund accounting perspective, is that after a manager makes a trade, it is duplicated in a portfolio accounting system, cost is tracked, relevant FX rates are factored in, and journal entries are generated. It gets more complicated if there is a sell or cover, as the system then needs to determine what cost methodology is being used (FIFO, LIFO, HiCost, LoCost, Specific, HiTax, LoTax, etc) and apply this methodology. So if you are selling Apple using FIFO, the system needs to go

through all the portfolio holdings at the tax lot level, and figure out which lot(s) to relieve the sale against. Finding the first available tax lot in 30,000 daily trades to relieve the sale against is not a problem. Three million trades can be challenging. And that's the volume we are seeing in some crypto strategies.

Volume Challenge # 2 - After-Market Trades

Supporting three million daily trades, including sales that need to be matched up to tax lots using FIFO, is time consuming enough. An extra challenge comes in the form of additional trades that are out of the market. They still need to be factored in so systems need to be able to recalculate cost relief on millions of trades at the touch of a button.

Volume Challenge # 3 – Cross Exchange Trades

Arbitrage across exchanges is the next domino in the volume challenge. Managers are trading at the micro-second level across exchanges. But these exchanges don't talk to each other or have standardized data/reporting. So, for example, when these millions of daily trades are downloaded, you may see 20,000 Bitcoin disappear from one exchange. You may then see 19,999.99999985 units appear in another exchange in the same micro-second. You can take a look at this, match the trades up, and assume there is a transfer and the difference is a fee. This process is easy enough to go through for 10 or 15 transfers but the volumes are usually much too high to go through this manually.

The solution is to employ a platform that can amalgamate all activity, look at micro-second level time stamps, and use artificial intelligence to determine transfers and fees, and build the chronological trade order from exchange transfers, DEX trades and OTC movements.

Volume Challenge #4 – Reporting

The challenge with high volume is catching many groups off guard – not just the technology providers, fund administrators and investment managers - because the challenge doesn't end after the trades are booked. There is also the reporting aspect to consider.

A year ago, one of our fund admin clients was working with an audit firm that asked for an excel list of all of a crypto fund's transactions. Excel only goes up to 1.9 million lines so for many crypto funds, you cannot capture a full year's worth of crypto transactions in one file. And you wouldn't want to – the file would be huge! When the auditors continued to insist, the fund administrator emailed them several files of trades which were so large that Excel froze every time the auditors tried to run their macro-based sample testing programs. Service providers need to be able to think beyond their traditional approaches. In this case, Titan provided JSON files to accommodate reporting volume.

What are the consequences of not having this information available?

The 2021 tax season highlighted many shortcomings occurring in the crypto landscape. Some investment managers were in hot water with the tax authorities because they couldn't provide a realized gain/loss schedule. Certain administrators had to explain to the auditors why they didn't have readily available transaction details.

The consequences are wider spread. If you can't track it, you can't audit it. And if you can't audit it, you can't regulate it. And this can lead to knee jerk reactions from governments.

If a fund accounting software can track long/short equity funds, why can't it handle crypto?

Where is the TECH to keep up with the TECH?

The underlying problem is that most fund accounting platforms are 25-30 years old and were not designed to adapt. Many legacy systems simply weren't built for the kind of volume we are seeing in the crypto space. Some were designed before the cloud existed so the speed and the adaptability just isn't there. Some additional nuances/factors that may result in "hiccups" in legacy systems when trying to account for crypto are decimal places, in-kind subscriptions, hybrid funds, and exchange communication.

Decimal Places – The majority of systems were designed to account for 2 decimal places in pricing. Maybe even 4 if they were somewhat forward thinking. Fair enough, who could have envisioned an asset class whose assets are priced out up to 45 decimal places.

In-Kind Crypto Subscriptions – Most systems have been designed to be able to accommodate, for example, a GBP class within a USD class Fund . However, we are seeing situations where investors subscribe into a USD fund with Bitcoin in-kind and want their share class denominated in Bitcoin.

Hybrid Funds – Fund technology platforms have historically been designed either to support hedge funds or to support private equity funds. As the lines continue to blur between these types of funds, historical systems aren't designed to accommodate characteristics of each. For example, if a PE funds have a liquid portfolio of Bitcoin and Ethereum, this often ends up being tracked on a different system or (gulp) on an excel spreadsheet.

Communicating with Exchanges At the beginning, there was no standard that exchanges followed when setting up their data flow. Each exchange was set up differently. There have been vast improvements since in terms of standardized data but it's still a bit painful. The way an administrator or investment manager receives data from an exchange is not via a CSV download like we see with traditional brokers. These parties need IT resources to help bring data in, because data these days is transferred via an authenticated API - which is often beyond the skillset of a typical accountant (this one included!).

A funny story to demonstrate how the accountants are always the forgotten ones - In the early days, some exchanges were set up with only one kind of access, with which the managers could buy and sell crypto, and access their records. Clearly, the manager wouldn't and shouldn't have given access to anyone else but themselves. So until the exchanges caught on that they also needed to provide read-only access, the investment managers had to download the reports daily and send them to their fund administrators.

At the time this article is being written, there are some exchanges that will send information only in response to very specific requests. For example, the user can ask for records for transactions that

involve a sell of BTC for ETH. You are not able to just get a listing of ALL the trades. There are many combinations of trades and new securities being created all the time, so this is not an efficient process to gather information. It also isn't a process the auditors can rely on to satisfy their completeness requirements.

Where are we now?

There is a big demand for fund administrators that can keep up with crypto. But not all fund administrators have systems that can support this asset class. There are some "add on" programs that can bring in the trades, but having a non-integrated program at those volumes increases data transfer risk.

There are administrators that have decided that they won't administer crypto funds, for whatever reason – be it lack of technology or that it doesn't fit their risk appetite. But there are also investment managers who dive into this asset class and their administrators find this out after the fact. They are then left scrambling to figure out what to do.

There are administrators that are taking on crypto funds with their own proprietary systems that haven't been able to keep up and have let their investment manager clients down. This has a "once burnt, twice shy" effect with these investment managers who are not just switching administrators, but looking to license an in-house system. (I haven't marketed heavily to investment managers and was surprised to receive five calls in one week from various managers who all wanted to do their own back office.)

We've heard rumors of some NAV Lite – where companies are just looking at their ending balances and taking those as their NAV values. But this kind of approach completely ignores relief methodologies and does not discharge a fund's duties of keeping adequate books and records.

Will the legacy programs "catch up" to crypto?

They might, if they were designed to be able to adapt to high volume, and if they were designed flexible enough to change. And to test and deploy changes efficiently.

Modern programs employ a technique called Test Driven Development, or TDD. For example, when the realized gain calculation of an option was first programmed for, at the beginning of the program's life, a test would have been written. Something like, "if we buy a Canadian option in our USD denominated fund for $A with a fee of $B at an exchange rate of $C and it sells for $D at an exchange rate of $E in Canadian dollars, we expect to see a realized gain of $G and here are the journal entries we would expect to see generated." That test is saved, along with hundreds of thousands of other tests, as the program is built. When something new (ie. crypto transfers) is programmed in, these hundreds of thousands of tests are run, to ensure that nothing has broken or changed in the process.

This TDD methodology wasn't created until about 20 years ago. So older programs do the majority of their testing manually, which of course makes it harder to keep up with releases and is more prone to error. It also makes these systems much more expensive, as they require armies of manual testers.

Summary

Daily trade volumes keep increasing. And the pace of change continues to increase.

There seems to be something new every two weeks in the crypto space. From a technological support point of view, keeping up with what is coming next down the pipeline – be that defi, micro-second trading among exchanges, movement of data etc., is a constant.

There is no finish line when it comes to supporting the finance industry. There will always be changes and new demands – new types of swaps, more stringent privacy rules, regulatory changes that allow over 2,000 shareholders, or entire new asset classes. To stay relevant, systems these days don't just need to be able to handle change – they need expect change and plan for it. Even if we don't know what the changes are going to be. There is a way of architecting a software program so that it is able to pivot when needed.

The original concerns of risk around crypto custody and ownership have shifted as the asset class has become better understood. The landscape continues to evolve and the administrator crypto challenges may look totally different in a year. But one thing holds true, these new challenges highlight the fact that modern and adaptable technology is needed to "Keep up with Crypto."

About the Author

Michelle Morgan is a Canadian chartered accountant who worked in fund administration in many years before becoming frustrated with the available technology. She went on to cofound the company that designed the Titan Platform, a modern, truly-integrated, cloud-based fund administration system that includes portfolio accounting, multi-currency general ledger and SRTA/income allocation functionality. The Titan Platform is used by fund administrators and investment managers and supports hedge funds, private equity funds, and hybrid funds on one technology.