

CrossPool: Addressing Challenges In The Private Markets Investments Industry Through The Use Of Distributed Ledger Technology

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Abstract— This informal paper summarises findings on the evolving challenges in the Private Markets sector within the Asset Management industry and a proposed solution building on distributed ledger technology and digital workflows. Its insights and the problem definition are compiled from interaction and structured interviews with industry actors and secondary market research. The solution presented is CrossPool, a digital platform developed by FinFabrik.

The Private Markets sector and its dynamics

Private Markets is a sector in Asset Management with globally USD 6 trillion in assets under management. The industry has been growing for years consistently at 8% or more per annum¹. We expect this dynamic to continue for one because of capital supply factors: investors seeking higher returns, institutions looking to invest large cash reserves and the emergence of private wealth particularly in Asian markets.

In addition, the expansion of growing economies will continue to drive capital demand and provide interesting investment opportunities. This is especially true in target markets such as Greater China. Macroeconomic developments (e.g., 'China 2025' policy²) and geopolitical forces

¹ (Preqin); (McKinsey & Company, 2019)

² Made in China 2025 (Chinese: 中国制造 2025) is a strategic plan of China issued in May 2015. (GBTIMES Beijing, 2015) With it, China aims to move away from being a goods production-centric economy and move to a higher share of the economy being research and development as well as the production of higher value products and services. (English.gov.cn, 2017). The formal

(e.g., the 'trade war') fuel a drive towards stronger domestic advancement in deep technologies. The development and commercialisation of these technologies will require capital as a vital resource, particularly from offshore sources. Similar dynamics can be observed in South-East Asian markets and in select European markets.

Challenges in Private Markets observed today

Private Markets represent a mature sector in asset management. Current processes and market practices are well established and time honoured. That very same current traditions and practices, however, contribute to the sector lagging in digitisation when arguably much of financial services is already post-digital. Issuance and transactions in alternative assets are routinely characterised as being paper-based, overhead-heavy and expensive, without the aid of purpose-built, modern software systems.

This inhibits progress in three problematic areas³:

- 1) **Inefficiency:** Private markets operations are still conducted in a highly manual fashion, with complex multi-party interactions and dispersed systems (of which MS Excel is still a major one). A staggering 25% of firms report inefficiencies of scale; in an industry of this size and growth this is a clear sign that change is inevitably coming.
- 2) **Lack of transparency and access:** Even large firms in alternative assets report challenges around access to high quality deal flow, particularly in foreign geographies. This issue is even more prominent for family offices and high-net-worth individual investors. Result: USD 2 trillion+ in dry powder are committed and waiting for good investment opportunities.
- 3) **Illiquidity:** While for some large-scale investors longer maturities match with their investment horizon, most private markets players consider illiquidity a major risk in their portfolios and expect a 20% risk premium on the asset price. The overhead and costs for sellers to get out of positions and for buyers to gain secondary market access is typically prohibitive and hence liquidity is extremely low.

goals of Made in China 2025 include increasing the Chinese-domestic content of core materials to 40 percent by 2020 and 70 percent by 2025. (Fang & Walsh, 2018)

³ As identified in FinFabrik industry interviews and industry reports. Cf. (Bain & Company, 2019); (McKinsey & Company, 2019); (McKinsey & Company, 2018)

Digitisation of Assets and the impact on Asset Management

By lifting private markets activities to the digital level, a fundamental change in the nature of the business can be achieved, tackling some of the most difficult challenges.

From complex administration to governance efficiency

Asset lifecycle management is data management. A digitised asset can be easily tracked, transformed and transacted, significantly reducing overhead.

From insufficient deal flow to broad access

An electronic platform for alternatives changes everything for investors. With undeployed capital at record levels, real-time transparency on quality investment opportunities on a global scale equals competitive advantage.

From locked-up assets to on-demand liquidity

Sustainable return premiums are generated not only from illiquidity of the underlier but rather from quality investments and special expertise. Dramatically lower friction in counterparty discovery, price quoting and ownership transfers unlocks flexibility and lowers risk.

In the long-term, the digitisation of the private markets sector will greatly shape its size and impact. Via digital assets and processes, automation can help lower costs, opening the space for a broader retail investor participation and in effect growing the size of the sector. We expect regulatory evolution to further support and enable this development, as indicated by various industry actors and even regulators⁴.

The Opportunity for digital platforms

The opportunity for asset digitisation platforms is to serve as an efficient capital bridge, connecting asset owners and investors across geographies and sectors. By attracting both investable assets and investors to the platform, deal flow will be generated that serves both sides and that serves as a revenue driver for the platform businesses.

We consider the digitisation of the private markets sector, including digitisation of assets, an inevitable development. Intuitively, moving closer to a state of electronic trading in these asset

⁴ For example, SEC chairman Jay Clayton, paraphrased: We want to make sure retail isn't left behind in private markets. (Michaels, 2019)

classes will bring many benefits, firstly of higher efficiency and lower costs. To test our hypotheses, we brought the CrossPool platform as we consider this the most efficient way to determine the appropriate approach.

CrossPool as an example of a digital assets issuance and transactions platform

CrossPool is one solution digitally connecting institutions dealing in traditional private market assets such as private equity, private credit and real assets.

Participants on the platform are enabled to digitally issue, list, transact and manage assets along their lifecycle.

Issuance: The creation of representation of rights in an asset via digital tokens minted on our proprietary permissioned blockchain protocol. Issuers can digitise assets and streamline their management along the lifecycle.

Listing: Making assets available on the platform to be accessed by investors. Issuers can determine the characteristics and visibility of their offering. CrossPool Markets is a web-interface providing investors simple access to deal-flow.

Transactions: The transfer of rights in an asset in a secure private-chain environment, including ownership title, legal privileges and records. Assets are transferred over the counter between private parties utilising a request-for-quote mechanism.

Asset Servicing: Managing the issued asset along its lifecycle, specific to the asset type. Digital workflows enable automation for operational activities such as valuation updates, reporting, investor management or recurring coupon payments.

This platform is live, with assets issued and revenue generated. In a next phase the aim is to scale this initial traction with a focus on specific sectors and asset types - all while further building out the platform.

Business Use Cases

There are three target use cases, along three core asset types in Private Markets: private credit, private equity and real assets, with live projects of the first two assets being live on the CrossPool platform.

Private Credit

Private credit involves the lending activity carried out by entities other than banks. This can include both peer-to-peer lending as well as lending by more specialised entities and companies that focus on segments of the economy. It is usually not publicly traded, and investors demand a premium for its unique structure, complexity and illiquidity.⁵

Private credit represents part of the broader alternatives investment class and encompasses a wide range of strategies, all focusing on different part of the capital stack from senior to equity. While some private credit strategies seek to maximise risk-adjust returns i.e. private equity, the majority focus on downside protection and aims to deliver a steady income stream i.e. loans.⁶

Benefits of using digital platforms such as CrossPool for Private Credit

- Issuances and transactions are stored in immutable distributed ledger for transparency and auditability
- Usage of digital Ricardian Contract and cryptographic signatures providing enterprise-level security and traceability⁷
- A standardized workflow implemented in web-based platform increases operational efficiency, e.g., time required for issuance and listing by 50% and a reduction in cost by 35%⁸
- Customizable web-based user interface for simplified and improved user experience
- Coupon payment automation, subscription, redemption made easy with smart contract saving administration cost by 60%⁹
- Deal flow discovery broader and faster through CrossPool Markets enabling primary placement and secondary market trading
- Higher liquidity in asset by standardising assignment of private credit contract and contained rights in digital format, lowering friction to transfer ownership of the asset as well as connecting pools of assets and capital across geographies and institutional networks

Private Credit instrument issued on CrossPool:

Machinery Asia, MAT1 – Private credit instrument issued to support machinery trading deals for a Hong Kong construction machinery rental and trading company with a fixed interest rate. Principle and interest payments are payable at maturity.

⁵ Cf. (Asian Private Banker, 2019)

⁶ Cf. (BlackRock, 2019)

⁷ Cr. (Grigg, 2000)

⁸ FinFabrik analysis based on live use cases. Further reductions expected with added scale, new features and additional standardisation of use cases on the platform.

⁹ FinFabrik estimate based on expected man-hour reduction to conduct manual payments.

Private Equity

In its broadest sense, private equity is an ownership interest in a company or portion of a company that is not publicly owned, quoted or traded on a stock exchange

Private equity is an alternative investment class and consists of capital that is not listed on a public exchange. Private equity is composed of funds and investors that directly invest in private companies, or that engage in buyouts of public companies, resulting in the delisting of public equity. Institutional and retail investors provide the capital for private equity, and the capital can be utilized to fund new technology, make acquisitions, expand working capital, and to bolster and solidify a balance sheet.¹⁰

Benefits of using digital platforms such as CrossPool for Private Equity:

- Issuances and transactions are stored in immutable distributed ledger for transparency and auditability
- Usage of digital Ricardian Contract and cryptographic signatures providing enterprise-level security and traceability¹¹
- A standardized workflow implemented in web-based platform increases operational efficiency, e.g., time required for issuance and listing by 40% and a reduction in cost by 30%¹²
- Customizable web-based user interface for simplified and improved user experience
- Cap table reporting with smart contract saving administration cost by 60%, avoiding data format breaks, information loss, reconciliation errors and manual reporting effort¹³
- Deal flow discovery broader and faster through CrossPool Markets enabling primary placement and secondary market trading
- Higher liquidity in asset by connecting pools of assets and capital across geographies and institutional networks
- Potential to digitise clearing and settlement processes as well as interfaces with registrar

Private Equity instrument issued on CrossPool:

Papicha, PAPEX – Digitisation of participation rights in a film.

Funding for production of a film was provided in form of a participation right, digitised, issued and traded on the platform.

As reported in the press:

“Papicha,” the Algerian film at Cannes this year, has received finance from two Hong Kong companies that have used modern financial techniques to “tokenize” their direct investment in the film’s equity.

¹⁰ Cf. (BlackRock, 2019)

¹¹ Cf. (Grigg, 2000)

¹² FinFabrik analysis based on live use cases. Further reductions expected with added scale, new features and additional standardisation of use cases on the platform.

¹³ FinFabrik estimate based on expected man-hour reduction relative to manual or tool-based reporting.

“By having their equity participation digitalized, investors will have the opportunity in the future to transfer or sell it to other investors who want to have access to an exciting alternative asset. “If allowed by the issuer, these tokens can immediately be traded on CrossPool over the counter, directly between investors. In the future, we may see more liquid markets on dedicated exchanges.” said Patrice Poujol, CEO of Lumiere.¹⁴

Real Assets

Real assets are physical assets that have an intrinsic worth due to their substance and properties. Real assets include precious metals, commodities, real estate, land, equipment, natural resources as well as exotic assets such as collectibles. They are potentially valuable for inclusion in most diversified portfolios because of their relatively low correlation with financial assets, such as stocks and bonds.

Benefits of using digital platforms such as CrossPool for Real Assets:

- Issuances and transactions are stored in immutable distributed ledger for transparency and auditability
- Usage of digital Ricardian Contract and cryptographic signatures providing enterprise-level security and traceability¹⁵
- A standardized workflow implemented in web-based platform increases operational efficiency and reduces cost
- Customizable web-based user interface for simplified and improved user experience
- Digitisation of interface and update processes with central registrar and immediate update of records, if applicable
- Deal flow discovery broader and faster through CrossPool Markets enabling primary placement and secondary market trading
- Higher liquidity in asset by connecting pools of assets and capital across geographies and institutional networks
- Alternative mechanism of price discovery, based on market transactions vs manual valuation

Differentiation to existing systems and comparable projects

CrossPool brings a novel way of thinking about the representation and exchange of value to this sector by leveraging blockchain technology. Two new central features of the platform serve as core enablers:

- 1) Asset digitisation: The concept of digitally representing rights in an asset. Rights extend to equity/ ownership rights, claim rights and voting rights. The asset type can be

¹⁴ (Frater, 2019); <https://variety.com.cdn.ampproject.org/c/s/variety.com/2019/digital/asia/cannes>

¹⁵ Cf. (Grigg, 2000)

tangible (e.g., real estate), intangible (e.g., patents) and financial (e.g., private debt). Essential for this feature are two elements: the correct legal structuring of the asset which allows its digitisation, and a purpose-built blockchain protocol that can capture the respective rights in a legally enforceable way. Moving the asset and its rights to a digital level provides the basis for changing how we interact with it.

- 2) Asset lifecycle management: All workflows required to operationally manage the asset. Activities that used to be conducted manually and typically on paper are now executed by multiple parties following a digital process. With a flexible foundation, asset-specific workflows can be created covering asset issuance, investor KYC and identity, transactions, audit, coupon payments and further innovation such as collateralisation. This allows for a high degree of automation and development of electronic trading functions.

In the context of market traction, CrossPool follows a 0-to-1 strategy. The team aims to define an attractive niche it can dominate and consequently to help grow this niche while maintaining market share. This approach is based on a unique differentiation stack across several dimensions.

- Building capital bridges to and from growth economies in ASIA
- Enabling and connecting INSTITUTIONS
- Digitising Assets in PRIVATE MARKETS
- Developing permissioned blockchain infrastructure as ENTERPRISE TECHNOLOGY

Technology Architecture

We believe offering a better solution for private markets does not start with technology. It starts with understanding people and their needs. Then defining the right approach and building reliable software.

CrossPool works using 4 system pillars tailored to serve key participants on the platform.

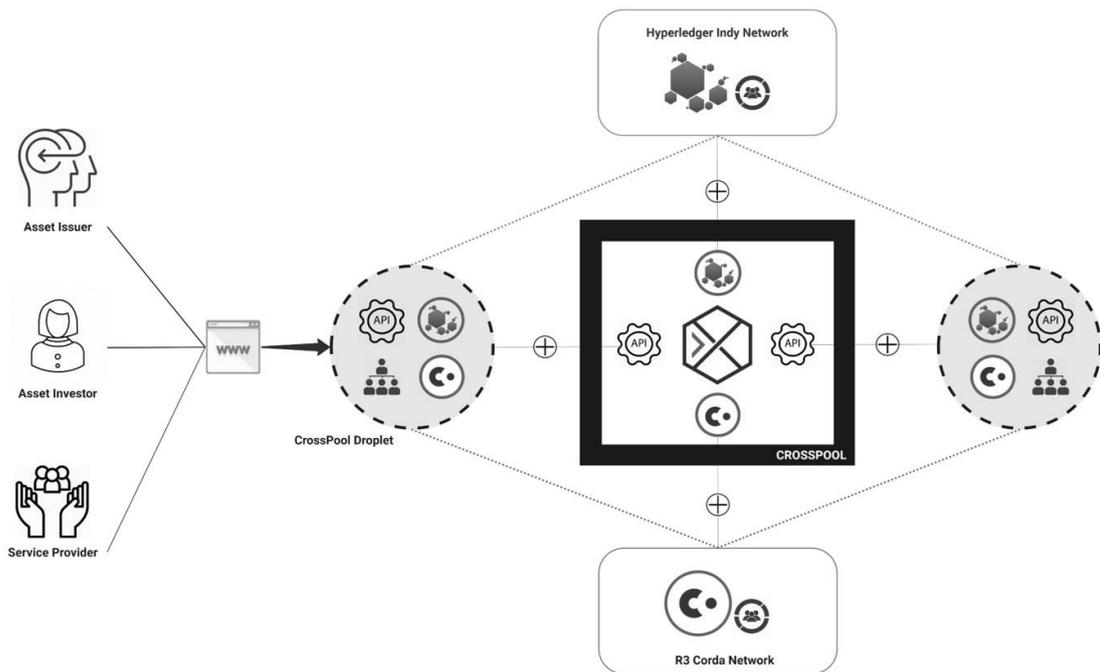


Figure 1: High-level architecture diagram of CrossPool

- 1) **CrossPool Droplet** (issue assets): ISSUERS can run a CrossPool Droplet to independently conduct their business on CrossPool. It's an open-source, stand-alone software package connecting to the CrossPool Network via APIs. It comes with built-in foundational functions and workflows and can easily be customised.
- 2) **CrossPool Markets** (invest and transact): INVESTORS can efficiently browse and search for investment opportunities. After conducting due diligence, an investor can request a quote and then track investments in her asset portfolio view.
- 3) **Provider Interface** (integrate service providers): PROVIDERS such as auditors can integrate their offering into existing workflows to act as a stakeholder and enabler on the ecosystem.
- 4) **CrossPool Network** (infrastructure): The proprietary core foundation of CrossPool integrating a trading technology stack, R3 Corda (issuing and managing assets) and Hyperledger Indy (managing identity).

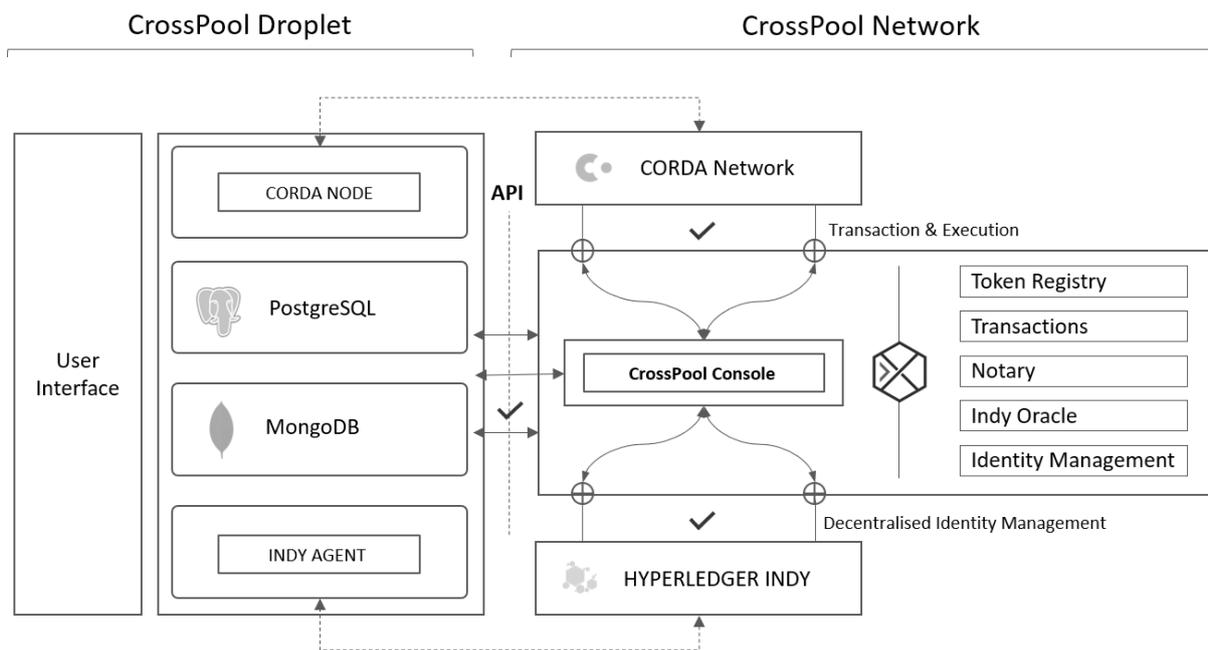


Figure 2: CrossPool Droplet and Network integration and components

Technical implementation status and plan

This solution is live with assets issued on the platform and CrossPool will be feature complete by end of 2019. Further building out CrossPool, like other projects on the market, will continue to be challenging and it will require tenacity and grit to stay at the forefront of innovators and bring it to significant scale. Two factors are decisive for the product to live up to its potential: sufficient differentiation of the solution (laid out above) and the successful implementation of our technology roadmap (see below).

All planned core features are built execution follows the pre-determined roadmap. Development work started with an emphasis on a strong, enterprise-grade core infrastructure and back-end capability. This is strategically in contrast to other players who start with frontend work or mock-ups that can be presented while not having a capable backend. The focus of development work for second half year of 2019 is on CrossPool Markets, the platform pillar focused on serving investors, as well as on some remaining core backend features.

Core backend features (CrossPool Droplet):

- Client Identity and KYC [done]
- User and Account Management [done]
- Token Creation [done]

- Digital Contract [done]
- Token Claiming and Allocation [done]
- Digital Custody [coming soon]
- Digital Payment [coming soon]
- Wallets and Transactions [done]
- Token Redemption [coming soon]
- Activity History [done]
- Audit Trail and Reporting [coming soon]

CrossPool Markets features:

- Asset View and Search [done]
- Due Diligence [coming soon]
- Request for Quote [done]
- Asset Portfolio [coming soon]
- Privacy Controls [coming soon]

Business rollout status and roadmap

CrossPool is live and currently runs in a private beta mode. Three assets have been issued fully digitally, each per private placement.

- 1) Private credit Issuer: technology company;
Investor: single family office
- 2) Private credit Issuer: construction machinery trading firm;
Investor: private investor group
- 3) Private equity Issuer: underwriter for film revenue participation right;
Investor: private investor group

We see a healthy pipeline of requests for asset digitisation, some of which are institutional firms looking to move their business to the digital age and issue projects as a pilot.

Furthermore, advanced conversations at MoU-stage are conducted with service providers such as auditors and 'trust services' providers such as fund administrators are progressing as planned.

Due to CrossPool Markets being available only in beta to select partners, investors are typically currently sourced traditionally and off-platform.

CrossPool looks to connect and enable actors in private markets. The go-to-market strategy follows a dual structure along the two target client groups. For both groups applies that forming strong partnerships with institutions is vital.

Issuers

Asset owners and issuers are the primary target group of CrossPool since quality investment opportunities are scarcer than capital. The market strategy hence builds to a large part on attracting premium assets and issuers to the platform, ideally by way of collaboration agreements. Several of these agreements are being discussed and the team will continue to work with suitable partners. The aim is to have a few top-grade assets issued on the platform by end of 2019, in collaboration with brand-name issuers.

Investors

Without investors interested in the offered assets, CrossPool will struggle to fulfil its mission to connect both capital demand and supply. The platform is initially aimed at mid-sized players such as family offices, asset managers, private wealth advisors or private investor groups. Beginning with Q4 2019 as per availability of CrossPool Markets, FinFabrik will campaign actively with these target groups and strive to sign up investors to the platform. The value proposition is simple: no-risk, no-cost signups to get access to quality deal flow, without required prior commitments. The aim is to get a significant number of institutional investors signed up by end of 2019.

Delivery team

CrossPool is developed with passion by FinFabrik, a Hong Kong based FinTech firm. We have been on our mission to help change capital markets by digitising assets since 2016.

Having started with three people and a whiteboard, FinFabrik today brings together 25 experts in areas like structured products, wealth management, blockchain development, machine learning and user experience design.

The platform is built jointly by the diverse FinFabrik team of 20+ people, with the following leading members.

Alex Medana: Co-founder & CEO; 18 years of experience, former Deutsche Bank, Merrill Lynch; equities, equities derivatives trading

Dr Florian M Spiegl: Co-founder & COO; 12 years of experience, former BCG, Credit Suisse; wealth- and asset management, fund management

Chi Zhang: Digital Assets Technology Lead, former HSBC, RBS, Goldman Sachs; FX and fixed income trading systems design, blockchain development, R3 Corda instructor

Nicolas Teck: Lead Developer; 10 years of experience, former BNP Paribas, Prive Managers; wealth management and equities trading systems development, web development

Lawrence Wong: Senior Blockchain Developer; 14 years of experience, former Barclays, KBC Financial, Daiwa; blockchain development, R3 Corda, equity structuring and derivatives trading

Ben McQuhae: General Counsel; 15 years of experience, former Jones Day; project finance, M&A, structured products

William Wong: Product Manager; 14 years of experience, former Deutsche Bank, Credit Suisse, Accenture and RBC; equities operations, project management and business transformation.

Patricia Cisneros: Platform strategy manager; 8 years of experience, former Deloitte Consulting Group; IT strategy and M&A, business and technology

Dr Yifeng Hou: Quantitative Trading Lead; 6 years of experience, former HSBC; machine learning, market making

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