




## Case Study

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How R3 is working with CryptoBLK, HSBC and other banks and corporates to revolutionize and revitalize trade finance letters of credit, using the power of the Corda blockchain platform





It's not often that a trade finance transaction makes global headline, but that's what happened in May 2018, when leading global banks HSBC and ING executed a letter of credit transaction for Cargill, the diversified international food and agriculture conglomerate.


The letter of credit facilitated bulk shipment from Argentina, through Cargill's Geneva-based trading arm, to Malaysia, with Cargill's Singapore subsidiary as the buyer. However, the global scope of the transaction wasn't the reason that the story made headlines. The reason was that this was no ordinary trade finance transaction. This was the world's first live letter of credit conducted on a blockchain platform. And it was done using R3's Corda blockchain technology.

The successful completion of this ground-breaking transaction is a testament to many years of hard work and innovation from multiple participants. These included CryptoBLK, the Hong Kong-based blockchain system developer and operator, which worked closely with R3 and HSBC to develop the Corda-based letter of credit platform—called Voltron—in just six months. Today, as more and more banks join the growing Voltron ecosystem, it's clear that CryptoBLK's efforts paid off and trade finance will never be the same again.

## Pain points

Global trade relies on complex cross-border networks where there is no central party to act as the intermediary. It's inherently a fragmented environment involving a multiplicity of participants, many of whom may never have done business with each other before. To help oil the wheels, international trade is supported and facilitated by trade finance, which includes diverse activities like issuing letters of credit, factoring, lending, and providing export credit and insurance. The companies involved in trade finance are equally diverse including banks, importers and exporters, insurers, export credit agencies and various service providers.

Letters of credit play a pivotal role in the trade finance system. A letter of credit is a document issued by a bank guaranteeing a buyer's payment to a seller. While this makes them a vital component of many transactions, traditional letters of credit-based trade finance face a number of challenges. They are largely paper-based and need the ability to share and validate documents between multiple parties in different countries. This makes the process slow, inefficient and expensive. Streamlining the process is often made more difficult by a lack of trust between the counterparties, meaning banks must act as the



intermediaries. Due to the intensive paperwork and lack of transparency involved, letter of credit transactions can take between five to ten days to complete, slowing down the international trade they're meant to facilitate and deterring many companies from using letters of credit at all.

## Finding a Better Way Enabled by Corda

However, there is a better way. As in so many other areas of business, advancing technology now offers an alternative to slow, costly, paper-based processes. Imagine a letter of credit transaction that doesn't require a complex global paper-chase, but instead involves a single, transparent, end-to-end trade executed quickly and seamlessly between buyer, seller and their respective banking partners, conducted on a single shared application rather than multiple systems. And, that doesn't take up to ten days to complete, but is done and dusted in just 24 hours. If you think that's a pipe dream, think again. It's exactly what HSBC and ING achieved in their blockchain-based live letter of credit pilot with Cargill.

The live transaction was conducted using HSBC's blockchain-enabled finance platform VoltronOne, whose distributed ledger technology (DLT) network is R3's Corda. In the transaction, a letter of credit was issued using Corda by HSBC to ING, with the two banks acting on behalf of the different Cargill entities. The transaction's smooth and speedy completion demonstrated that blockchain is commercially and operationally viable as a solution to trade digitization. Vivek Ramachandran, HSBC's head of growth and innovation, comments: "What this means for businesses is that trade finance transactions have been made simpler, faster, more transparent and more secure. The need for paper reconciliation is removed because all parties are linked on the platform and updates are instantaneous. The quick turnaround could mean unlocking liquidity for businesses."<sup>1</sup>

<sup>1</sup>Source: HSBC press release - <https://www.hsbc.com/news-and-insight/media-resources/media-releases/2018/hsbc-trade-blockchain-transaction-press-release>

## CryptoBLK: Uniting Blockchain and Trade Finance

The effect of the live pilot is nothing short of revolutionary – and one that could potentially revitalize letters of credit as a tool for facilitating trade. One of the most important players here is the Hong Kong-based blockchain developer CryptoBLK. The company was formed in April 2017, when the blockchain team from Hong Kong's largest R&D Center, Hong Kong Applied Science and Technology Research Institute, spun off as a separate business. From the moment it was established, CryptoBLK already had deep expertise both in trade finance and blockchain and could see clear opportunities and advantages in combining the two. CryptoBLK is also committed not just to developing blockchain applications, but also supporting its customers in operating them.

Duncan Wong, Founder and CEO of CryptoBLK, on the story: "We had been working on trade finance for several years," he says. "In late 2016, when we were still at ASTRI, we published a white paper for the Hong Kong Monetary Authority looking at DLT and its potential use cases, including trade finance. Around the same time, we also finished developing

a prototype blockchain system for trade finance, and we found that blockchain's features make it a very good technology for supporting trade finance."

He goes on to explain why: "The trade finance process is distributed and involves multiple parties. By using blockchain, which is distributed by nature, we can segregate the data to these different parties, while also making use of the blockchain technology to enhance the transparency of the whole process. So, everybody can see the status of the trade finance process, which is quite complicated, and at the same time we can have a data segregation that protects the security of all the customers on the same platform. This is why all participants, including the banks and corporates, are now realizing that using blockchain for enhancing the trade finance experience is a no-brainer."

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Duncan Wong, Founder and CEO of CryptoBLK

## From Prototype to Live Pilot

Even as CryptoBLK was scoping out the potential of blockchain in trade finance, rapid advances were occurring in parallel elsewhere. R3 was already working with a group of banks—including HSBC—to develop and run a proof of concept (PoC) for a trade finance system based on R3's Corda platform, with a project code name Voltron. The success of the prototype used for the PoC convinced HSBC to develop the system further as the basis for a pilot run of a live trade finance transaction. To progress the solution from prototype to live pilot, the bank needed a third-party specialist developer with deep skills in both blockchain—including Corda—and trade finance. Having evaluated the firms available in the marketplace, HSBC chose CryptoBLK.

In October 2017, CryptoBLK hit the ground running as HSBC's delivery partner for the VoltronOne live trial. "I think one of the main reasons HSBC selected us was that we already had several very experienced Corda developers on our team," says CryptoBLK's Duncan Wong. "Originally, the whole project had been initiated by R3 in consultation with several banks so the system was already on Corda, and we didn't need to choose what platform to use. Our job was basically to ride on the success of the prototype and transform the prototype to a live pilot run."

## HSBC Live Pilot at a Glance

In September 2017, HSBC engaged CryptoBLK as an independent and neutral technology solution provider to continue the development of the Voltron letter of credit blockchain platform based on R3's Corda and deliver the platform for a live pilot run. First, CryptoBLK received a detailed workshop briefing from HSBC's Global Innovation Group, and the handover of the Voltron development was completed. Then, beginning in October 2017, the CryptoBLK engineering team worked closely with HSBC trade finance specialists in Commercial Banking and their Innovation Group teammates to design and develop the pilot run platform. CryptoBLK completed all the major development works in February 2018. The key aspects of this pilot run phase of Voltron included workflow design, web-based user experience and user interface design, front-end development, Bolero electronic Bill of Lading connectivity, hybrid DLT node deployment, business logic development, and multiple phases of smart contract upgrades from Corda version M11 to V3.1.



## Why Corda is the Best Fit

While blockchain is well suited to support trade finance, Wong adds that the specific features of Corda make it an especially good fit for transforming the letter of credit process. “We had a number of requirements that Corda is actually the best fit for,” he explains. “The first is around data segregation. When documents are sent from one blockchain node to another, we don’t want them to be replicated across the entire DLT network because of privacy considerations. For example, when the letter of credit is at the application stage, the document should be accessed by the applicant and issuing bank or maybe the beneficiary, but not the nominated bank. With Corda, data is segregated by nature, so it’s easy for us to apply this type of access control.”

Another positive aspect of Corda is R3’s ongoing and highly active development cycle for the Corda platform. Wong says that this—combined with R3’s responsive and highly collaborative approach to working with CryptoBLK—proved highly beneficial during the course of the project. “When we picked up the project in September 2017, Corda was at version M11, not even version 1. Now it’s at version 3.1,” he says. “Almost every other month there have been new features coming in from the Corda development team that we can benefit from in our system. Also,

whenever we have a new requirement to the DLT system, we can give immediate feedback to the Corda team and discuss the possible solutions together. This speeds up and simplifies the entire development process for our side.”

This co-development approach has produced significant benefits for R3 as well. Just one example among many was CryptoBLK’s development of a generic relational database connector for Corda, a feature that R3 has now integrated into the core Corda code. “The generic connector is a very important tool, because it makes Corda more production-ready by being able to support various kinds of relational database systems,” says Wong. “Once we’d developed it, we contributed it back to the Corda development team, which did some thorough testing and integrated it into the Corda core. So, it will now be de facto for all new versions—which again make our development work easier.

Corda’s features and R3’s collaborative approach, combined with constant support and communication from HSBC, gave CryptoBLK the best possible base for their development work. “Essentially, we see Corda as the infrastructure that we need for the trade finance system,” Wong sums up. “That means we, as a critical block, can just focus on application development itself.”

## Going Live

Within four months of CryptoBLK starting the project, the major development work was complete and it was time to start preparing for the live pilot run. For CryptoBLK, this involved engaging with ING and Cargill, initially through demos and workshops about the new solution, and then by gaining feedback on any additional requirements they might have. CryptoBLK's Duncan Wong says: "We spent roughly another two months further fine-tuning the entire trade finance system based on their requirements and their experience while using it. Finally, by the end of April, everybody felt comfortable with the system and we were all ready to press ahead with the live run."

When this took place in early May, it went without a hitch, reflecting the thorough testing that all parties had put in beforehand. "The live transaction took less than 24 hours, it worked, and there were no surprises, which was just what we wanted," Wong recalls. "All the participants had done a lot of preparation, uploading their documents and testing out the system. So, when we did the live run, everybody was already very familiar with the system. That's why we got a 24-hour completion with no surprises, which was good news for us."

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## More Banks and a Move to Production Level

With the live test of the letter of credit system successfully completed, Wong says the pace of the project hasn't slacked off. Quite the reverse: it's accelerated, as more and more banks become involved. "Right now, we are working closely with R3 to engage more banks," he says. "Getting more banks on board and doing live runs is vital, because it will enable more people to see the impact that DRT can bring to the trade finance community."

As banks' adoption of the platform gathers pace and scale, the next step will be to move up to production level – something Wong expects to see within the next two years. "At the moment, we're still at the pilot run stage," he says. "But we foresee that we are going to have more banks conducting live runs on the system, and we will be continually supporting its development. Ultimately, we envisage that the system can go into full production within one to two years."

As Duncan Wong's comments underline, the move to blockchain for trade finance processes in general –and letters of credit in particular—isn't a question of if, but when. And, through the collective efforts of HSBC, ING, R3 and CryptoBLK, the Corda-based Voltron is in pole position to lead the way. With more banks set to join the Voltron community, the blockchain-enabled transformation of trade finance is well under way. It's a leap forward that every participant in the market, whether bank, corporate or service provider, is likely to embrace enthusiastically.

## About CryptoBLK

CryptoBLK Limited is a Blockchain company focusing on building and running Blockchain solutions for the financial services industry. Our customers include major banks and we focus on building trade finance, asset management and settlement DLT (Distributed Ledger Technology) systems. For more information visit [cryptoblk.io](http://cryptoblk.io).

## About R3

R3 is an enterprise blockchain software firm working with a broad ecosystem of more than 200 members and partners across multiple industries from both the private and public sectors.

R3 is working with its global network to develop on Corda, its blockchain platform designed specifically for businesses. Corda is already being used in industries from financial services to healthcare, shipping, insurance and more.

R3's global team of over 180 professionals in 13 countries is supported by over 2,000 technology, financial, and legal experts drawn from its global member base. R3 is backed by investment of over USD 120 million from more than 45 firms.

Corda is the outcome of over two years of intense research and development by R3 and its members and meets the highest standards of the financial industry, yet is applicable to any commercial scenario. It records, manages and executes institutions' financial agreements in perfect synchrony with their peers, creating a world of frictionless commerce.

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