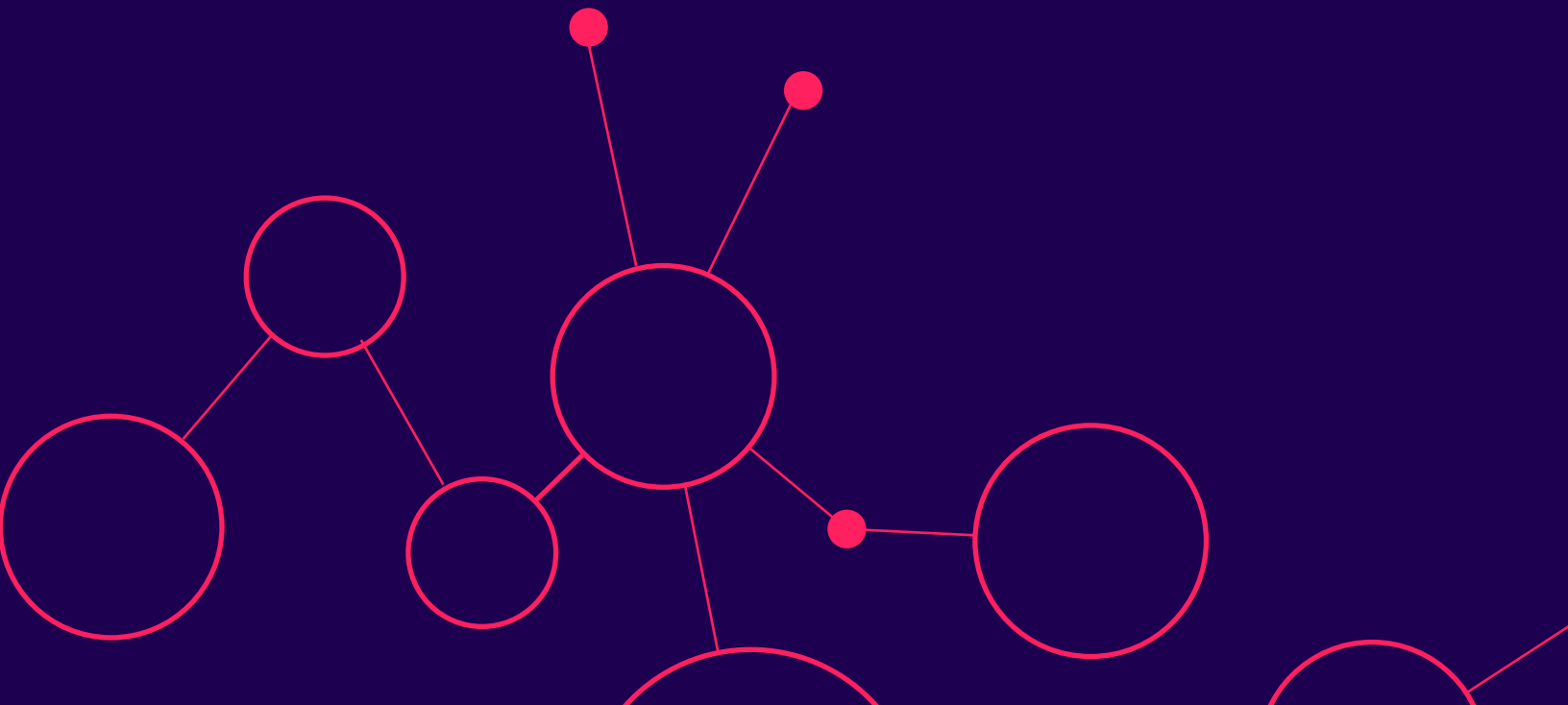




**KOMASU**  
TRADE THE BLOCKCHAIN





The Komasu platform is being developed to solve the following problem.

1

Field service and retail companies throughout the World face the same supplier issues.

Let's take an example of a Flooring company that has a retail outlet.

They offer over **50 products** and each of those with on average **12 colour variants**.

Each supplier and manufacturer makes a price **adjustment 2 to 4 times per year**.

This makes approx. 240,000 prices that need to be stored and changed annually for each retailer.

As they can never keep and track the prices of the products accurately they must call the supplier or manufacturer direct for pricing. This is a slow process involving an exchange of information between 2 humans.

The manufacturer has a large team of admin people dealing with client pricing enquiries. They want to significantly reduce this team.

The retailer is busy and does not want to make these calls.

An online, **real-time pricing platform** will take care of this in one go.

2

Secondly, the supplier very often extends credit to the retailer and sends a monthly or quarterly invoice.

The supplier has to pay insurance for this, adhere to credit and lending terms and suffers cash flow issues because they are extending credit to many retailers.

**They would prefer not to do this** but there is no other mechanism to get short term loans for the retailers.

**A centralised block-chain solution would allow the retailer to get instant loans form the de-fi apps on the blockchain thereby relieving this obligation for the supplier.**



## Block chain technology

A blockchain is a decentralized and distributed ledger. A digital system for recording transactions among multiple parties in a verifiable, tamper-proof way. The ledger itself can also be programmed to trigger transactions automatically. For cryptocurrency networks the main function of blockchain is to enable an unlimited number of anonymous parties to transact privately and securely with one another without a central intermediary. For supply chains, it is to allow a limited number of known parties to protect their business operations against bad actors while supporting better performance. A successful blockchain application for a supply chains requires a permissioned blockchain.

## The Advantages of Blockchain for suppliers and retailers

To illustrate the limitations of current ERP systems, along with the potential benefits of a centralised blockchain, imagine this hypothetical scenario. A simple transaction involving a retailer that sources a product from a supplier, and a bank that provides the working capital that the supplier needs to fill the order. The transaction involves information flows, inventory flows, and financial flows. Note that a given flow does not result in financial-ledger entries at all three parties involved. And state-of-the-art current ERP systems, manual audits, and inspections can't reliably connect the three entities, which makes it hard to eliminate execution errors, improve decision-making, and resolve supply chain conflicts.

## Capturing the details of a Simple Transaction: Conventional vs. Blockchain Systems

A blockchain system eliminates the blind spots and allows the supplier and the retailer to share the information about the purchase instantly with a financial party.

Click the image below to download the PDF of this exhibit. Diagram illustrates two different ways of creating a record of how information, inventory, and money move among three parties in a simple supply-chain transaction: a retailer that orders merchandise, a supplier that fulfills the order, and a bank that loans capital to the supplier to produce the merchandise. The transaction is broken down into six steps. With conventional record keeping, not every step of the process triggers an entry in a financial ledger, and two parties may interact without the third party's awareness. With blockchain, however, every step is recorded on the blockchain, and information on every interaction between two parties is visible to all.

This approach limits execution errors—such as mistakes in inventory data, missing shipments, and duplicate payments. This is an issue with all current order processing systems and they are hard to spot and time-consuming to remedy. Although ERP systems capture all types of flows, it can be tough to assess which journal entries (accounts receivable, payments, credits for returns, and so on) correspond to which inventory transaction. This is especially true for companies engaged in thousands of transactions each day across a large network of supply chain partners and products. This is further complicated as orders, shipments and payments may be split into several shipments and corresponding invoices, or multiple orders may be combined into a single shipment. This is very hard to decipher.

When blockchain record keeping is used, assets such as units of inventory, orders, loans, and bills of lading are given unique identifiers, which serve as digital tokens (similar to bitcoins). Additionally, participants in the blockchain are given unique identifiers which they use to sign the blocks they add to the blockchain. Every step of the transaction is then recorded on the blockchain as a transfer of the corresponding token from one participant to another.

Consider how the transaction in our example looks when represented on a shared blockchain (refer again to the exhibit). First, the retailer generates an order and sends it to the supplier. At this

point, since no exchange of goods or services has taken place, there would be no entries in a financial ledger. However, with blockchain, the retailer records the digital token for the order. The supplier then logs in the order and confirms to the retailer that the order has been received which is recorded on the blockchain but would not generate an entry in a financial ledger. Then the supplier requests a working-capital loan from a de-fi app to finance the purchase of the goods. The de-fi app verifies the order on the shared blockchain, approves the loan, and records the loan's digital token on the same blockchain. This now eradicates the requirement for the supplier to extend the retailer credit.

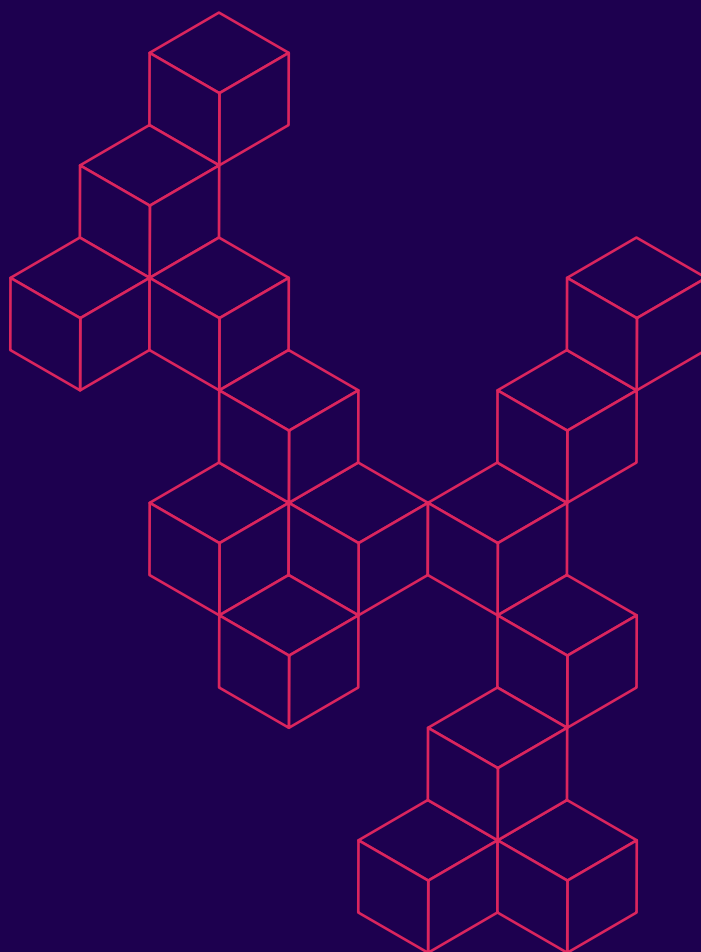
A blockchain is valuable partly because it comprises a chronological string of blocks integrating all three entities in the transaction and captures details that aren't recorded in a traditional financial-ledger and database system. Each block is encrypted and distributed to all participants, who maintain their own copies of the blockchain. Thanks to these features, the blockchain provides a complete, trustworthy, and tamperproof audit trail of the three categories of activities in the supply chain.

As participants have their own individual copies of the blockchain, each party can review the status of a transaction, identify errors, and hold counterparties responsible for their actions. No participant can overwrite past data because doing so would entail having to rewrite all subsequent blocks on all shared copies of the blockchain.

The de-fi company uses the blockchain to make a lending decision and unlike a traditional credit and lending model can verify the transactions between the supplier and the retailer without having to conduct physical audits and financial reviews, which are tedious and error-prone processes. Including lending records in the blockchain, along with data about invoicing, payments, and the physical movement of goods, can make transactions more cost-effective, easier to audit, and less risky for all participants. All these functions can be automated through smart contracts, in which lines of computer code use data from

the blockchain to verify when contractual obligations have been met, payments can be issued and goods released.

With this hybrid, centralized blockchain solution the blockchain does not have to replace the broad range of transaction-processing, accounting, and management-control functions performed by current ERP, accounting and inventory systems which manage the existing invoicing, payment, and reporting tasks. The blockchain enhances these processes by interfacing with legacy systems. Each company would generate blocks of transactions from its internal ERP system and add them to the blockchain.



## Applications for Komasu

An in-depth look at how applying blockchain will enhance current technologies and methods.

### Increasing traceability

If a supplier discovers a faulty product, the blockchain enables the firm and its supply chain partners to trace the product, identify all suppliers involved with it, identify production and shipment batches associated with it, and efficiently recall it. If there are concerns about the authenticity of a product that a retailer returns, the blockchain can allay them, because counterfeit goods would lack a verification history on the blockchain.

### Increasing efficiency and speed and reducing disruptions

Supply chains are often long and unpredictable with variable lead times and a lack of visibility. As a result, a small delay or disruption in any part of the supply chain can lead to excess inventory and stock-outs in other parts. A blockchain would give all participants visibility of the order and automatically update the delivery times if there is an issue further up the chain.

### Improving financing, contracting, and international transactions

When inventory, information, and financial flows are shared among firms through a blockchain, significant gains in supply chain financing, contracting, and doing business internationally are possible.

For example accounts payable management, an elaborate process that involves invoicing, reconciling invoices against purchase orders, keeping track of terms and payments, and conducting reviews and approvals at each step. Even though ERP systems have automated many of these steps, considerable manual intervention is still needed. And since neither of the transacting firms has complete information, conflicts often arise.

Another area of opportunity is cross-border trade, which involves manual processes, physical documents, many intermediaries, and multiple checks and verifications at ports of entry and exit. Transactions are slow, costly, and plagued by low visibility into the status of shipments.

### In summary

By connecting inventory, information, and financial flows and sharing them with all transacting parties, a blockchain enables companies to reconcile purchase orders, invoices, and payments much more easily and to track the progress of a transaction with counterparties. When the supplier receives an order, a de-fi company with access to the blockchain can immediately provide the

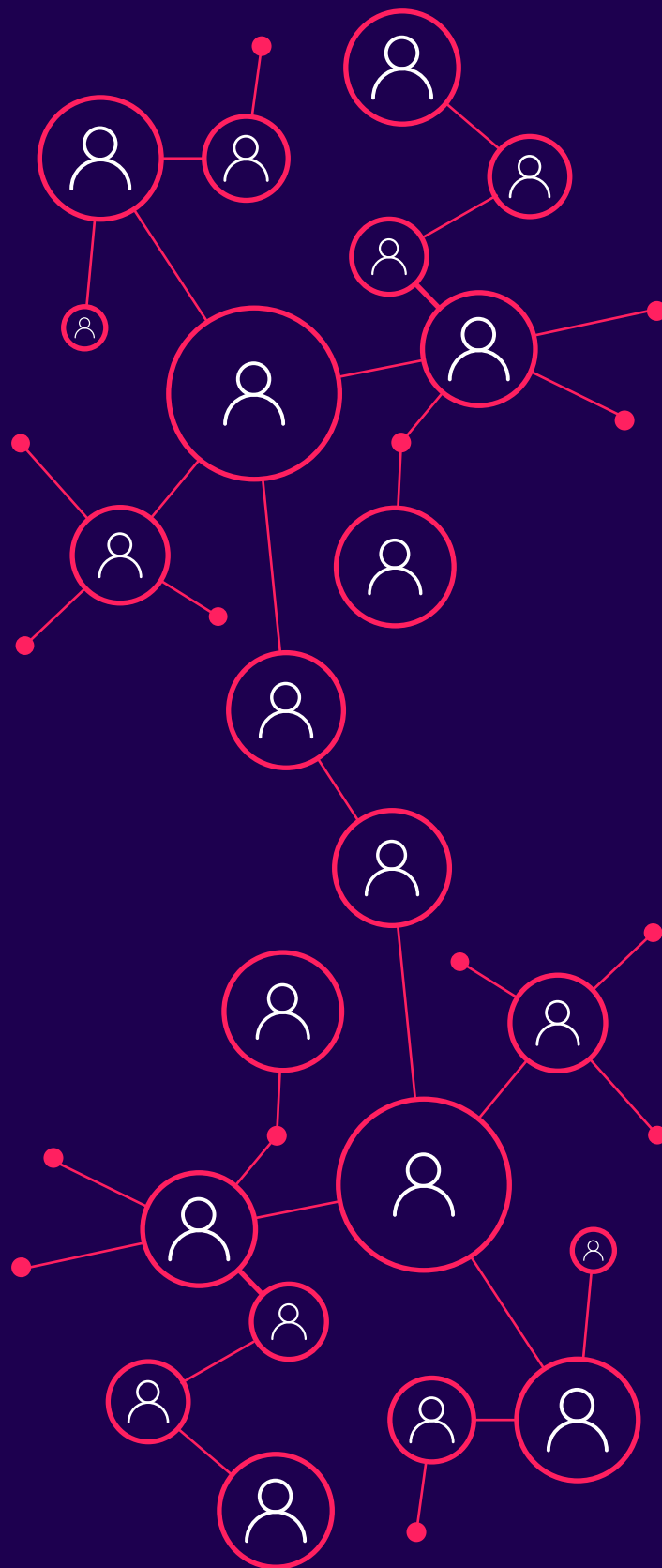


retailer with working capital, and when merchandise is delivered to the buyer, the supplier can promptly obtain payments. Since there is a readily available audit trail and reconciliations can be automated, using smart applications that rely on the blockchain data, conflicts between any party can be reconciled.

## Centralised blockchain for known participants

Supply chains require private blockchains among known parties, not open blockchains among anonymous users. So that members of a supply chain can ascertain the source and quality of their inventory, each unit of it must be firmly coupled with the identity of its particular owner at every step along the way. Consequently, only known parties can be allowed to participate in such a blockchain, which means that companies must receive permission to join the system.

Moreover, permission must be granted selectively. That's because the open and decentralized structure of blockchain poses a risk to data privacy. When companies post transactions on a blockchain, that data can be accessed by any participant. As the volume of data swells, it could potentially be misused to gather competitive intelligence, trade stocks, or predict market movements. For security reasons, therefore, the blockchain participants need to be vetted and approved. This is what Komasu will solve.



## Round robin Protocol

Fortunately, if a blockchain is permissioned and private, the proof-of-work method is not necessary to establish consensus. Simpler methods can be used to determine who has the right to add the next block to the blockchain. One such method is a round-robin protocol, where the right to add a block rotates among the participants in a fixed order. Since all participants are known, a malicious actor would be discovered if it used its turn to modify the chain in a harmful or illegitimate way. And disputes can be resolved easily by participants' validating previous blocks



### Scope of works

A database that will contain materials prices for multiple industries.

Each industry will most likely have different requirements so the database needs to be flexible and easy to add searchable fields.

We will start with a smaller vertical like a flooring price database.



### Key requirements

As this database will hold millions of pricing variants it needs to be quick.

It needs to be scalable

It needs to be rapidly searchable with fuzzy search

We want the very best architecture to make this future proof.



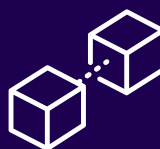
### Data entry input

Through manual entry

Through spreadsheets in correct format

Through API (a later requirement)

We also need a function to allow a user to upload a pricelist that we don't have at that point in time and then approve it for entry into the database.



### Output

We will create an open API for other field service management systems and inventory systems to attach to.

We will build API connections to the largest and most popular software platforms currently on the market to encourage adoption.

## How it works at a granular level

### Stage 1

Lets take an example of Suppliers S and retailer R

Supplier S uploads their price list to Komasu

Retailer signs up gets email and logs in. They tick the manufacturers and suppliers that they have agreements with and these are verified on a central database.

Once verified they can then search for any manufacturer they have an account with for prices without having to call the supplier.

If they want access to suppliers they do not have agreements with they can make an application via Komasu and once approved they get access to their price list.

This significantly reduces the application cost for the supplier and eradicates the need for the supplier to provide the retailer with updated pricing. For the retailer it streamlines the application process for new accounts and eradicates the need to ever call the supplier for a price.

### Stage 2

Order processing

Once we have the suppliers on board we link their current ERP and inventory systems through API to Komasu. The retailer can then see stock levels, estimated delivery times and prices. They can also search multiple suppliers instantly to identify prices and availability. They can then place an order onto Komasu and it will connect to the internal order processing system of the supplier.

At that point the order is fulfilled through the blockchain so that each party has visibility of the order.

For each order we will charge a small percentage of each transaction for creating the blocks on the blockchain

### Stage 3

When we have created the blockchain system, the centralizing database and signed up a suppliers and retailers we will integrate a de-fi app or selection to provide the finance loan to replace the credit system currently managed by the supplier. This will satisfy the requirement for credit from the majority of retailers and the reluctance of the suppliers to extend it.

## Additional revenues

Search and paid search placements

With a significant amount of manufacturers and retailers paid promotion can be offered to the suppliers and manufacturers to advertise on the portal, and pay for their products to be listed first in the filtered searches.