VIEW POINT

OVERCOMING PROCURE-TO-PAY PITFALLS WITH BLOCKCHAIN

Abstract

The procure-to-pay (P2P) lifecycle is frequently plagued by delays and errors with far-reaching consequences. This paper explores how Blockchain technology can help organizations streamline processes, and bring in efficiencies, transparency, and trust.

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Untangling procure-to-pay

Procurement is integral to an organization's operations, and yet it is a complex function involving multiple departments and business functions - within and across an organization's boundaries. The largely manual and paper-based processes are further complicated by siloed systems and disparate technologies. This invariably results in non-availability of data in real-time, lack of trust due to ambiguous, non-verifiable, and error-prone data, as well as cumbersome reconciliations and delayed decision making.

Common challenges in the procurement function

Each of the issues mentioned above impacts cost, time, and efficiency. For example, without a real-time view of inventory levels, organizations can either over-purchase or under-purchase, both of which have costly implications. Similarly, 56% of surveyed organizations agree that lack of real-time data affects their ability to predict cash flows and anticipate spending.[1]

In the case of contracts, even though the terms are alterable by both parties over time, but the lack of proper mechanisms to manage updates can lead to discrepancies in contract rates, impacting price, promotions, and ownership, among other things.

Improper handling of invoices is another challenge. For instance, inconsistencies in reconciling and validating invoices against contracts, purchase orders, and fulfillment data, can result in serious inaccuracies. Besides, tedious and error-prone reconciliation processes can lead to disputed transactions and a costly audit process. Overdue invoices leading to disruptions in supplier relations is another common challenge with nearly 60% of organizations reporting delays faced in payment due to lengthy approval processes and delayed information sharing.

Bringing in the Blockchain

Blockchain provides a distributed way of storing, sharing, and processing important information while ensuring privacy through permission-based access. Every piece of data is verified and validated by participating nodes through a consensus protocol before it is committed to the network.

The advantage of leveraging Blockchain solutions in procurement is that it allows organizations to move from a centralized bespoke system — that does not provide transparency in information and material flows — towards a more collaborative system. For the procure-to-pay lifecycle, the procurement and payment process can be optimized and automated through a single view of real-time, integrated, and trusted data. For example, smart contracts can significantly reduce the scope of human error and costs by automating existing operational workflows such as purchase order generation and invoicing.

The benefit of this ecosystem is that all information that is stored is both traceable and immutable, which improves trust and transparency between transacting parties. To bring in enhanced automation and optimization, Blockchain can also be integrated with other emerging technologies such as the Internet of Things (IoT) and quick response (QR) code scanners.

[1] Financial Services Technology 2020 and Beyond: Embracing disruption

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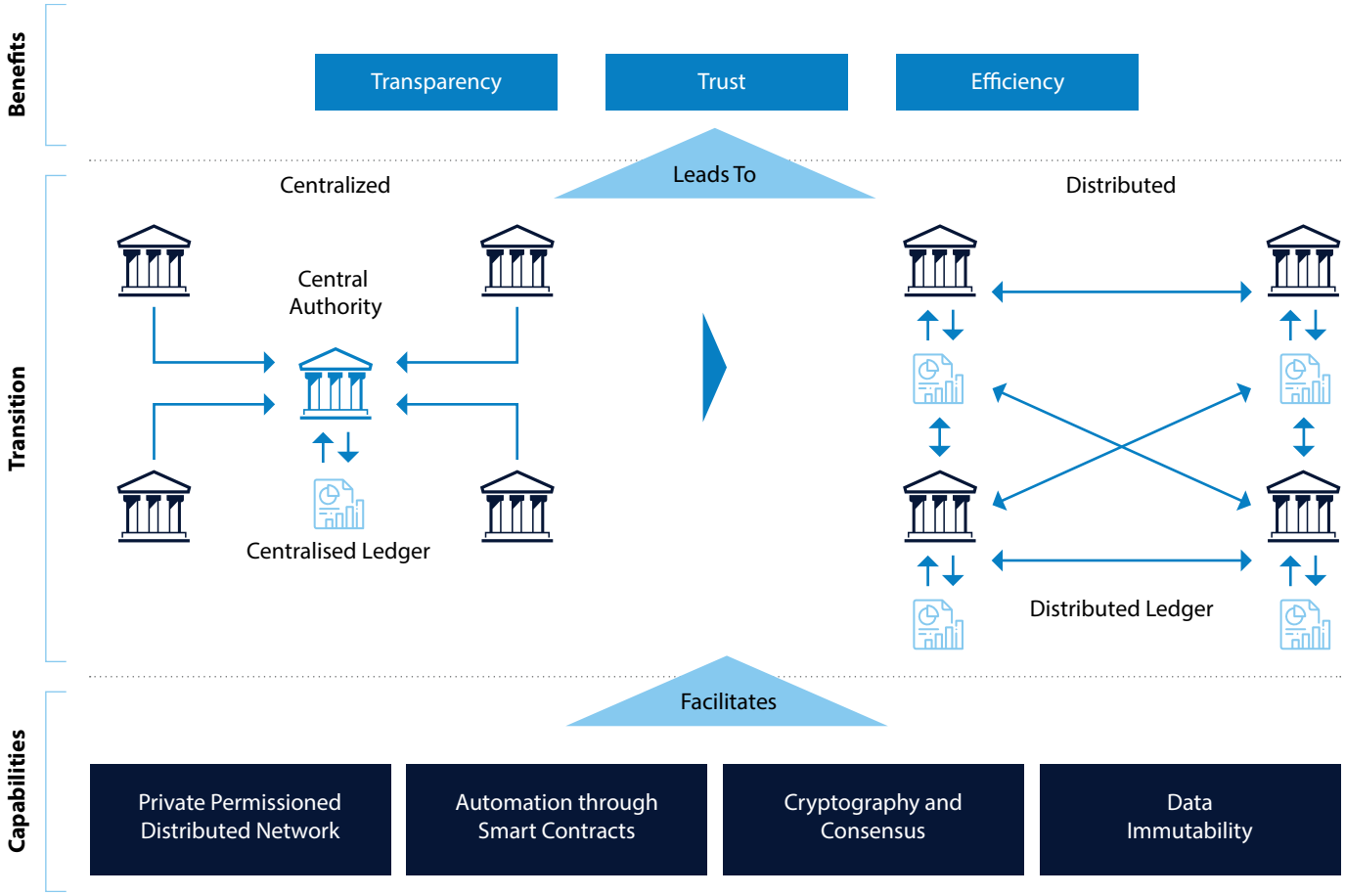

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Key areas for application

There are several areas in procurement where Blockchain has the potential to add value. Let's look at three key business functions and understand how a Blockchain-based solution can help enhance efficiency in terms of both cost and time savings.

1. Procure-to-pay lifecycle management

Blockchain can bring about substantial cost savings, reduce delays, and improve forecasting by accentuating existing procure-to-pay business processes:

- **Accelerated purchase order management:** Purchase order and receipt information can be processed quickly through radical streamlining of various critical processes such as inquiries, status follow-ups, consent, validation, and approvals across multiple parties.
- **Improved visibility of inventory:** Organizations can get real-time inventory updates and leverage smart contracts to raise a purchase order when stock levels go below pre-configured volumes. By replenishing inventory promptly, businesses can reduce stockout situations, delays, and inventory holding costs.
- **Efficient tracking of shipment:** Shipments can be tracked from dispatch to final receipt of products by maintaining information transparency. The technology allows for the creation of digital twins of products using smart tags such as QR codes or bar codes, and links them to the product data on the network. It also allows for automatic monitoring of processes and ambient conditions through integrated IoT devices, ensuring that transactions cannot be tampered with during subsequent stages of the value chain.
- **Enhanced quality checks/certifications:** The technology helps maintain immutable records for certificates as well as audits and links them to the chain of custody, thereby enhancing trust and adherence to sustainable practices.
- **Faster and accurate invoice reconciliation:** By providing a connected view of processes, the technology helps reduce the effort involved in reconciling invoices against purchase orders and actual deliveries. It produces a single version of network-generated invoices that can be trusted by both organizations and their suppliers.
- **Integrated chain of custody:** Blockchain is designed to enable the chain of custody to be maintained across upstream and downstream stakeholders, thus providing granular insights into products. The digitized artifacts are intelligently linked to relevant transactions and securely accessed by stakeholders based on appropriate permissions. Consumers can access product details such as source, process, and custody by scanning physical identifiers such as QR codes or bar codes through mobile applications.

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Manufacturer Purchase Department

Supplier

QA/Certification Lab

3PL/ Logistics Provider/Carriers

Manufacturer Warehouse

Budgeting & Planning (1)

Capture key data related to approved procurement budget

Raise Purchase Order with Supplier (2)

- Automated purchase order creation based on available Inventory position
- Real time PO workflow status tracking (Reviews and approvals)

Accept Purchase Order (3)

Real time PO workflow status tracking (Reviews and approvals)

Process Purchase Order (4)

Sort supplies into batches for shipment to manufacturer

Dispatch (5)

- Create logistics work order with logistics provider
- Capture dispatch details (ASN, dispatch time, batches)

Raise Invoice (8)

- Real time Invoice workflow status tracking (Reviews and approvals)
- Accurate Invoice reconciliation based on PO, contract terms, deliveries

Asset QA Check

Key details related to quality and compliance and publish inspection certificates

Supplier Certification

- Publish certificates for supplier's sustainable practices
- IoT enabled real time shipment tracking

Shipment (6)

- Link attributes like Container IDs, BL Number, ASN against a shipment
- IoT enabled real time shipment tracking

Receipt of supplies (7)

Capture GRN details of each batch of shipment

Invoice Validation (9)

- Automated Invoice validation and reconciliation based on PO, GRN, contract terms
- Real time Invoice workflow status tracking (Reviews and approvals)

Ledger

- PO: Purchase Order
- ASN: Advance Shipment Notice Practices
- BL: Bill of Lading
- GRN: Goods Receipt Notification

BLOCKCHAIN & IOT DATA CAPTURE & PROCESSING

Budget & Planning | Purchase Order Management | Material Movement | QA/Certification | Invoicing

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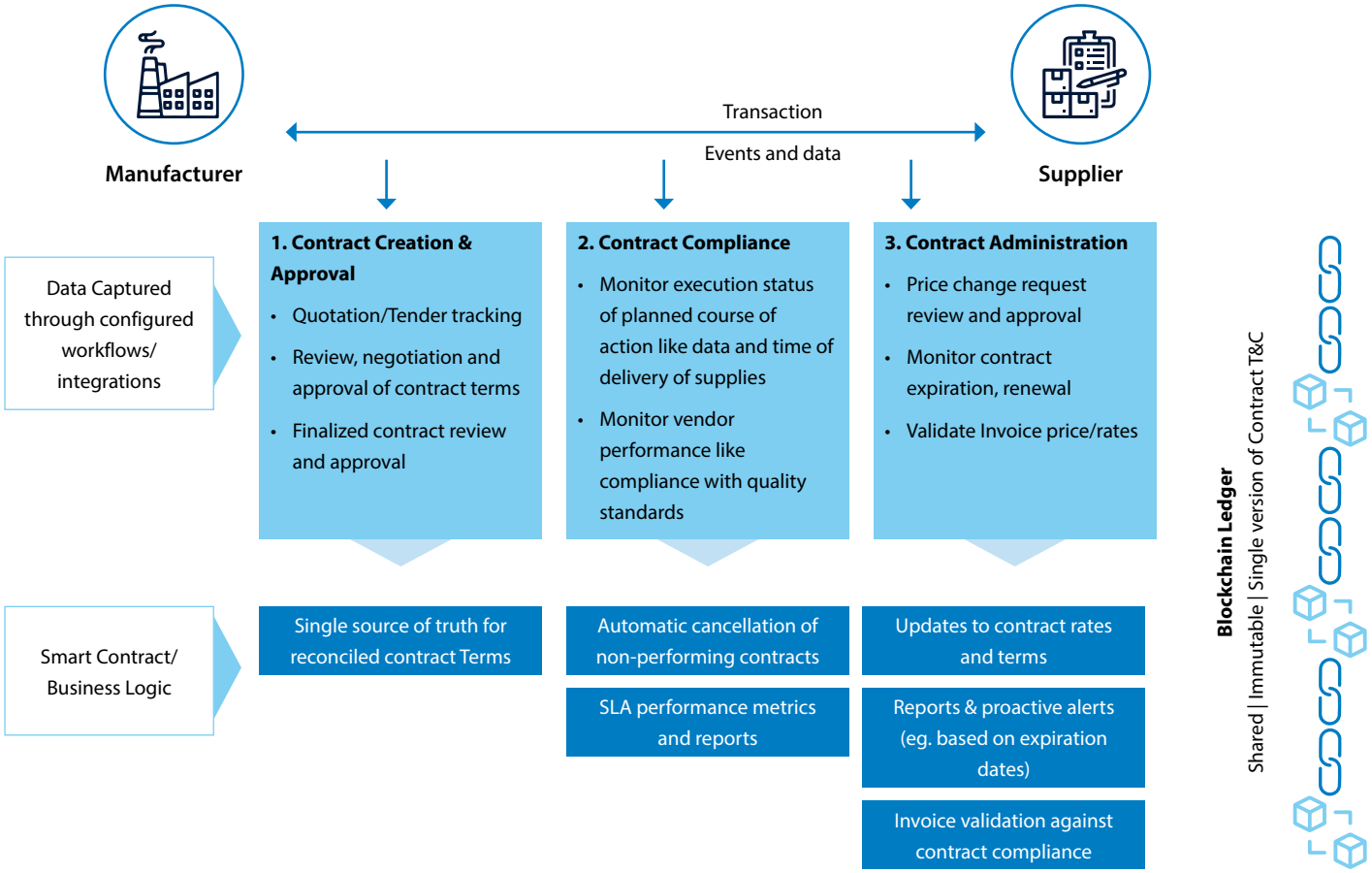
2. Contracts lifecycle management

Blockchain has the potential to usher in value in terms of efficiency and enhanced control when applied across different processes under the contract lifecycle. The applications include:

- **Seamless creation process:** Creating contracts using Blockchain helps seamlessly manage the process of contract review, negotiation, and approval. The technology creates a single source of truth by storing the mutually agreed upon contract terms in an immutable ledger.
- **Automated compliance monitoring:** Blockchain helps in maintaining the evidence of a supplier's adherence to contract terms and helps meet quality standards and safety guidelines. Invoices can be automatically generated by referring to the appropriate version of the digitized contractual terms and delivery fulfillment data on the same Blockchain network.
- **Smarter administration:** Blockchain allows seamless management of contract updates through smart contracts that trigger actions and alerts based on pre-defined conditions.



3. Know your supplier (KYS)

A Blockchain-based decentralized supplier network enables faster and more efficient exchange of information between issuers, holders, and verifiers of supplier credentials, enabling easy onboarding and verification of suppliers.

- **Efficient management of credentials:** With Blockchain, the exchange of credentials between stakeholders can occur in a secure peer-to-peer manner that prevents inadvertent exposure of information in the public domain.
- **Verification of credentials** happens through the same network, helping reduce the cost of supplier onboarding and enhancing trust through improved visibility and proof of process protocols between organizations and suppliers.

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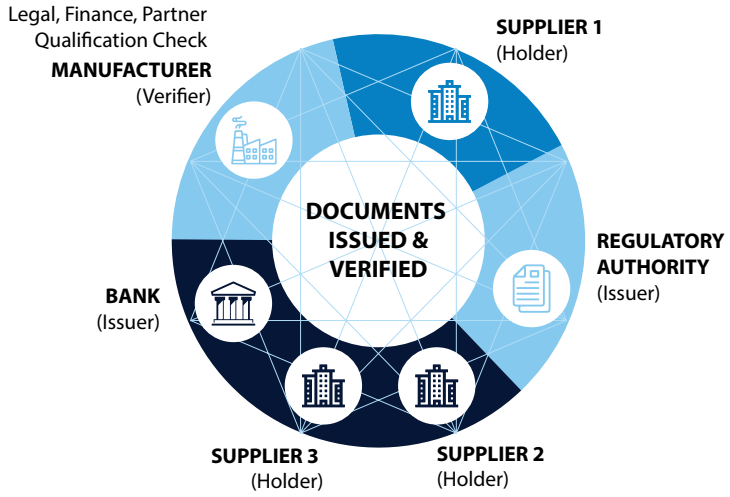

PEER TO PEER INFORMATION FLOW

1. Issuer issues, amends, or revokes credential to holder
2. Holder shares credentials with verifier for background verification through the network

INFORMATION FLOW ON NETWORK

1. Issuer logs digital signature for issued credentials
2. Issuer revokes/amends document and signs change
3. Verifier requests holder for consent
4. Holder provides consent to verify
5. Verifier verifies integrity, status, authenticity on network

Reaping the benefits, realizing the potential

By empowering procure-to-pay processes with the emerging ttechnologies such as Blockchain, IoT, Digital Twin,, organizations can reduce conflicts through the prompt availability of information across stakeholders, the enablement of real-time audits, and the reconciliation of data exchanged between various partners. Additional benefits in terms of cost and time savings, as well as process improvements, are summarized in the table below.

	Cost Savings	Improved Lead Time	Other Qualitative Benefits
Procure-to-Pay			
Purchase Order Management	↓ Losses due to Over/Under Purchasing	↓ Purchase Cycle Time	✓ Improved Forecasting
Inventory Visibility	↓ Stock Outs ↓ Inventory Holding Costs	↓ Procurement cycle	
Shipment Tracking	↓ Redundant Documentation ↓ Losses Due to Fraud and Error	↓ Shipment Delays ↓ % Variation to Indicated Lead Time	
QA Check/Certification	↓ Compliance Cost	↓ Verification Time	✓ Improved trust due to Immutable Certifications
Invoice Reconciliation	↓ Effort for Invoice Recon. ✓ Improved Cash Flow	↓ Lost/Misplaced/Duplicate Invoices ↓ Payment Cycle Time	
Integrated Chain of Custody	✓ Improved Inventory Management ↓ Risk of Counterfeits	↓ Reduced Recon Efforts	✓ Proof of Sustainable Sourcing
Contracts Management	↓ Manual, Paper-based Efforts ↓ Conflict Resolution Cost	↓ Contract Lifecycle Time ✓ Faster Multi Party Recon.	✓ Proof of Process Compliance with SLAs
Know Your Supplier	↓ Audit Costs	↓ Supplier Onboarding Time	✓ Improved Trust in Supplier Performance Metrics

The procurement space, prone as it is to human error, stands to benefit greatly from technology solutions designed to bring in greater efficiencies across key business functions.. With an already proven ability to transform various operations, Blockchain has immense untapped potential for delivering significant value as business problems are not unique (they are very much common), but they are being addressed via a different approach.

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About the Authors

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Amit has over 20 years of diverse experience across Business Strategy, Product Management, Solution Consulting & Delivery Management. He is currently responsible for delivering blockchain-powered digital innovations to clients in multiple industries viz Manufacturing, Retail/CPG, Logistics, Government Services, Ed-Tech & Hi-Tech. In past, he has led Product Management & Strategy functions for Infosys' Finacle digital banking solutions and consulted banks globally. He has often presented at academia and industry events.

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