BY CHAINFLUX

BLOCKCHAIN FOR GOLD TRADE

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A Blockchain platform for Gold

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Understanding Blockchain

Introduction

- A Blockchain is a group or “Block” of any transaction that is stored in a “Chain” as a sequence of events.
- Blockchain can securely record, share information about anything that has value –money, IP, land. Blockchain solves for 3 C’s –Coordination, Commitment, Control.
- As per the Dea report, a gold spot exchange is to be created in India - ?Development of regulated electronic spot exchanges both for agricultural and non-agricultural commodities like gold, silver, base metals, energy products for better price discovery” - https://dea.gov.in/sites/default/files/ReportCommodityDerivativeMarkets042018.pdf
- As per the Niti Aayog report, ”Make in India”, “Financialization”, “Gold board in India”, and “Bullion exchange” are the key drivers to a new gold policy in India.
- We are proposing to use Blockchain as a technology to facilitate bringing about the new gold policy through a traceability, bullion exchange, and spot exchange platform.

Problems Blockchain can address in the gold industry

- **Reducing imports:** Reducing imports and enco uraging local sourcing requires stringent quality standards. This can be achieved through a **Blockchain based traceability solution** that certifies and guarantees the quality of gold.

- **Financialization of gold:** As per the Niti Aayog paper, creating schemes such as the GSA could facilitate bringing in gold from the household into circulation and a bullion exchange would create a trusted ecosystem for trading gold; We're proposing a **blockchain based bullion trading platform for banks.**

- **For consumers:** As per the Pahle report on "A gold Policy in India", for consumer protection, a transparent price discovery mechanism, securitization of gold and encouraging new financial products on gold would help increase bringing in legacy gold into the system. This makes a case for **e-gold built on bl ockchain** that would facilitate easy e -gold conversion, trade, creating financial products, and settlement.

KEY BENEFITS OF A BLOCKCHAIN

TRUST AND TRACEABILITY

Blockchain enables “automated trust”, sharing sensitive data and seeing who has viewed, and who has modified the data. **This enables full traceability.**

SMART CONTRACTS

- Blockchain smart contracts enable **automation of record keeping and record sharing** .
- This means no more hundreds of pages of manual contracts, no more reconciliation of invoices/goods receivables, no more manual signatures.

DATA VALIDITY

- Dat a stored on a Blockchain cannot be tampered or changed.
- Digital certificates, digital signatures, tracing the history of a product before purchasing – all of this can be done on a Blockchain based platform.

Blockchain traceability solution for Gold

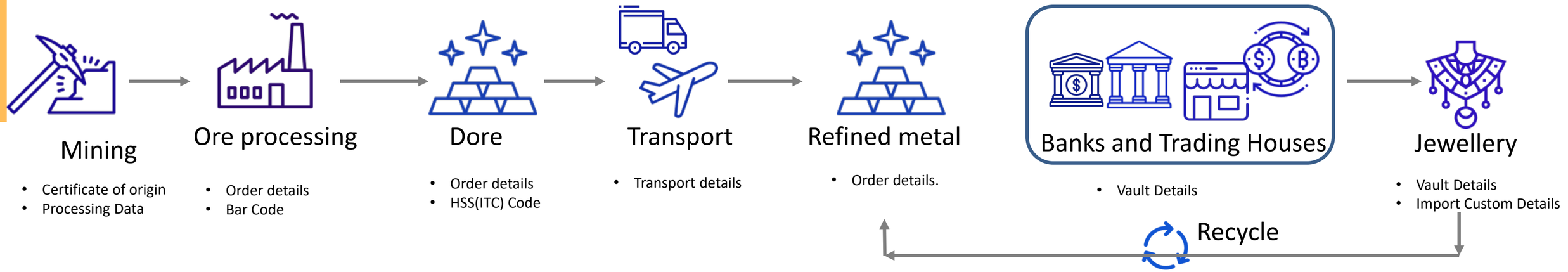
Making a case for a blockchain based traceability solution

- Currently, Indian banks can only source from MMTC locally due to LBMA certified bars. RBI is looking to open the market to other refiners, but systems have not yet been put in place for it - https://economictimes.indiatimes.com/news/economy/policy/proposal-to-allow-banks-to-buy-gold-from-local-refiners-discussed/articleshow/68756192.cms

- As per the Niti Aayog report on revamping the gold industry in India, encouraging "Make in India" in gold would increase local sourcing and increase exports. In order for increased exports – mining, recycling, refining should be done as per "Indian Delivery Standards". Creating and implementing these standards could be done by an independent advisory body and a single representative body.

- Blockchain as a technology would enable facilitating this process.

Blockchain platform for Banks



Mining
- Certificate of origin
- Processing Data

Ore processing
- Order details
- Bar Code

Dore
- Order details
- HSS(ITC) Code

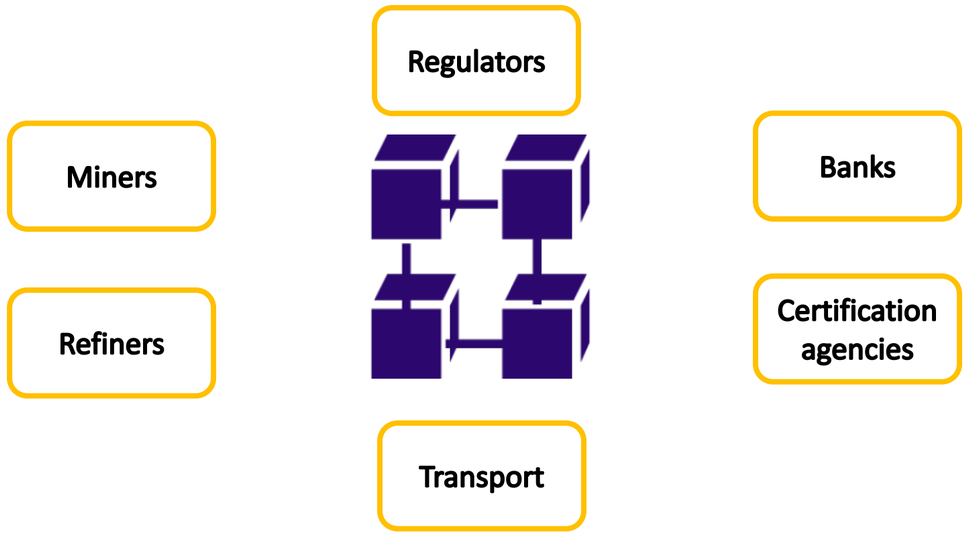
Transport
- Transport details

Refined metal
- Order details.

Banks and Trading Houses
- Vault Details

Jewellery
- Vault Details
- Import Custom Details

Blockchain Traceability solution				
	• Match Supply order, Invoice, Shipment • Quality check against specification • Pay Supplier	• Match Certificate of origin • Shipment Data • Equipment Number • Pay Supplier	• Match Supply order, Invoice, Shipment • Quality check against the specification • Vault Details • Pay Supplier	• Trace the scrap metal data on recycle • Pay Supplier



- Each party is a node in the network.
- Each party can validate all transactions that happen from the point of mining the gold.
- Real time information on gold production, Dore exports, Refined metal exports can be seen.
- Traceability of refined metals can be easily determined.

Blockchain based Bullion trading platform for Gold

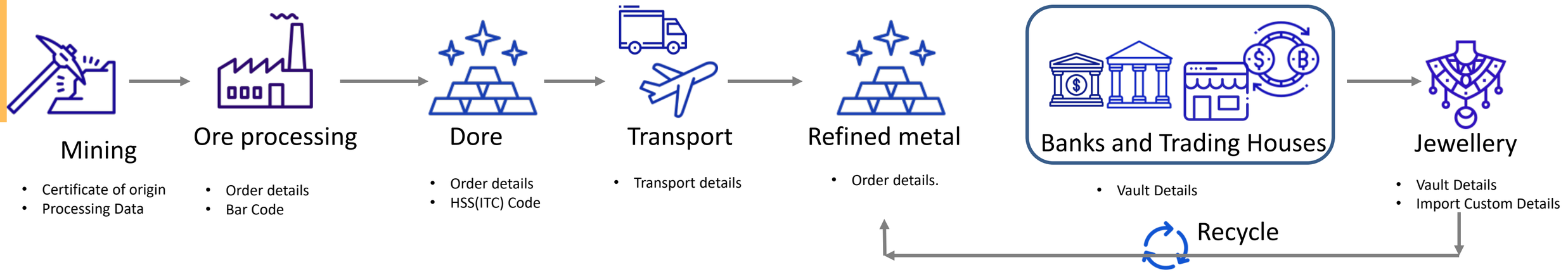
Making a case for a blockchain based bullion platform for Banks

- As per the IGPC, Bullion banking would enable banks to source locally, finance bullion and refining businesses, finance refineries to import dore , hedge their position on Indian exchanges, and create gold backed products.

- As per the WGC, Bullion banking and spot exchanges would benefit consumers and small jewelers.

- As per the Pahle report, encouraging the formation of specialized institutions such as Bullion banks that deal only with gold would help converting gold from an unproductive asset to a productive financial asset.

Blockchain platform for Banks



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Regulators **Miners** **Refiners** **Banks** **Transport** **Certification agencies**

Regulators

Vaults **Traders**

Exporters

- A Blockchain based Bullion trading platform built for banks will be on top of the traceability solution.
- Data from the traceability solution will feed into the bullion trading platform, and Banks can use this data to trade, to create credit scores for refiners, to lend to refiners, to enable trade financing for dore exports.

Blockchain based spot exchange for Gold

Making a case for a blockchain based spot exchange for gold

Spot exchange for Gold:

- The government proposes to setup a single spot exchange for gold and it forms a part of the FY19 budget of the central government - https://economictimes.indiatimes.com/markets/commodities/news/india-to-set-up-gold-board-for-spot-exchanges/articleshow/68589664.cms.

- As per the WGC report, a spot exchange would enable better price discovery, reduce settlement time and formalize parts of the gold market - http://ficci.in/spdocument/20514/Gold%20Report%20%20final.pdf.

Blockchain based spot exchange:

- A Blockchain based spot exchange combines traceability, efficiency, and data privacy on a single shared distributed ledger.
- Removes middlemen from every transaction, hence automated clearing and settlement.
- Local data control.
- Enables building applications on top of the core Blockchain platform such as working capital financing, creating gold financial products such as the GSA.

BREAKING THE MYTHS

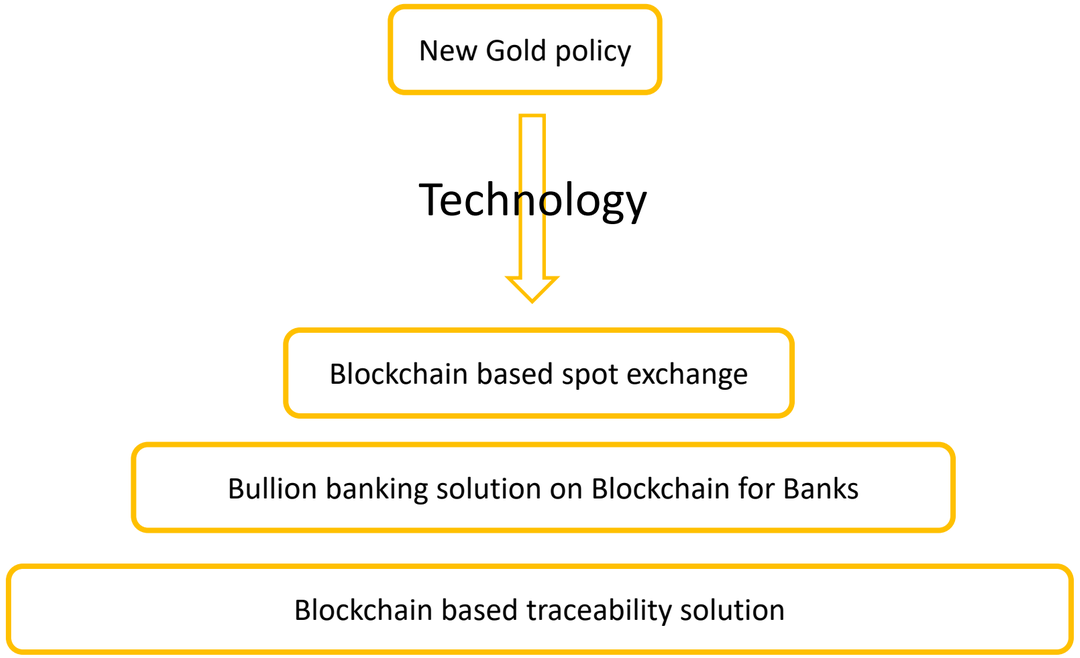
- **Scalability:** New Blockchain platforms, Scaling solutions using side -chains solves for this issue.
- **Hosting:** The Blockchain node can be hosted on any on - site or cloud based server.
- **Security:** Blockchains are the most secure databases in the world. Once data is written onto the Blockchain, it cannot be changed or erased.
- **Speed:** Blockchain platforms are arriving at faster speeds due to sidechains and dPoS (over 4000tps).
- **Data size:** Data size can get very large, but whatever data is not needed by a node, it can simply be “not stored”.
- **Transparency:** Not all data can be seen by everyone on a Blockchain. Access controls can be defined to only allow certain data to be visible.

Benefits of this new platform

Stakeholder	Current issues	Blockchain platform
Bank	Possible GST, no source verification	Real time Traceability solution, blockchain smart contracts, minimum physical documentation, helps export bullion due to proper traceability, knowledge sharing amongst banks stopping non-compliant clients having access to any of the banks.
Bullion bank	Source, counter party risk, GST	Real time settlement, traceability, minimum physical documentation, helps export bullion due to proper traceability
Regulator	Spurious bars, fake certificates, otc deals, secure and transparent spot exchange for commodities, limited participation in imports	Traceability solution, blockchain spot exchange.
Retailer	Source verified products, best prices for the product	Spot exchange ensuring price discovery, traceability ensuring source verification, members of the chain do not have to keep security deposit which runs to crores otherwise, no membership fees
Manufacturer	Proving fair trade practices, proving authenticity of gold produced	Increased sales as authenticity of the product is determined
Trader	No efficient price discovery mechanism, hedging risk, getting the best price and ensuring authentic product	Every traded price can be used to derive a VWAP which can be benchmark price, members of the chain do not have to keep security deposit which runs to crores otherwise, no membership fees
Vault/Custodian	Knowledge of source would be limited, tampering of numbers could become a problem.	These can be managed and has greater scope to expand the business without creating sourcing integrity issues.
End customer	Unable to ensure authentic product and best price	Ensuring accurate price discovery and

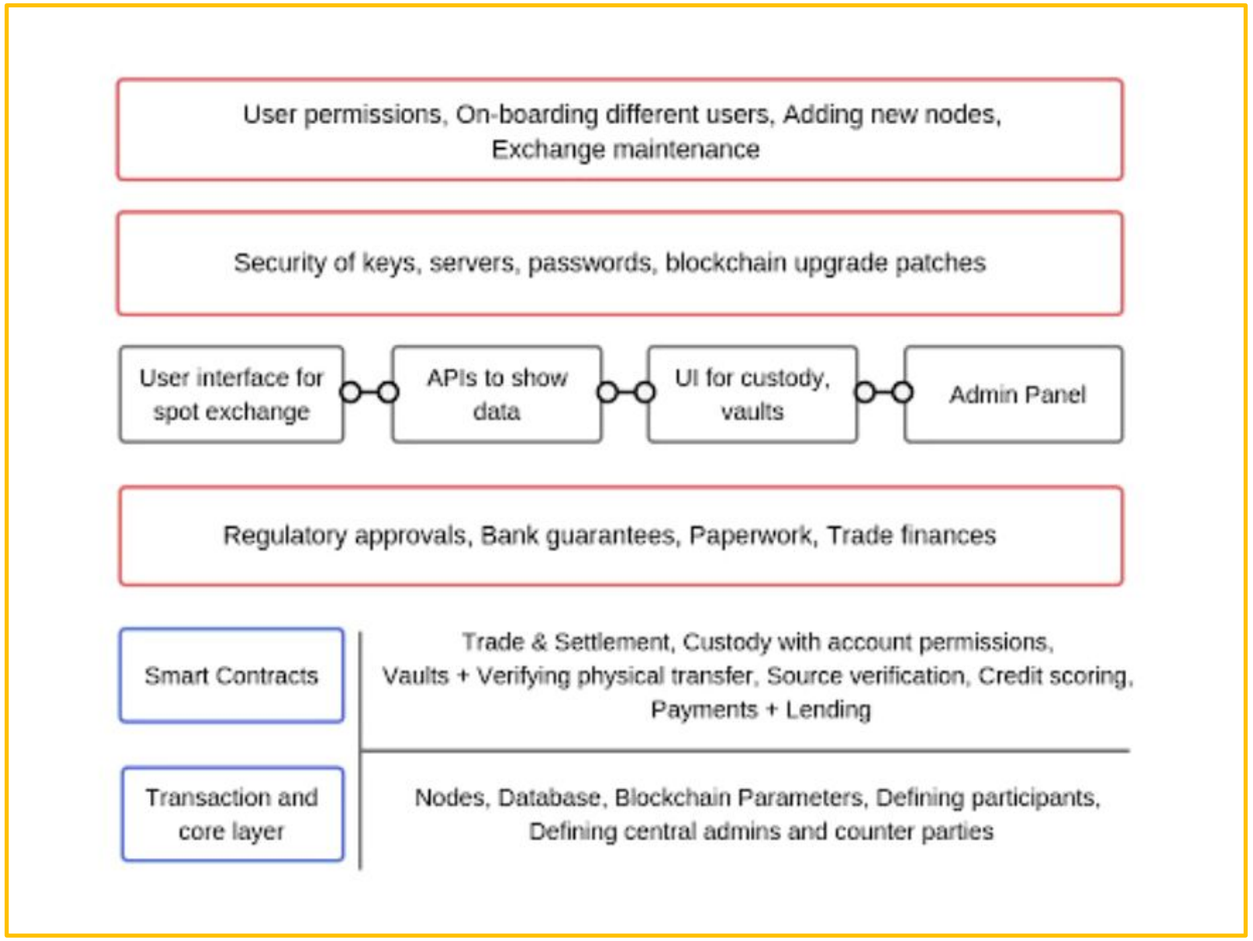
Conclusion

- A new gold policy for India to revamp the gold market ought to be built on technology that would best facilitate bringing about the implementation of the policy.
- Blockchain as a technology would be an enabler towards bringing about an “Indian Delivery Standard” for gold, for creating a bullion platform for Banks, and for increasing recycling of gold from Indian households.
- Blockchain is deemed as the technology that will create the internet 3.0, which handles data privacy, security, and enables full traceability of data that flows across different siloed systems.

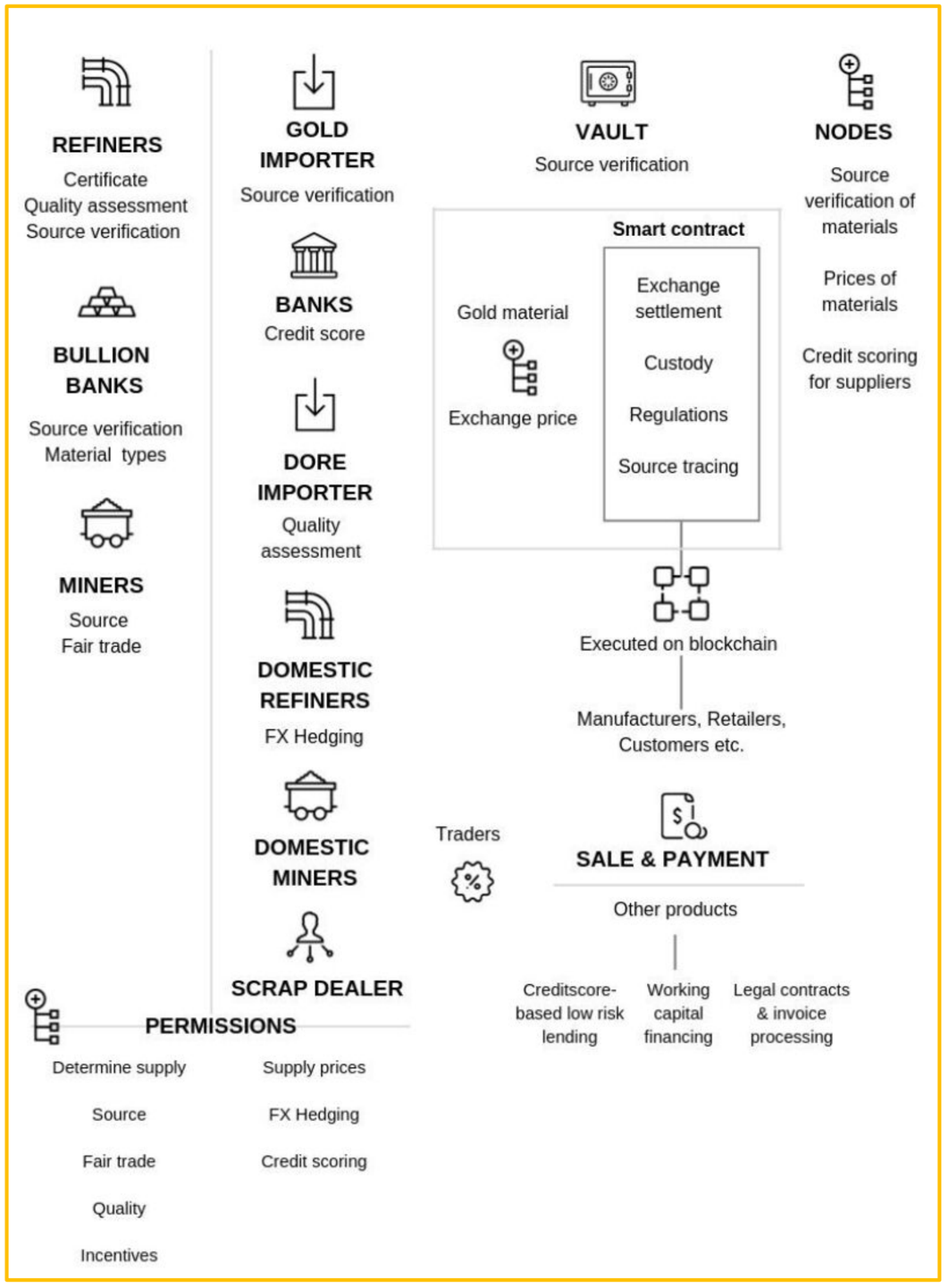


Appendix

How will the Blockchain platform work



- Create a Blockchain private network based on either Ethereum, Hyperledger, EOS, R3Corda.
- Create a shared, secure database as the core blockchain layer.
- Create smart contracts for the trading system.
- Every party in the distributed system is a node, that holds the database of all transactions created on the system.
- Access controls ensures that each party sees only their data, for example, if a bank conducts a gold trade, they will see the confirmation of that particular trade and not the trades of other brokers.
- Standardization: Every material will be assigned an ID, and every trade of that material can be traced in the blockchain, without any party knowing the identity of the other parties (show example of etherscan).
- Liquidity: All trades happen on the exchange, hence growing the liquidity of gold trading.
- Price discovery: All trades happen through smart contracts on the private blockchain network, hence prices are discovered for every material.
- T+2 Settlement: Every trade is instantly settled on a blockchain, hence solving for the time lag in settlement.
- Read our gold whitepaper to see how we have architected such a solution.



Cost Comparison

Type of Cost	Normal trading system	Blockchain trading system
Development	=	+
Maintenance	-	=
Upgrades	=	+
Hosting	=	=
Deployment	=	=
Testing	=	=
Resources required to run the system	=	-
Future-proofing	**-**	**+**
Security	**-**	**+**

Disadvantages of a centralized trading platform

- **Lack of transparency** because of centralization. This leads to lack of trust in the system.
- **High time, effort, monetary cost** of coordination on a different data silos for every party rather than having a shared database.
- **Middlemen** required for clearing and settlement.
- **Data privacy** concerns due to centralized ownership of data.
- Creating a closed system such as a Paytm rather than an open system such as UPI.

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