Blockchain-V

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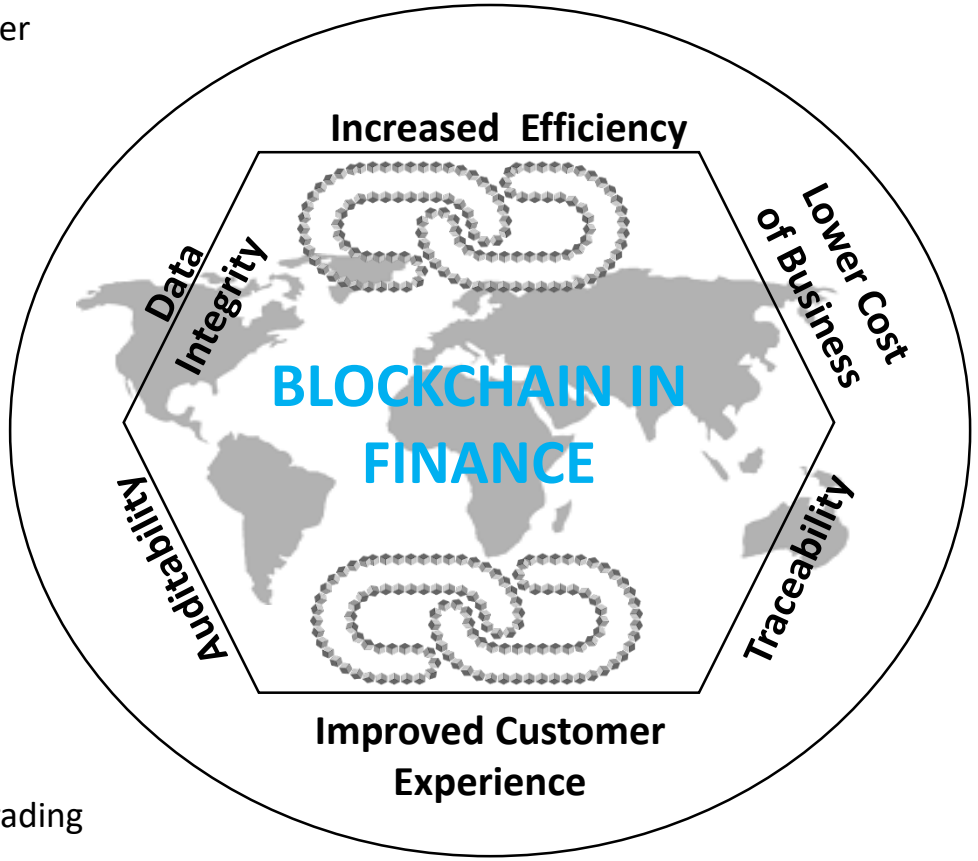
Applications of Blockchain

Challenges in Finance Sector

- Data Integrity:
  - Immutability and Transparency improves data accuracy and security, reduces delays and risk of fraud.
- Increased Efficiency:
  - Using blockchain for data processing and maintaining single version of truth increases efficiency. Ledger is continuously synchronized throughout the network.
- Improved Customer Experience:
  - Sharing permissioned and relevant information allow financial institutions to serve customers better by faster processing.
- Lower cost of Business:
  - Consensus mechanisms and smart contracts automate transfer of funds.
  - Eliminate transaction fees by reducing reliance on third parties.

Potential Blockchain Applications in Finance



Cross-border Payments

Real-time Payments

Know Your Customer and AML/CTF

Core Banking

Regulatory Reporting and Compliance

Banking Services for Crypto

Clearing and Settlement

Secure Data Storage and Sharing

Trade Finance

P2P Finance

Stock Trading

Loans and Insurance

Services for the Unbanked

Potential Blockchain Applications in Finance

- Know Your Customer (KYC):
  - KYC data, once stored, is immutable and transparent resulting in greater operational efficiency, increased trust.
  - Waiting time reduced.

- Cross-border Payments:
  - Financial institutions and banks are adopting blockchain for near-instant cross-border payments with higher security, transparency, reliability, lower cost etc.

- Trade Finance:
  - Participants are banks, shippers, importers, exporters, regulatory bodies, custom officers etc.
  - Verification points at each node on the supply chain, delays and faults are common.
  - Blockchain fosters increased trust and accountability among enterprises, regulators and consumers.
  - Single source of truth to capture receipt of goods, and record the payment transfer.

Potential Blockchain Applications in Finance

- Stock trading:
  - Give every party a say in the validation of a transaction, speed up the settlement process and allow for greater trade accuracy.
  - Transactions can be settled near instantly.

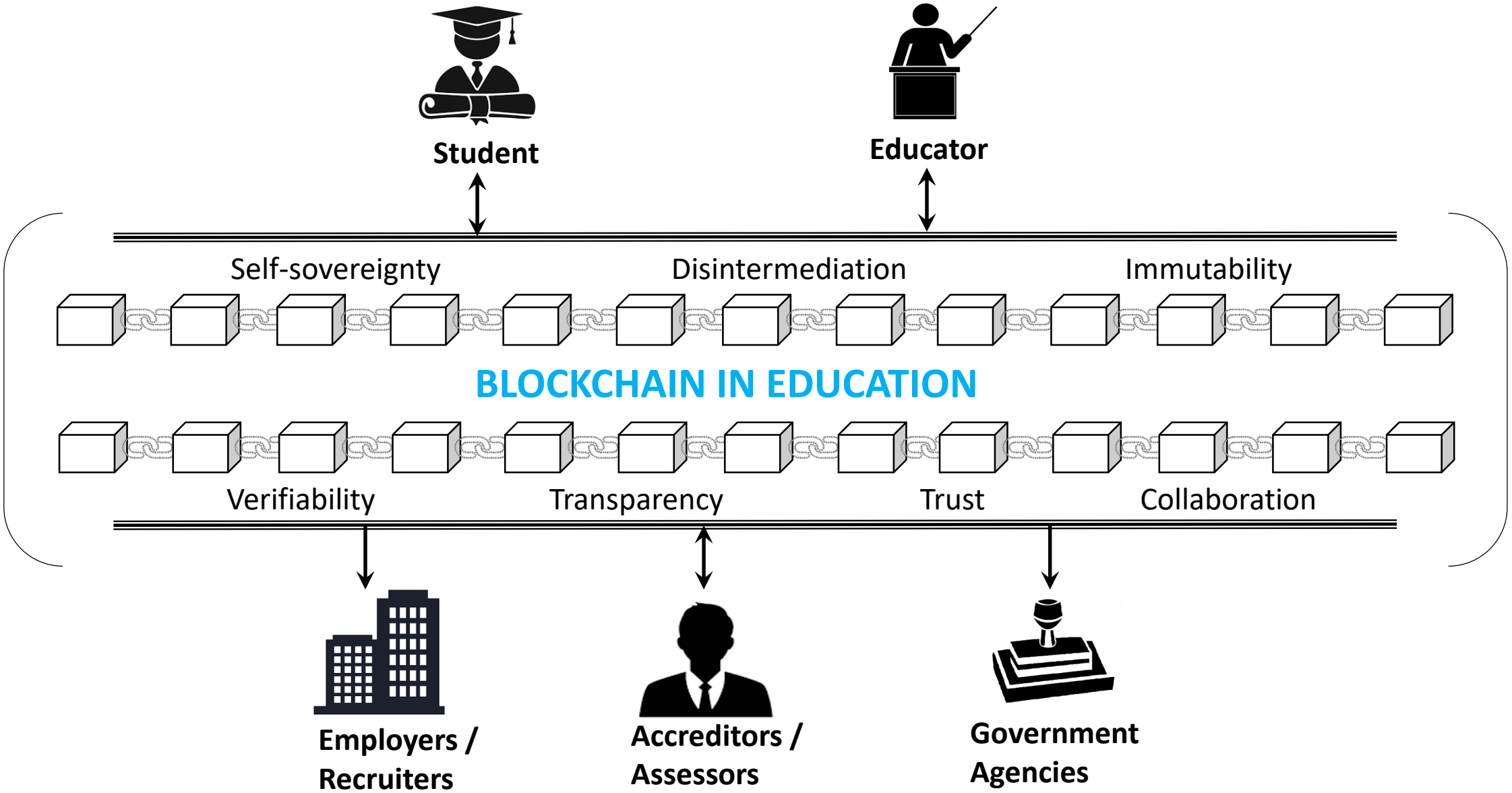
- Insurance:
  - Make the process of sharing data faster and more efficient, creating operational savings.
  - Payment can be automated using smart contracts.
  - Eliminates cost of insurance claims processing, reducing insurance frauds and improving customer satisfaction.

- Mortgages:
  - Property can be tracked directly on the system by the various parties based on access rights provided.
  - Smart contracts implemented to release funds as soon as specific conditions are met.
  - Reduces need for administrative overhead, improves approval turn-around time, faster settlement times and relieves all-round stress.

Challenges in Education

- Self-sovereignty:
  - It is the sovereign right of an individual to keep his identity private.
  - Gives control to students over their educational portfolio and avoid dependency on educational institutes for storing PII (personally identifiable information).
  - A permissioned blockchain based decentralized registration system can provide an individual with an independent ID that is not under any centralized authority and cannot be controlled or interfered with by any third party without the individual's consent.
- Immutability:
  - Transaction records like transcripts, attendance sheets, assessment records and results, certificates, credits, records of achievements are permanently added.
  - Student's certifications and qualifications cannot be faked.
- Transparency and Trust:
  - Data is secured through cryptographic techniques.
  - Enhances the authenticity and strength of certificates/degrees issued.
- Disintermediation and Collaboration:
  - Eliminates the need for central controlling authority, moderates number of player interactions, saves time and cost, promotes collaboration between students, teachers and employers.

Players within the Education Blockchain



Potential Blockchain Applications in Education

- Identity and Student Records:
  - Students have full control of their PII and can share their degrees/certificates directly with prospective employer or institution.
  - Tamper-proof system, saves millions of administrative costs eliminating paper-work and manual labour for degree verification.

- Student Financing:
  - Can improve system for calculating scholarships for students, provide transparent mechanism for funding grants and projects. Through smart contracts, financial aid can be targeted towards personal development.

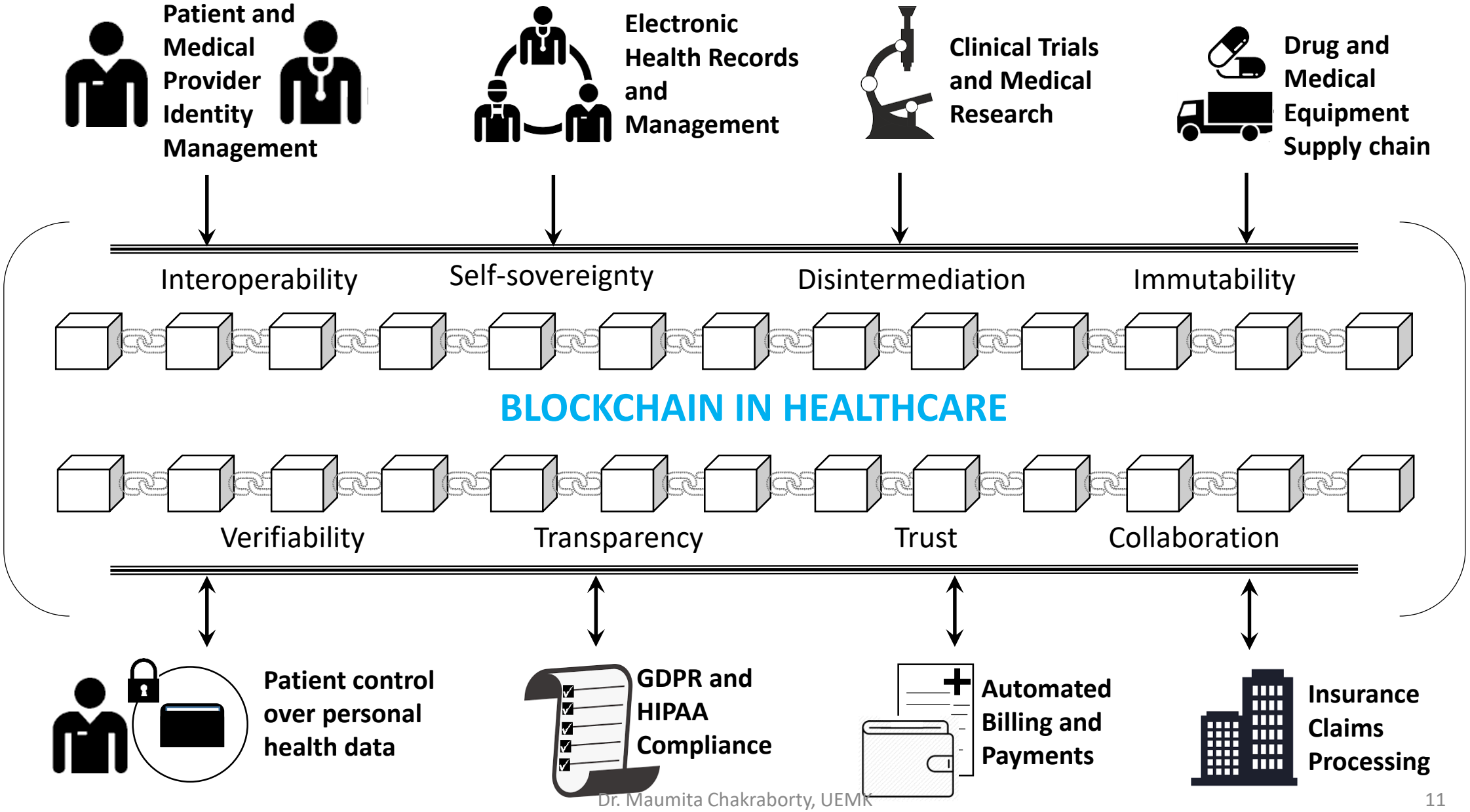
- Verification of Academic Credentials:
  - Tamper-proof verification of education records.

- New Pedagogy:
  - Allow people to access education around the world and without high costs. Performance and immutability of blockchain are used to secure and authenticate formal education qualifications.
  - Model learning: Students can get paid for their time in self-driven tasks powered by smart contracts, thus rewarding mastery-based learning and leading students towards skills needed by employers.

Challenges in Healthcare

- Interoperability:
  - Freely exchanging healthcare information among electronic systems to ensure delivery of high-quality, effective and efficient care to patients.
- Security:
  - Along with immutability and data encryption, via blockchain, one has a full history of who can and has accessed one's data, what was accessed and when was it accessed.
- Accessibility:
  - Quality healthcare means universal accessibility.
  - With blockchain enabled smart contracts, patient or authorized doctor can share patient's electronic health records.
- Integrity:
  - Blockchain, through its distributed technology, can address challenges of synchronizing patient data across multiple, contrasting healthcare information systems.
- Rising Costs:
  - Utilizing immutability of blockchain, meaningful data can be shared across healthcare organizations.
  - Transaction costs can be reduced through blockchain technologies, thus declining overall healthcare costs.

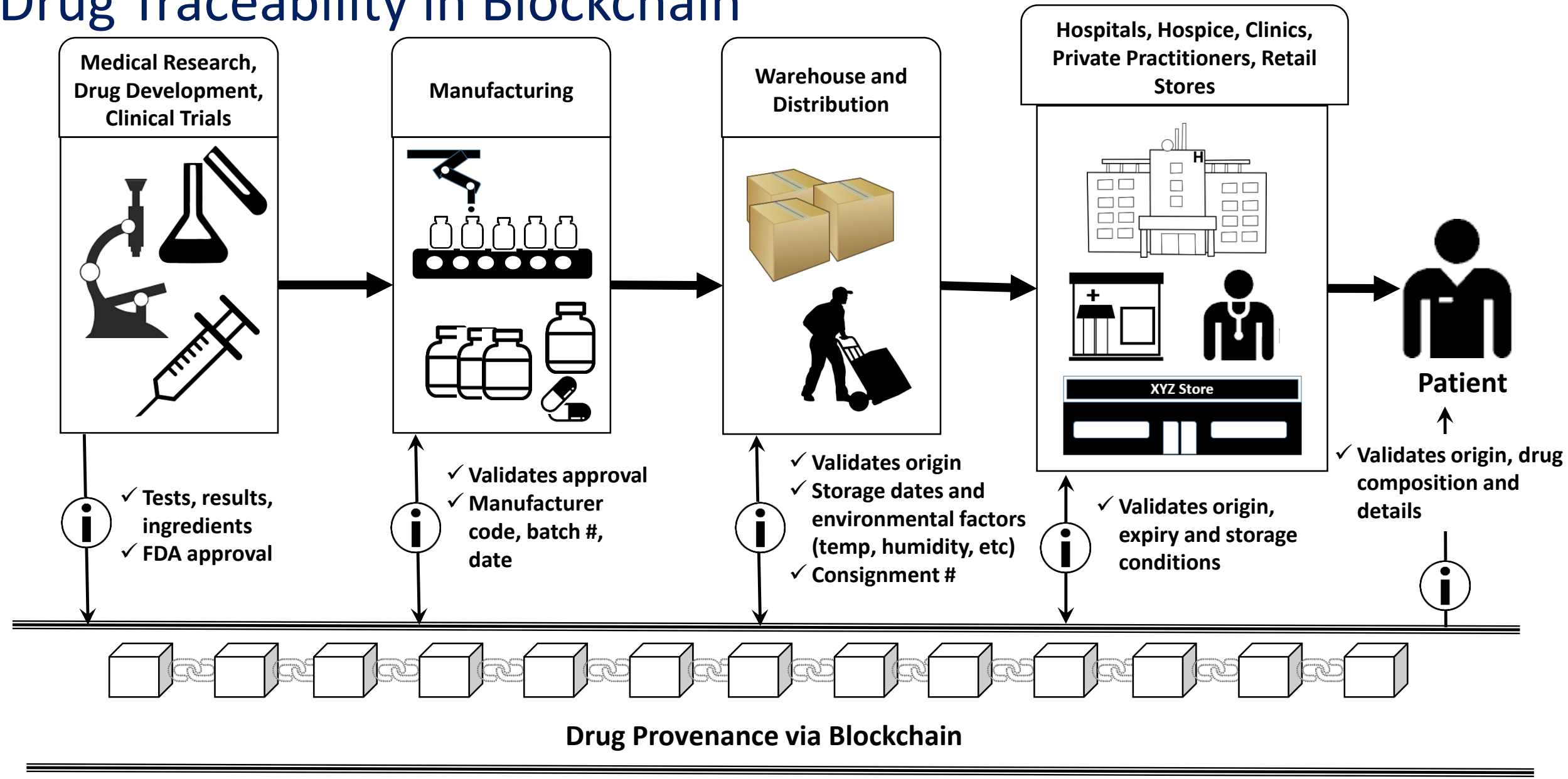
Potential Blockchain Applications in Healthcare



Potential Blockchain Applications in Healthcare

- Health Records Management:
  - With blockchain implementation, members of a private, peer-to-peer network can share the relevant medical information with appropriate viewership permissions, while the original member maintains ownership of the data shared.
- Claims and Billing Management:
  - Blockchain enables smart payment system, automating the workflow and parties can share single copy of contracts and billing-related information.
  - Increases transparency and efficiency, lowering administration costs, processing claims faster and loosing less money.
- Drug Supply Chain Management:
  - With blockchain ensuring data transparency, organizations can track the complete path of origin of a particular drug or product, thus reducing circulation of fake drugs.
- Patient and Provider Identity Management:
  - With a combination of decentralized blockchain protocol and a comprehensive system for verifying identity, a unique digital ID can be created for each online user (patient or provider), that can ascertain the truth of individual identity and prevent identity theft.
- Clinical Trials and Medical Research Management:
  - Blockchain add credibility and authenticity to clinical trials by providing a permanent, valid and immutable ledger of record for all research findings. Can also aid in the funding of clinical studies and research using crypto tokens. Trustless nature of ledger minimize chance of academic frauds and duplication of work.

Drug Traceability in Blockchain



Challenges in Real Estate

- Public Record keeping:
  - As data stored on the blockchain is secure, immutable, and can be made public, it becomes the perfect platform to record property sales and leasing transactions.

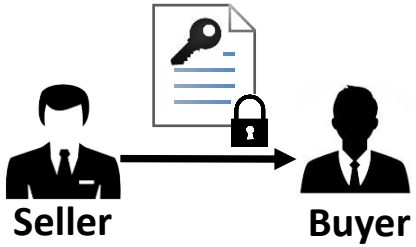
- Trust is a must:
  - Every transaction can be verified.
  - Risks associated with fraud, abuse and manipulation of transactions are mitigated.

- Near real-time:
  - Blockchain provides a platform that can contain leasing transaction data that is open, shared and immutable, which enhance data quality and also enhance real-time recording and retrieval.
  - Enables near real-time settlement of payment transactions, thus reducing friction and risk during rental and buying process.

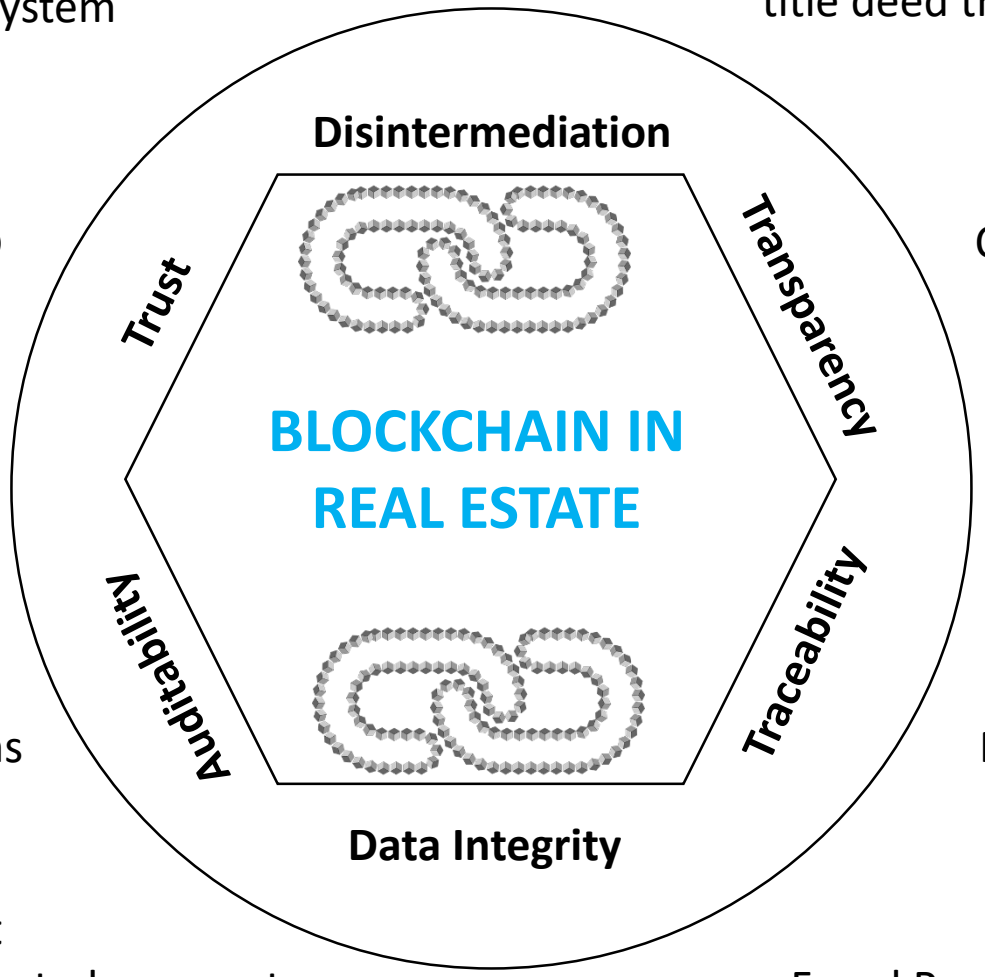
Potential Blockchain Applications in RE Sector

Multiple Listing System

Frictionless and transparent title deed transfer



Property Ownership Traceability



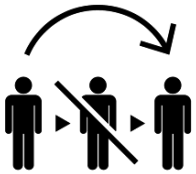
Crowd funded RE Investments

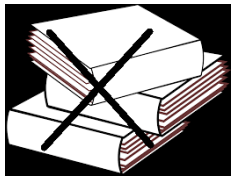
Smart Contract enabled lease agreements

Tokenization of properties

Paperless and near real-time transactions

P2P mortgage / lending





Smart contract enabled automated payments (rental, commissions, etc.)

Fraud Prevention on titles, mortgages and wire fraud

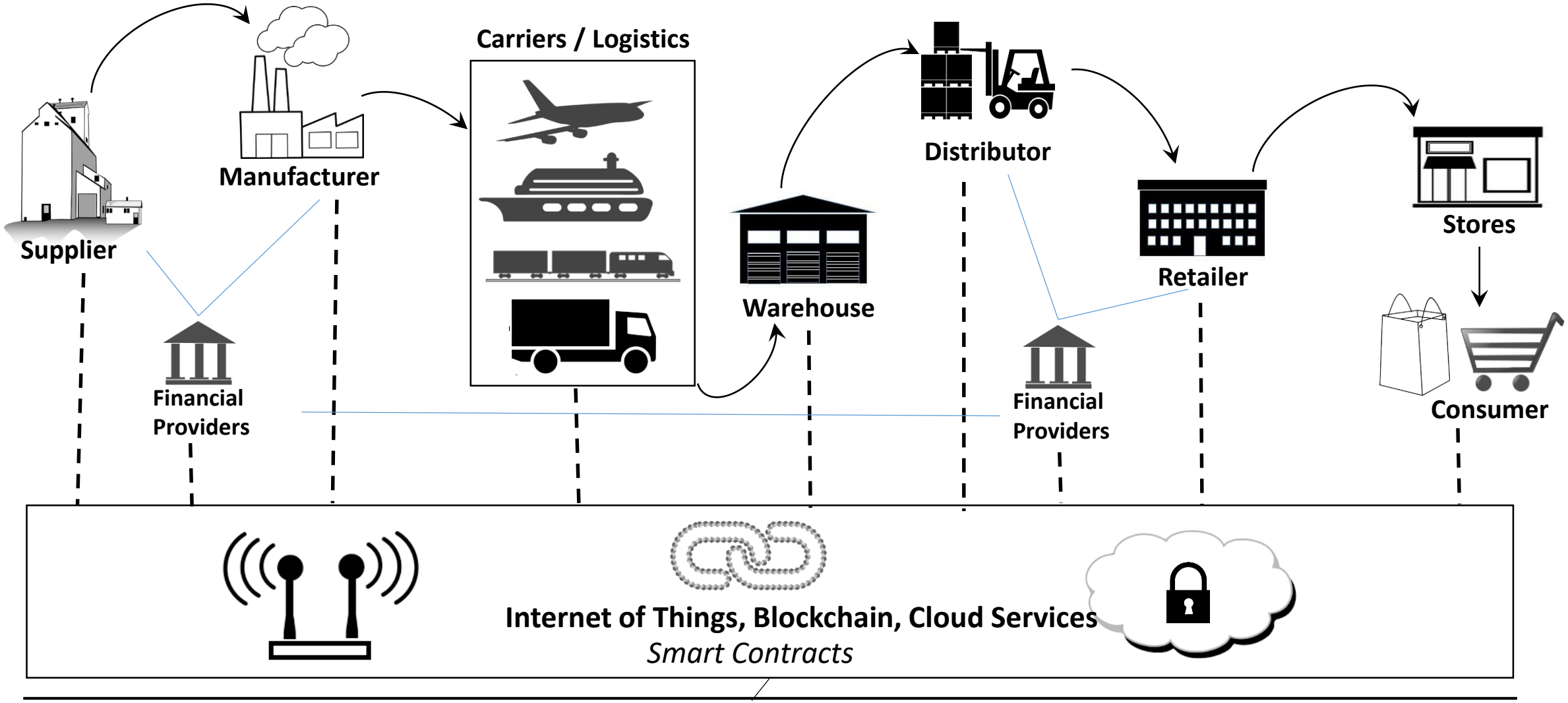
Potential Blockchain Applications in Real Estates

- Property Listings:
  - Using blockchain ledger will provide a more precise and accurate view of the property enabling faster decision-making and also save time.
  - Will open up the access to all available property for anyone to view.
- Tokenization of properties:
  - Property-owners can issue blockchain-based tokens, which represent shares in an asset.
  - Blockchain leverages the advantages of real-estate investing and mitigate high costs, inaccessibility etc.
- Frictionless transactions:
  - Execution of a legal transaction can be algorithmically encoded so that it happens almost instantaneously.
- Peer-to-peer mortgages:
  - A peer-to-peer blockchain-based mortgage system can enable a lender and borrower to transact directly with each other, helping those who are unbanked and reducing costs.
  - Smart contracts can execute deals and facilitate payments.
  - Transparency and trust promotes confidence between borrowers, lenders and sellers and also provide check on fraudulent activities.
- Smart Contract Property Management:
  - Smart contract digitally transfers funds from the tenant's account to the property owner's account.
  - Data fed into blockchain from IoT devices that transparently record energy, utilities etc.

Challenges in Supply Chain

- Provenance Tracking:
  - Blockchain can hold complete provenance details of each component, which can be accessed by each manufacturer in the production process, including owners, producers, maintainers and government regulators.
- High Costs:
  - Real-time tracking of a product in supply chain via blockchain reduces overall costs of moving items, and enables better tracking, monitoring and recording, avoidance of delays, faster payments and settlements, better inventory control etc.
- Trust Issues:
  - No single authority controls the provenance information which increases trust. Frauds and corruption can also be easily detected.
- Process and Time delays:
  - Product transactions are time-stamped and can be tracked from the point of origin. Reduction in time taken to diagnose and remedy a fault, improving system utilization.

Benefits of Blockchain in Supply Chain Management



Provenance Tracking

Auditability and Compliance

Prevent delays, human errors and counterfeit products

Automated demand planning and forecasting

Near-time Payments and Settlements

Data Analytics

Food Safety

Benefits of Blockchain in Supply Chain Management

- Supply Chain Financing:
  - Financing: process that links buyers and suppliers with financial service providers like banks to unlock the working capital for both the buyer and the seller.
  - Blockchain simplifies the process by providing a single source of truth such as purchase order receipt and approval, invoice receipt and approval, inventory delivery and quality control.
  - With transparency, immutability and authentication measures, there is an inherent trust between buyer, supplier and financial institutions.
  - Blockchain-based supply chain via smart contracts can automate transactions and payments including refunds for damaged or delayed goods.

- Blockchain logistics:
  - Logistics: part of supply chain process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services, and related information between point of origin and point of consumption in order to meet the customers' requirements.
  - Blockchain brings efficiencies through improved data sharing, permission-based transparency, disintermediation and collaboration between partners.
  - Complex processes can be streamlined , by automating them and making them error-free.
  - Visibility and predictability can provide time-bound services leading to cheaper rates and customer satisfaction.

Benefits of Blockchain in Supply Chain Management

- Supply Chain Traceability:
  - Blockchain allows each player in the supply chain to generate and securely share data points that create an accountable and traceable system.
  - Record of a product's journey, from origin to destination, can be made available to monitor in real-time.

- Food Safety:
  - Global food chain consists of a network of farmers, distributors, wholesalers, retailer, warehouses, factories, shopkeepers etc.
  - Blockchain improves traceability in this massive amount of information flow.
  - Using blockchain, retailers can easily identify and remove contaminated food and the point of contamination can also be identified to ensure non-recurrence.

Blockchain and IoT

- Union of the two technologies can provide following benefits:
  - Shared Platform:
    - With smart devices communicating with each other on a ledger-based platform, operating on preset smart contracts, we can get a fully decentralized reliable digital infrastructure.
  - Build Trust:
    - IoT is all about storing, sharing, exchanging, analysing and monetizing of data.
    - Blockchain can make IoT device data tamper-proof.
    - Combination of secure IoT devices and blockchain introduces a real-verifiable source of IoT data, which can be trusted upon.
  - Reduce costs:
    - IoT can benefit from the reduction of the high infrastructure and maintenance costs associated with traditional centralized model and improve efficiencies.

Thank You