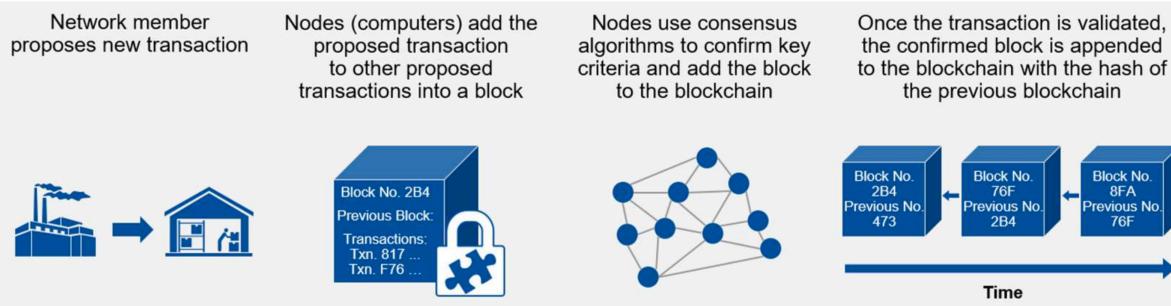


Blockchain Analytics in Financial Services

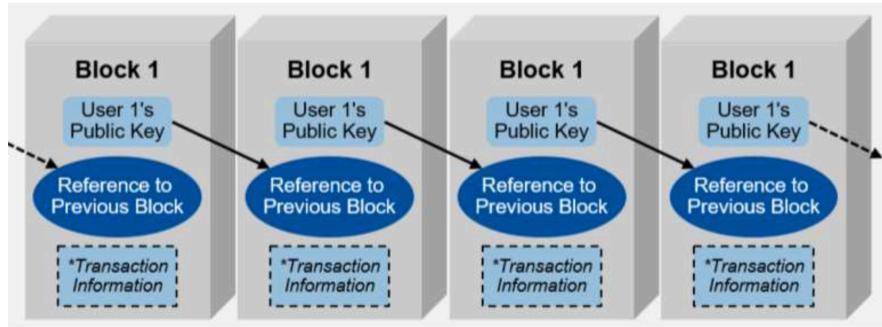
Dr. Vishwanath Rao

How Does Blockchain Work?

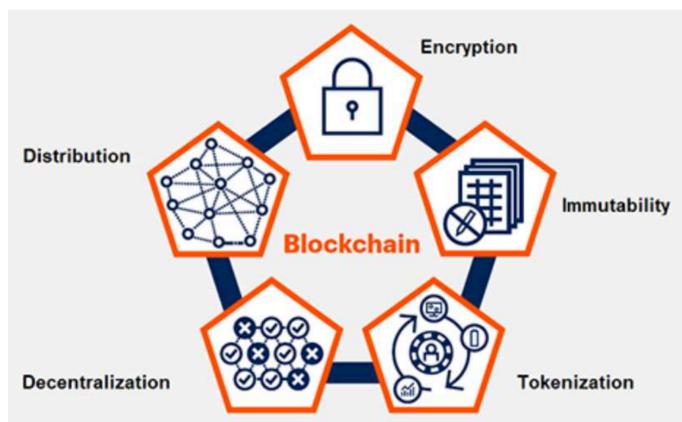


Blockchain Transactions

Source: Gartner



Blockchain has five elements



1. **Distribution:** Blockchain participants are located physically apart from each other and are connected on a network
2. **Encryption:** Blockchain uses technologies such as public and private keys to record the data in the blocks securely and semi-anonymously
3. **Immutability:** Completed transactions are cryptographically signed, time-stamped and sequentially added to the ledger
4. **Tokenization:** Transactions and other interactions in a blockchain involve the secure exchange of value
5. **Decentralization:** Both network information and the rules for how the network operates are maintained by nodes on the distributed network due to a consensus mechanism

Spectrum of Blockchains

Permissioned vs. Permissionless: Who can write to a Blockchain (i.e., accessibility)

Public vs. Private: Who can read from a Blockchain (i.e., visibility)



Blockchain Strengths, Weaknesses, Opportunities and Threats (SWOT)

Strengths	Weaknesses
<ul style="list-style-type: none"> Distributed resilience and control Decentralized network Open source Security and modern cryptography Asset provenance Native asset creation Dynamic and fluid value exchange 	<ul style="list-style-type: none"> Lack of ledger interoperability Customer unfamiliarity and poor user experience Lack of intraledger and interledger governance Lack of hardened/tested technology Limitation of smart contract code programming model Wallet and key management Poor tooling and poor developer user experience Skills scarcity and cost Immature scalability Lack of trust in new technology suppliers
Opportunities	Threats
<ul style="list-style-type: none"> Reduced transaction costs Business process acceleration and efficiency Reduced fraud Reduced systemic risk Monetary democratization New business-model enablement Application rationalization and redundancy 	<ul style="list-style-type: none"> Legal jurisdictional barriers Politics and hostile nation-state actors Technology failures Institutional adoption barriers Divergent blockchains Ledger conflicts/competition Poor governance

Source: Gartner

What Are the Critical Issues of The Finance Industry?



Increasing Cyber Attacks



Complicated Regulations Across Territories



Delayed Cross-border Transactions



Low Customer Satisfaction



Poor IT Infrastructure



Problems with Big Data



Payment Frauds and Identity Thefts



Repetitive KYC Procedures

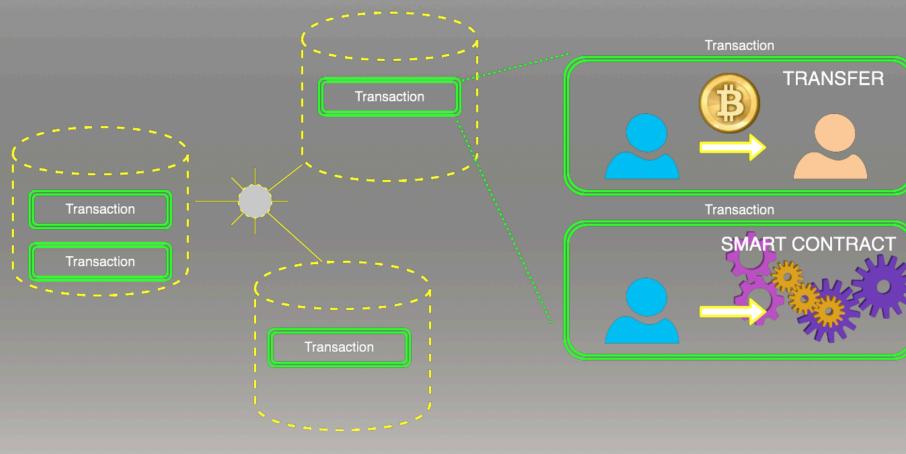


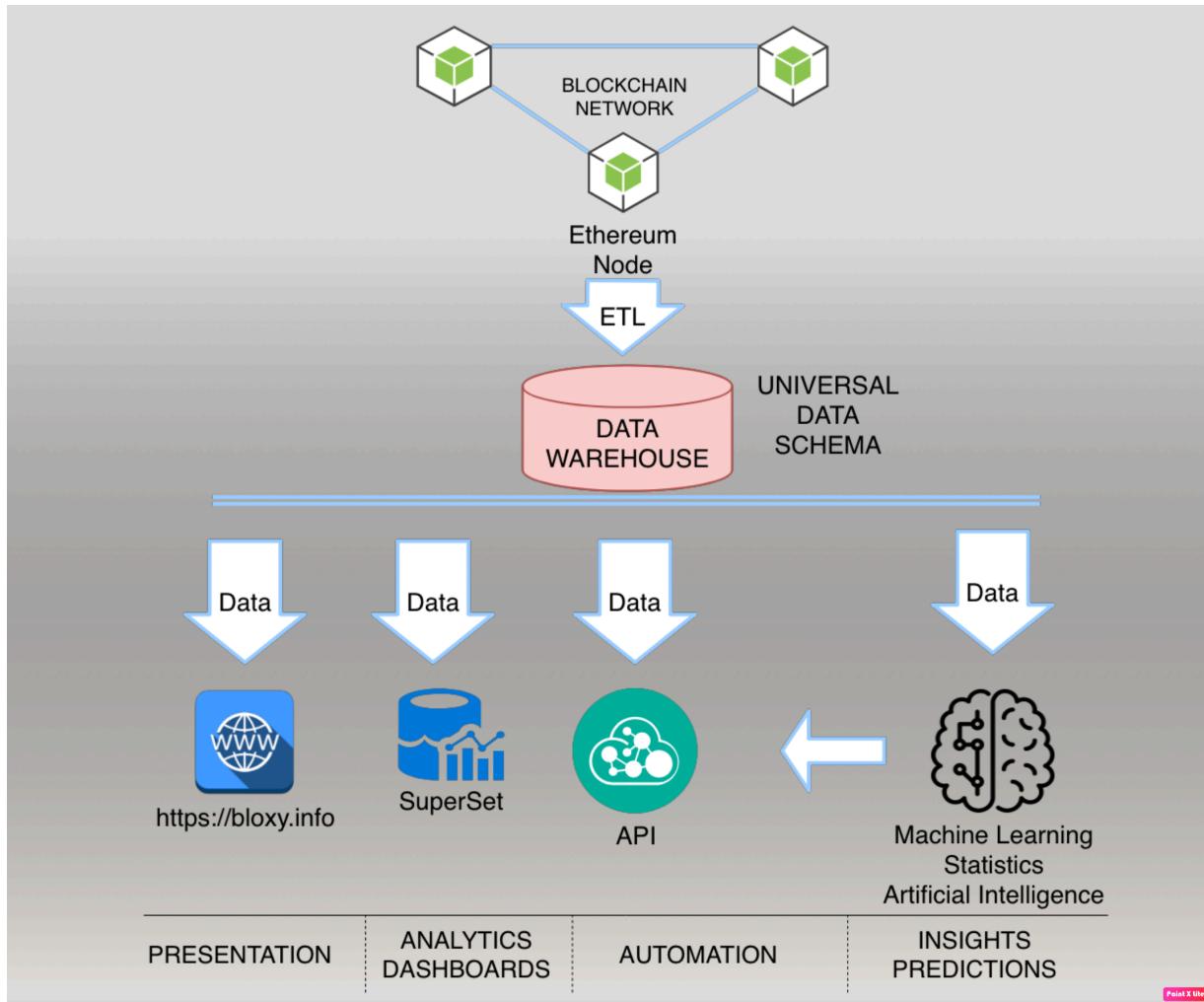
Problems with Big Data

- Data silos create a barrier for financial companies from having a holistic view of organizational data.
- Many companies aren't transparent about the usage of big data to their customers, which creates a lack of trust.
- Most companies don't have the necessary analytical tools to harness the full power of Big Data.



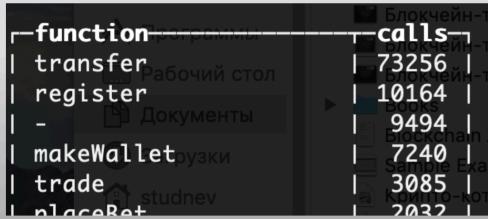
DLT = DISTRIBUTED DATABASE WITH EVENTUAL CONSISTENCY



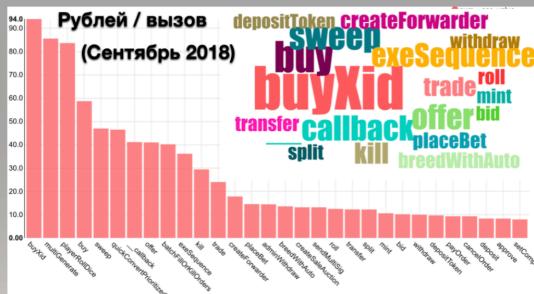


DATA REPRESENTATION TECHNIQUES

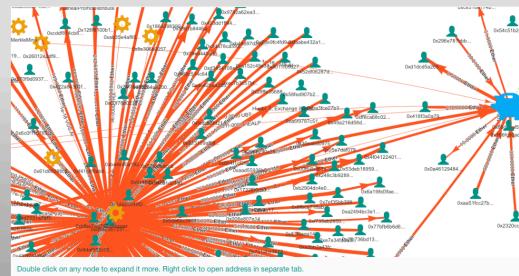
OLAP / SQL



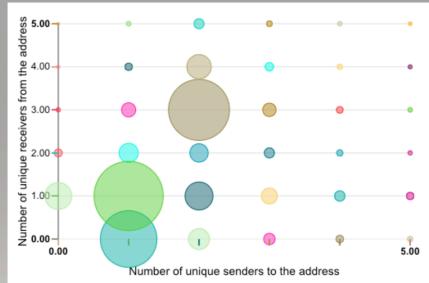
Aggregated Data



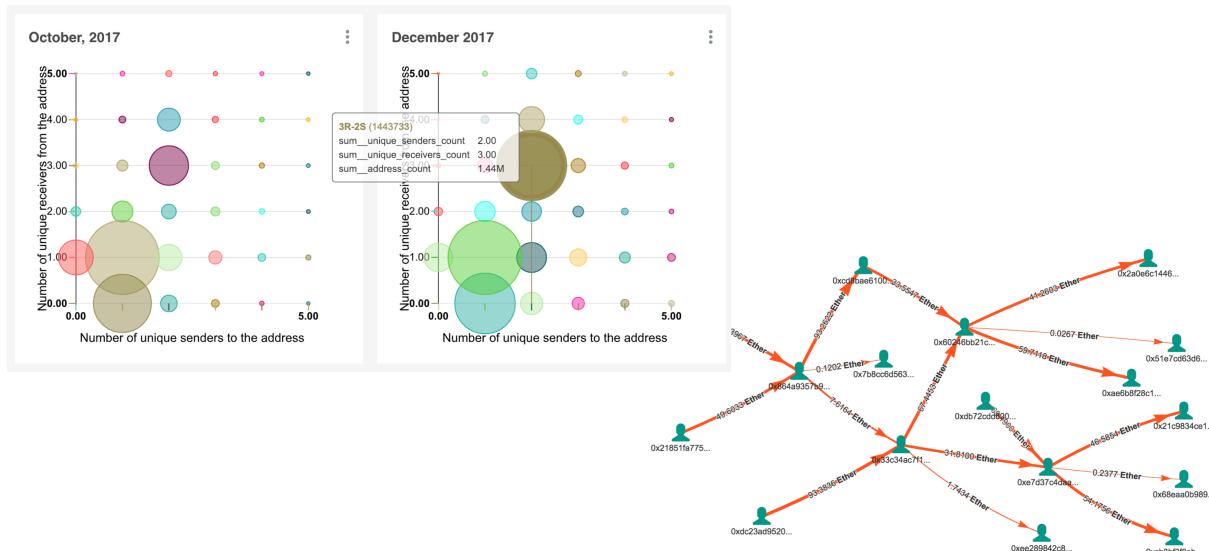
Graphs



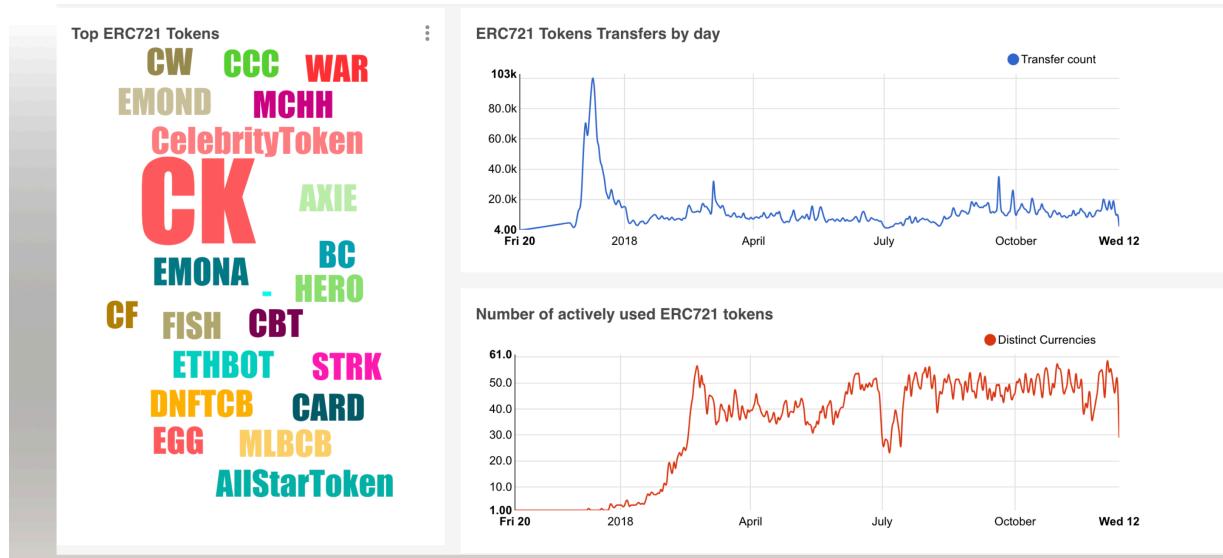
Statistical



Money Mixer (or «Blender»)



CRYPTO KITTIES



Decentralized Exchanges (DEX)

