Blockchain: Impact on Business, Finance, and Accounting

An Information Resource for Professional Accountancy Organizations

To be read in conjunction with the report, *A Vision for the Finance Professional and the Finance Function*

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Overview of this Slide Deck

- Explain the fundamental concepts in blockchain
- Provide a broad overview of developments in blockchain and how it can streamline processes, and change business models in use cases covering
  - Accounting and reporting
  - Financial services
  - Supply chain
- Highlight the potential role of finance and accounting professionals

WHAT IS BLOCKCHAIN?

“A distributed infrastructure technology held collaboratively that enables a decentralized exchange of trusted data. It uses cryptography to allow each participant on the network to manipulate the ledger in a secure way without the need for a central authority.”

- Rajat Kapur, Ernst and Young LLP

Blockchain – Greater Awareness Needed

- Limited understanding of blockchain and its potential among business and finance leaders
- Important to understand how and where it might be applied
- Recent surveys in UK and US suggest:
  - Many non-IT staff do not understand blockchain
  - Few business leaders think their organizations have required skills
  - Many believe blockchain will not become a mainstream enabler of business transformation in 3-5 years
  - Others believe that their company would be at a competitive disadvantage if it failed to adopt blockchain

BLOCKCHAIN DEVELOPMENT PATH

- At experimentation & development phase with proofs of concepts & use cases in finance & supply chain
- Cryptocurrencies are one powerful application of blockchain but has potentially significant application in other areas
- Most large and global banks, and emerging Fintech are experimenting with blockchain to
  - **Streamline processes and reduce costs and**
  - **To create new competitive advantage through modified business models**
- Accounting firms facilitating innovation and application

Blockchain – A Distributed Ledger

- A **protocol** for transacting and implementing a distributed ledger enabling the
  - Recording and storing of digital records & transactions
  - Exchange of assets & transfer of ownership
  - Self governing digital contracts to automate processes
- A distributed ledger allows a shared record of a transaction distributed to all in a network
- A network of nodes - computers connected to the blockchain network - validate transactions, add to the ledger and broadcast to other nodes. There are as many identical ledgers as there are nodes

BLOCKCHAIN AND TRUST

- Potentially provides higher levels of transparency, visibility & accountability through **immutability**
- No central authority or intermediary required to authenticate & settle transactions
- Allows people who do not know each other to trust a shared record of transactions because they cannot be altered
  - **A transaction and record occur in one single event**
  - **Changes to previous transactions need to be approved by all participants (nodes)**
  - **Automated validation of a record in a "block" via a unique cryptographic identifier for each block (a hash). Hashing refers to the repeated calculations to ensure block validity**

Blockchain Fundamentals

- Blockchain combines two existing technologies
  - Peer to peer file sharing
  - Cryptography and cryptographic consensus
- Underlies the functioning of cryptocurrencies (e.g., bitcoin) but has diverse applications beyond financial transactions & records
- Blockchain serves as a platform for smart contracts (digital agreements), tokens representing real world assets such as currency or property, and decentralized autonomous applications

Programmable Blockchain – Smart Contracts

- Automating transactions and controls via self-executing smart contracts also extends blockchain use to multiparty agreements
- Programmable code replicates counterparty obligations & settlement instructions
- Any business logic (terms) can be encoded into smart contracts, not just legal contracts so that funds can be distributed correctly
- Use cases include transfer pricing, loan agreements, supply chain, trade finance
- Using Blockchain for Smart Contracts, & Ethereum

Blockchain - Public and Private Network

Permission-less / full visibility of transactions

- Public blockchains support cryptocurrencies with no identifiable ownership structure
- No legal recourse

Permissioned access / transactions are private

- Shared only between invited participants
- Financial institutions & supply chain partners typically use private blockchains
- Subject to same laws & regulations as non-blockchain records

Involvement of various industry players in a collaborative blockchain

- Consensus process controlled by pre-selected nodes

Blockchain - Implications for Value Stream Processes

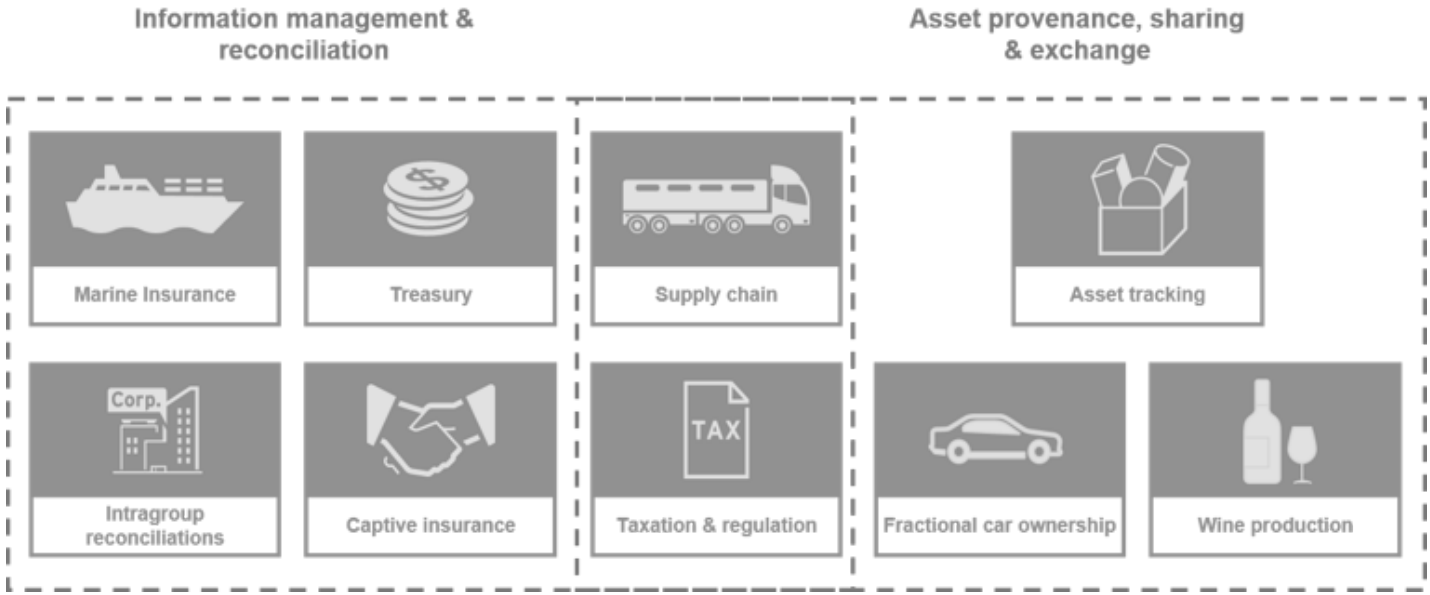
- Procure-to-Pay, customer to cash, account to report
- Potential to bring together goods/services with their respective payment
- Highest potential - transactions relevant to all parties in the chain (e.g., organization, customer, supplier, bank) visible & seamless on a distributed general ledger so no human validation needed
- Processes to complete transactions can be streamlined
  - Shared access between accounts receivable and accounts payable removes need for invoices
  - Smart contracts to automate generation of invoices & confirm payments & enabling automatic reconciliation of payments to corresponding invoices, and connectivity to bank payment network

BLOCKCHAIN – IMPLICATIONS FOR ACCOUNTING

- Fundamental shift from data held by a single owner to the lifetime open history of an asset or transaction
- Blockchain future allows full visibility on transactions with timestamp & audit trail across value streams
- Access and reporting tools could provide greater performance insights to various stakeholders in real time
- Programmable smart contracts reduce monitoring/enforcement
- The enhanced auditability and accountability in transaction data in a distributed ledger means that credibility and trust need not arise from a published set of financial statements

A Distrubuted Ledger Concept Has Many Use Cases

19 industries that Blockhain will disrupt



- Healthcare: records management
- Media: verifying intellectual property
- Supply chain and logistics: traceability
- Real estate: property records allowing proof and transfer of ownership
- Public sector: voting and public registries
- Manufacturing, power & utilities: cross-border trade & logistics

SUPPLY CHAIN USE CASES

- Collaborations key in obtaining data needed to track objects
  - The more organizations that participate the more valuable the solution
- Wine: this video outlines how Blockchain has been used by wine producers to verify authenticity
- Blockchain for food safety consortiums – based on collaboration, standardization as well as new technology
  - Worldwide food safety IBM-led coalition
  - China collaboration – Walmart, IBM, JD, Tsinghua University
- Logistics: Maersk and IBM – recording & tracking shipments
- Exotic – Diamonds Everledger

Other Use Cases Relating to Social Impact

- Using blockchain to advance the Sustainable Development Goals
- Link to sustainable development through financial inclusion
  - Reducing cost of payments and increasing access to capital
- UN sponsored Climate Chain Coalition researching use cases in climate relate initiatives
- UN World Food Programme – blockchains for aid payments

Use Cases in Financial Services and Exchanges (beyond digital currencies & peer-to-peer payments)

- **Finance**
  - Related entity transactions, such as those involving intercompany, joint ventures and franchises allowing instant transactions with immutable documentation, and cross-border payments
  - Financial proxy voting and securities lending, repurchase agreements
  - Securities and derivative clearing & settlement streamlining internal processes and processes which are typically siloed and require reconciliation, and leading to improved transparency with external market participants
- **Finance Markets Use Cases – Bain & Company**
  - Virtually every function in financial services could be disintermediated and decentralized

Blockchain Helps Address Transactions with Related Entities e.g., Intercompany

- Intercompany challenges include manual payment procedures, inconsistent processes, high volume, disparate ERP systems, poor compliance
- Smart contracts can establish automated intercompany transaction processes
- Potential to eliminate transaction imbalances and reduce discrepancies between different ERP systems
- Overall reduction on manual intercompany procedures
- More accurate and timely reporting to improve compliance

BLOCKCHAIN DEVELOPMENT IN FINANCIAL TECHNOLOGY COMPANIES – FINTECHS

- Start-ups challenging established banking business models in providing peer-to-peer financial services
- >50 of world‘s largest banks are in a consortium to develop blockchain solutions
- Fintech applies to banking, payments & wealth mgt
  - Industries where Fintech is changing the game
  - ACCA Fintech report
  - How banks can keep up with digital disruptors
  - International Organization of Securities Commissions (IOSCO) *Research Report on Financial Technologies*
  - Citi GPS What Fintech Investments Tell Us

Regulatory Opportunities and Challenges

- Governance & trust of blockchain & digital currencies evolving
  - Regulatory concern about certain aspects of decentralization
  - Perhaps a need to develop & enforce certain standards and rules around blockchain? E.g., digital identities and cross-border standards
- Implication for financial regulation needs to be considered particularly in relation to cryptocurrencies
- Blockchain could reinvent regulatory compliance
- Company regulations need to allow business to use blockchain for record keeping

When to Consider Blockchain?

Guidance from **Sam Peterson**, Partner/Principal, Blockchain Leader, Americas FAAS Digital & Analytics, EY [presentation at PAIB Committee]

- **Multiparties – greater security with more parties**
- **Network effect – more value with greater number of users**
- **Seeking to enhance trust between all parties at scale (records are permanent and cannot be changed)**
- **When a system could benefit from improved transparency in terms of records and ownership of assets**

Blockchain Investment Case – Key Questions

- What new business opportunities exist from blockchain?
- Is disintermediation beneficial in all use cases?
- What benefits does a shared database provide in terms of improved effectiveness and reduced cost? (in the context of existing databases and systems)
- What is required in terms of data and digital security?
- How mature is the source data? Blockchain does not solve data accuracy (garbage in, garbage out)
- Where will the development expertise come from?
- Are regulatory arrangements enabling or disabling?
- How much investment is needed in appropriate security? E.g., complexity of consensus algorithms used can be key to proper data validation

BLOCKCHAIN - CHALLENGES

- **Scalability:** Expanding ledgers and the need for all participants to access the ledger creates need for storage capacity, computing power and electricity
- **Security:** The smart contracts that enable automated transactions to a blockchain can be exploited if badly coded. Blockchain will not solve bad coding or sub-optimal processes
- **Data privacy concerns:** Data can be stored indefinitely, which raises concern over compliance with data protection regulations
- **Loss of keys:** Public and private digital keys that represent a user's address on the blockchain providing access can be stolen or misplaced
- **Immutability:** any time lag until transactions are verified can be an opportunity for manipulation

Blockchain - A Selection of Resources

- Blockchain and the Future of Accountancy
- The Future of Blockchain
- Audit Futures, Unchaining the Blockchain
- Blockchain will Impact Accounting
- Introduction to Blockchain Technology
- How Blockchain Technology Could Change Our Lives
- Blockchain: So much bigger than bitcoin
- Divided We Fall, Distributed We Stand. The Professional Accountant's Guide to Distributed Ledgers and Blockchain
- Blockchain: Re-imagining Multi-Party Transactions for Businesses
- Crunch Time IV, Blockchain for Finance

Blockchain - Resources

- How secure is blockchain really?
- Blockchain to Blockchains: Broad Adoption and Integration Enter the Realm of the Possible
- Blockchain: The New Technology of Trust
- Blockchain, the Next Disruptor for Finance
- Blockchain: How This Technology Could Impact the CFO
- How tax fits into blockchain
- Blockchain audit technologies
- How Blockchain can bring Greater Value to PTP Processes
- Trust Me, Digital Identity on Blockchain

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