



Sustainability and Supply Chains: A Blockchain Trust Technanism

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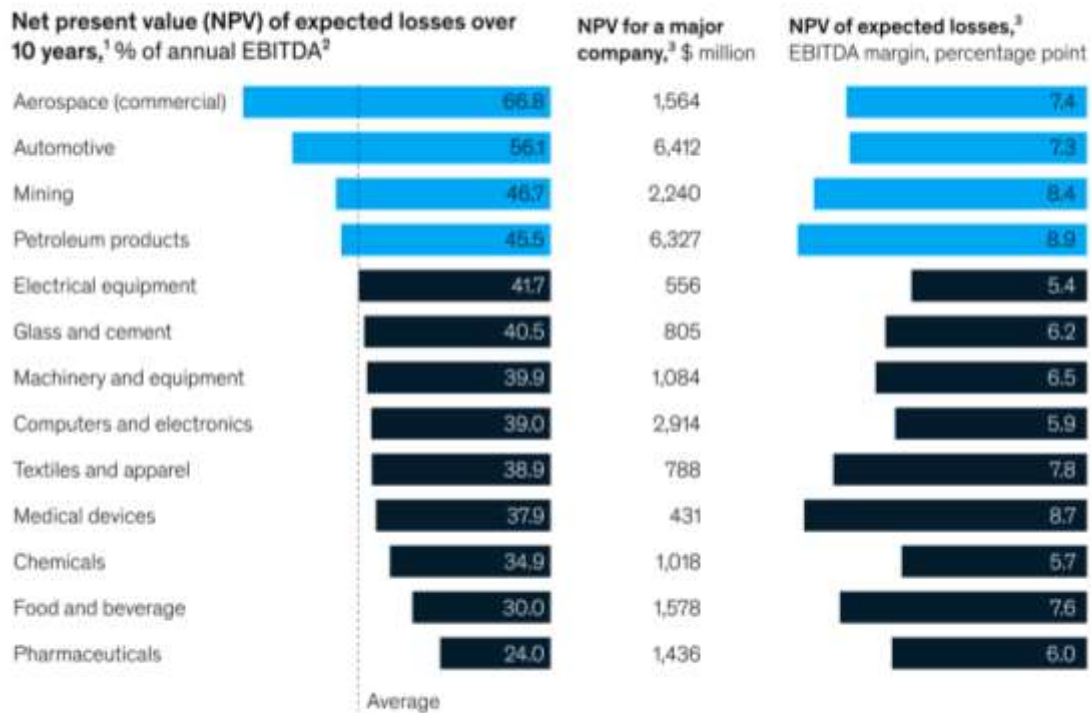
Sustainability and Efficiency

- ▶ How can DLT technology promote transparency and verification for sustainability all through the supply chains?
- ▶ Blockchain, a technology with unique abilities to record, track, monitor, and exchange assets without need of an intermediary, may be the solution to many of the logistical and cost issues that plague the growth and operation of global value chains, while acting as certification mechanism for issues of provenance and inclusion.



The Cost of Supply Chain Disruption and the Need for Resilience

Supply-chain-disruption losses equal 42 percent of one year's earnings before interest, taxes, depreciation, and amortization on average over a decade.



COVID19: an outlier?

Supply chain disruptions lasting a month or longer now happen every 3.7 years on average.

¹Based on estimated probability of a severe disruption twice per decade (constant across industries) and proportion of revenue at risk due to a shock (varies across industries). Amount is expressed as a share of one year's revenue (i.e., it is not recurring over modeled 10-year period). Calculated by aggregating cash value of expected shocks over a 10-year period based on averages of production-only and production and distribution disruption scenarios multiplied by probability of event occurring for a given year. Expected cash impact is discounted based on each industry's weighted average cost of capital.
²Earnings before interest, taxes, depreciation, and amortization.
³Based on weighted average revenue of top 25 companies by market cap in each industry.
 Source: S&P Capital IQ; McKinsey Global Institute analysis

The problem: Complex, Opaque SCs: Why supply chains?

- ▶ Arteries of global trade, Operating them is **complex and costly** --Ripe for disruption
- ▶ Increase in complexity because of global supply chain networks, cross jurisdictional (Cost of operating supply chains is 2/3 of final cost of traded goods)
- ▶ Paper still prevails: **7% of the global value of trade is absorbed in documentation costs***
- ▶ Safety and provenance concerns (increased regulation is driving up the cost of regulatory compliance)
- ▶ This complexity makes it difficult to make efficient transactions, trace products and data, and assess veracity of information



Key advantages for Distributed Ledger Technology

Distributed and sustainable. The ledger is shared, updated in near real-time, not dependent on any individual entity.

Secure and immutable. Cryptography authenticates and verifies transactions. Records cannot be tampered

Transparent and auditable. Access to the same records, validate transactions without third-party intermediaries

Orchestrated and flexible. Business rules and smart contracts can be built into the platform

Blockchain: A solution? The DLT Trust Mechanism

A new solution to solve some of the transaction costs associated with SC governance. Record, track, monitor, and exchange assets without need of an intermediary

- break existing information silos** and interconnect data sources and participants.
- share trusted data among large numbers of actors** in a supply chain, and, **via smart contracts, can support the automation of transactions.**
- Support verification and reporting on sustainability** concerns ('Green', Fair Trade, Bio, Non-conflict minerals etc)

The Supply Chain Trust Deficit

- Global trade since the great recession has slowed and COVID19 has only made matters worse. Industries have signaled several critical challenges to global value chains, including:
 - a. (i) a lack of transparency due to inconsistent or not readily available data;
 - b. (ii) a high proportion of paperwork;
 - c. (iii) a lack of interoperability; and
 - d. (iv) limited information on the product's journey in the chain.
- ▶ Growing mistrust among both businesses and citizens (safety, environmental concerns, data misuse)
- ▶ Perceptions of risks regarding governance of physical goods and AI data usage, carbon footprint of value chains
- ▶ Ethical considerations and consumer demands for verification
 - ▶ COVID19 health risks
 - ▶ Green Finance emergence (TCFD, EU Taxonomy)
 - ▶ ESGs considerations for corporates and public actors
- ▶ Need for greater transparency and accountability, ethical guidelines, companies required to provide more safeguards in terms of reliability, accessibility, scalability, and affordability

The Green Imperative across Supply Chains for Companies

Crisis as an opportunity: Action

- **A Risk: Reputational and Regulatory**
 - **Rising pressure from consumers:** consumer behaviors shift due to climate change awareness, companies are increasingly looking to integrate a more sustainable approach to their businesses
 - **Rising pressure from regulators** and Investors in view of Climate Change urgency
 - Green Growth Strategy and ESG focus of Asset Managers
 - EU impending Sustainable Corporate Governance raising the stakes for companies
- **An economic opportunity: “Green trade”** rising in political and economic importance, “with a global market of \$1 trillion a year for environmental goods and services close”* Sustainability Consortium’s Impact Report
- “Greening” of global supply chains requires traceability and transparency.
 - Track hazardous products and materials, allocate responsibilities and monitor environmental compliance.
 - Achieve credibility, legitimacy and fairness, and to avoid “greenwashing” or shifting polluting activities to developing countries

*OECD

More Sustainable, Resilient Value Chains through Technology

- ▶ (McKinsey survey), 85% still struggle with insufficient digital technologies in the supply chain, while 90% now intend to increase digital supply chain talent in-house
- ▶ **Blockchain** can address both bureaucracy and climate change mitigation imperatives
- ▶ Convergence of deep tech in global value chains (**AI, Blockchain, IoT, robotics** etc) to provide integrated solutions
- ▶ Address in both the issue of trust and security to move ahead with new business models
 - ▶ Circular and Volvo mission electric vehicle project traces cobalt, a product associated with child labour (DRC). “The reality is that, when you get to the other end of the supply chain, the car manufacturer really has no idea whether stuff has been responsibly sourced or not.”

Some examples

- ▶ TradeLens (Maersk/IBM), Food Trust
- ▶ Most initiatives are on permissioned blockchains
- ▶ ICC launches a public blockchain with Perlin, targeting SMEs (45 million ICC members)



Partners	Purpose
Everledger	Blockchain-based system to provide secured proof of origin and ethical sourcing for diamonds
Crystalchain	Blockchain-based solution called Blockpharma built on the Tracey blockchain platform by Crystalchain aiming to identify counterfeit medicines
Block Verify	Blockchain-based anti-counterfeit solution to trace pharmaceuticals, luxury items, diamonds and electronics
VeChain	Public blockchain-based track & trace solution for various industries from retail to automotive
Chronicled	A range of blockchain-based supply chain solutions including traceability, revenue management, master data management and compliance solutions. Multiple vertical markets covered from pharmaceutical to agriculture
Modum.io	Track & trace supply chain solution based on IoT, blockchain and AI. Originally launched to track medicines but is also suitable for food, electronics, art objects and valuables.

Case Study: Trado

A Sustainable Trade Finance Model

Consortium of:

University of Cambridge Institute for Sustainability Leadership (CISL), BNP Paribas, Barclays, Rabobank, Sainsbury's, Sappi, Standard Chartered, Unilever, as well as technology companies Provenance, Halotrade and Meridia, and IDH, a sustainability NGO.

How does it work?

- ▶ Pilot using blockchain technology to track tea from farmers in Malawi being sold to Unilever and financed by BNP Paribas.
- ▶ Ethereum-based blockchain solution developed by **Provenance**, a social enterprise that helps firms track their supply chains using blockchain, and **Halotrade**, a fintech firm that uses smart contracts to convert supply chain sustainability data into automated access to trade finance.
- ▶ The pilot saw **Meridia**, a data collection company, collect a range of data on the individual smallholder farmers supplying the tea, all verified by **IDH**.
- ▶ Data collected:
 - ▶ demographic (gender and educational level),
 - ▶ economic data (type of transport and source of income),
 - ▶ financial data (savings and borrowing) and
 - ▶ agricultural data around the crop.
 - ▶ production data (quality, quantity, date, price and sample approvals) were provided by Unilever's direct supplier
- ▶ **Benefit for farmers** : local tea factory, shares data with Halotrade's system and enable shorter approval time for invoices, thus getting early access to Unilever's supply chain finance program.
- ▶ **Benefits for Unilever**: share info with prospective shoppers to increase sales (consumers prioritise products that communicated a positive impact at smallholder level) and prove to regulators compliance with environmental and labour standards.
- ▶ **“data-for-benefits swap”**

Challenges Ahead

Reaching economies of scale
and leveraging networks effects

NEED for Collaboration
Innovators and Market leaders

NEED for Public-Private
Leadership

NEED for Multi-stakeholder
dialogue

- ▶ Lack of legal and regulatory clarity
- ▶ “Gargage in-Garbage Out” Oracle Problem: blockchain can guarantee the origin and non tampering of the document, does not guarantee against false declaration
- ▶ Lack of standards
- ▶ Limited interoperability of solutions
- ▶ Need energy efficient solutions
- ▶ Governance issues
 - ▶ Lack of universal protocol for cross-border information exchange among various stakeholders.
 - ▶ Technology has to be adopted by all stakeholders to have network effects
 - ▶ Lack of budgets at the moment

A glowing green Earth is the central focus, set against a dark, starry space background. The Earth is covered in a network of bright green lines, resembling a global communication or data network. The lines are most prominent over the Americas and Europe. The text "Thank you!" is overlaid in white, centered on the Earth.

Thank you!