Deep-Dive Slides

Blockchain Traceability & Authentication

28th November 2024

Why is it important?

Section 1

Frauds, Fakes, and Foolery

Alcohol Fraud:

Over **25%** of alcohol consumed worldwide is believed to be fraudulent, often diluted or counterfeit, posing health risks and financial losses.

Olive Oil Fraud:

An estimated **60%+** of the olive oil sold globally is mislabeled or fraudulent, with cheaper oils often being mislabeled as extra virgin**.**

Luxury Goods Fraud:

Up to **30%** of luxury goods in the global market are counterfeit, including fake designer bags, jewelry, and watches.

Honey Adulteration:

About **30%** of honey globally is adulterated, often diluted with sugar syrup or containing other additives.

Let’s start by defining a few things...

- **Traceability Definition:** Traceability is the capability to track and record the path of any entity—whether it's a product, information, or service—through its various stages, from origin to its final destination.

- **Key Points:**
  - It encompasses not just physical products but also digital data, supply chains, and service workflows, ensuring transparency at every step.

  - By tracking these pathways, traceability provides insight into how, where, and when an entity has interacted or transformed, supporting compliance, quality control, and accountability.

Let’s start by defining a few things...

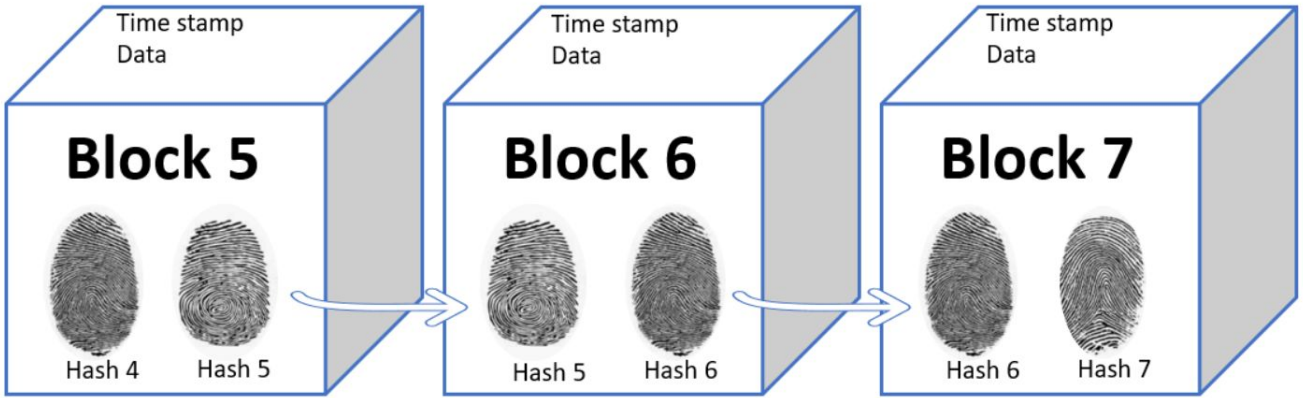
- **Authentication Definition:** Authentication is the process of verifying the legitimacy, origin, and identity of any entity, such as a document, product, digital asset, or service, to confirm its validity.

- **Key Points:**
  - It can be applied to various domains like digital identity verification, product certifications, and data integrity checks, ensuring that the entity is genuine and trusted.

  - Authentication establishes confidence and reliability by providing evidence or records that an entity is what it claims to be, whether it’s a credential, a product’s origin, or the authenticity of information.

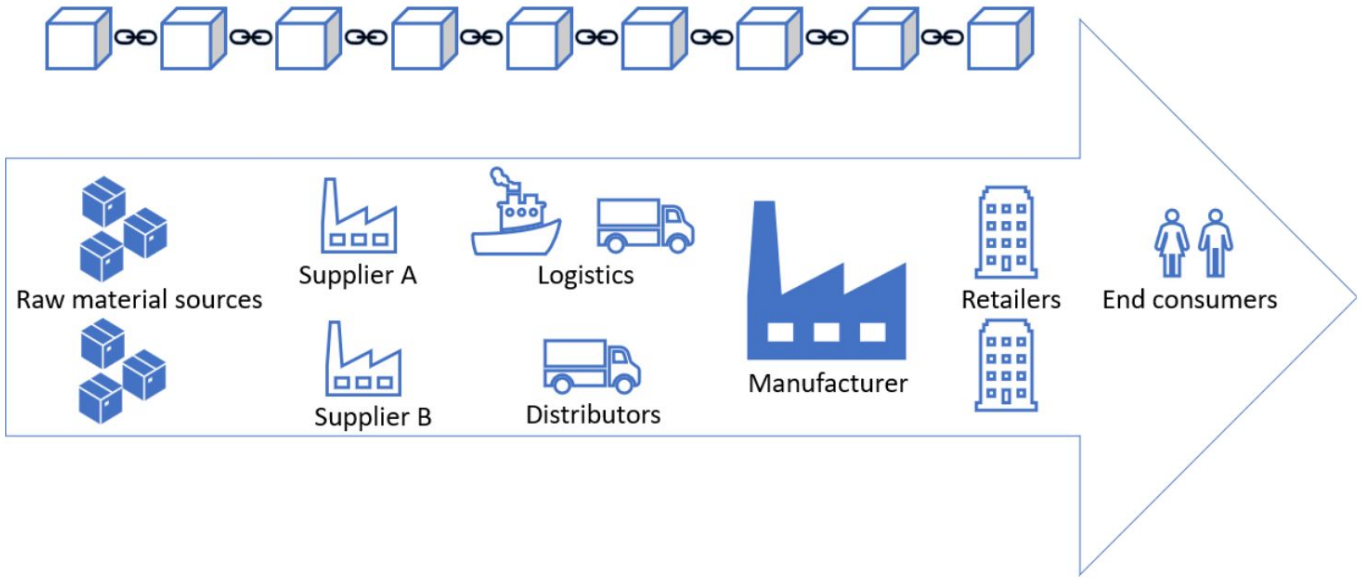
Block...chains

Figure 1. A visualization of how blocks are cryptographically linked through digital fingerprints.



Source: Afry (link)

Figure 2. An example of a generic supply chain to explain the process of tracking goods by using blockchain technology.



Source: Afry (link)

Why is this so important?

- **Changing Customer Dynamics**: Modern consumers are increasingly conscious about where their products come from and how they're made. They want assurance about ethical sourcing, sustainability, and quality.
- **Premium Pricing:** data suggests that people will pay more for products with greater transparency. Allows for product differentiation.
- **Government Regulations:** Governments worldwide are introducing stricter regulations that require businesses to provide transparent supply chain records and compliance details.
- **Business Requirements:** As global supply chains become increasingly complex, businesses need more efficient ways to track products, verify compliance, and reduce fraud (and protect their brands).

Compliance and Regulation

Section 2

Upcoming Regulations

EU Deforestation Regulation

By 2025, this will impact commodities valued over **€100 billion** annually.

FDA Compliance Requirements

By 2026, this will affects imports into the USA, collectively valued over **$130 billion** dollars annually

EU Carbon Border Adjustment Mechanism

EU imports of these goods amount to over **€50 billion annually**.

Carbon Markets

Capitalize on these new markets and leverage existing agriculture dominance and systems.

Deep-Dive on the EUDR

- **The EUDR will be enforced** from January 1, 2025.
- Exporters must comply with EUDR **regulations for seven commodities** (soy, beef, palm oil, wood, cocoa, coffee, rubber) to access the EU market.
- Fines of up to **4%** of operating revenues.
- Non-compliance = lose market access

Mechanisms & Use-cases

Section 3

Few steps to consider

What data to capture

What are the **key steps you want to track**?

Motivation for trace: E.g business vs consumer vs gov.

What **metrics** are important (and for who)?

Do these follow **industry standards** and enable portability?

How to capture it

Mechanisms to capture data such as: **RFID chips, IoT** sensors, **QR codes** or **human input**.

Trade-off between **automation** vs **human** touch.

Where to **store** this data (e.g which private or public blockchains / file-storage solutions like IPFS)

How to verify it

How do you ensure this **data is good data**?

Digital Signatures (e.g using credential systems by authorised parties).

Automation / APIs (using devices like IoTs…reduce need for human entry or checks).

Trade-off: override vs resubmission of data for dealing with mistakes.

More than supply-chains

- **Blood Bank Tracking:** Ensuring traceability of blood donations from donor to recipient.
- **Government Procurement:** Monitoring sourcing, quality, and delivery of goods for public projects.
- **Charity Funding:** Tracking where donations go and ensuring they reach intended recipients.
- **Education Records:** Verifying the accuracy of academic achievements over time.

Self-Sovereign Identity & Verifiable Credentials

Section 4

Defining a few things...

- **Self-Sovereign Identity:** is a digital identity framework that empowers individuals to own, manage, and control their personal information without relying on centralized authorities.

- **Key Points:**
  - SSI enables users to securely store and share their credentials, ensuring privacy and reducing the risk of identity theft or data breaches.

  - Key projects and tools on Cardano include: the **Cardano Foundation Identity Wallet**, **Hyperledger Identus** (formerly known as Atala PRISM), IAMX.

Defining a few things...

- **Verifiable Credentials:** are cryptographic proofs issued by trusted entities attesting to certain attributes or information about an individual. The importance of these technologies lies in their potential to revolutionize how we authenticate and verify identity in the digital realm.

- **Key Points:**
  - Credentials are critically important because they establish trust and authenticity in a system where multiple parties need to verify specific attributes or claims.

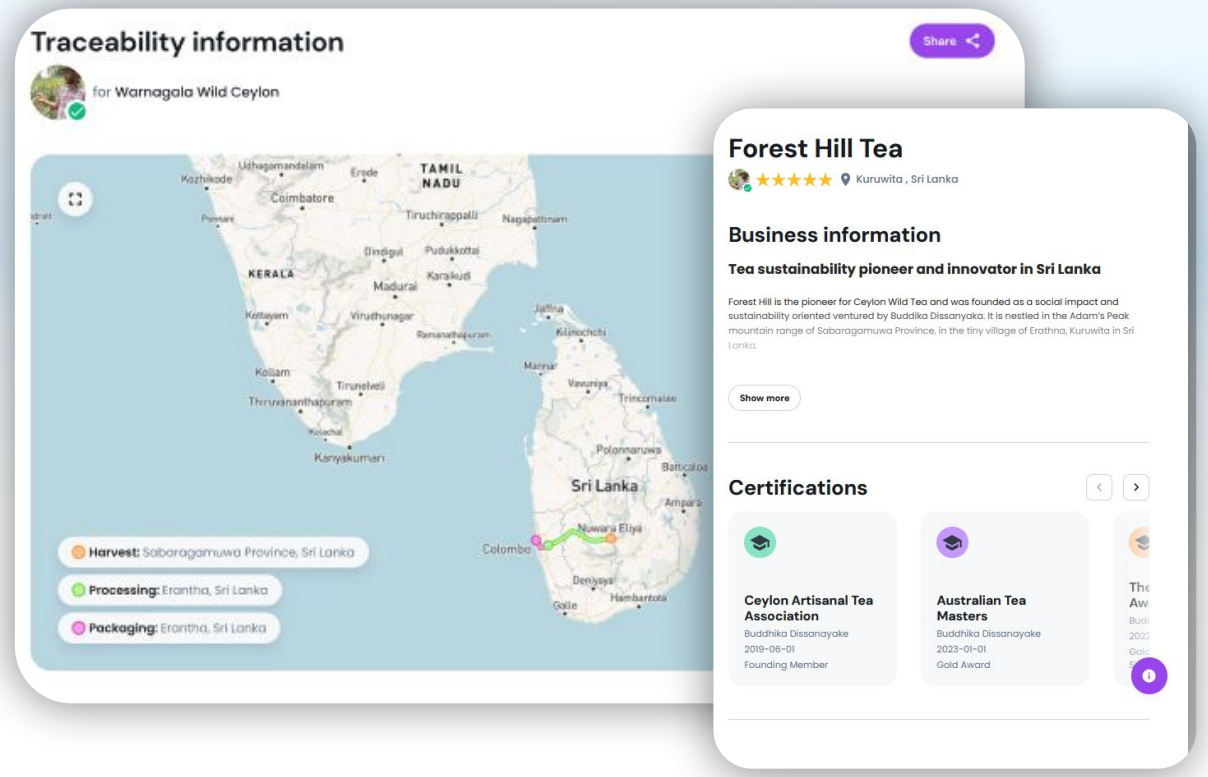
  - They ensure that data shared is both verifiable and tamper-proof, making them essential for high-stakes industries like agriculture and supply chains where trust is paramount.

Storytelling & Brand

Section 5

ZENGATE | Blockchain Traceability & Authentication

Telling Your Unique Story



Risks to your brand & consumer trust

Product Tampering, Fraud and Counterfeiting:

- Can lead to severe reputational damage if customers are harmed or deceived.
- E.g: Counterfeit bottles refilled with fake substances can pose health risks & legal action.

Compliance Penalties:

- Signals to customers inability to follow rules or focus on things that matter to them (e.g ESG).