BLOCKCHAINS PRACTICES IN THE BRAVE NEW WORLD

BLOCKCHAIN AND ACCOUNTANCY: A Smart Combination?

Martijn Siebrand

Aim of the session:
- To inform
- To inspire
- To think about the impact on our business
- To discuss opportunities
Introduction

Work experience
- Specialist Logistics Van Oers Accountancy and Advice
- Program manager Supply Chain Finance Dutch Institute for Advanced Logistics, DINALOG
- Business Developer ABN AMRO Commercial Finance Holding
- Senior New Business Manager ABN AMRO Commercial Finance N.V.
- Account manager Financial Restructuring & Recovery ABN AMRO Commercial Finance N.V.
- Relation manager Fortis Commercial Finance N.V.

Education
- 2015 Rotterdam School of Management, Erasmus University MSC-plus,
- New Business: Innovation & Entrepreneurship
- 2012 Master in Business Administration at the Rotterdam School of Management Erasmus University Master Operational Excellence in Services and Supply Chains

Cyprus Blockchain

The University of Nicosia offers the first Master of Science degree in Digital Currency, available worldwide through an online format.
### Fintech ecosystem

**Focus**

<table>
<thead>
<tr>
<th>Mobile Advisory &amp; Personal Finance</th>
<th>Blockchain &amp; Bitcoin</th>
<th>Insurtech</th>
</tr>
</thead>
</table>
| Rewire Source
| IEX
| MYOB
| Fintellix
| Bitnow
| BOOKBEE
| CFOx
| Fintellix
| Bitnow
| BOOKBEE
| CFOx

<table>
<thead>
<tr>
<th>RESTechs</th>
<th>Digital Banks</th>
<th>Alternative Finance</th>
</tr>
</thead>
</table>
| TransferWise
| Revolut
| Zopa
| LendingClub
| Prosper
| OnDeck

**Blanc paper!**

![Diagram](image)
Who do we see here?

The history of accounting

Signor Luca Pacioli
(1446-1517)

“…I wish I had a color printer…”

Annual report 2016

Curiosity
Four Years on Mars
8.05.2016

Jet Propulsion Laboratory
California Institute of Technology
Technology Adoption Lifecycle

In 2025, 80% of all packages will be delivered unmanned.

Speed of innovation

Before 2005: Closed and centralized IoT networks
Today: Open access IoT networks, centralized cloud
2025 and beyond: Open access IoT networks, distributed cloud
What do we see here?
How many cryptocurrencies are there?

Blockchain Definition:
What is Blockchain Technology?

A blockchain is a type of distributed ledger, comprised of unchangeable, digitally recorded data in packages called blocks.

* These digitally recorded “blocks” of data is stored in a linear chain.
* Each block in the chain contains data (e.g. bitcoin transaction), is cryptographically hashed.
* The blocks of hashed data draw upon the previous-block (which came before it) in the chain, ensuring all data in the overall “blockchain” has not been tampered with and remains unchanged.
Distributed Ledger Definition:
What is Distributed Ledger Technology (DLT)?

A distributed ledger is a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, and/or institutions.

- Users of Distributed Ledger Technology (DLT) significantly benefit from the efficiencies and economics by creating a more robust environment for real-time and secure data sharing.
- The Bitcoin blockchain is not the only distributed ledger, in fact, many other users of Distributed Ledger technology use different methodologies to achieve the same consensus (e.g., Ripple, MultiChain, HyperLedger Project).

Blockchain vs. Distributed Ledger:
What is the difference between the two?

A blockchain is just one type of distributed ledger, not all distributed ledgers necessarily employ blocks or chain transactions.

- Although the term ‘blockchain’ is used more frequently than ‘distributed ledger’ in discussions, a blockchain is only one of the many types of data structures that provide secure and valid achievement of distributed consensus.
- The bitcoin blockchain, which uses ‘Proof-of-Work Mining’, is the most publicly proven method used to achieve distributed consensus.
- However, other forms of distributed ledger consensus exist such as Ethereum, Ripple, Hyperledger, MultiChain, Eris, and other private enterprise solutions.
In essence it is a shared, trusted, public/permissioned ledger that everyone can inspect, but which no single user controls. Entries in the ledger are synchronized to all ledgers in the network. Consensus ensures that these shared ledgers are exact copies, and lowers the risk of fraudulent transactions since tampering would have to occur across many places at the exact same time.

Cryptography

Ability to protect records with a personal digital signature — the blockchain generates a private and public key to seal that record. It is encrypted, hashed, and sent to the network of validating nodes.

Smart contracts

A smart contract is a computer program that can automatically execute the terms of a contract.
Blockchain transaction

1. A wants to send money to B
2. The transaction is represented as a "block"
3. The block is broadcast to every node in the network
4. Nodes in the network approve the transaction as valid
5. The block then can be added to the chain, which prevents an imitable and transparent record of transactions
6. The money transacts from A to B

Why you can’t cheat at Bitcoin

1. Everybody is working on block #1
2. But one miner wants to alter a transaction in block #14
3. He’d have to make his changes and redo all the computations for blocks #14–91 and do block #91. That’s 18 blocks of expensive computing.
4. What’s worse, he’d have to do it all before everybody else in the Bitcoin network finished just the one block (number 91) that they’re working on.
Public versus private

Public, make the world better

Private, make processes more efficient

Some key facts Bitcoin- Blockchain

Bitcoin is a way to digitally transfer ownership without a middleman

Blockchain is a database that records ownership throughout time
Smart Contracts

- Pre-defined contract
  - Terms are established by all counterparties, such as:
    - Variable interest rate (e.g., LIBOR)
    - Currency of payments
    - Currency rate
    - Conditions for execution (e.g., time and date, LIBOR rate at given value)

- Events
  - Event triggers contract execution
  - Event can refer to:
    - Transaction initiated
    - Information received

- Execute & Value transfer
  - Terms of contract dictate movement of value based on conditions met.

- Settlement
  - Settlement process
    a. For digital assets on the chain, such as a cryptocurrency, accounts are atomically settled
    b. For assets represented off the chain, such as stocks and fiat, changes to accounts on the ledger will match off-chain settlement instructions

Some idea’s?

[Diagram of idea’s]
Blockchain news

TU Delft bouwt blockchain hypotheek

TU Delft heeft een werkend prototype ontwikkeld voor een op blockchain-technologie gebaseerde hypotheekmarktplaats.

9 februari 2017

EU Commission: We Plan to Boost Support for Blockchain Projects

Stan Higgins (@mpmcweeney) | Published on February 15, 2017 at 15:00 GMT

Dubai to use blockchain technology for all government documents by 2020

The Dubai government is seeking to position the emirate as a leader in blockchain technology

FEBRUARY 7, 2017

Banking Is Only The Start: 27 Big Industries Where Blockchain Could Be Used

Blockchain is 5 Years From Mainstream, Post-Trade Consortium Members Say

Stan Higgins (@mpmcweeney) | Published on February 15, 2017 at 15:30 GMT
Blockchain news

ECB Not Ready To Embrace Blockchain Technology

Sandra Dinis

Lisbon, Portugal (April 9, 2017) – The European Central Bank, the banking regulator for the European Union’s economies, has ruled out using distributed ledger technology within the so-called Eurosystem’s market structure and for the foreseeable future, until the software meets high security and reliability standards.

But the ECB would continue to monitor the development of DLT and explore practical uses of the technology, the central bank said in a special report published today. The bank’s Executive Board under the authority of the President, consisting of the ECB and the national central banks of the 19 member states whose currency is the euro.

Big on Blockchain

While all four services firms are known to be engaging in researching and developing blockchain applications and protocols for clients, Deloitte is reportedly leading the pack with a multitude of developments in the blockchain-specific FinTech space.

The firm’s “global blockchain lab” consists of 800+ professionals across 29 countries, who have developed over 30 blockchain-related prototypes in areas including digital banking, payments and insurance.

Blockchain consortia

Major Blockchain Consortia and Networks

Digital Asset Holdings (Investors)

Hyperledger Project (selected members)

The four major accounting firms in the world are set to meet with the American Institute of Certified Public Accountants to discuss the establishment of a distributed ledger consortium.

OPEN MIND IN BUSINESS
Blanc paper!
Anti-double finance register Blockchain

In the context of SCF Innopay developed two innovations for the factoring community to lower risk and operational costs

**Track & trace of invoice statuses**
- A technique for financiers to improve authenticity of (factored) invoices and to track invoice statuses from buyer’s ERP. Both will lower invoice risks (e.g. false invoice, performance, collusions).
- Track & trace is enabled through a special permissions protocol and API technology.
- A first Proof of Concept has been realised in 2015 (i.e. invoicePermissions)

**Anti-double financing register**
- The register prevents fraudulent SMEs to extract funds from multiple financiers by using the same invoice.
- A blockchain solution allows for a clear and secure record of receivables ‘ownership’ to be managed cost-effectively.
- A first prototype of the anti-double financing register has been realised in 2016

---

Practical: Overview of Music Copyright Ecosystem

**Here’s how to fix it.**

**Two Mutually Independent Solutions**

- The Blockchain Half-Step: Blockchain and blockchain centralised music rights information databases with open distributed transaction processing. It is secure and scalable, but cannot ensure blockchain data remains linked to music.

- Audio Watermarking & Identity: Digital audio watermarking (like Digital Barcodes), is a way of embedding immutable data directly into audio files. The signal can't be removed or changed in any way.

**Joining Technologies**

- The Blockchain & Watermarking Answer: Blockchain with audio watermarking allows the identity is a blockchain transaction record to be linked to a music file via an identifier, ensuring rights to be confirmed and royalties to be distributed efficiently and unambiguously.
How does Everledger.io keep track of each individual diamond?

A: We store the identity, ownership and movement of diamonds on our global, digital ledger. Once the diamond’s defining characteristics (4Cs — cut, clarity, colour and carat, 40+ pieces of meta data and high res photos) are uploaded on the blockchain, all stakeholders invited to the ledger can access the same set of information and track the diamond as it moves throughout its journey from mine to counter. Think of it as a digital passport of the diamond on the blockchain — a permanent record that can’t be changed without required consensus.

Decentralized Autonomous Organization

Chronicled Demos Blockchain-Connected Delivery Drone

By Jamie Redman - October 18, 2016 - 2773 - 0
Overall project objective:
The combination of the ledger technology with smart contracts have the potential to form a powerful logistics innovation platform. We will use existing, deployed, and proven blockchain technology as the foundations of our "core business infrastructure", to be tested with 3 use cases. The aim of this project is to unequivocally show the business value of the blockchain in logistics.

Project lead
TU Delft: DR.IR. J.A. (JOHAN) POUWELSE
For instance: how a consumer could check the authenticity of a bag on the blockchain

- Goods flow
- Possible blockchain information flow
- IT Infrastructure
  - Auditable by third parties
  - Possibilities for (automated) finance, customs, optimization, etc.
  - Transparency
  - No cost for redundancy
  - Scalable
  - Permanent up-time
  - Strong ID controls

Blockchain & logistics innovation
Identified use cases:

- Using digital consignment notes to trigger smart contract finance for carriers
- Asset based inventory finance
- Enabling a Circular Economy

Possible use-cases:

- Fairtrade products
- Platooning
- Inspection transport
An average trade transaction involves over 10 parties and over 30 different physical documents.

**Current ecosystem**

**Blockchain based ecosystem**

**OPEN MIND IN BUSINESS**
The use of electronic chips on shipping containers would enable real-time visibility of goods along the supply chain. These chips could interact with smart contracts built on distributed ledgers to automatically carry out functions without manual processing, thus further enhancing automation and enabling more granular payments.
Accountancy and Blockchain

The General Ledger Accounting Cycle

Libra audit Blockchain

PwC FinTech Lead Joins Blockchain Startup Libra

LibraAudit

LibraReg

LibraTax

- Focused on internal auditors
- Being built with big partner
- External audit being considered

- Focused on regulators
- Supports access to blockchain data
- Make regulator requests self service

- Focused on tax professionals
- Centered on digital asset tax treatment
- Capital gains/losses available today

VANOERS.COM
“It’s inevitable — not a matter of if but when blockchain will impact your business. Executives need to start thinking about the implications to their organization as the underlying technology of distributed shared ledger is maturing at a rapid pace. The policies, governance and regulatory guidelines are being developed, so companies that are ready to embrace this change will be successful in the long run.”

— Deep Ghumman
Principal, EY Advisory

Let’s take the papers back with idea’s!

Martijn Siebrand
M.siebrand@vanoers.nl
06 – 24 62 15 98
Here are some potential uses for blockchain in accounting and audit:

- Traceable audit trails;
- Automated audit processes;
- Authentication of transactions;
- Tracking ownership of assets;
- Development of “smart contracts;” and,
- Registry and inventory system for any asset, ranging from raw materials to intellectual property.

So, while blockchain in accounting and audit may not yet be felt, it’s never too soon to survey the technology landscape and adjust the strategy of your firm accordingly. In such a fast-paced technological environment, being informed and open to change is really the only way to remain successful.