

8 Block Chain – The Technology behind Cryptocurrencies like Bitcoin, Ethereum and the Internet of Values

Ing. Felix Edelmann, MAS, IAFeS Board

Helix IT Consulting e.U. Wiener Straße 18, 2483 Ebreichsdorf, +43 664 2000 547,
edelmann@helix.at

8.1 Introduction

Blockchain establishes a system of creating a distributed public ledger or register in the digital online world. This allows participants to know for sure that a digital event happened by creating an immutable record in a public ledger. It opens the door for developing a democratic and scalable digital society not based on any kind of centralized authority. There are tremendous opportunities in this disruptive technology and the Blockchain revolution has just begun.

“The technology likely to have the greatest impact on the next few decades had arrived. And it’s not social media. It’s not big data. It’s not robotics. It’s not even AI. You’ll be surprised to learn that it’s the underlying technology of digital currencies like Bitcoin. It’s called the Blockchain.” (Source: Don Tapscott)

8.2 Bitcoin Payment system

The Bitcoin payment system is somehow fancy and exiting but it’s only one well known application based on the revolutionary Blockchain technology. The implementation of the Bitcoin application is used as an example to show how the Blockchain technology works.

“Blockchain is to Bitcoin, what the internet is to email. A big electronic system, on top of which you can build applications. Currency is just one.” (Source: Sally Davies, FT Technology Reporter)

8.3 Topics in this Presentation

- Blockchain as Technological Revolution
- Internet of Information
- Financial Crisis 2007/2008 and Satoshi Nakamoto, November 2008
- Internet of Values
- The Man in the Middle
- The Double Spending Problem
- Public Ledger
- Blockchain and underlying Technologies
- RSA Crypto System named after R.L. Rivest, A. Shamir, and L. Adleman
- Private / Public Key Cryptography

- Hashing and SHA-256 secure hash algorithm
- Bitcoin: A Peer to Peer Electronic Cash System
- Bitcoin Transaction
- The Miners
- Adding Blocks to the Chain
- Ethereum, Platform for smart Contracts
- Future Outlooks

E-Mobility and the Blockchain: The „Car eWallet“



8.4 Using Bitcoins

Bitcoin.org - <https://bitcoin.org/en/>

Get a Wallet, Breadwallet - <https://breadwallet.com/>

Securing your wallet

Bitcoin price is volatile

Bitcoin payments are irreversible

Bitcoin is not anonymous

Unconfirmed transactions aren't secure

Bitcoin is still experimental

Government taxes and regulations

8.5 Conclusion

"At its core, the Blockchain is a global database – an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions, but virtually everything of value and importance to humankind: birth and death certificates, marriage licenses, deeds and titles of ownership, educational degrees, financial accounts, medical procedures, insurance claims, votes, transactions between smart objects and anything else that can be expressed in code." (Source: Don Tapscott)

The potential impacts of Blockchain technology on society and the global economy are hugely significant.

"Every human being on the planet with a smart device will have equal access. Expanding the total addressable market by a factor of 4" (Source: Brock Pierce)

8.6 References

Harvard Business Review: "A Brief History of Blockchain" by Vinay Gupta, 02.2017

Don Tapscott and Alex Tapscott; Blockchain Revolution: "How the Technology Behind Bitcoin Is Changing Money, Business, and the World"

PwC; Bitcoin Is Changing Money, Business and the World

BEKO Holding AG; Blockchain/Bitcoin und Internet of Things

Satoshi Nakamoto; Bitcoin: A Peer-to-Peer Electronic Cash System

Berkeley Engineering; Blockchain Technology Beyond Bitcoin

NIST (National Institute of Standards and Technology) SHA-256
<https://www.cryptocoinsnews.com>