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Is Blockchain the missing internet link? Reality, Integration, Adoption and Mainstream.

Research article and Overview by Dr. Tali Rezun

Abstract

The internet changed the way we live, it opened the ways of unlimited communication and revolutionised access to information, but it failed greatly in regards to our personal digital freedom. Instead of providing trust, granted privacy, security, auditability, peer-to-peer communication, simplification and digital money, it evolved in to a system of global intermediaries, that manipulate our private data and charge a percentage for every interaction. There is a new technology at the horizon called blockchain, that in its core excludes any intermediary's, it brings peer-to-peer communication, online trust, security, privacy, authenticity, identity, synchronize ledger and much more. Could this be the long-waited solution that could upgrade the internet and how it's evolving?

Keywords: internet, digital transformation, cryptocurrency, blockchain technology, decentralisation, peer-to-peer, online trust, online security, online privacy, libra

Introduction

As an answer to 2008 global financial crisis Bitcoin was created, as a decentralised, independent digital cash network, that operated above the internet, out of banks and institutional reach. Soon the innovation of its backing technology (i.e. blockchain) was discovered as it could offer permissiveness solution to online privacy, security, digital identity, authenticity, peer-to-peer transactions and much more. From the launch of Bitcoin in 2009, the rollercoaster of volatility, hyped start-ups, excessive profits and loses followed the cryptocurrencies and the technology behind it. The last cryptocurrency market crash in 2018 almost completely silenced the infant vulnerable industry, but in 2019 development continue. Contrast to excessive blockchain projects from 2016 to 2018, where everything was a disruption, new more refined user cases are emerging. The focus goes back to the basics; (1) solving blockchain scalability; (2) upgrading banking industry; (3) updating industrial processes; (4) authentication of digital data; (5) implementation of global digital currency (e.g. Facebook cryptocurrency Libra), and; (6) administrative blockchain supporting solutions (e.g. eDelivery, digital voting, digital identity, land registries). The article from The Economist ("The second half of the internet," 2019), predicts that, billion new internet users will be joining the rest of us soon, there are countries such as Mauritius that are skipping centralised digitalisation and want to adopt blockchain technology directly, so now more than ever a significant internet upgrade is urgent.

Blockchain Technology

One of four main technologies behind bitcoin or any other cryptocurrency is blockchain. Blockchain is a peer-to-peer public transaction ledger, a decentralised computer trust network where in theory anybody can participate by mining, processing transactions, investing or innovating. To explain blockchain innovative security approach, let's simplify by telling that every computer on the blockchain network shares, synchronizes and validates all transactions in a common blockchain ledger. Manipulation would be theoretically possible only if an attacker controlled more than 51% of the network's computer power. Bitcoin is still the largest open public blockchain in the world, followed by Ethereum. Blockchain technology is one of the most promising developments in the information technology (IT) domain. It enables a ledger that can be accessed by all parties involved in the transaction and can act as the universal irrefutable depository of all transactions between involved parties. According to 2018 Market Research Report, the global blockchain technology market size was valued at USD 604.5 million in 2016

and is predicted to exhibit a CAGR of 37.2% over the forecast period.

Article structure

To simplify this article structure, four evolution periods were devised; (1) Blockchain, the Infant phase; (2) Blockchain, ICO chapter; (3) Blockchain, the Reality; (4) Blockchain, the Adoption accompanied by the sub chapters; (1) Constitutional adoption and recognition and, (2) Adoption by the Big Banks and Big Tech.

Blockchain, the Infant phase

In 2008 a white paper called "Bitcoin: A Peer-to-Peer Electronic Cash System" was published by an anonymous Satoshi Nakamoto. Antonopoulos (2016), describes the Bitcoin phenomenon is as first digital, decentralized, borderless system of financial payment and trust that enabled innovation without permission with high resistance for censorship and political manipulation. From 2009 to 2013, Bitcoin struggled with newer ending volatility and dark internet scandals, when finally, the blockchain technology behind it was recognised. With the launch of Ethereum in 2013, world first decentralised super computer, digital blockchain transformation really took off.

Blockchain, the ICO chapter

Initial coin offering was a new unregulated way of crowdfunding via the use of cryptocurrency tokens. CoinDesk (2018), analyses that ICO funding hit a record in second quarter of 2017, and that the total amount raised by start-ups via ICO reached over $800 million dollars, with the sum of over 3 billion dollars in raised funding all together. An ICO basically aligns with the blockchain ideology perfectly. It's digital, borderless process that is based on trust, highly censure resistant and enables innovation without permission. Tokens, Digital assets are the stars in this new process. Most of the new tokens are Ethereum based. In essence, tokens could be anything that exist in a binary format and comes with the right to use, transfer and the possibility to be exchange for Ether, Bitcoin or fiat currency. The value of an ICO is determined by the start-up team based on what they think their company is worth at present stage. Through a simple supply and demand, the value of the token is settled on by the network of participants and investors, and not by a central board or authority.

Blockchain recognition and adoption by constitutional organizations

The impulse behind the blockchain technology is revolutionary. This new 21-century technology brings online trust, security, privacy, authenticity, synchronize ledger and much more, but the reality is, that the adoption is slow. To achieve fastest worldwide adoption several challenges should be overtaken; (1) establishment of legal regulatory and governance framework that could be adopted world-wide; (2) synchronise the competing interests, and; (3) achieving infrastructure replacement or upgrade.

There are emerging countries like Malta, Estonia or Mauritius that see Cryptocurrencies and Blockchain technologies as development or investment opportunity. At the 2019 Mauritius World Blockchain summit, the Prime Minister of the Republic of Mauritius, The Hon. Pravind Kumar Jugnauth gave an engaging speech on growth enablers for Mauritius. In his speech, he quoted "We want to maximize the use of emerging technologies in our journey towards a better Mauritius. I have no doubt that the future of industries and businesses will depend very much on the use of new technologies like Artificial Intelligence, Blockchain, FinTech, the Internet of Things and Big Data." According to tolar.io (2019), there is an ongoing project already in place to plan the adoption of blockchain technology in Mauritius. Definition of the Tolar – HashNET "Scalable, fast, secure, and fair decentralized beyond blockchain project, leveraging Distributed Ledger Technology (DLT) and consensus algorithm which keeps all positive characteristics of a blockchain technology while increasing throughput to more than 200,000 transactions per second" (tolar.io, 2019).

Slovenia is also a big supporter of emerging technologies. The former Prime Minister of the Republic of Slovenia dr. Miro Cerar opened the first European Blockhain Summit 2018 at Brdo pri Kranju. He emphasized that Slovenia is involved in global development flows and is a recognized player on the global map. "We are aware of the responsibilities that bring us dynamic change of the digital environment, which affects all aspects of our existence," he pointed out. There is a lot of political talk regarding blockchain, but mainstream adoption is still far from reality.

As we speak, applications are being built to match the EU requirements and specifications. The 4th Pillar project already developed a DLT infrastructure solution with two products;(1) sensitive document exchange and delivery (i.e. eDelivery) in the form of FOURdx protocol, and;(2) FOURid individual digital identity mechanism. FOURdx protocol was developed in 2018 and it combines several advanced technologies delivering EU compliant solutions in the form of

blockchain based eDelivery. According to the projects documentation, when a user (i.e. sender or receiver) wants to share documentation, he or she must first go through the onboarding process (i.e., KYC identification, which is needed only for the first registration process), then select the document and privately encrypt it with the receiver's public key stored in a database of registered users. Once this step is done, the Central FOURdx Platform takes over. FOURdx.io, (2018), explains, that the document is sent to the FOURdx API with the help of unique Google Chrome add-on, developed by the team (i.e. add-on is unique wallet, capable of managing sensitive documents). The user is provided with the "link" of the saved location that serves as admittance to the sent document. This link is later, through a smart contract, collected on the Ethereum blockchain and accessible by the recipient. The innovation offers a safe, fast and inexpensive blockchain based solution, a principal future way of sensitive document exchange and eDelivery and digital identification.

Estonia runs point in blockchain adoption. As explained by Williams Grut Oscar (2016), Estonia uses Guardtime technology with partnership of Estonian e-Health Authority and Estonian Information Systems Authority to manage a blockchain network of private citizens, companies and government. The county has already successfully migrated 1m of health records on their blockchain network. The network is accessible by smartcard that stores user's data and gives access to over 1,000 government services. The user case it's also known as Estonia model and it placed Estonia between most digitally advanced societies in the world.

Other countries are implementing blockchain solution successfully as well, the Swedish Landmateriet (i.e. cadastral agency) has implemented solutions to enable the creation of a permanent register of real estate assets. With the goal to improve the transparency and speed of operations by removing the need for expensive, time-consuming clearance of real estate settlements. As a result, such contracts can be executed substantially cheaper and faster. The Swedish model has inspired also Sweden, Georgia, Ukraine and Rwanda, that are currently launching initiatives to use this technology as the basis for their land registers.

Adoption by Big Banks and Big Tech

It took a few years for the Big Banks and Big Tech to officially acknowledge cryptocurrencies, blockchain technology and discard the offense position. The benefits of the technology are just too hard to dismiss. J.P. Morgan (2019) points out, that their new Blockchain Centre of Excellence (BCOE) explores blockchain, develops the technology, invests in strategic partnerships, and participate in cross-industry consortia.

In June 2019 the world has witness the Libra announcement, Facebook first cryptocurrency. With 2.4bn users, the social networking company would have no problem to propel cryptocurrencies into the main stream (Richard Waters, 2019). The announcement triggered a tsunami of complaints from politicians, privacy activists and bankers. Richard Waters (2019) notes, that the idea marks a long overdue full-frontal attack by Big Tech on the payments industry. The same Financial Times article concludes that, the planned Libra launch will be within a year, with the backing of partners like the payment networks Visa, Mastercard, Stripe, PayU, PayPal, Coinbase, Marcado pago, internet companies Uber, eBay, Lyft, Spotify, Farfatch and others, that will later form a Libra government body. Governing body will oversee the currency and manage its reserve, which will back the coin one-to-one-the reserve, composed of bank deposits and short-term government securities (Wagner, 2019). Bloomberg Businessweek further states, that each association member, including Facebook, will have a single vote on important decisions regarding the currency, like how and where the currency will be issued and similar. To address the token value, Josh Constine (2019), explains that Libra's value is tied to bank deposits of stable international currencies, including the dollar, pound, euro, Swiss franc and yen. The Libra Association will maintain this deposits of assets and could change the balance of its composition if necessary to offset major price fluctuations in any one foreign currency so that the value of a Libra stays consistent. Josh Constine (2019), also states that each time someone cashes in a dollar or their respective local currency, that money goes into the Libra Reserve and an equivalent value of Libra is minted and doled out to that person. Wagner (2019), warns that the Libra Association tasked with managing the coin hasn't yet drafted a charter, which will stipulate how the cryptocurrency is backed, distributed, and governed. This is extremely important as Libra will not be 100% decentralised, frictionless and governed by the consensus algorithm like Bitcoin or Ethereum. According to Facebook, the end goal is to provide in apps payments with the same experience like sending a picture or an emoji. The infrastructure of apps and users already exists (i.e. WhatsApp, Facebook messenger), there is just a matter of cryptocurrency Libra integration.

Ripple is also one of the operating blockchains in the crypto space. Ripple is an open-source protocol that is used as a distributed peer-to-peer payment system exclusively in the banking industry. According to Ripple.com, Ripple connects banks and payment providers via RippleNet to provide one frictionless, cost saving experience for sending and receiving money

globally. It runs on the most advanced blockchain technology, that is scalable, secure and interoperates with different networks. As stated by (Ripple.com, n.d.), they already connect 200+ partners like MUFG Bank, Itau, CIMB Bank, American Express, MoneyGram, SCB and others.

Blockchain advantages have not stayed unnoticed also by Microsoft and Amazon. ESA (2019) explains, that Microsoft has partnered with ConsenSys to offer Ethereum Blockchain as a Service (EBaaS) on Microsoft Azure and Amazon Web Services (AWS) has introduced the open source frameworks Hyperledger Fabric and Ethereum in its Amazon Quantum Ledger Database (QLDB) and Amazon Managed Blockchain products.

The mainstream adoption

A blockchain initiative for seaborne cargo is a good example of blockchain adoption, aimed at cutting costs and improving cargo tracking. According to Paris, (2019), Germany's Hapag-Lloyd AG and Japan's Ocean Network Express stated they will join the TradeLens platform launched by A.P. Moller-Maersk A/S and International Business Machines Corp., dedicate the program five of the world's six largest carriers and controlling about 60% of the oceangoing container cargo capacity. For ocean cargo carriers, blockchain technology allows participants to share information as goods move through maritime focused supply chains (Paris, 2019).

To achieve blockchain global scale adoption, there are still open network issues to address like transaction cost, scalability and energy consumption. According to The Cryptocurrency Consultant (2019), Vitalik Buterin (i.e. Ethereum founder) presented the concept of Ethereum 2.0 in detail. The upgrade is named Serenity and the goal is to make some changes and restructurings to improve the scalability of the blockchain and reduce transaction costs. As a benchmark for a sufficient transaction rate, the performance of Visa with several thousand transactions per second is often taken as a model. Currently, Ethereum can only handle about 15 transactions per second. With the implementation of Serenity, Ethereum would be able to process up to 15,000 transactions per second without moving compromising decentralized model or risking security, explains The Cryptocurrency Consultant (2019).

There are schools already that offer blockchain lectures as a part of MBA programs. Cotrugli Business School recognised blockchain advantages early on. According to Cotrugli Blockchain Academy, they offers two programs; (1) blockchain EMBA program for managers, and; (2) program for certified blockchain developers. Other universities such as Cornell, Georgetown, MIT, NYU, Princeton, Stanford, Berkeley are also adding blockchain to their educational programs. The importance of blockchain has also been recognised by Oxford university as they stated "As 30% of bank jobs face elimination due to disruptive technologies by 2025, businesses are warned to prepare for the blockchain revolution."

Conclusion

The blockchain technology is in fact mind-blowing. The possibility to enable access to financial instruments to over 1.7bn underbanked people is truly revolutionary, as is the idea of the world's first uniformly digital currency. Blockchain could solve open questions in the fields of finance, insurance, notary functions, supply chain management, identity, privacy and digital rights management, IOT (i.e. internet of things), state administration, online security, seaborne cargo tracking, 4D printing, quantum computing, augmented data discovery, machine learning, autonomous driving, virtual reality and much more. With Big Banks, Big Tech and constitutional organizations on board, the development can move forward and mainstream adoption can begin, finally placing the human king on the side of the beneficiary.

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Bios

Dr. **Tali Rezun** is Slovenian, of Slovenian and Jordanian origin. Born in Ljubljana in 1978, he started his entrepreneurial career at the age of 18 and grew his business organically until this day. Dr. Rezun specializes in various fields of tourism, management, leadership, online brand marketing and Blockchain technology. In 2012, Tali finished his EMBA and later in 2018 his Business Doctorate (i.e. DBA) specializing in online brand development, SEO and Social Media Marketing under the domain of Cotrugli Business School, where he also enjoys the title of a lecturer. Currently Dr. Rezun acts as group CEO in Lighthouse holding, publishes articles associated with his expertise, serves as projects consultant and appears as a guest speaker to the media. (https://talirezun.com/, contact@talirezun.com)