BLOCKCHAIN, THE TRUST, AND TRANSPARENCY ECONOMY

Group 2

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Part I:

1. Critical Reflection

As a group reflection, we have various perspectives related to Blockchain and the technology in general, which enriches the overall discussion about the topic.

To deep dive into the standpoints, we started by discussing each of our points of view about the topic. One member sees the Blockchain as a very useful technology for the future, especially the decentralized feature attached to it, which will be a game-changer in the scientific field. Indeed, an important improvement in this domain is the ability to find scientific data across networks. When research and studies are performed, scientific data is often hard to find, as publications tend to make it difficult to find one specific answer and the time lost to research among academic papers or files is consistent. Moreover, Blockchain could be used on an international level to track the success of clinical trials for new medications, which are currently tracked through outdated systems that can often mix up the information and could be resolved in a blink of an eye. Another relevant part to take under consideration is given by the secure algorithm and the key contribution of the nodes, the idea to have all the participants aware since the very first block was generated, of the further directions taken along the way is a terrific transparency improvement.

Another member does not only see it as useful for the future as an unbelievable opportunity but already in our present. Although it carries some risks, especially being at a very early stage of development, those risks are worth taking because the benefits overpass them. The point taken is, at this stage, to contribute at the best of our possibilities to allow the expectations that we have in mind to develop, to be well reflected in the reality and giving chance to translate them into an overall contribution to the community.

Coming to one more team member's perspective, this technology is, for the time being; still full of issues considering the power consumption side and the linked environmental issues which with the new ESG implementation became something we cannot ignore anymore as already too much damage has been done to our planet. The energy consumption of Blockchain solutions is highly related to the underlying mechanism that is used for achieving consensus between the nodes of the network. Let's think, for example, of Blockchain that is based on Proof-of-Work, such as Bitcoin and Ethereum, which are characterized by a high level of energy consumption. Therefore, the Blockchain community must come up with a solution for the mentioned problem. Time processing of each block transaction also becomes a current issue which shall be solved, to make the ecosystem more competitive with non Blockchain Financial Digitalization Technology. Moreover as part of Decentralization Autonomous Organization, Blockchain Technology have interoperability challenges between available platforms. And this will impact not only the trust and transparency, but also block transaction time processing and bridging the gap of smart contracts between ecosystems. Other points of view include the idea that we are far behind the time with the use of the Blockchain and we might be able to see good results in the future, considering the possible combinations with IoT and AI. Current IoT and AI technology which are growing rapidly in several sectors have gaps in security issues which could be bridged through Blockchain technology as part of the solution.

Another member's point of view introduces us to the idea that being involved at this time is like being a pioneer. Having the possibility to shape a revolution, such as a Blockchain technology, is a lifetime occasion to re-invent our way of perceiving the innovation. This same member let us reflect on the fact that all of us were not able to participate in the advent of the very first internet and even when this latest was already upgraded to a new conception (Web 2.0 and the boom of the

social networks), timing played against our inclusion for an active part into it. Now instead, we can leave our footprint, and considering only our small sample and our diverse operational fields we cannot stop thinking of how many industries will benefit from it.

The last outlook is that we haven't seen anything but the iceberg's tip of this new technology revolution and that many more innovative ideas still have to be developed with the help of the Blockchain, the revolution resulting from the applications of Blockchain is therefore just at the beginning. It does not only concern the cryptocurrency investment niche but will soon touch every aspect of our lives. This last member continues by sharing the idea that in the near future not only certain investments, but many entities will be able to be 'tokenized' and thus more easily valued and exchanged in a decentralized system, i.e., without intermediaries. We are already seeing many examples of areas that are approaching tokenization via NFTs: art collections, music, and digital native games are experiencing considerable success. This will bring more and more "players in the game", enlarging the user basis and extending it to entire populations.

Our general take is that the future looks very promising and that nowadays we must work a lot to smooth the angles and improve the use of this technology. We believe that what will propel Blockchain out of a few specific areas, first and foremost the financial one, will be its application through NFTs, which will radically change our lives and every kind of business it will. Of course, not stop at that and will touch all aspects which closely impact our daily lives (like scientific research, medicine, the notary, and so on). The revolution will be political, economic, and cultural; we are only in the initial phase of an epochal change where the figure of the intermediary will increasingly lose its relevance while the individual power will gain importance.

2. Portrait Environment

In a group discussion related to the Portrait Environment of Blockchain, we concluded that Blockchain technology will change and transform society with several key factors to be considered including the biggest challenges and opportunities surrounding it.

The first reason stated was that Blockchain-based money transactions establish rapid, inexpensive, and secure public records. Furthermore, they can be used for a variety of non-financial purposes, such as voting in elections or verifying the existence of a document at a certain time. Blockchain is ideally suited for scenarios in which ownership histories must be recorded. For instance, they may improve supply chain management to ensure that diamonds are acquired ethically, garments are not made in sweatshops, and champagne is produced in Champagne. They could assist in resolving the issue of music and video piracy while allowing digital media to be properly purchased, sold, inherited, and given away in the same manner as books, vinyl records, and videotapes. At the forefront of Blockchain development are self-executing contracts that pave the way for autonomously operating businesses.

Blockchain redistributes some authority over users' daily interactions with technology from centralized elites to users. Consequently, systems become more transparent and possibly more democratic. However, this is unlikely to culminate in a revolution. Governments and business titans that engage extensively in Blockchain research and development are not attempting to become obsolete, but rather to improve their services. There are also some broader considerations to make. For instance, the transparency of Blockchain is acceptable for public records such as land registries, but what about bank balances and other sensitive data? It is possible (albeit seldom and with much effort) to identify the parties involved in transactions. This might put their privacy and identities at risk. While certain Blockchain provides complete anonymity, sensitive data should not be

transmitted in this manner. Nevertheless, even though Blockchain is not the answer to every problem and will not revolutionize every part of our lives, it could have a significant impact in several areas, and it is important to be prepared for the challenges and opportunities they provide.

The main challenges Blockchain technology is facing are inefficient technological design, criminal connection, low scalability, high energy consumption, lack of privacy, no regulation, security problems, lack of adequate skill sets, not agile enough, and public perception. The evolution of Blockchain technology architectures including consensus algorithms and interoperability between platforms, become a big challenge for the Blockchain Community. For this Paper, we will take a short look at how high energy consumption is a key challenge that the whole Blockchain industry must overcome.

The majority of Blockchain technology is or was built on the architecture of Bitcoin and uses proof-of-Work as a consensus technique. Proof-of-Work, on the other hand, is not as good as it appears. Any of block transaction will take a lot of power consumption during transaction validation or crypto mining. Mining is something we've heard about. Mining will require utilization of High-Performance Computers (HPC) to solve complex equations. When we start mining, our HPC will require more and more electricity to overcome this predicament. Miners currently consume 0.2% percent of total electricity. If it continues to rise, miners will need more power than the world can supply. As a result, it has now become one of the network's key challenges. Many businesses are attempting to avoid Blockchains entirely due to this issue. As a result, the issue must be managed, as it is one of the most significant obstacles to Blockchain adoption. But how? To validate the transitions, Blockchain uses alternative consensus methods and algorithms that process with minimal energy.

Now we looked at some of the opportunities of Blockchain technology such as reducing costs, increasing traceability, improving customer experience, verifying ownership and proving identity, and enhancing security. The use case of this application, we can see such as in Logistic/ Supply Chain Management which required a safe, secure, and trust ecosystem to validate, trace, ownership and identification verification through Blockchain Ecosystems. Moreover, the Healthcare Management System has adopted this technology for patient registration, medical treatment record, etc. In the Banking and Payment Gateway verifying identity, fund transfer tracking and verification could be done in short times though Blockchain Ecosystem since the architecture does not accommodate the intermediary which bridging between the fund sender and receiver. Blockchain Technology could be adopted as part of Digital Transformation in Government Sectors which can protect confidential data, streamline the processes, and reduce fraud, waste, and abuse while simultaneously increasing governance trust and accountability.

In the age of the Internet, when an image can be copied and distributed to a million people with the click of a mouse, it has become a nightmare to keep track of intellectual and other property rights. The international patenting system is also extremely convoluted, with rules varying from nation to nation.

Kodak (ROCHESTER, N.Y.) is attempting a comeback by positioning itself as a Blockchain technology company. They recently announced a platform that will record and track the internet usage of photographs and images. It is intended to facilitate more transparent and automated invoicing when a photographer-publisher relationship exists.

There is also the expectation that Blockchain will result in fairer compensation for musicians. Imogen Heap founded the "think and do" tank Mycelia (Heap), which is investigating

Blockchain contracts, IP management, and payment solutions. However, Blockchain can be used to secure more than just intellectual assets.

Paperwork and legal compliance procedures bog down the real estate market, which is inevitable when dealing with high-value transfers. Compliance and due diligence are required at each step of the mortgage application and approval process, which can take several months due to the number of hands each application passes through. Ubiquity, a company based in the United States, offers a Blockchain-based solution to this issue in the form of a transparent and public ledger for recording property titles and deeds. Additionally, Blockchain can be used to establish identity and credentials.

Recruiters are accustomed to deal with exaggerations and outright lies from applicants, but this issue can have costly long-term effects. In the field of recruitment, a Blockchain-based CV verification and matching service has been introduced, which promises to drastically reduce the amount of time required for employers to verify candidates' credentials and experience. APPII (Gary McKay) hopes that its platform, "the world's first Blockchain-based career verification platform," will assist in resolving this issue.

3. Interviews

We have interviewed some involved people from the Blockchain ecosystem and described their perspectives on Blockchain Technology.

We started the interview with Mihajlo Stojanoski – A mining expert who stated that crypto mining is important for solving complex mathematical equations of cryptographic hashes generated for securing data transferred on a public network.

Determining whether crypto mining is worthwhile depends on the mining rig's hash rate, electric power consumption, and overall costs. Generally, crypto mining machines consume a considerable amount of electricity and emit significant heat and huge carbon emissions. And as the number of miners rises, the difficulty of the hashing algorithm changes, and the technology and the machines need to be upgraded more often. This makes the environment even more vulnerable.

That's why there were attempted bans, the most important was the China ban on mining, also several government regulations attempted, to decrease the volume of the coins, raising the difficulty of the algorithms, decreasing the production of the GPU amounts, or producing GPUs with LHR, raising the electricity bills, but it didn't provide many positive results as expected, because the miners - still mine. They even made the Proof-of-stake framework vs. the Proof-of-work framework, which is a good consideration, but still, POW is needed.

There are a lot of companies that do a lot of scientific research or other work using Blockchain technology and as long as the Blockchain exists, and it's on a rise, mining will be needed to calculate the algorithms and secure the transferred data.

On the other hand, some companies like TeraWulf are starting to build mining facilities using green and renewable energy from the hydro and nuclear power, not just for preserving the environment, but also to show that there is a way to decrease the bad effects on the environment and to also open a lot of new green job positions for people.

Moreover, we did group interview discussions as part of Cardano Catalyst - Eastern Town Hall Indonesia. During the interview, it was discussed how the interoperability issue between Blockchain architectures became highly concerned as part of Blockchain Ecosystem Development. Cross Blockchain dApps (Markus Nissl) will bring the most used smart contract programming language across Blockchain, meanwhile another concern related to time processing each block with the current system update (Yan-ETH).

Meanwhile, during the Smart Cities World Debate Forum, we raised the concerns related to implementation of Blockchain Technology as part of data proliferation and enhanced connectivity for more livable cities. As relying on AI Technology in Smart City Ecosystem could have several risks, especially on privacy and security, integrating IoT, AI, and Blockchain technology could become the option, even though as part of Digital Transformation the scale-up and enhanced Technology should continue.

Further interviewed with 2 personnel's who are currently active in developing Digital Transformation in Oil and Gas Industries which has come up with ideas to bring the AI Technology as part of the implementation of Blockchain technology in the Environment Gas Emission Management System to achieve Environment Pollution, Control, Evaluation, and Rating Performance (PROPER) Standard. The integration of Gas Emission Live Report through IoT, Data Analysis, and validation through Artificial Intelligence Model before sending to Blockchain

network, will ensure the validity and accountability of Environment Data Insight. Moreover, with

a smart contract, carbon print bonuses could be integrated and valued as a carbon credit point.

Part II:

4. Reflection and use of Technology

4.1. Ciro Gargiulo: Blockchain in Real Estate/ Property

Blockchain has been around for a bit more than a decade and the past years have seen it take the central stage globally. The hype that currently surrounds Blockchain technology is huge and despite the big claims about how revolutionary this technology is and how many benefits it carries; the practical adoption of this technology has proven to be much slower than all the publicity would have suggested. With this preview, I come to raise my first very big question: is it clear to me that there's a lack of adequate knowledge on how exactly to implement the technology so many companies simply steer clear of it, but exceptions made for this, why there's still so much reluctance towards Blockchain? How the technology can practically be implemented in a way that has a social impact on problems?

I use Blockchain to keep track of my investments within the Real Estate tokens and the cryptocurrencies, especially when I move them from one wallet to another and I want to double-check that the transaction has been correctly validated. Mainly, I use the Blockchain to verify the background of a specific investment.

I am very curious to discover deeply what are all the implications in which Blockchain can be used and how can I practically do it. I want to learn how to apply efficiently this technology not only in my professional sector (finance) but in many others. Moreover, I want to learn everything about tokenomics, DeFi, and Tokenization to become a focused expert on Blockchain in Finance with a broader knowledge also on other sectors.

4.2. Sonny Dhamayana: Blockchain in Digital Asset Management

Blockchain technology has influenced and brought impact to several businesses as part of digital transformation including Banking, Payment Gateway, Healthcare, Government, Communication, logistics, Asset Management, etc. The integration with the Internet of Things (IoT) and Artificial Intelligence (AI) has led to new challenges and big questions about how to bring the technology in a safe, secure, effective, and efficient way with inherence to technology ethics key principles/ guidelines.

Interaction of Blockchain technology in the current company has been started as part of the Digital Asset Management System within the Private Blockchain System. The developed system integrated IoT and AI technology which involved image processing to identify and recognized asset stock and movement within the facility, meanwhile NLP technology will be utilized for the recognition and validation of critical asset documents including certificates of inspection, preservation reports, etc. Further, the validation and recognition report as AI insight will be registered as an asset management block in Private Blockchain Networks. The outcome of this system is to bring the corporation not only more effective and efficient in maintaining the critical asset, but furthermore in a reliable, safe, and secure way.

The expressed interest to learn and adopt the Blockchain technology with current development stages including but not limited to enhancing and scaling up the technology to be more effective, efficient, safe, and secure with compliance with ethical key principles and guidelines will become further challenges as part of research, exploration, and project implementation.

4.3. Jelena Gjorgjev: Blockchain in Crypto-currencies and mining

Although a cryptographically secured chain of blocks was established as an idea in the early 90s, it became a reality back in 2008 by the Satoshi Nakamoto (Nakamoto) group. Since then, it became a well-known technology and is widely used in the tech world. It was mostly used for crypto-currencies and this last year for NFTs, but there are more aspects to it. Blockchain has been used in a lot of scientific research, business models, marketing models, etc.

I have been mining crypto-currencies since 2010 and I have been crypto-trading. I also research what innovative ways the crypto currency is used for. To fully grasp its potential, I also started making NFTs and researching to see their meaning of them and why they became so much popular.

I want to understand the full potential of Blockchain technology and the ways I can use it as a developer, the way it can improve the software and the security of data, and the way we can implement it and use it in our everyday lives. I love the concept of decentralized network and the security of the data it provides, and I think can be implemented in huge scientific innovations and technological improvements in the near future.

4.4. Johannes Kofler: Blockchain in Variety of non-Financial Applications

While Blockchain technology seems to enable a decentralized and permissionless world I am deeply wondering how this could play out in the right way. Yuval Noah Harari wrote amazing Books such as "Sapiens: A short History of Humankind", "Homo Deus: A Brief History of Tomorrow" where he talks about intersubjective realities we created such as the financial system which builds on the foundation of trust. This means as long as we trust the system it works, the moment we don´t it might collapse. We have seen that playing around with new ideas such as "communism" can lead to millions of deaths. And here starts my main question. How can we bring this amazing technology into our world without threatening humankind too much? As history has shown, inventions are a double-edged sword. We must take responsibility and remember our values and principles.

The second question which is moving me is a simple one; it is basically how do we measure that diamonds are real diamonds or that champagne is really champagne. So how do we make our information "real information" and prevent fraud there?

I have been invested for many years and am enjoying the returns. Right now, I started learning Javascript, CSS, Rust (Solana), and Solidity to help with some projects. I am most curious to learn about the craft, the resources, and the knowledge needed to tackle questions such as how we build sustainable systems, and how we can make the world a fairer place.

These questions are not simple. Much thinking, working, and practicing has to be done to be able to build antifragile systems. So how can we leverage Artificial Intelligence (AI) and Blockchain, how can we incentivize players to make great work for the whole group, network, or community?

4.5. Agrin Azizi: Blockchain in Crypto-currencies and Tokenomics

Blockchain has been with us for more than a decade now. When I came across cryptocurrencies for the first time in 2016, the technology behind them was not even an issue. Only later did I take the time to understand what technology cryptocurrencies are created on. I understand what Blockchain is and how it can be used in banking. But Blockchain is much more than just cryptocurrencies.

I have been trading cryptocurrencies since 2016. I use Blockchain to track my investments and to see how other people are involved in these cryptocurrencies. I started trading NFTs this year. However, I see myself as a long-term holder in the area of cryptocurrencies and NFTs. Otherwise, I don't use Blockchain every day because there aren't many topics that I can use myself.

I want to understand Blockchain from the ground up and know the risks involved. I would like to discover what possibilities there are when using Blockchain and to be able to create cases on a technical level and generate possible use cases that generate a potential business. I would also like to understand the impact of artificial intelligence, IoT, and Data Science on Blockchain

5. Conclusion

After long discussions and talking about our experiences with the Blockchain technology, sharing our knowledge, our different points of view or what each of us wants to learn we definitely agreed on one thing: The Blockchain technology gives us so many opportunities, besides the disadvantages it has at this stage, that we believe will be resolved soon and it will definitely be a revolution that will make huge changes in our everyday lives, also it will have huge social, political, economic, scientific and cultural impacts that will change the way people and societies behave and collaborate and we are eager to learn it, get the most advantages we can from this technology and see the world become even better.

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