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AUTOMATION PROCESSES AND BLOCKCHAIN SYSTEMS

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ABSTRACT

Blockchain Systems and Ubiquitous computing are changing the way we do business and lead our lives. One of the most important applications of Blockchain technology is in automation processes and Internet-of-Things (IoT). Machines have so far been limited in ability primarily because they have restricted capacity to exchange value. Any monetary exchange of value has to be supervised by humans or human-based centralised ledgers. Blockchain technology changes all that. It allows machines to have unique identities and hence a virtual presence. Blockchain technology even allows for automated verification by the network of machines itself. It permits machines to exchange value and introduce the element of discretion in the hands of Machines. This can form the basis for ultimately developing IoT going on to Artificial Intelligence. This paper deals with the various interplays of Blockchain with Automation processes. Firstly, the concept of cryptocurrencies (also referred to as cryptocoins in this paper) is explained. Then the concept of Regulated and Sovereign Backed Cryptocurrencies (RSBCs) is discussed. Later on, I explain how Blockchain systems are related to IoT. Then we discuss the concept of Smart Mining that will lead to advanced Blockchain activity and Machine

intelligence. Finally, the paper concludes as to how Blockchain technology will impact automation processes.

INTRODUCTION

A cryptocurrency is a medium of exchange using cryptographic techniques to safeguard transactions and also manage the formation of additional units of the currency.

A Blockchain is a widely disseminated archive of data that maintains a continually-expanding register of records fully and reliably protected from any alteration or modification. Each block has a timestamp and link to the preceding block.

A Crypto wallet is an encrypted electronic device that allows an individual to make electronic cryptocurrency transactions. Each wallet will have a public key visible to anyone. But it can be operated by only a person who has a private key. Transactions on the cryptocoin network are usually anonymous.

When people send cryptocurrencies to each other, someone has to keep account of who spent how much at what time. In case of fiat money (or paper money) it is done by banks (known as Trusted Third Parties, for which they charge a commission). But in case of Cryptocoins, it is registered on a ledger called Blockchain (with nil or minimal fees).

The cryptocoin network makes this possible by detailing all the transactions made during a certain timeframe into a list. This list is known as a block. A certain set of people called 'miners' verify these transactions mathematically and register them on the Blockchain.

Those bona-fide miners who have successfully verified the transactions are paid freshly created Cryptocoins. This is how miners are rewarded, and new cryptocurrencies are generated. This is also the reason why no transaction costs are levied, as the network (in the form of miners) verifies the transactions.

Bitcoin is a peer-to-peer based cryptocurrency which is not backed by any commodity and (unlike fiat money) carries no sovereign guarantee whatsoever.

Regulated and Sovereign Backed Cryptocurrencies (RSBC), on the other hand are government backed cryptocurrency akin to paper currency, but in digital form. It is based on the K-Y Protocol ^[1]. The K-Y Protocol is a set of rules and instructions to implement the Regulated and Sovereign Backed Cryptocurrency (RSBC) system.

In this system, the cryptocurrencies (known as NationCoins) are backed by Sovereign Guarantee. They are run on a highly secure Controlled Blockchain(CBC)^[2] in which Sovereign backed Cryptocurrencies will be transacted without any hassles. NationCoins are completely managed by the Sovereign Authority i.e. the Government.

Basically IoT means a network of items which have embedded in them, electronic chips that will allow such items to gather and exchange information. IoT will enable the items to be controlled via the internet or any appropriate network.

If automation is the use of a system to minimize or reduce human intervention, IoT can eliminate the need for human supervision or management altogether.

If the machine age means the proliferation of machines everywhere, then IoT means the proliferation of machine intelligence everywhere.

IoT is closely associated with the concept of ubiquitous computing. Ubiquitous computing means a situation in which computers or microprocessors are everywhere. Today miniaturization has allowed microprocessors to be embedded in any object.

One simple example of IoT is our house lighting being linked up to sensors that can sense our presence or absence in the room. As soon as you enter the room, the room lights up. The lights may be so calibrated to brighten or dim on your command.

IoT and ubiquitous computing are like two faces of the same coin. Smart homes, smart grids, smart city and even smart transport can be made possible by the IoT. And the concept that underpins this possibility is the Blockchain technology.

Earlier, transactions made by machines had to be verified by banks or other human intermediaries. Blockchain technology allows the network of machines itself to verify the transaction obviating human intervention.

Now it will be possible for our fridge to order milk cartons and pay for it, all by itself without any human (sitting at a bank) and clearing the transaction. In fact, no financial

intermediary may be required. The network will verify and validate the transaction, all by itself.

The repercussions of this possibility are immense. Embedded chips in objects will provide them a digital identity and a virtual presence. A coffee mug on a table will have a defined existence in the digital world. One can sell the mug, loan it or pawn it on the internet. One can rent one's car to someone for a week. As soon as the week is over, you can automatically lock the car, trace it and take back control of your vehicle. With ubiquitous computing, business too will become ubiquitous.

IoT will not only enable automation, it will accelerate automation to a level which may not be possible by other means. The basis for this kind of development will be Blockchain technology.

Machines will be able to talk to machines, transact among themselves, settle their accounts and keep doing it for ever without slowing down or getting tired. The various machines involved in manufacture of goods will be able to automatically order for parts or raw materials for production. Supply chain will become fully automatic.

Blockchain technology will enable Automation in a sustainable way. That is because Blockchain technology is decentralised. Any centralised system which controls machines is vulnerable to single-point failures (E.g. - Hacking or power failure in central server). But Blockchain systems are highly decentralised and loss of one part of the network

does not compromise the whole network. This also allows for the development of Swarm Intelligence ^[3] as a precursor to Artificial intelligence.

The IoT enabled by Blockchain technology may very well be just one of the small “steps” in the path of developing a truly artificial intelligence.

“SMART MINING”

The Internet-of-Things combined with Blockchain and mining gives rise to a new phenomenon which I have labelled as “Smart Mining”.

“Smart Mining” is the process where objects, apart from fulfilling their function, pay for the function that they are designed to execute. IoT will give way to a situation where almost all objects will be just be platforms on which to mount microprocessors which will keep mining crypto currencies. Since RSBC cannot be mined by private networks, only private crypto currencies (like Bitcoin, Ether) will be mined. They can then be exchanged with RSBCs (or independently traded) at exchanges. Such exchange will be done by the machines themselves with no human intervention.

This will allow for Machines (with embedded microprocessors) to be flown (or built) on Extra-Terrestrial settlements where they can carry out cryptocurrency mining and add value to the Extra-terrestrial economy ^[4]. Smart Mining will lead to a condition where everyday objects will be able to act as miners and keep on adding value.

Advanced algorithms can be programmed into the Machines to 'learn' and 'think' on how best to add value to society. Everyday objects or Machines programmed in this way (let's call them Machs) may 'earn' and 'invest' in the market (based on market conditions), loan the money to other machines (or humans), or buy things (or other machines) which will make their job (Mach's) easier. For example, a huge industrial machine with many spare parts will be able to automatically detect flaws in its parts and order for spare part replacement or repair. All this will be done on the Blockchain, without human intervention. Essentially, every object will 'earn' its manufacturing, presence and maintenance.

CONCLUSION

We have seen how Blockchain technology and Smart Mining empowers Machines to freely exchange or add value in an economic system. Not only that, it also enables machines to improve their working and maintain themselves. This phenomenon will accelerate automation and possibly the development of a fully independent Artificial Intelligence.

It will take away a major burden of supervising and up keeping of machines from human hands and free human minds for greater pursuits. It has huge implications for the future of Mankind and Man-Machine relations.

This is a great leap in terms of economic and technological thought. We do not yet know the manifold impacts of this possibility. But since a net addition of value is involved, it will most likely be a positive development.

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