THE DECENT RALISED FUTURE

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ABSTRACT

Block chains appear to have the ability to disrupt any industry, business procedure, government structure, or economic system. Block chain technology's transformative power should not be seen as an existential threat to existing systems of governance, but rather as an opportunity for national and international institutions to defend the rights of those they represent and to accelerate our collective progress towards the Sustainable Development Goals of the United Nations.

A block chain can offer immutability and verifiability to business operations while also bringing transparency to otherwise opaque or corrupt systems. While protecting sensitive infrastructure, they may also promote trust and collaboration by fostering an environment of cooperation and mutual respect while also protecting individual privacy.

A wide range of sustainability, humanitarian, and environmental efforts can benefit from the use of block chains.

This white paper shows how this unusual technology works and how it is already being utilised to achieve conventional goals. – – – For example, it shows how block chains have revolutionised development aid, supply chain management, the renewable energy sector, and economic growth.

As a result, we wanted to demonstrate how block chain technology can be used by governments, non-profits, and individuals to build new, strong collaborations. The dangers of this emerging technology are discussed, as well as possible solutions.

1.**INTRODUCTION**

BLOCK CHAIN: WHAT DOES IT MEAN?

Block chain technology, like many other innovative ideas, inspires both excitement and hope. What may it be used for?

In a nutshell, block chains may enhance any process in which individuals need to access, verify, communicate, or store sensitive information. A person's identification, a product's shipping history, or a digital asset like money might all be included in this data.

Objects, people, and their interactions are all stored in databases, spreadsheets, and ledgers. a large portion of the world's information, including credit rating dataThese kinds of systems keep track of everything from credit card purchases to medical and financial information.

There are several, well-known flaws in these systems since they are centrally managed. Because of the lack of transparency, centralised records are open to unauthorised viewing or distribution. A "master" copy is similarly subject to irrevocable edits or deletions since it is a "master."

Information can also be stored in block chains. However, there are two critical differences between the two.The first step is the packaging and sealing of data. Every ten minutes or so, a new block is generated on the Bitcoin block chain, which holds all of the network's transactions. A chain is formed as each block

is joined to the one before it.This "chain of blocks" does not reside in a single location. Instead, distributed ledger technology copies and distributes each block across a network of peers - whether people, governmental institutions, NGOs, or enterprises. "Distributed Ledger" and "block chain" are commonly used interchangeably, although for the purpose of clarification, block chain technologies tend to utilise distributed ledger technology."

A new block is added to the chain every time someone adds one to their copy.
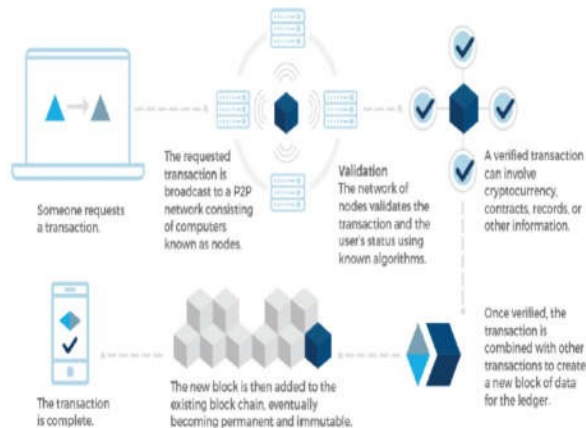
BENEFITS

A variety of advantages may be gained by using this method of organising and storing information.

Immutability

No one peer can modify the history of a peer-to-peer network's block chain since it is preserved in numerous copies and governed by agreement.

SecurityDespite the difficulty of the challenge, it is possible to put it up in a way that makes it relatively straightforward to find a solution. In actuality, even the largest networks are unable to reverse what is very simple for a network of computers to accomplish.

Verifiability

Full public verifiability is made possible by the combination of transparency and immutability: anybody anywhere in the world may check to see if the system's rules are being followed, such as in the case of digital currencies, the requirement that coins be used only once. Network scale and power make it possible to verify information that has been modified.

Resilience

The ledger's resilience is a result of its decentralised design. Even if a large number of your peers choose to disconnect, you will still be able to view the data.

Transparency

The ledger is transparent due to the fact that all transactions are broadcast to all peers. Although the transactions are encrypted, the privacy of the users is also ensured.To guarantee that privacy, accountability, and transparency are securely regulated, block chains may be adapted to their individual tasks and adjusted to their specific functions.

For example, a land register must be accessible to everyone in order to be valuable. On the other hand, the allocation and use of government financing may have to be publicly verified without the availability of some sensitive facts to everybody. It's understandable that an individual would prefer not to reveal too much about their personal information while dealing with a bank, hotel, airline, or doctor.

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Each of these advantages would be enough to establish the block chain as a unique system. However, the true transformational power of this technology is shown when we combine these advantages.

COOPERATION WITHOUT CONFIDENCE

Because the system is decentralised, transparent, and verifiable, we may put our faith in individuals and organisations without fear. Everyone's participation in the system, as well as the integrity of all transactions are supported by the whole network at large. Like data, trust has been disseminated and safeguarded.

There are so many potential applications for this technology because of the trustless protocol's ability to combine decentralisation with resilience, transparency, and immutability.

Block chains are not "magic beans," as some people have claimed.

Block chain is still a new and experimental technology, despite all of the potential uses and advantages it may have. But it's not flawless or universally applicable, and it has a great deal of potential.

This virtue of trustless, completely public verifiability comes at a high cost in terms of compute, storage, security, and coordination.

Because of this, it is critical to recognise that not every situation calls for the use of a block chain or distributed ledger. A block chain may be acceptable in some situations, but it is still required to choose between numerous options..

How Do People Make Use of BLOCK CHAIN?

Although Bitcoin and other digital currencies rely on block chains, its larger uses are just now becoming apparent to the general public. The immutability of block chains, for example, can be used to notarize or witness documents, while others can be used to grant and transfer digital art licences. Post-trade settlement and cheaper payments can be made more efficient by using block chains in the financial sector. They can provide visibility in supply networks. If you need to validate website certificates or provide secure communication, they can help you.

These so-called'smart contracts' may be used to automate complex transactions between several parties if certain predetermined circumstances are satisfied, such as in the case of Ethereum, a leading blockchain platform. Developers have been able to build services like crowdsourcing, censorship-resistant microblogging, and identity management because of the substantially enhanced capabilities this enables.

Record levels of investment in digital currency firms have been fueled by an abundance of prospects beyond the immediate use cases. According to CoinDesk, more than $2.5 billion has been invested in blockchain projects and enterprises (CoinDesk, 2017).

More and more universities are working together on open-source projects, such the Digital Asset Research Lab at Oxford University and the Massachusetts Institute of Technology (MIT).

This open-source feature is essential required for security and trust, and it also fosters new ideas and approaches to existing problems. An open-source platform allows for greater freedom in building, modifying and deploying block chain technology, and the overall value of a particular effort improves in step with its ability to grow beyond the local or even national context. Although the value may rise, it is imperative that the accessibility of block chain technology stay low, as so many of the challenges to which it might be applied influence accessibility.

It is crucial that affordability is not a barrier for the poor, who suffer disproportionately.

Finally, governments and central banks are eager to learn about and engage in the block chain ecosystem as well. New public-private partnerships that combine political authority, third-sector ambition, and

commercial experience with the required financial and technical skills are being formed as a result of the efforts of the private, governmental, academic sectors.

2. **DEVELOPMENT AID EFFECTIVENESS**

Defined broadly, assistance effectiveness pertains to the efficacy of capital deployment in promoting economic or human development. Billions of money are spent yearly by NGOs, sovereign states, and private foundations on this crucial humanitarian task, however much of this is squandered via inefficiencies and corruption.

Everyone engaged has an interest in enhancing efficiency and effectiveness. This is more than merely a moral imperative. Measuring and enhancing efficiency and effectiveness is crucial when it comes to getting extra funds and resources.

The intentions and techniques of people involved in providing or administering development aid differ greatly. The numerous organisations engaged all have their own frictions to resolve. The following example is instructive of some - but by no means all - of them.

The South African government supports a subsidy plan for 40,000 Early Childhood Development (ECD) institutions, most of which are situated in the country's poorest regions. ECD centres give children from impoverished families with access to quality preschool education, care, and nourishment. While specific data are unclear, it is believed that these centres serve roughly 700,000 children between the ages of three and five (Wazimap ECD, 2017). (Wazimap ECD, 2017).

In 2016, the ECD subsidy mechanism gave out roughly $200 million (R2.3 billion) (R2.3 billion). In future years, the government wants to boost ECD financing by $50 million (R800 million) (R800 million). However, making these resources available is predicated on having a sense of how many children already use subsidies, and adopting effective protections that guarantee the money is not diverted. In addition to government subsidy programmes, firms towards South Africa are mandated to contribute 1 percent – 1.5 percent of their turnover in community socio-economic development. In 2014, this amounted to more over $800 million (CSI Expenditure, 2015). (CSI Expenditure, 2015). ECD services are appealing beneficiaries for corporate investment, but they have yet to benefit from systematic investments. This is primarily because they lack the data infrastructure to enable accountability and transparency.

The existing system places enormous amounts of money in the hands of disadvantaged populations. However, because small communities frequently lack the infrastructure for effective administration and recordkeeping, it is impossible to knowhow successfully the present system is operating, or how the South African government may detect service shortages and avoid fraud.

FRICTIONS

The lack of sufficient data infrastructure makes it impossible to address problems of efficiency. Who does the money reach in the last mile? How long does it take to disburse? How is it spent and how does it contribute to development outcomes? Where are the gaps in service provision and where are efforts being duplicated? (UN, 2015) .

This challenge of insufficient data infrastructure is worsened by a lack of openness surrounding the data that is accessible, which makes it impossible to measure what is being lost to abuse of funds or corruption. This is particularly relevant when it comes to development finance being directed into or via the private sector.

• The available data isn't being used properly for planning reasons or to enhance results. Aside from the squandered chance to enhance methods of working, this failure also creates a negative feedback loop: why would individuals provide the data if the data isn't making their jobs any easier? (International Aid Transparency Initiative, 2015

• Diversification of the available money for developing nations puts pressure on donors to be both more open with what they have and to release it fast (ODI, 2016). (ODI, 2016). There is a need to future-proof the aid data by building platforms flexible enough to cope with the changing financial environment and to ensure that not only can aid be tracked but that it can also be mixed and matched with various different sources such as remittance flows and peer-to-peer lending.

3. DIGITAL IDENTITY

SUMMARY

It is easy to ignore how vital our capacity to define our identities is to the smooth operation of the modern world. Everything from access to financial services to the successful management of property rights rely upon it.

When it comes to giving help properly and efficiently, this skill is more that just convenient. In such settings, not only is it more necessary than ever to be able to show you are who you say you are, it is also more difficult.

Intrinsic to this difficulty are the questions of how the essential personal data is kept, secured, and disseminated, and also who owns and manages it.

These challenges touch all of us. However, they have particularly far-reaching consequences when it comes to reducing poverty and hunger, and to promoting good health and great education all throughout the world.

Block chain technology has the potential to address these

difficulties and enhance access to key services.

FRICTIONSSome UN organisations are already seeking to make use of existing ID records.

One drawback of existing systems is that the data in these systems is typically isolated. John Edge, cofounder of the worldwide ID2020 programme - a cooperation involving UN agencies, NGOs, technology companies, and banks - points out that ID systems are typically separated from one another, making it impossible to monitor individuals across borders.

Another issue is a lack of trust. Individuals have grown increasingly mistrusting of governments, yet trust is crucial to any unified digital identification system. Not only must the system be tamper-proof, it must be perceived to be such. locations, the 'last mile' fees involved with collecting cash payments also have a substantial influence.

Decentralised, block chain-based solutions are not only safe and robust, they are also speedy and can decrease transfer prices in half. When integrated with the requisite communications infrastructure, they can further lower the cost of sending money home by allowing recipients to collect and spend their monies online.FRICTIThe World Bank estimates that 7.57 percent of each remittance transaction goes toward transfer costs. This indicates that the fees placed on remittances flowing to the poor countries will likely amount to more than $33 billion in 2017.

In many situations, digital wallets are the sole option that such populations have for receiving payment from faraway senders. These wallets, however, must be coupled to digital identities to verify that money is paid to the proper individual.

OPPORTUNITY

Immutable, verifiable, and secure block chain technology can play a major role in reconciling the contradiction between the notion of self-sovereign identities and present data handling methods. Distributed and open source, they can tackle the issue of mistrust that plagues present digital identification systems and hinders them from working successfully.

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Entirely new segments of the global population could access basic banking services.

Forcibly displaced communities might carry their identities with them across borders and get vital help without fear of compromise.

• Governments and humanitarian groups might better foresee or plan for major population changes, maximising the efficiency and efficacy of their activities.

We have seen how international agencies, NGOs, private foundations, and public-private partnerships can use block chain technology to collect data that helps them improve their models; this same technology allows them to use and even issue secure, self-sovereign digital identities to those involved with their programmes and more widely.

5. REMITTANCES

SUMMARY

Wherever there is persistent unemployment and poverty, workers must seek further and more away to find income prospects. The remittances they send home help their family to buy food and access crucial services. They also have a major influence on local and national economy.

However, sending remittances by bank transfer or conventional Money Transfer Operators (MTOs) can be sluggish and costly. And for underbanked populations in distant

Because low-income persons rely on remittances for basic needs like food, health care, heating, and education, high transaction costs have a disproportionately detrimental effect on the well-being of the poorest.

The fundamental source of these high transaction costs is ageing and inefficient financial infrastructure.

Remittances flow across national lines to sustain hundreds of millions of people, greatly contributing to the GDP of certain rising nations. Unfortunately, most of the global payment infrastructure predates the internet, and was not built to facilitate payments like remittances which tend to be smaller transactions.

Without anything like to the system used to safely transport email immediately over the world, these sorts of frictions are likely to remain.

OPPORTUNITY

New transaction mechanisms have already demonstrated remarkable promise in locations with substantial unbanked populations. According to the Global Payment System Survey, 1.43 billion new transaction accounts were created in 2015 (World Bank, 2015). (World Bank, 2015). 85 percent of these were formed in China and India, which between them account for 30 percent of the world's unbanked population.

Blockchain, developers of the world's most popular digital assets wallet, has witnessed the number of sign ups on its platform soar over the previous five years. With over 23 million sign ups across 140 countries, they are well positioned to produce statistics that point to five key trends:

The popularity of digital wallets and currencies has been expanding quickly all around the world throughout the five years they have been freely available. This expansion is largely in frontier and emerging markets.

Based on their survey results, these wallets and currencies are utilised largely for cross-border payments.

Not only are more and more individuals utilising these digital wallets and currencies, they are using them more regularly, with transactions doubling in quantity every 12-18 months.

Transaction volumes are rising even quicker.

5. SUPPLY CHAIN MANAGEMENT

SUMMARY

The global transport and logistics sector is both large and extremely valuable. Even slight gains in efficiency can have a significant influence on pricing and profits. Similarly, even slight modifications to working methods may have a huge influence on economic development, working conditions, inequality, the environment, and the biosphere.

However, many supply chains operate across nations, out of sight of authorities and beyond effective oversight. There is, consequently, considerable possibility for exploitation of employees, environmental degradation and lasting ecological effect.

The block chain can enable immutability, traceability, and transparency. This promotes effective governance and regulation and also allows merchants and customers to reward ethical, sustainable production.

FRICTIONS

The rising complexity and interconnection of global production and commerce offers enormous problems:

Companies have more diverse and complicated supply chains.

Products are growing more complicated, needing raw materials from various areas.

Delivery methods are growing more complex, particularly as the e-commerce industry continues to develop.

Retailers confront growing regulatory scrutiny and must comply with formal laws, certification requirements, voluntary industry standards, and regional variances in regulations. These rules are justified for safety, environmental, social, and anti-corruption grounds, but they tend to create a higher burden on shops.

As the world's population reaches 10 billion, with 3 billion extra families joining the middle classes (mainly from non-OECD nations throughout the world), global supply networks experience increased demand from locations that have inadequate supply chain infrastructure.

In addition to this increased complexity, government and private sector executives must comply with new regulatory systems. For example, store COOs responsible with preserving supply chain integrity and Ministers of Environment must take into consideration national greenhouse gas emissions and also enable stronger Foreign Corrupt Practices Act (FCPA) prosecution.

6. ENERGY

SUMMARY

The UN's objective of guaranteeing access to cheap, clean energy by 2030 (SDG 7) is as ambitious as it is vital. Conventional options (such as expanding existing grids) are not successful enough when it comes to reaching more than a billion people who are energy deprived (Power for All, 2017). (Power for All, 2017).

A range of technology developments and improvements - from smart metres to ever more efficient renewable energy

sources - advocate an alternate approach: local small grids and marketplaces.

Underpinned by block chain technology, they may back up existing suppliers, and also offer independent, consistent, and inexpensive energy in underserved regions.They have the ability to execute smart contracts, encourage lower total use, and promote sustainable energy. As such, these decentralised grids can play a vital part in establishing a scalable, robust, and efficient solutions worldwide.

CONTEXT

Electricity markets nowadays are in most cases organised commodities markets that deal with the exchange and supply of electricity. Large utility firms - likewise centralised - tend to focus on generating power from fossil fuels and function as intermediaries, trading that energy to customers.

In the past several years, the green energy transition has encouraged a decentralised power generating model headed by small stakeholders such as people, farmers, SMEs, and cooperatives. However, even if electricity generation is becoming increasingly decentralised, energy supply is still centralised and power utilities (suppliers) are establishing the electricity rates in the markets.

The emergence of green, decentralised power generating technologies such as solar and small wind combined with innovative business models in electricity markets like net-metering implies that users can create their own electricity. Their link to the national grid is utilised exclusively to dump their surplus electricity or take it back when necessary.

Consumers are joining together in greater numbers and opting to join the same provider. This provider absorbs all these consumers' extra energy and offers it when they need it (either electricity produced by the group or acquired on the market) (either electricity produced by the group or purchased on the market). Such cooperatives have become increasingly active within the previous few years and have developed fast. For example, SOM Energia in Spain, Ecopower in Belgium, Enercoop in France, and EWS Schonau in Germany all have tens of thousands of members. This business model allows organisations to invest in new electrical installations and spend the electricity production on their own needs, even without renewable energy subsidies.

FRICTIONS

There are two primary challenges that impede these organisations growing on their investments in green energy:

Their energy has been traded solely administratively, through the shared provider. They are unable to establish parallel small grids within the present system.

They lack a method to attribute higher value to renewable energy. Verifying and assigning additional value to every sustainably generated MWh would enable the establishment of a negative carbon tax; instead of taxing power from fossil fuels, green electricity could be granted additional value.

Block chain is the technology that can enable both decentralised, parallel small grids, and the negative carbon price.

Combined with renewable energy and the Internet of Things (such as smart metres) block chain allows communities to manufacture their own electricity, to keep profits local, and even offer back-up electricity to the main grid.

7. PROPERTY RIGHTS

SUMMARY

Alongside our capacity to establish that we are who we say we are, our ability to show that we own what we claim we own is crucial to our own sense of security. It also underlies the just, effective operation of our businesses and of society more generally.

However, much of the world's land and property remains unrecorded. In certain nations, particularly where governments are weakest, the data is prone to modification. Also, as women in many nations are less likely to have the requisite evidence to demonstrate their claims and exercise their rights, it is also a problem that affects them disproportionately.

In an era in which faith in government is waning, developing safe, verifiable, transparent, and irreversible land registries has never been more crucial.

CONTEXT

Of the 2.5 billion individuals throughout the world that rely directly on land use for subsistence, just a fifth own a title document (Pearce, 2016). (Pearce, 2016). In Africa, as much as 90 percent of rural land is undocumented (World Bank, 2013). (World Bank, 2013).

Women, who comprise 43 percent of the agricultural labour globally, rarely have legal documentation or representation to support their rights and claims, and are disproportionately affected (Sida, 2015). (Sida, 2015). Without secure land tenure, the poor are the most exposed to land grabs, territory-based disputes, and social mobility stagnation (Oxfam, 2017). (Oxfam, 2017).

Even when tenure rights are documented and guaranteed, such record and guarantee is given by the state, held by the state and updated by the state.

FRICTIONS

If the state is unable to guarantee the registration owing to corruption or inefficiency, the land registry loses its credibility. Land tenure rights become less secure or perhaps nonexistent. This issue affects the majority of farmers in Africa, where the World Bank estimates it would need

$4.5 billion in expenditures over 10 years to give documentation to all rural landholders (World Bank, 2013). (World Bank, 2013). These expenditures would focus on enhancing the efficiency of land management departments within governments. However, this investment is at danger if the issue of corruption is not addressed. Not only may block chain technology minimise the amount of time and money needed to generate this documentation, it might lessen the load on individual governments and offer immutable, secure, verifiable, resilient, and transparent records.

OPPORTUNITY

Using block chain technology, a shared ledger, and supporting digital IDs offers various advantages:

The safe, decentralised structure of the land register assures transparency in transactions and immutability of registration data.

The integration of digital identities into the land registration system can give quicker transaction information to guarantee that data is up to date

Landholders have higher faith in the registry's authenticity, boosting their well-being and promoting involvement. Similarly, governments are incentivised by the potential of successful collection of land-related taxes.

Block chain technology will be cheaper than the existing, analogue methods of land management, and will also be available for reference at any hour of the day, any day of the week.

Block chain technology can be readily integrated to other decentralised ledgers such as those in the banking sector, making it easier and quicker for loans to be secured against assets.

CONCLUSION

The success and the scale of block chain adoption both depend on a variety of external variables. Throughout this paper, we have emphasised the ways in which the block chain may assure efficiency, transparency, and trust in development aid, digital identification, remittances, supply chain management, energy, and property rights. In each of these examples, pilot programmes have proved the practicality and benefits of deploying this technology for the public good.

In this final piece, we must also address some of the reasons that may limit block chain adoption:

Telecom infrastructure. It is vital that a specific quality level of ICT is available in a country. Some block chains may employ simple instructions provided by SMS messaging, whilst others require smartphones and 4G internet connectivity for more complicated activities. The absence of relevant technologies can

impede the scope of the block chain technology. For example in 2014, just 15 percent of cell phone owners in Africa owned smartphones (Pew Research Center, 2015) yet this figure is growing yearly.

Legislative impediments. All block chain technology is expected to be subject to national regulation, especially in the long run, in order for it to be regarded legal (Brandman, 2016). (Brandman, 2016). If the aim of the block chain is far apart from a country's legislation, then it may meet legal difficulties or not be viable at the upmarket level. Consideration of the country's laws and how they interact with block chain technology is essential.

Integrity of data. As of right now, there is no way to know whether or not cyber-attacks will constitute a danger (Geiling, 2016). Significant (50 percent or more) damage would have to be done in order for the decentralised ledger to recognise an assault and its effects.

The implementation of network control by means of computing. Nonetheless, proper data security processes and procedures must be implemented.

Management of a project. An effective management strategy is essential for success. It is common knowledge that the use of block chain technology is a cutting-edge strategy. Innovating is putting a theory to the test for a product using agile management, randomised control trials, and informed iterations of the actual product itself (Kaplan, 2012). Those that provide financial support for blockchain projects should be mindful of the necessity for flexibility in their strategy.

Communication and education are hindered by obstacles. The demand and utilisation of a new product or service must be strong in order for it to be a success. Understanding what the technology performs and how it may benefit customers is essential (Brandman, 2016). The product's safety must also be communicated and ensured; it might take time to build demand for a new way to manage money, property rights, or other personal data, especially on an upscaled, sustainable level. It is critical to use effective methods of communication and education (Edwards, 2015).

Institutional inadequacy. A company's capacity to satisfy customer demand must be commensurate with the demand itself. Institutions with operational responsibilities must have the necessary human, financial, procurement, and logistical resources to do so. Additionally, they must have the essential technical skills (i.e., the necessary computer technology and skill base).

Our case studies have been successful, but blockchain technology is still very much a work in progress. The findings does point to some basic (and, dare we say, quite common sense) implications for the design of future block chain-driven initiatives in the development and humanitarian sectors:...

Don't hurt anyone. Privacy and individual rights should take precedence over technology firms' need to get new products to market as rapidly as feasible.

ii) Create 'with' rather than 'for.' Every blockchain project should take into account how individuals' rights and interests should be prioritised if we are to achieve this goal. Individuals' rights over their personal data must be adequately protected, and this should be accompanied by the resources necessary to guarantee that this is done.

iii) The dynamics of power. A community's power structure is likely to be affected by any decentralised system for data, transactions, or asset monitoring. Understanding who will be impacted and how will assist secure widespread adoption of the policy.

iv) Implications for policy. It is important to keep in mind the current systems and methods of functioning when integrating block chain technology into a certain industry. This will assist predict, overcome, or prevent specific regulatory repercussions. This relates to the prior point in some ways, but it's alsofundamentally, it may aid in understanding how a particular service or a policy or a procedure may

appear radically differently when the new technology is deployed. Block chain technology is not only digitization; it may have major implications on how a system or process runs.

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