Unique Applications of Blockchain Technology beyond the appeal of Decentralisation & Automation

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Literature Review (Introduction)

Why Blockchain?

A World Economic Forum survey suggested that 10 percent of global GDP will be stored on blockchain by 2027 (wef, 2015). PwC's (2020) economists also expect blockchain to boost global GDP by US$1.76 trillion – which is 1.4% of global GDP by 2030 at the time of the report publication. Seemingly, corporations are seeing the importance of incorporating Blockchain into their operations in order to stay ahead of the curve; this is a concept proposed by Lacity and Hoek (2021) as well.

The problem with Business Applications of Blockchain today

However, despite the widespread applications and fascinating underlying technological processes that make up the Blockchain, there has been this notion highlighting how the combination of decentralization and automation through smart contracts is considered the core value proposition of blockchain technology (Carson, B., 2018). Moreover, blockchain applications, according to Lacity and Hoek's (2021) research, enable programming rules for value exchange and shared record keeping at their heart, further supported the concept of automation.

Decentralisation

In contrast to a single centralized authority, data and transactions are recorded across a network of computers (nodes) in Blockchain, a decentralized distributed ledger system, as Khan et al. (2020) point out. Because blockchain technology is decentralized, there is no longer a requirement for a dependable third party to oversee and approve transactions, which lowers the possibility of a single point of failure. Because each member of the network has a copy of the shared ledger and can independently confirm the legitimacy of the transactions that have been recorded, decentralization improves transparency. The system's overall security and resilience are enhanced by blockchain's decentralized architecture, which makes it harder for attackers to access or alter the data.

Automation

Regarding automation, blockchain technology uses self-executing digital contracts called smart contracts, which enforce the terms and conditions of a transaction or agreement automatically (Christidis & Devetsikiotis, 2016). The authors go on to say that because smart contracts are preprogrammed with predetermined logic and rules, they may automate a variety of corporate transactions and procedures without the need for human interaction. Blockchain-enabled automation can speed and streamline procedures, lowering the possibility of delays, human error, and the necessity for middlemen. Blockchain can lower costs, boost overall reliability across a range of applications and use cases, and increase productivity by automating operations and workflows.

The *current* focus should not be on Decentralisation and Automation

The problem with this approach, however, is that AI is the go-to for software automation purposes as mentioned by Dinesh (2021), a Senior Vice-President at IBM while a strong need for decentralisation is not apparent in the **near** future. Although there has been a discernible increase in mistrust of centralised political and non-political institutions, as the four figures below indicate (Brady & Kent, 2022), this gradual change has been going on for decades with periods of stagnation and slightly different gradients of decline (or even inclines for some industries) in confidence across different political and business organisations. While readers may point to this continuous trend of declining lack of confidence towards centralised institutions and hence advocate decentralisation, it is crucial to note that the need for decentralisation only comes about at low levels of confidence, and having moderate levels of trust and confidence in these organisations would likely not be a compelling reason for the general population to actively switch to a decentralised platform.

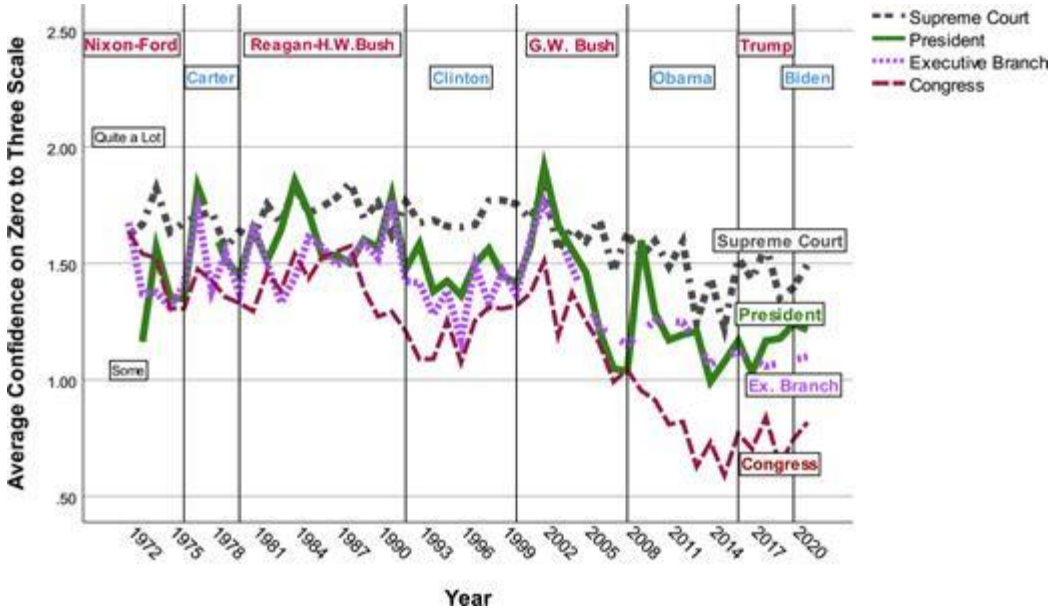

Figure 1: Average Confidence of Centralised parties part 1

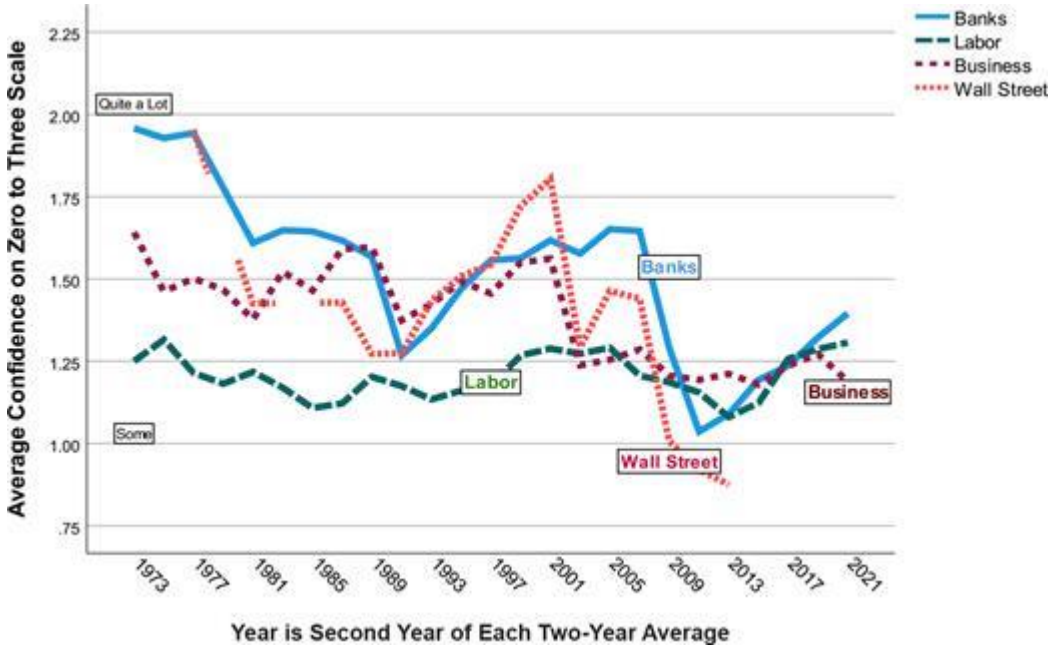

Figure 2: Average Confidence of Centralised parties part 2

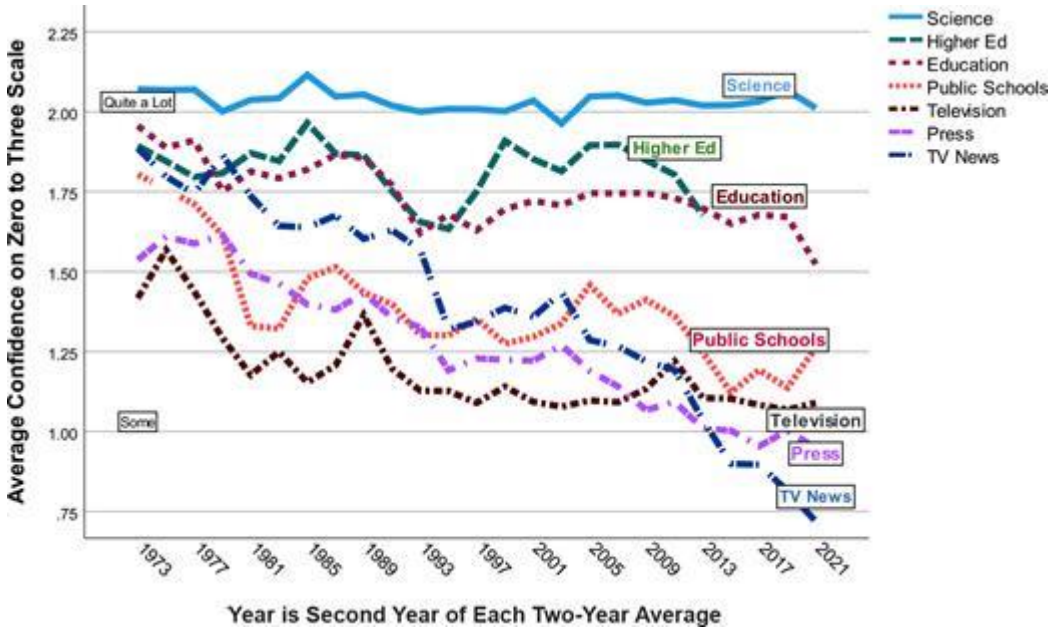

Figure 3: Average Confidence of Centralised parties part 3

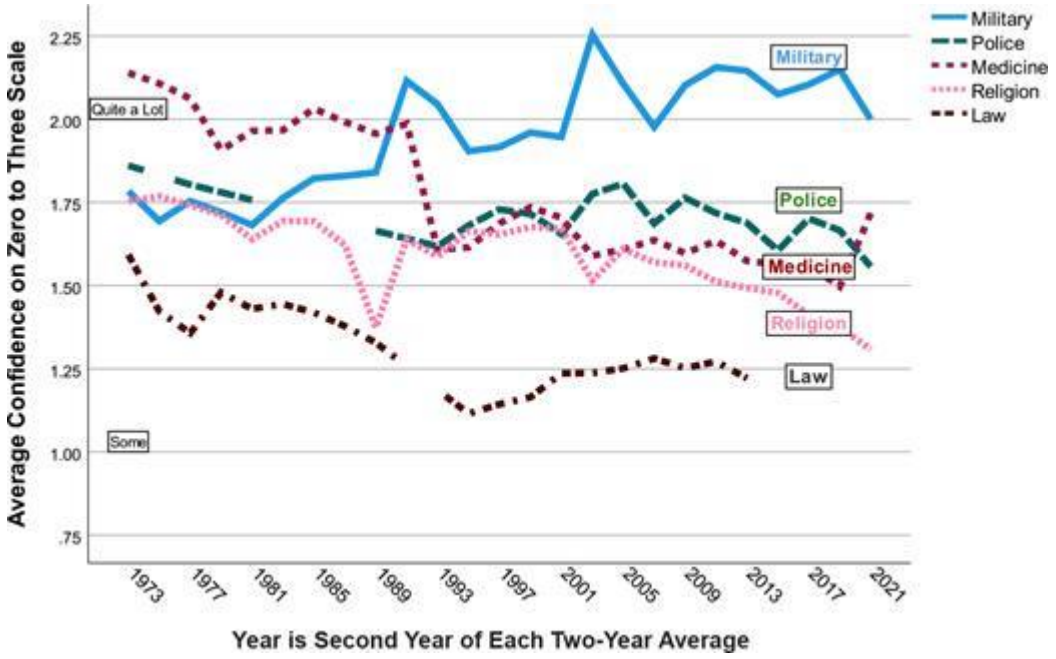

Figure 4: Average Confidence of Centralised parties part 4

Based on the four charts above, Congress, Wall Street, Television News and the Press are the only four subsegments that appears to have a possible projection value of 0.5 average confidence by 2030. A 0.5-point average confidence score would indicate that at least 50% of respondents had little faith in the organization and would strongly advise a shift in direction toward a decentralized approach. Regarding organisations in other fields, it is doubtful that there will be an immediate need to move to decentralized systems as public confidence in these industries are not too low. This is not to say that decentralised platforms are not required. It is needed for some, but not needed for most at this given the current state of confidence levels as researched. It may be however, something worth considering in the next 5 to 10 years.

The reason for this article

If developers of Decentralized Applications (Dapps) are basing their efforts and initiatives primarily on the notion that blockchain technology is decentralized and capable of job automation, this research would argue that they are barking up the wrong tree. If people were not adamantly opposed to centralised authorities, there would be no need to use a platform that promotes decentralisation.

Therefore, it would be more beneficial to examine alternative potential applications for blockchain technology, as well as analysing ways to decentralise organisations where the public has low confidence in (However, this article will be reporting on the former rather than the latter). By doing so, it would highlight the technology's truly distinctive features, which go beyond the allure of automation and decentralization. This article aims to discuss the use of blockchain technology beyond its traditional roles of decentralisation and automation.

Properties of Blockchain

Aside from Blockchain being decentralised and automated, what some other properties of this technology?

1) More honest – makes fraud and counterfeiting harder for any party due to transparency. For example, each item can be tracked and contaminated products will be flagged (can be applied to Provenance). It has been estimated by PwCs' analyst to boost global GDP by $USD 962 billion from 2020 to 2030 (2020, PwC).
2) User and transaction pseudonymity and anonymity, both to the general public and any party behind the platform. Anonymity in the blockchain network has only applied to Bitcoin transactions and ownership. For the rest of the blockchain network, pseudonymity is more prevalent.
3) Immutable – Once transactions are stored on the blockchain ledger, it is recorded across the entire network and cannot be changed.
4) Embedded Security – Not a single point of access, would need a 51% control of the entire network to make changes to transactions. In addition, Blockchain uses cryptographic techniques to ensure data security.

Unique propositions of Blockchain

1) Revamped education platform using blockchain

Problem with Education Today

In an article written by Johnson (2024), the education correspondent at The Economist, he mentions how educational progress has stagnated or declined in many developed countries over the past decade, despite increased spending on education. The article implies that the current educational models and approaches being used in rich countries are not adequate to drive continued improvements in student outcomes, and a rethinking of educational strategies is needed.

In another journal article published by Bolden and Tymms (2020), they said that the reforms were ineffective, curriculum was narrow, issues with retaining and training competent teachers as well as a lack of long-term strategic vision for the future of education are all reasons for the stagnation and decline. In another report, Nurakhir (2016) has highlighted how bureaucratic inefficiency and the stifling of innovation and diversity are main disadvantages of centralised education systems, which is what is being adopted today.

What do Experts think about the Future of Education

In a Forbes article by Futurist and author Bernard Marr titled, "The Biggest Education Trends Of The Next 10 Years", he states how education is evolving quickly. A model

where we graduate from high school prepared for a lifetime profession is just not viable in the fast-paced world of today. The world is changing due to technology, and education is changing to meet this need for continuous training, upskilling, and reskilling. Online education, artificial intelligence (AI), and cutting-edge technologies like virtual and augmented reality (AR/VR) are already becoming more and more significant. Over the next ten years, they will all be more thoroughly included into our educational process.

While lifelong and constant learning will become ever increasingly important, the implementation of blockchain could be a huge tool for effective education reforms in addition to other technological implementations.

The Solution

In a McKinsey & Co survey conducted in 2020, 44 percent of respondents say their organizations will face skill gaps within the next five years, and another 43 percent report existing skill gaps (Figure 5). In other words, 87 percent say they either are experiencing gaps now or expect them within a few years (Agrawal et al., 2020).

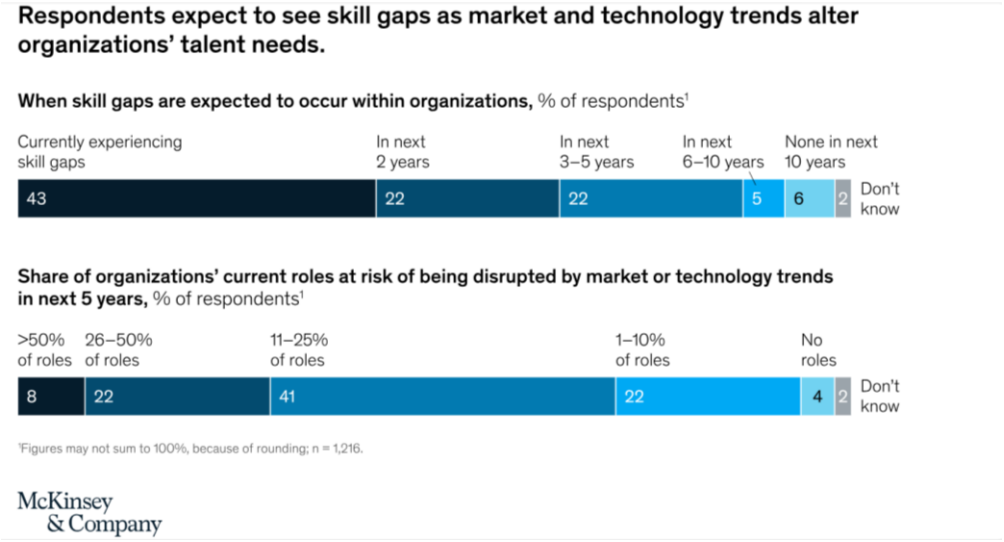

Figure 5: Percentage of organisations facing skill gaps within organisations

Organisations have first-hand data and should lead skills-based educational programs instead of outsourcing it to educational institutions such as Universities as Universities not only have their own interest in mind (eg. Research and preparing students for research), plus conveying information to a middleman (in this case, universities) who prepares graduates for the general workforce and not tailoring it to the specific needs of the company.

Institutions and corporations across different industries most affected by a skills mismatch between roles offered and employees available could come to corporations across different industries could use leverage and come together to design their own education program on the blockchain.

Companies could potentially roll out their own education program (Companies such as Google and Microsoft and IBM do have their own programs educating people, but I believe that this is insufficient). which equips employees with the necessary skillsets to take on the role. This can be done without blockchain but would be much better with blockchain, incorporating this idea with other platforms, creating an entire ecosystem of platforms that support one another.

Now, why then do we need Blockchain? Where does Blockchain come into the equation?

A Decentralised infrastructure needed for Decentralisation of Education

Decentralisation of education is not completely new, it has been around for years, with platforms such as YouTube, EdX and Khan Academy as a few of the more prominent examples of go-to educational content over the past few years. However, certification fraud – people claiming that they have completed a certain course or acquired a certain skill can become more easily faked and harder to verify as a result. As Rutgers Researchers conclude, "There is no single set of standards, no mechanism or system to help workers, employers, policymakers, and educational institutions to define quality or to measure it" (Marcus, 2021, para. 12).

With institutional recognition and verification of certification using the Blockchain Distributed Ledger Technology (DLT), the technology enables decentralisation of education to be more legitimised, which resolves existing problems caused by the centralisation of education. DLTs are public or private networks recording transactions across distributed infrastructure. Meanwhile, the stored transactions are encrypted using unique, unchangeable hashes. Multiple nodes verify information based on permissions or economic incentives to reach majority consensus to add transactions to the ledger (McKinsey & Company, 2018).

2) Blockchain-run globalised Hiring Platform (mitigating risk of resume fraud and easy access to talent pool)

According to a Harvard Business Review research, poor hiring practices account for 80% of employee turnover, with a lack of processes contributing to 45% of these cases. A bad recruiting choice can come at a considerable cost; estimates for executive-level roles range from as little as $18,700 to hundreds of thousands of dollars (Satterwhite, 2024).

Blockchain is perfect as a tool for career building platforms

Unlike most blockchain technology applications which main appeal factor lies with decentralisation, pivoting it to blockchain improves the effectiveness and efficiency of the hiring process by reducing bad hires and being able to get access to the right candidate more easily. Instead of candidates applying. Companies will reach out to individuals whom they deem are a suitable fit for the company.

Through utilising blockchain which has both transparent and immutable properties, potential candidates are not able to delete, change or fake their experiences, leading to recruiters getting a better understanding on the individual based on a well-rounded information available.

This suggestion would imply that this platform could be a possible replacement to the existing career social networking platform – LinkedIn, with roughly half of adults who have a bachelor's or advanced degree (51%) say they use LinkedIn (Auxier & Anderson, 2021). The main value of LinkedIn to users is not only to connect recruiters and potential candidates. It is also a platform for business to understand what other companies are doing in their respective fields as well as for job seekers and business owners to understand certain industrial developments and build connections. Besides, transactions on Blockchain networks could be anonymous hence encouraging more users onto platform, getting rid of the "imposter syndrome" issue that drives many people away from LinkedIn (University of Edinburgh Business School, 2023), increasing application usage.

Comparing with Blockcerts, Sovrin and understanding historical-based hiring

Blockcerts, the Open Standard, which issues and verifies blockchain-based records for educational credentials, professional certifications, workforce development, and civic records, is a concept that is similar to this one but more condensed. But this blockchain-powered recruiting platform offers more than just certification and hard-skills-based hiring; it offers companies and job seekers more all-encompassing career-related alternatives.

The Sovrin Network, on the other hand, is designed to be private by design on a global scale by using pairwise pseudonymous identifiers, peer-to-peer interactions, and allow selective disclosure of personal data using zero-knowledge proofs. The Sovrin network operates on a permissioned, invitation-only model, where only approved steward organizations can participate in validating transactions and maintaining the network. This creates a form of management that is decentralised yet contrallable.

The proposed Blockchain-run Hiring Platform could adopt a similar model to the Sovrin Network, combining it with a platform like Blockcerts, but with the idea of not only storing certificates but other relevant information deemed necessary for effective, low turnover rate hiring. As posited in Muthukrishna, Henrich, and Slingerland's (2021) work "Psychology as a historical science", a useful, albeit mostly underutilized, source of psychological data are the remnants of historical human cognition that can be found in historical texts and artifacts. They go on to say that both our civilizations' histories and our psychology are shaped by them and comprehending the psychological landscape of today necessitates understanding the historical processes, settings, and limitations that shaped it.

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