

Blockchain Technology: Implications for Accountants

Shafi Mohamad^{a*}, Adamu Pantamee Abdurrahman^b, Ooi Chee Keong^c,
^{a,b,c}School of Accounting & Finance, Faculty of Business & Law, Taylors
University, Malaysia, Email: ^{a*}Adamu.Abdurrahman@taylors.edu.my

The aim of the study is to assess the potential of blockchain technology as well as its acceptability. In this age of digitization where advancement in technology is reaching new heights, this study emphasizes management aspects, the structure, and execution aspect of blockchain. At the same time, this study will explore its association with Bitcoin and utilizing the technology in an extensive environment. Firstly, the technological background is discussed, followed by its algorithm and the prominent safety characteristics. The study also examines practices in different important fields which include accounting, finance, as well as in commercially viable areas where large organizations are investing heavily in blockchain technology. A combination of techniques were used in order to improve the overall accuracy of the study which includes both qualitative as well as quantitative approaches. These techniques include using existing environmental data, financial scrutiny, and text mining. Through appropriate application of the technology, it is likely to affect several parts of society Therefore it is imperative to study its utilization from numerous perspectives. The study contributes significantly to the existing literature relating to blockchain technology. The paper highlights the prospective drivers as well as shortcomings associated with blockchain technology, its utilization in the real world, and its effects on the end users, namely, managers. It also determines the rate at which blockchain technology is spreading, while at the same time explaining both how and why. Organizations are slowly and gradually getting accustomed to blockchain technology since it is currently in the innovation phase of its lifecycle, and its acceptability has also increased as currently more firms are investing in the technology.

Key words: *Blockchain, Accounting, Technology*

Introduction

Blockchain is a foundational change in how financial records are created, kept, and updated. Thus, rather than having one single owner, blockchain records are distributed among all their users. The genius of the blockchain approach is in using a complex system of consensus and verification. The system ensure that, even with no central owner and with time lags between all the users, a single, agreed-upon version of the truth propagates to all users as part of a permanent record. This creates a kind of ‘universal entry bookkeeping’, where a single entry is shared identically and permanently with every participant. Hence, blockchain can also be perceived of as a notion which consists of multiple applications and technologies, it allows organizations to not only digitalize their ledger in order to maintain the P2P (person to person) transactions, but also decentralize the authority level. It can be equated with the internet which allows users to utilize different applications and technologies on a single platform. Researchers are of the opinion that the impact of blockchain technology will be as revolutionary in its overall impact as when the internet was first introduced. It has the capacity to take over the core functions of central banking systems and facilitate users with its wide-ranging capabilities. Blockchain technology has played the main role in enabling digital assets such as cryptocurrency. The latter is an exchange medium which uses robust cryptography in order to protect financial transactions and authenticate the relocation of assets. The technology was conceived and universalized through the medium of crypto currency. The idea was first introduced by Satoshi Nakamoto in 2008 and during the following year, Bitcoin was released with a source code which allows users to review, adjust and improve the code. Blockchain technology was effectively executed following the mining of the first bitcoin (Serapiglia, Serapiglia, & McIntyre, 2015).

Blockchain technology is not dependent on a centralized structure, P2P computing is utilized where blockchain is present in all the computers connected to the network (Lord, 2016). All the transactions are digitally stored in a circulated database and can be confirmed by every computer connected to the network, which does away with the need for centralization (Hackett, 2016). Every computer connected to the network is called a ‘node’, and they all have equal rights with respect to the database. They can also track the transaction and find its source. Blockchain is a sequence of blocks connected with each other through convoluted algorithms. In its very simplest form, a block can be considered a record book or ledger. In order to build a block, data associated with certain transactions are booked in the block. This input data is then encrypted into output, this function is called hash. This hash is dichotomized with a new hash, again the information is hashed and dichotomized. In the end, there is a solitary hash left which is termed as ‘Merkle root’ Crosby, Nachiappan, Pattanayak, Verma & Kalyanaraman, 2016). Every block comprises of data from another block, which is generated prior to the most recent blockto fit these blocks computationally all these blocks are chained together on blockchain.

Following frequent technological advancements and growth opportunities, organizations have shifted their focus accordingly in order to explore these new avenues. David Cearley, a Gartner Fellow, established a list of strategic technological trends in 2017. The main trends which he identified included a) Artificial Intelligence & Machine learning b) Virtual Reality & Augmented Reality c) Digital Technology platforms d) Intelligent Mash App and finally e) Blockchain. In this dynamic environment, the sustainability of organizations is very much dependent on how it utilizes growth opportunities. Management does realize the importance of resifting their focus to these trends, but the changes do not always produce effective results. Currently, Internet of Things (IoT) trends suggest that there will be more than 20 Billion IoT devices in usage by 2020. The numbers are there but the paradox for different organizations is that they do not identify the mechanism to enhance their existing capacity. Organizations are not only facing competition from local manufacturers, but also from international chains who are giving them a tough time in the prevailing market. For example, Alibaba has presented a stiff challenge to Amazon which is not easy to overcome (Olaf, Hagen, & Hajj, 2017). The focus of this study is to explore the dynamism of blockchain and its associated capacity. Researchers have also shown great interest in examining blockchain technology which can reshape several industries in the future. Despite its effectiveness, the execution part of blockchain technology is still in its infancy as organizations need to face major technological challenges (Woodside, Augustine Jr., & Giberson, 2017). Likewise, the market associated with blockchain technology is very fragmented with restricted trading and capital investment of less than 1 million dollars as reported by Vlastelica. (2017).

Blockchain technology was first introduced in 2009, since its inception it had not seen any major success until bitcoin was introduced. Since then, more and more applications related to the network were unveiled. It also helped in changing the general impression associated with blockchain that it is only connected with crypto currency. Blockchain practice also established the possibility of using bitcoin as currency with legitimate value. Now organizations are showing interest in venture capital in order to adopt blockchain technology rather than solely investing in the technology (Coy & Kharif, 2016). Organizations are forming coalitions and alliances to make the most of blockchain technology. These organizations include different financial institutions, digital media, and healthcare companies to name a few. A company named R3 provides an ecosystem of blockchain technology for more than 300 organizations, whose purpose is to provide a colossal automated system while at the same time, reducing overall operational costs (Lee, 2016).

Analyzing the Adoption of Blockchain Technology Using a Theoretical Lens

Systems embracing a new ideal, product, technological advancement, or services over a period can be elucidated through the diffusion of innovation theory. The rate at which new

innovations are embraced vary from organization to organization. since people working in those organizations take different lengths of time to adopt the innovation (Wani & Ali, 2015). In 1962, Everett Rogers identified five main classifications of adopters which include innovators who adopt specific technology mainly because it is new. They are courageous and have the required resources and knowledge related to the innovation. The second group of early adopters can be considered opinion leaders who are very active in their related social system. They play vital roles in promoting and enabling innovation. The third group to embrace any new technology is the early majority who adopt innovations during its growth phase. They gauge the benefits and accordingly take decisions, however, they don't put themselves into leadership positions. The fourth group are the late majority who are cynical and careful in adopting new innovations. They need to be persuaded before they adopt new technologies. The fifth and last group are the laggards, which as the name suggests are last to embrace the technology. They usually resist change and are very doubtful and will only adopt because everyone else has (UO,2017).

From a theoretical perspective as well as from a management viewpoint, the precise position of blockchain technology on the adoption curve is difficult to ascertain with any certainty. This is due to a number of elements which can influence the adoption process including technical intricacies, network externalities, technical congeniality, applicability and comparative benefits. Normally, the adoption curve as well as the diffusion of technology depends very much on the success rate of embracing an innovation or technology. In the recent past block chain technology and, more specifically, Bitcoin have seen considerable growth in terms of embracing its conventional form while at the same time accepting it as a currency. Current data estimates that there are roughly 34.6 million blockchain wallets accounting for daily transactions of more than USD300,000. However, these are global numbers and the rate of adopting blockchain technology varies from country to country with adoption rates slower in those countries where strict regulations have been put in place by their respective governments. This contrasts with countries like Malta (which is now commonly referred to as Blockchain Island), which has approved different regulations encouraging new blockchain setups. Estonia and Switzerland have also approved and implemented different regulations in order to promote the use of blockchain technology.

Organizations which give significance to diffusion of innovation theory, adoption curve, and work rigorously towards building and embracing technologies, which improve their competitive edge, can gain an early entry position in the adoption curve. Being innovators and early adopters helps organizations to build an advantage over the competition which is often reluctant to embrace the innovation. This study attempts to recognize the position of blockchain technology on the adoption curve and accordingly pinpoint the management ramifications. A combination of different techniques has been utilized to ascertain the exact

point of adoption for blockchain technology. For this purpose, an environmental analysis was performed, followed by text mining and rounded up by completion of the financial scrutiny.

Environmental Analysis

In order to examine the environmental aspect of blockchain technology, PEST analysis (Political, Economic, Social and Technological) was performed with respect to administering blockchain technology. When analyzing the political aspects of blockchain technology, activities like government interference, the impact of taxation, approved regulations, and other similar controls were reviewed. The economic side of blockchain technology comprises elements like growth in potential new markets, forex rates, and monetary regulations. Whereas the social elements of blockchain technology include cultural modifications, buying habits, climate changes and product acceptance. Finally, the technological aspect comprises elements like recent technological developments and innovations. The consideration of all these environmental aspects is a very strategic way of understanding the current needs of the business environment which allows organizations to establish and install specific plans and policies. Over the years, different organizations have used PEST analysis to study and apply different technological advancements and its application is very evident in areas like E-commerce, SaaS (software as a service) and electronic government (Borker, 2016).

Political

Fran Casino, Thomas K. Dasaklis, & Constantinos Patsakis (2019) state with respect to public blockchain, that it can be viewed by every member and does not permit any modification. This builds confidence in the transaction without the supervision of the controlling authority. In spite of this, countries have not fully explored the viability of blockchain technology. Countries like the United States are reluctant to allow its use in the finance sector, whereas other countries like the United Kingdom have greeted the technology with open arms and encouraged startups with the finance sector being supported by blockchain technology. At the same time, the UK is also working to amend their current regulations to facilitate the use of technology (Anderson, 2018). The United States has been watchful in altering its regulations with respect to blockchain technology, but this stance may change with the influx of huge investments from reputable organizations. As per IRS (Internal Revenue Services) rules, all types of virtual money including Bitcoin must be reflected as property, and codes that are applicable for property are therefore pertinent to virtual money (IRS,2014). There is still much volatility associated with Bitcoin and other virtual money, hence the likelihood of implementing new regulations and imposing new taxes on blockchain technology cannot be ignored. In recent times, the Securities Exchange Commission has categorically rejected prearranged investment funds related to Bitcoin. This is because the markets related to such types of virtual currencies cannot be controlled,



increasing the possibility of deceitful and devious acts which can expose customer financial privacy concerns (McGinnis, Roche, 2017).

Economic

The effect of blockchain technology can be significant and it has the capacity to unsettle many industries by making numerous present functions of organizations fully automated. Automation associated with blockchain technology can deescalate the number of jobs that were previously considered significant to organizations operations. Early estimates suggest that in coming years with the execution of blockchain technology, jobs related to retail banking will be cut by 30% (Al-Saqaf, Seidler, 2017). There is also another side to blockchain technology, namely, the capacity of generating new jobs. Currently there is a dearth of individuals who have the required expertise in the field of blockchain technology. Managers have been forced to hire new people as well as conduct training sessions in order to update the current skill levels of existing employees (Rizzo, 2016). Furthermore, blockchain has t(he capability to boost transaction speeds, while at the same time limiting the role of third parties which is considered an essential requirement in today's world (Casino, Dasaklis, Patsakis, 2019).

Cryptocurrency claimed to be very legitimate, but it somewhat deviated from the general understanding of law. This impression associated with cryptocurrency is very much the reason for its volatility. Recently the variability associated with Bitcoin was quite discernible as the exchange rate that was established in comparison to USD kept fluctuating. It started off with \$0.008 per BTC in 2010 and reached an astounding value of \$2422 per BTC in 2017 (Coinbase,2016).

Social

Blockchain technology uses a database that is distributed which signifies absolute transparency for every user. This further facilitates users who have complete control over each step of the transaction. Nonetheless, the downside of this transparency is that the privacy of users can be compromised as there is a possibility that the private information of users might get leaked on the network because it wasn't securely saved (Umeh, 2016). Similarly, another point of consideration is that once the information is saved on the network, it is almost impossible to eradicate the same. These factors very much hinder the likelihood of blockchain technology being regularized. Even so, companies like IBM are trying to design Blockchain networks which are open sourced but also safeguard the privacy of users. They have named this network 'Codra', the purpose of this network is not only validating the user but also keeping the private data of users protected and encrypted (Koulouri-Fyrigou, 2018). Overcoming these limitations can be the ice breaker to regularize blockchain technology by

indicating that the technology can be modified and accordingly accommodate the needs for processing personal data of users securely.

The other point of consideration is that it is a software-based network, hence sensitive to different bugs and large numbers of malevolent acts (Attaran & Gunasekaran, 2019). According to its conceptual framework, it is very challenging to hack blockchain, but it is not difficult to hack a node. Similarly, the main feature of blockchain technology, which is decentralization, means that it is prone to hacking attacks as other computers connected to the network may not be properly secured (Attaran & Gunasekaran, 2019). Recently, there was a major security infringement which resulted in a great loss. This incident highlighted a huge drawback of blockchain technology. These imperfections, which can infect various nodes connected to the network, necessitates the need to further study the technology and make the required changes in the way it is used. These hiccups create impediments towards regularizing the Bitcoin technology and accordingly put off potential investors as well as users in capitalizing on this digital currency.

Technological

Blockchain technology can be considered as one of the most cutting-edge applications that has been developed recently. In every aspect, ingeniousness is very much visible, its hash function, the intricacy, safety features, the distributed database and its processing speed all truly represent a very technical and modern technology. It does not require any advanced hardware and is very much reliant on its software facet which has an open code and supporting capacity. In coming years, there is a high possibility that blockchain technology will be regularized and more innovative ways will be identified to apply the technology in different industrial sectors. In order to achieve the desired results, issues related to rapidity of data processing and sharing, as well as technology assimilation within the prevailing system needs to be addressed (Casino, Dasaklis, & Patsakis 2019).

The feature that distinguishes blockchain technology from others is the non-reliance of any node to other nodes connected to the network. The classic form of network has a main server which is regulated by an arbitrator in order to save the data, whereas in blockchain network all nodes need to validate any particular transaction which is input through an intricate unanimity process (Attaran & Gunasekaran, 2019). This means that it is difficult to process duplicitous transactions as all nodes connected to the network need to verify the transaction which also builds trust factors amongst users. In blockchain technology, all blocks are connected together and hold a hash of preceding block. Therefore, in order to modify a particular block, the block connected before and after also needs to be altered. Thus, as the chain of blocks gets bigger, the overall network becomes more protected. Further, every node also has a ledger which has the detail of all transactions, so it is very difficult to maneuver

previous transactions. This means that blockchain technology has one of the most secured networks (Kiviat, 2015).

Text Mining

Text mining is the second method used in order to examine the diffusion of innovation with respect to blockchain technology and further assess the adoption rate of the technology. This method can be very useful in discerning valuable patterns, guidelines, inclinations, and directions from disorganized text. Relatively speaking, text mining has only recently been developed and comprises of different characteristics including information reclamation and eradication, sentiment analysis, tagging/annotation to name a few. Approximately 85% of organizational data is saved in the form of disorganized text, and if data mining systems is placed in an organization it can facilitate better decision making and determine an organizations innovation and adoption capacity. Specifically, text mining is the procedure of developing a dataset, eliciting important details, and gauging the results (Richards, Yeoh, Loong Chong & Popovič, 2017).

In order to define the procedural aspects of text mining, a small dataset was drawn up comprising a sample of Fortune 50 companies. The idea was that the dataset chosen should represent diverse industry sectors while at the same time highlighting the significance of the leadership aspect. Data was collected from multiple sources, which was then arranged into groups of directories. The results were then evaluated to validate the existence of blockchain technology in selected organizations. The adoption rate was then analyzed by comparing blockchain with other major recent technological break throughs including artificial intelligence, virtual reality, cloud computation and internet of things (IOT) (Woodside, Augustine Jr., & Giberson, 2017). Moreover, annual reports from these companies were examined in order to check whether they were using blockchain technology. Only one company was found using the technology, namely, IBM. Moreover, digital currency like Bitcoin was also specifically searched, however it was not singled out in any of the annual reports. This highlights the fact that the rate of adoption for blockchain technology was the lowest in comparison to other technological advancements. Artificial intelligence and cloud computing had the highest adoption rate. Currently, practitioners have categorized blockchain technology as a project for the future as it might not be able to provide immediate returns due to different regulatory and technical issues. However, considering its potential the role of this technology cannot be ignored in future.

The strategic significance given to blockchain technology was visible in the annual accounts of IBM. In addition, they also provided details with respect to the technological modifications that they are likely to implement in the future. There is a high possibility that with the regularization of blockchain technology, financial institutions will be able to negotiate their

instruments in just one click. Rather than taking days and at the same time, there will be a significant reduction in product withdrawals as actual logs will be visible to supply chains and related departments. Almost every type of industry can utilize the technology in smoothing both their product movements and recovery cycles. Realizing the potential of blockchain technology, IBM is revamping its existing system by closely engaging banks, associated retailers and transporters, and connecting them to an open network (Kastelein, 2016).

Microsoft, although a Fortune 50 Company, has not provided any detail with respect to blockchain technology in their annual accounts. In past they have given major hints of integrating Bitcoin into their existing payment procedures related to Xbox and Windows (Gilbert, 2016). Upon further scrutinization, it was identified that the accounts of Microsoft have established a cloud computing services platform known as Azure which utilizes blockchain technology as part of its element. This might be a logical explanation for not including blockchain in their annual accounts since they have already discussed Azure as PaaS (platform as a service). The annual letter, which was shared with the stockholders, had a detailed explanation related to the metamorphosis aspects however blockchain was not one of them.

Financial Scrutiny

Financial scrutiny is also one of the important ways to gauge the adoption phase of blockchain technology. It includes some basic elements and standards which is capital contribution, fair market value, and supplier acceptance. Despite the regularization issues related to blockchain technology, many accounting organizations are keenly exploring the field as well as spending heavily to adopt the technology. This recent trend advocates growth in its financial aspect and recognizing its prospects by major players in the different industries. The latest numbers suggest that Bitcoin has reached a market capitalization of approximately \$180 Billion. Ethereum, another digital currency related to blockchain technology, also has a market capitalization of over \$19 Billion. Many organizations are now also accepting Bitcoin as mode of payment including Subway, Microsoft, Wikipedia, and Overstock to name a few (Ross, 2019). Although Bitcoin is by far the leading cryptocurrency and is pushing for regularization, there are also other digital currencies which have been accepted by different organizations. Ethereum is the other notable digital currency which has been able to test the boundaries of blockchain. It also facilitates organizations with a common ledger, which can be used by all the participants at the same time and cannot be altered (Peck, 2017). Ethereum was first developed in 2015, since then it has grown rapidly, but it is still considered very unstable (Vujičić, Jagodić, & Randić, 2018). Another well-known cryptocurrency is Litecoin which has also been able to achieve the desired acceptance levels.

It is similar to Bitcoin, but the difference is that it aims to reduce the processing time of the block which ultimately helps in the quick verification of transactions.

In order to support financial scrutiny, the values of digital currencies in rotation associated with blockchain are marked and add up with different exchange average prices. As currency is very much influenced by different global events, there is a high probability of fluctuations. In order to negate the effect of fluctuations, Nov-19 prices have been used. The total market capitalization of all the cryptocurrencies is approximately \$238 billion whereas US currency in rotation is approximately \$1.5 trillion which indicates that the market share of all cryptocurrencies is about 16%. The current year has been very volatile since the value of Bitcoin in comparison to the US dollar has been fluctuating wildly reaching a minimum value of \$3225 at the beginning of 2019 and the highest value of \$12500 in July-19. On the other hand, another key cryptocurrency, Ethereum, had the minimum value of \$100 at the beginning of 2019 and reached the highest value of \$334 in the month of June-19. Currently, it is trading at a value of \$185. These indicators play a significant role in the adoption rate of these digital currencies. Additionally, the easy availability of information is also a very important factor. There are other criteria used by different organizations such as relevant transaction fees when making decisions regarding the adoption of cryptocurrency.

Currently, when considering the market share of cryptocurrencies in relation to total dollars in circulation, blockchain technology has moved to the position of early adopters on the adoption curve. In view of the expansion in cryptocurrency usage, there is a high probability that soon the technology will be moving to an early majority position on the adoption curve. However, the volatility factor cannot be ignored since this may translate into substantial fluctuations. In early 2016, Bitcoin was the most dominant digital currency with an overall market share of 91% but this supremacy has somewhat declined over the years. Currently, Bitcoin has a market share of 67% followed by Ethereum with a share of 8%. However, it is to be noted that overall market capitalization of cryptocurrencies has grown significantly over the same period. At present, nearly 2000 cryptocurrencies are being traded in the market, so there is a high possibility that the big players in the market might only want to invest in leading currencies and that the gap of market capitalization might broaden even further between the currently traded currencies.

#	Name	Market Capitalization	Price	Vendors
1	Bitcoin	\$159,769,333,307	8857.84	Wikipedia, Microsoft, Expedia, KFC, Overstock etc.
2	Ethereum	\$20,105,703,236	185.33	Overstock, Snel.com, Chicago Gem Shop, Laptop Power Bank
3	XRP	\$12,097,994,583	0.28	SMMKings, Snel.com, CoinPayments, Guarda Wallet, BitDials.eu
4	Bitcoin Cash	\$5,107,518,302	282.13	BitPay, Coinify and GoCoin all support Bitcoin Cash
5	Tether	\$4,115,790,265	1.00	B2BinPay, CoinPayments.net, Green Earth Robotics Inc.
6	Litecoin	\$3,912,644,699	61.48	Cryptopet.com, Bitcoin.shop, Bitroadmarket.com, Allthingsluxury
7	EOS	\$3,257,480,292	3.47	Private exchange in the purchase of good and services
Total		\$239,052,638,378		

Findings of Analysis

Technique	Diffusion of Innovation Classification	Explanation
Environmental Analysis	Innovators	In recent years, overall acceptability index of cryptocurrency among leading organizations has improved, though many organizations are still wary of its performance as the value of leading currencies has decreased in recent times. There are companies who have moved to early adopters' stage on the adoption curve, but the fragility associated with the technology has led many companies towards indecisiveness. Similarly, the regularization and taxation issues connected with cryptocurrency and other technical flaws has also created uncertainty among different industrial sectors. Consequently, environmental analysis suggests that the blockchain technology is very much at the innovator stage of the adoption curve.
Data Mining	Innovators	Based on the analysis of annual reports covering Fortune 50 companies, IBM was the only company which provided details regarding implementation of blockchain technology in their systems. The findings further revealed that despite the technology having been used for many years. The overall impression of the technology is that it is meant for the future. These findings signify that blockchain technology remains very much at the innovator stage.
Financial Scrutiny	Early Adopters	Based on financial scrutiny of cryptocurrencies, the results indicate that overall market capitalization has improved a lot. However, the values of the different currencies are still very unstable and frequent market fluctuations can cause serious damage. Market share of cryptocurrencies has improved in comparison to dollar circulation; moving the technology adoption from the innovators stage towards early adopters' stage on the adoption curve. This movement is only visible amongst the major players which include Bitcoin, Ethereum, XRP, Litecoin and Bitcoin Cash.

Conclusion and Implications

The future potential of blockchain technology is undeniable since it has the capacity to unsettle as well as transform important functional areas within an organization. The field which is going to be greatly affected by the execution of blockchain is accounting, since with the help of this technology, organization's manual procedures can now be automated. Currently, organizations are following double entry bookkeeping and in order to maintain the

trust of the stakeholders the accounts are periodically audited. The blockchain system validates precision and verification but in order to manage the system, organizations require costly labor and lots of time to maintain the books. Another downside of the current bookkeeping mechanisms is that it is very difficult to automate the overall procedures. On the other hand, blockchain technology facilitates organizations to book entries directly in the common register which further establishes the sequence of transaction records. Once the transaction has been booked and chained in the blockchain sequence, it is almost impossible to alter that record (Kokina, Mancha, & Pachamanova, 2017). This highlights the fact that every accounting transaction can be confirmed promptly and automatically, hence permitting computerized audits to be carried out in accordance with defined procedures and practices. Practitioners and influencers of blockchain technology are of the opinion that it has the flexibility to be implemented in any type of system. The potential of blockchain technology has not been fully explored yet; due to its extreme security features. Practitioners have argued that it can even be used to book health records, likewise during elections it can even be used to cast and record votes. Currently, on a technical level, the technology has not been fully explored yet, so the execution remains vague. Experts have also presented another perspective that the main idea of blockchain technology is that it will not only allow financial institutions to become fully automated, but it will also completely digitalize existing physical currency.

One cannot deny the positive influence blockchain technology will have on different industrial sectors but nagging questions regarding its safety and privacy features need to be answered. Cryptocurrency is digital money, there is always the possibility that it can be utilized in an illegitimate way. Bitcoin has been widely accepted in transactions related to the darknet market; although it wasn't meant for this purpose, Bitcoin became associated with illegal practices which ultimately hinder the expansion of blockchain technology. Measures have been taken to overcome these security concerns. As previously highlighted, IBM has developed a network which only allows legitimate participants to connect having put in place detailed security protocols. Users can set universal confirmation codes which facilitate secure transactions. This facility is not only helpful to negate external threats, but it also safeguards the clients from any malevolent activities designed internally in addition to complying with rules and regulations set by the government (Kastelein, 2016).

Protagonists associated with blockchain technology are relating its regularization issues to that of the internet. When internet was first introduced in early 90s, there was indecisiveness as to how it should be regulated, and different agencies presented contradictory guidelines. Currently, internet technology is a part of daily life without any conflict as to how it should be regulated. Blockchain seems to have identical features and organizations who have equipped themselves are likely to gain from the technology in future. This research paper has a very important implication as it not only adds to management's existing knowledge base,



but also contributes in outlining the technical aspects of the technology. The techniques that have been used to analyze the technology diffusion of innovation and adoption curve have furnished detailed understanding which can be very beneficial for organizations considering applying the technology in their existing system. An important outcome for any organization is the current status of the technology with respect to its adoption while at the same time organizations can also develop their strategies by not only considering the positive side of the technology, but also overcoming any shortfalls and drawbacks of the technology.

Limitations

This research paper has some limitations which include a dependence on secondary data in order to perform the environmental analysis, text mining, and financial scrutiny. Furthermore, a convenience sampling technique was applied as only Fortune 50 companies were used for text mining hence the findings cannot be generalized to the overall population. Likewise, there is always the likelihood of over or under depiction of population. Only annual reports were analyzed in order to check whether companies were using blockchain technology, however, future studies should enlarge the sample size while at the same time including internal reports detailing the complete transactional history. An observational type study will be very beneficial in case of such scenarios involving different industrial sectors as technological adoption and advancement are usually adopted over a period.



REFERENCES

- Anthony Serapiglia, Constance P Serapiglia, & Joshua McIntyre, (2015): Crypto Currencies: Core Information Technology and Information System Fundamentals Enabling Currency Without Borders; Information Systems Education Journal; V13 N3 Pages 43-52.
- Hackett, R. (2016). Blockchain /Blok-Cheyn/ Noun. Fortune
- Lord, S. (2016). Bankchain & Itbit: Settling On The Blockchain. Modern Trader, pp 16-21.
- Michael Crosby, Nachiappan, Pradan Pattanayak, Sanjeev Verma & Vignesh Kalyanaraman, (2016): BlockChain Technology: Beyond Bitcoin; Applied Innovation Review; Issue No. 2 June 2016
- Olaf, A., Hagen, H., Hajj, J. (2017). 2017 Technology Trends. PwC. Retrieved from <https://www.strategyand.pwc.com/trend/2017-technology-trends>
- Gartner's Top 10 Strategic Technology Trends for 2017. Gartner. Retrieved from <http://www.gartner.com/smarterwithgartner/gartners-top-10-technologytrends-2017/>
- Joseph M. Woodside, Fred K. Augustine Jr., & Will Giberson, (2017): Blockchain Technology Adoption Status and Strategies; Journal of International Technology and Information Management; Vol. 26 (2017), Iss. 2
- Vlastelica, R. (2017). With bitcoin surge, cryptocurrencies top \$100 billion in market capitalization. <http://www.marketwatch.com/story/with-bitcoinsurgecryptocurrencies-top-100-billion-in-market-capitalization-2017-06-06>
- Coy, P. and Kharif, O. (2016). This Is Your Company on Blockchain. Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2016-08-25/this-is-your-company-on-blockchain>
- Lee, P. (2016). Banks Take Over the Blockchain. Euromoney, pp 92-99.
- Tahir Ahmad Wani & Syed Wajid Ali, (2015): Innovation Diffusion Theory, Review & Scope in the Study of Adoption of Smartphones in India; Journal of General Management Research, Vol. 3, Issue 2, July 2015, pp. 101–118.



- UO. (2017). Diffusion of Innovation Theory. University of Oklahoma. Retrieved from <http://www.ou.edu/deptcomm/dodjcc/groups/99A2/theories.htm>
- David R. Borker, (2016): Gauging the Impact of Country-Specific Values on the Acceptability of Global Management Accounting Principles; European Research Studies Volume XIX, Issue 1, 2016, pp. 149 – 164
- Fran Casino, Thomas K. Dasaklis, & Constantinos Patsakis (2019): A systematic literature review of blockchain-based applications: Current status, classification and open issues; Telematics and Informatics, Volume 36, March 2019, Pages 55-81
- Braeden Anderson, (2018): Regulating the Future of Finance and Money: An Integrated Regulatory Approach to Maximizing the Value of Cryptocurrencies and Blockchain Systems; Asian Bus. Law. 115, 2018
- IRS. (2014). IRS Virtual Currency Guidance: Virtual Currency Is Treated as Property for U.S. Federal Tax Purposes; General Rules for Property Transactions Apply. Retrieved from <https://www.irs.gov/uac/newsroom/irs-virtual-currency-guidance>
- John O. McGinnis, & Kyle Roche, (2017): Bitcoin: Order without Law in the Digital Age; Northwestern Public Law Research Paper No. 17-06
- Walid Al-Saqaf & Nicolas Seidler, (2017): Blockchain technology for social impact: opportunities and challenges ahead; Journal of Cyber Policy; Volume 2, 2017 - Issue 3
- Rizzo, P. (2016). Consulting Firms Face Talent Shortage As Blockchain Offerings Grow. CoinDesk. Retrieved from <http://www.coindesk.com/consultingfirms-hiring-blockchain-talent/>
- Coinbase. (2016). Coinbase charts - Bitcoin Money Supply. Bitcoin & Ethereum Wallet - Coinbase. Retrieved from <https://www.coinbase.com/charts?locale=en>
- Jude Umeh, (2016): Blockchain Double Bubble or Double Trouble? ; ITNOW, Volume 58, Issue 1, Spring 2016, Pages 58–61
- Marina Koulouri-Fyrigou, (2018): Blockchain Technology: An Interconnected Legal Framework for an Interconnected System; Journal of Law, Technology & the Internet; Volume # 9



- Mohsen Attaran & Angappa Gunasekaran, (2019): Blockchain and Cybersecurity; Applications of Blockchain Technology in Business pp 67-69 **Summers, T.C. (2016).**
- Kiviat, T.I. (2015). Beyond Bitcoin: Issues In Regulating Blockchain Transactions; Duke Law Journal; pp 569-608.
- Gregory Richards, William Yeoh, Alain Yee Loong Chong & Aleš Popovič, (2017): Business Intelligence Effectiveness and Corporate Performance Management: An Empirical Analysis; Journal of Computer Information Systems; Volume 59, 2019 - Issue 2; Pages 188-196
- Kastelein, R. (2016). IBM to Roll Out Blockchain as a Service in the Cloud. Blockchain News. Retrieved from <http://www.theblockchain.com/2016/07/15/ibm-roll-blockchain-service-cloud/>
- Gilbert, D. (2016). Microsoft Moving Beyond Bitcoin to Create Blockchain Marketplace on Azure Cloud. International Business Times. Retrieved from <http://www.ibtimes.com/microsoft-moving-beyond-bitcoin-createblockchain-marketplace-azure-cloud-2310462>
- Sean Ross, (2019): 5 of the World's Top Bitcoin Millionaires; <https://www.investopedia.com/articles/people/083016/who-are-top-5-bitcoin-millionaires.asp>
- Morgen E. Peck, (2017): Blockchain world - Do you need a blockchain? This chart will tell you if the technology can solve your problem; Institute of Electrical and Electronic Engineers Spectrum (Volume: 54, Issue: 10, October 2017); Page(s): 38 – 60
- Dejan Vujičić ; Dijana Jagodić, & Siniša Randić, (2018): Blockchain technology, bitcoin, and Ethereum: A brief overview; Institute of Electrical and Electronic Engineers Spectrum; 2018 17th International Symposium INFOTEH-JAHORINA (INFOTEH)
- Julia Kokina, Ruben Mancha, & Dessislava Pachamanova, (2017): Blockchain: Emergent Industry Adoption and Implications for Accounting; Journal of Emerging Technologies in Accounting; fall 2017, Vol. 14, No. 2, pp. 91-100