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Bitcoin and Ethics in a Technological Society

Eva R. Porras and Bryan Daugherty

Abstract

Bitcoin came into existence as a peer-to-peer payment system for use on online transactions. This achievement was the result of a shared vision about the future relationship between governments' control and citizenry, and the collaborative work of the many who contributed to the development of the cryptographic field. This innovation and its underlying technology, the blockchain, have been at the root of a change of paradigm, as the joint use of blockchain and artificial intelligence (AI) seed the next technological revolution. However, as it is often the case, these revolutionary inventions have also been met with skepticism in the financial sector and society at large. Using the case of Bitcoin and the blockchain, this paper analyzes the intersection between the philosophy and technology underlying these innovations, and the outlook of a sector of society who fears these developments while others try to profit. In this chapter, we first look at the history of Bitcoin together with that of those behind it. We then review the mixed reception it obtained after coming to the market. We assess the innovations' properties and confront these with the needs of a society eager to obtain further clarity and enjoy more transparency in matters of relevance to their participation in democratic processes.

Keywords: Bitcoin, Blockchain, Ethics, Cryptocurrencies, Satoshi Nakamoto, Craig S. Wright, Distributed Ledger Technologies, Artificial Intelligence, Data Privacy, Freedom, Crypto-anarchy, Libertarianism, Cryptography

1. Introduction

> " *On ne résiste pas à l'invasion des idées.* " – *Victor Hugo, Histoire d'un Crime*

Bitcoin [1] came into existence in 2009 as a peer-to-peer payment system for use on online transactions. This type of electronic cash system was designed to make online payments without the need of an intermediary financial institution to coordinate the transaction. The system became known when an individual using the pseudonym of Satoshi Nakamoto broadcasted the first version of the protocol in October 31st 2008 and released the related software in January 2009 [2, 3]. This software could be downloaded by anyone, and any computer running it could join the network. With Bitcoin, third parties to a transaction become dispensable because now the exchanges could be executed with no middleman to connect the sender and the receiver. Instead, the operations used a network of computers that communicated with one another directly through the Bitcoin open source software.

By the time Bitcoin was introduced to the market, there had been multiple prior attempts to launch a digital currency (E-gold, or the Liberty Reserve). Given the long

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history of technological evolution prior to the public coming out of Bitcoin, we can say that the ideas that led to its success were in the making for decades. This achievement was the result of a shared vision about the need to develop electronic payment systems in a way that was coherent with the concurrent evolution of online technologies. In addition, this outcome responded to the wants of an ultra modern society in which the needs for privacy, efficiency, effectiveness, and transparency could not be ignored and would have to inhabit shared spaces with a perception of individual freedom. Thus, although Bitcoin was masterminded by Satoshi Nakamoto, this technology was the result of the active collaboration among individuals who, each in its own way and to different extends, cooperated in its development.

However, aside from many other conceptual and technical differences, in contrast to the earlier failed attempts at creating various types of digital cash, Bitcoin became successful and it remained the only decentralized digital cash coin until Namecoin emerged in April 2011 [4] as the first "alt coin". A key reason for this success, is that the creator of Bitcoin was able to incorporate in the design the solution to two long-standing conundrums: the *Double-Spending Problem* and the *Byzantine Generals Problem*. The first of these problems refers to ensuring the information received is complete and accurate and no falsified updates get introduced into the ledger so that the same money is never spent more than once. The second problem relates to the reaching of consensus among parties who do not trust each other because they do not share the same interests.

Ever since becoming public in 2009, the "block chain" or "time chain" -as Nakamoto first called Bitcoin's underlying technology -, has been at the root of a change of paradigm. The reason is that the joint use of the blockchain and AI is expected to seed the next technological revolution. This is so much the case, that a new economic sector has already surged around engineers and inventors who are developing applications in various industries.

Together with this technological expansion, the hype of a revolutionary development and, particularly, the promise of huge potential economic rewards has also brought herds of people into performing other activities around these new sectors. Some have become entrepreneurial miners, and others have gone into performing roles such as those of investor, trader, and/or speculator of these markets. These events have occurred while the world at large has taken the role of spectator: on the one hand attempting to capture the essence of this technology, and on the other hoping to envision what, if any, could be the potential uses and the consequences for society of its meaningful implementation. Concurrently, the speculative nature of the financial markets around most of these assets has become undeniable and worrisome.

One essential impediment preventing the fair evaluation of the various solutions grouped now under the general umbrella of "cryptocurrencies" or "alt-currencies" is the technical complexity of these products. This explains why many publications and investors mistakenly compare and think of them as equivalent. In addition, there is also an underlying intellectual and moral battle among those who do understand the technology as to what attributes should define their structure and substance. In particular, there is the key issue of traceability, one that was already at the core of the evolutionary history of the creation of electronic payment systems.

Beyond that, as it is often the case with innovations, these have raised strong emotions among many in society. Part of these emotions are explained by the challenges presented when trying to adapt to the existence of the new technology. But, in addition, much of the emotional tide surges due to the issues highlighted in the prior paragraph. The lack of understanding of how the technology works and the permeability of attitudes rooted on moral grounds have resulted on high-peach-statements by many including relevant figures in the financial sector and society at large. The following are three early examples of the animosity of relevant

public figures who use skepticism and express abhorrence at the new technological revolution. These are: "Bitcoin Is Evil [5, 6] "by Nobel award winner Paul Krugman; "Why I want Bitcoin to die in a fire [7] "by Charlie Stross; and multiple declarations by JPMorgan CEO, Jamie Dimon [8, 9]. Given that historically Bitcoin is the most recognizable and relevant among the assets grouped as "cryptocurrencies" much of the criticism uses it as a representative of the asset class.

2. The deep web and cypherpunks

Independently of the differences among the various digital assets, cryptocurrencies -as an asset class, and the blockchain -as a technology, have awaken strong emotions in market observers and participants. At the heart of the problem is whether these technologies merit their own existence; and if so, how to house them within the common categories of property and personal rights. Beyond that, the early use of these technologies by individuals in the deep web to make illicit and illegal trades [10], casted a negative shade that has proven difficult to shake. This negative impression has been further cemented by a general unscholarliness about the workings of these technologies and the inability of the common reader to tell these apart from each other. For instance, there is a generalized understanding that Bitcoin is "untraceable digital cash." As such, this digital cash tool could be potentially used to avoid the payment of taxes and to finance a myriad of illegal activities such as drug trade, terrorism, kidnapping, and extortion. So the semi-anonymity or anonymity quality of many crypto currencies is at the core of this unfavorable perception. Nonetheless, this sentiment is entrenched also due to the legend of the cypherpunk movement.

The cypherpunk was a 1970s' movement that advocated for less government control which, in their view, stifled economic growth [11]. This belief came together with a libertarian notion of freedom, and the intuition that a strong cryptography could guard against government interference in personal matters [12]. One aspect of the objectives embraced by this group, dealt with restructuring how people economically interacted with one another. And the solution proposed was the use of a digital cash currency that would be free from government control. In his paper "b-money [13]" Wei Dai described:

> *[] A community is defined by the cooperation of its participants, and efficient cooperation requires a medium of exchange (money) and a way to enforce contracts. Traditionally these services have been provided by the government or government sponsored institutions and only to legal entities. In this article I describe a protocol by which these services can be provided to and by untraceable entities.*

Centered around the Cypherpunk email list [14], the group championed encryption as a way to shift power from the government to individuals. And as public-key cryptography evolved, they began to conceive how a future society could deal with money. Their attempts to develop a digital cash currency that would be free from government control underwent numerous stages and, through time, various publications described the possible structure of this future cash. However, it was David Chaum, the one who first proposed digital cash as files of digital value that were anonymous and exchangeable [15]. His 1981 paper: *Untraceable Electronic Mail, Return Addresses, and Digital Pseudonyms* [16], was the cornerstone for later research of "anonymous communications".

The cypherpunk generation achieved great progress towards the development of a decentralized, strong, online currency. For instance, Chaum created an algorithm which allowed the modification of coins without breaking the signature of the

mint. In his 1982 paper "Blind signature for untraceable payments. [17]" Chaum explained that the growth of electronic banking services, and the creation of automated payment systems would require to balance the need for personal privacy and the potential for the criminal use of payments. He then summarized that the ideal payment system would have the following three key properties:

1. Inability of third parties to determine payee, time, or amount of payments made by an individual;

2. Ability of individuals to provide proof of payment, or to determine the identity of the payee under exceptional circumstances; and

3. Ability to stop funds which have been reported stolen.

To illustrate the use of this technology, Chaum proposed how by fulfilling the three enumerated properties electors at an election event could vote without having to meet at the electoral school to drop their secret ballots. Chaum's system would balance the need to keep the vote secret, the ability to verify that the vote was counted, and the capacity to prevent voter fraud.

In addition to Chaum, several pioneers also worked in other versions of electronic cash. One example is Hal Finney, a developer that came out with a Reusable Proof-Of-Work (RPOW), a short-lived solution called this way because it was based on proof-of-work [18]. But, as said, it was not until 2009 that after decades of technological evolution, hard work in cryptographic research, and many failed attempts, Bitcoin came into the market to become the first digital cash coin capable of withstanding the process of its own development.

3. Emotions versus facts, and perception versus reality

There are many reasons why people resist change. For one, change is a psychological experience that requires time to process. Furthermore, if change is big and unexpected a common reaction is denial. In this scenario, we can tell ourselves that nothing of relevance is happening and excuse our participation in the process. Feeling unprepared for the new environment also explains this rejection as people are pushed out of their comfort zones. Change implies a departure from the "old ways." Hence, those who did not catch up to the new version might feel superseded and are bound to be defensive about it. And, if change involves a new technology, a common concern is personal competence. People worry that their skills will be obsolete and, as a defensive mechanism, they might express skepticism about the success or adequacy of the innovation. In addition, change is likely to imply more work and this may ripple into resentments and other negative feelings. At the end, depending upon the position of those affected by it, resistance to change may be externalized in one of a variety of manners, from foot-dragging behavior and indolence, to sabotage and rebellion.

When new technologies displace old ones it appears as if whole sectors of society will be hurt. This will be particularly true when those affected resist catching up with the times. In these instances, the damaged sectors can be quite large, as they might include different industries such as providers and users of the old technology. The emotional experience of these processes of resistance has been compared with "being irrational" (see Fineman, 1993 [19]). From this point of view, emotions are understood as the root of the problems, rather than an expression of the underlying difficulties confronted during the implementation of change. From a psychological

perspective emotions are not necessarily destructive as they help individuals adapt to difficult situations. But they might motivate an unhealthy resistance that can block the ability of those under stress to assess the situations properly.

The common reactions to change introduced in the prior paragraphs might be able to explain, in part, the strong emotions shown by mainstream media outlets and many relevant figures in society when reporting about cryptocurrencies. Albeit the recentness of the innovation, and that the high volatility experienced in these markets alerted many, the way concerns were expressed frequently showed a high level display of emotions as well as a limited understanding of the technology. These expressions of "hate" most often addressed all products grouped under the "cryptocurrency/Alt-currency" headings as if these were equal or equivalent assets. That is, in general, many commentators did not differentiate between key aspects of the technologies underlying these assets. Be it news, investment or entertainment, television or written press, online media including social media outlets, all expressions published on these forged the vantage point of millions of people when thinking about cryptocurrencies.

For instance, at a public forum reported by the Financial Times on February 15, 2018th, Berkshire Hathaway vice chairman Charlie Munger depicted Bitcoin as "totally asinine [20]" adding it should receive a government crackdown. On March 5th, 2018th, Harvard economist Kenneth Rogoff told CNBC reporters that Bitcoin is *"more likely to be worth $100 than $100,000"* by 2028 implying its value depended upon its use in *"money laundering and tax evasion* [21]." Another laud Bitcoin basher was JPMorgan CEO, Jamie Dimon [22, 23] who declared publicly and repeatedly his disdain for Bitcoin. For instance, during a public conference in New York, Dimon declared that trading the virtual currency *"was stupid"* and he [24] would *"fire in a second"* anyone found doing it at his firm. Later, while at the Aspen Institute's 25th Annual Summer Celebration Gala on August 5th 2018, Dimon called Bitcoin a "*scam*" and a "*fraud* [25], "and reiterated comments he had made a year earlier when stating that Bitcoin was:

> *"worse than Tulip Mania"* and "*only for people in countries like Venezuela [26, 27], Ecuador or North Korea [28, 29] "or a bunch of parts like that, or if you were a drug dealer, a murderer, stuff like that, you are better off doing it in Bitcoin than US dollars." "So there may be a market for that, but it'd be a limited market."* He further argued that "*governments should shut them down if they were uncapable of controlling them*" [30–32].

Three examples of articles whose titles already show laud emotional content are: 1) Nobel award winner Paul Krugman's "Bitcoin Is Evil [33]"; 2) Charlie Stross' "Why I want Bitcoin to die in a fire, [34]" and 3) Nobel Laureate Robert Shiller's "Cryptocurrencies have a mysterious allure – but are they just a fad?" [35] Some of the statements made in these literally include: *Bitcoin comes with an implicit political agenda attached, it is designed to be untraceable, and easy to hide, libertarians love it because it pushes the same buttons as their gold fetish and it does not look like a "Fiat currency", it will become central to a commodities markets where the goods traded will include assassination, drugs, child pornography and so on, Bitcoin was designed for tax evasion, Cryptocurrencies are designed by people who hold themselves above national governments* [36].

Given the histrionic nature of many publications, in 2018 Gareth Jenkinson developed the idea of testing the waters of "hate-going" emotions when it came to cryptocurrencies. His findings were published in a cointelegraph article: *Tulips, Bubbles, Obituaries: Peering Through the FUD About Crypto* [37]. In this work, the author showed that during the nine-year-existence of Bitcoin, more than a handful obituaries asking for its 'death' had been published. These writings came from a wide variety of industry experts and commentators who offered their overall

subjective and negative comments, showing a fear-mongering mentality that tried to belittle the breakthroughs sparked by the blockchain technology. In his section "A brief history of Bitcoin deaths," the author analyzed instances when mainstream media outlets had signaled the death of Bitcoin. By 2017 these obituaries [38] contained 118 articles. As of mid-January 2021, this figure had increased to 395. Their conclusions were based on assumptions or quotes from a wide range of commentators who used fraud, money laundering, Ponzi schemes, and the likes to announce Bitcoin's demise. A glance down the list of headlines from the various publications helps assess the profound effect these could have had on the sentiment of many people. The examples brought here referred to Bitcoin but this type of press also affected other crypto assets [39] such as Ethereum. In this case, it was the web Digiconomist [40] the one who compiled the list of Ethereum obituaries between 2015 and 2017. Criticism has also affected other cryptocurrencies with plenty of pessimistic forecasts.

With respect to some of the most common criticisms, rebuttals have used the following arguments [41]:

1. the ironic weakness of fiat currencies [ie. the dollar has lost 98% of its value over the last 100 years [42] or

2. the fact that it was it JP Morgan, rather than Bitcoin, the one that was bailed out by the government [43] in 2008 at the tune of US$25,000,000,000 from the Troubled Asset Relief Program (TARP) program [44] while admitting they did not need the funds, or

3. the fact that his bank has only 10% of what they claim to keep from deposits, and uses "Fractional Reserve Banking" to create 90% of its money out of thin air every day, but still claims it is the bitcoin currency the one that is illegitimate and the one with the real problem the government must stop, or

4. the fact that he is a CEO of a bank who for years sat on the Board of Directors for the Federal Reserve Bank of New York, the one that regulates his bank, or

5. the fact that J. P Morgan Sees Crypto as 'competition' and 'risk' as it was stated in the *"Risk Factor"*, segment on cryptocurrencies, of their 2017 Annual Report to the Securities and Exchange Commission (SEC) filed Feb. 27 [45–47].

With respect to the latter one, this report uses the generic "cryptocurrencies" under the *"Competition"* subsection of Item 1A of Risk Factors to explain a change in landscape with new competitors that can threaten J.P. Morgan's operations:

> *"Both financial institutions and their non-banking competitors face the risk that payment processing and other services could be disrupted by technologies, such as cryptocurrencies, that require no intermediation."*

The new technologies

> *"could require JPMorgan Chase to spend more to modify or adapt its products to attract and retain clients and customers or to match products and services offered by its competitors, including technology companies." And eventually this competition could "put downward pressure on prices and fees for JPMorgan Chase's products and services or may cause JPMorgan Chase to lose market share."*

These observations are not farfetched as competitors have come to realize the potential of cryptos. This became particularly obvious as fellow giant Goldman Sachs revealed it was looking into the creation of Bitcoin Futures [48, 49], planned to buy and sell cryptocurrency and offered various contracts with Bitcoin exposure [50–52]. According to Goldman executive Rana Yared: the bank is not a bitcoin believer but it had to acknowledge multiple clients' requests to work with bitcoin.

Goldman and JP Morgan are just two among many banks who are taking notice of the changing environment. For instance, in its annual report to the Securities and Exchange Commission (SEC) filed 2018 Feb. 22 [53] Bank of America (BoA) stated to feel behind and "unable" to compete in the growing crypto market. In this report BoA recognizes that it will have to afford major costs to remain competitive in the cryptocurrency arena [54, 55]:

> *"Our inability to adapt our products and services to evolving industry standards and consumer preferences could harm our business," BoA states in the filing: "the widespread adoption of new technologies, including internet services, cryptocurrencies and payment systems, could require substantial expenditures to modify or adapt our existing products and services []."*

Thus, BoA decided to innovate by requesting a patent for a cryptocurrency exchange system. However, this has not prevented the bank from stopping their clientele credit card purchases of cryptos [56] as the bank is very aware of how the new competition will be detrimental to its prospects as read in their SEC report [57]:

> *"...The competitive landscape may be impacted by the growth of non-depository institutions that offer products that were traditionally banking products as well as new innovative products," and "this can reduce our net interest margin and revenues from our fee-based products and services. In addition, the widespread adoption of new technologies, including internet services, cryptocurrencies and payment systems, could require substantial expenditures to modify or adapt our existing products and services []."*

BoA's declarations to the SEC as well as those made by other institutions such as JP Morgan Chase [58] recognized that while cryptocurrencies endanger their business they are *"innovative"* and *"unlikely to disappear"* as they note obvious advantages in several traditionally problematic or slow areas, such as cross border or international payments.

With respect to Krugman's statements [59], his opinions have been challenged [60] on the grounds that the Bitcoin technology is an electronic payment system designed to work directly between sender and receiver, thus saving the users the 2–3% or higher tax taken by the processors. As a payment system, this technology is ethically neutral even if some use it for unethical purposes. Equivalently, the banking system has also been used by many to make illegal payments, but we do not call HSBC or the Deutsche bank "evil". Hence, one could interpret that Krugman's opinions, these and others, are built on an emotional defense of the status quo: the central banks, payment intermediaries such as Visa or MasterCard, and the State in general.

Virtual currencies are just a form of private money that uses Blockchain technology to record the transactions. But this technology can be easily built upon to address problems and gain efficiencies and effectiveness in multiple types of operations, so its potential uses across industries are boundless. Also, the transaction networks are comparatively safe, transparent, fast, and borderless. So economists who try to belittle and discredit their relevance on the grounds that these are concoctions of "quacks and cranks" (Skidelsky, 2018 [61]), tools for money laundering, crime, and tax evasion,

or a renewed version of old libertarian or bubble manias (Shiller, 2018), are simply wrong. For instance, it is easy to clear up two of the most common misconceptions:

CLAIM: Bitcoin's main use is laundering money and making payments for illegal trades.

REBUTTAL: Bitcoin's underlying technology is the blockchain: a ledger that keeps a permanent record of all transactions ever made since the beginning of its existence. This permanent record registers every holder (a bitcoin wallet) of each coin. So the records tie each bitcoin with one or more wallets. The wallets are handled from smartphones and computers so even though technically the bitcoins are not associated directly, nonetheless, they are associated indirectly with a person through the electronic device. Thus, illegal transactions can be spotted, cannot be erased, and can be tracked to a specific individual.

CLAIM: Bitcoin helps avoiding taxes.

REBUTTAL: As already said, every bitcoin transaction is permanently recorded and publicly accessible. Thus, the Internal Revenue Service (IRS) or any equivalent organization can track their movements and easily estimate any taxes due for any individual.

4. Ethics in social networks

Unfortunately, current governance within the social networks does not help distinguish legitimate sources from others trying to piggyback on their work. And apparently, there is also a problem actively prosecuting people and companies who use the image and name of others to confuse and lie to the unsuspecting visitor. This is true at various levels: the private corporation having a direct responsibility over their networks and actions, as well as the government level having the authority and responsibility to ensure corporations can grow within the rule of law.

During a recently recorded conversation with Ryan X. Charles, Dr. Craig S. Wright provided one such case as an example [62]. The situation he relates, refers to a complaint he had placed on Twitter. The motive was to bring their attention to copyright breaches under the Digital Millennium Copyright Act [63], and asked the network to take action against people using copyrighted photos of himself. In response to his request, Twitter deplatformed Dr. Wright while, apparently, taking no action against those using the copyrighted images, which could be found posted at the network thereafter. But, Twitter is not alone. For instance, just as recently as January 26th. 2021, numerous accounts using Dr. Wright's picture and name could be found on Instagram.

In the Abstract of his January 2021 work "An exploration of ingroup behaviour and social psychology in developing socially abhorrent behaviours in social media and financial systems" Dr. Write summarizes the following related observations [64]:

> *"The following paper provides a preliminary investigation into the growth of "Cryptocurrency" subgroups, the abuse of social media using automated systems, the enhancement of trolling and the ability for these activities to pose both a political and financial threat. Malicious actors have utilised technology to leverage existing psychological behaviours and create tribalistic responses that allow for the automated approach to controlling and manipulating individuals online. In this, authoritarian leaders can asymmetrically leverage sociological and psychological benefits that developed through evolutionary benefits but yet exhibit adverse effects in modern societies."*

and concludes [65]:

> *"The ability for malicious actors to use anonymous social systems and technology has allowed for the creation of criminal groups that target political systems, financial systems and generally cause dilemmas that result in lost economic opportunities for*

> *many people and may even go as far as Social psychology causing personal harm. In providing access to a wide variety of platforms that can be tied to fake and manipulable sources such as those controlled in asymmetrical systems using bots, authoritarian and socially deviant actors can manipulate others to polarise and partisanise groups. These results may be seen in the false manipulation of Cryptocurrencies including Bitcoin through groups such as BTC Core and the introduction of specialist language for ingroups who believe not only that they will get rich, but they will gain in power and prestige. Consequently, the rise in new technologies that allow for the disassociation of the individuals' identity and the creation of methods that allow individuals to distance themselves from their activities must be investigated to regulate these systems*".

5. How can we judge what is ethically right?

In his Tanner Lecture *Science and Revolutions* [66] Sagdeev states that "the intellectual community rarely has been the direct beneficiary of revolutions". In his words, this group "has played the role as a patient, the victim of change; and as a doctor, preparing and implementing the revolutionary processes [67]". The truth is that, even though Sagdeev is referring to other types of uprisings, Bitcoin and the Blockchain are providing a comparable revolutionary environment. This revolution too comes with a conflict of interest: on the one hand the political slogans, the power plays, the status quo, and those taking advantage of the confusing environment to loot for their own personal benefit, and on the other the intellectual drive to search for truth, rationality, and progress.

The attempt to use intellectual thinking to social political phenomena is, in Sagdeev's view, one reason why scientists become the "first revolutionaries, and often the first prisoners after the success or failure of revolutions [68]". As an example, he cites the time Einstein and a group of physicists became victims to the attacks of Soviet philosophers who demanded quantum mechanics be liberated from the: ""bourgeois" principle of uncertainty," and the theory of relativity be "liberated" from the dubious role played by imaginary observers [69]".

In those times, science was hostage to the "supreme wisdom" of communism as given in the form of proclamations by the classic manifestos of Marxism. And many of those incapable of undergoing the soul engineering process required to produce the "new Soviet man" or hiding successfully, were exterminated. Comparable events had been experienced at earlier revolutions, such as the one in France when Jean-Paul Marat demanded that chemistry in particular, be a "people-friendly science." This resulted in a general bloodshed including the beheading on the guillotine of the founder of chemistry: Antoine Lavoisier, whose ideas about the nature of chemistry differed from those Marat had.

Now, we live in different times. But still we can feel a serfdom, not subservient to a recognizable regime, but rather to a plethora of forces, −be some big corporations, be a number of governments, be the concept of the welfare state, be other sources of status quo power such as communication giants- that also try to mold at their convenience a type of "new modern man" and determine who is the worthy intellectual. Against these attacks, each person can chose to go the way of "internal emigration" and keep quiet, just as in the old Soviet Union, or face concerted efforts to end with one's prestige and reputation and maybe even ones' physical safety [70].

As things stand now-a-days, it does appear that our current "intelligentsia" will also need to split into at least two groups. In Spain for instance, the one who wants to progress, might be forced to be de facto "above their own national government" such as Shiller suggested [71], in search of a milieu where growth is not stopped. The reason is that in the agenda of the civil servants and politicians responsible for ensuring legislation catches up with the reality of the times, this is not a priority. However, Bitcoin

and blockchain-based innovations need a regulatory system that is flexible, clear, transparent, agile, and competent. And of course, that would require those regulating the environment understand the technology. One more reason the responsible agencies and business groups should clear the air as to what is true and what is not.

Obviously, when entrepreneurs cannot obtain the necessary licenses or the processes are delayed in such a way that their inventions become obsolete, or they suspect their fiscal obligations might not be clear, they are forced to rethink their situation. In Spain, he following is a list of some of the problems faced by managers wishing to organize these businesses according to the law [72]:

1. Obtaining electronic money licenses takes a long time.

2. Given the authorities' limited understanding of the technology which they view as a financial asset rather than a protocol, there is also uncertainty on how to treat tokens for the purposes of taxes.

3. The same goes with respect to the possibility and agility to enter the legal sandbox. In Spain the sandbox has just been approved, and it remains a bureaucratic and administrative mess.

4. Companies cannot set up and manage their firms 100% remotely, without some face-to-face activities. This requirement boosts set-up costs and adds no value.

5. Company taxation and administration is more expensive than other jurisdictions such as the US, the UK and Switzerland, which in addition offer fewer obstacles to growth.

These are just some of the key problems confronted by digital-cash and blockchain entrepreneurs who want to set up their businesses within the Spanish territories. Much of the void can result from the government's belief in Bitcoin as a financial asset or financial instrument, rather than a communication protocol and therefore they continue to believe that Bitcoin is for speculation and for criminals When an environment is not legally and technically ready to receive innovations, the credibility of those set under that administration suffer. In the case of our example, the many relevant and significant inadequacies of the Spanish system force many local innovators to leave their country and set up their companies abroad, mainly in Switzerland, the UK, and the US. That is because these countries have managed to develop a more transparent and user friendly environment easing both the rate of company creation and the rate of technological transfer into their borders.

This situation raises legal and ethical problems for all involved but in addition, it also has strong financial consequences. However, often, in lieu of fixing the problem, governments such as the one in Spain try to stop the rate of development by creating a bureaucratic maze or by confining its development within organizations they control directly or indirectly. Once more, this situation brings to mind the environment in the Soviet Russia where most scientific development was scheduled by the political authority and supported by work on contracts or grants.

6. The honest truthful asset

In the first part of his 1986 Lecture titled *How Is Legitimacy Possible On The Basis Of Legality?* [73], Jürgen Habermas questioned whether "legitimacy" is possible on the basis of "legality". And to highlight the conflict and incongruity hidden within

this statement, he used Max Weber's vision of Western political systems as forms of "legal domination [74]." The point being that the legitimacy of these political systems resides on the belief in the "legality" of their exercise of political power versus, say, that of the "tradition".

In current modern democratic societies, the acceptance of such a premise may create contentions that cannot be resolved within the existing political structures. The reason is the conflicts of interests inherent to such systems. For instance, the most important objective of a political party in a democratic system is to be reelected. And, to achieve this end, politicians will often use public assets, such as public mass media communications, as if these were their own. Given that all political parties share the same interests and thus will benefit from these actions, checks and balances may be removed so each of them can take turns at abusing the system. Furthermore, given that the underlying infrastructure of the "welfare state" consists in taking wealth from some sectors of society, using a part of these to support the apparatus, and redistributing the remainder among other groups expected to became the captive electorate of the parties in power, we can already see situations when the rights and property of first are threaten to benefit the latter.

On October 2015, acting as the moderator of an "All-Star Panel" during a Bitcoin Investor Conference at Las Vegas, Michele Seven asked about the nature of property rights [75]. The first to answer, Dr. Craig Wright [76], highlighted:

" [] We need to be able to control our own freedoms and the only way to do that is to basically have the right to property, to ownership [] That means being able to dispose of property as we want, to be able to share it, to take it -- and that is what it is all about. Once we get things to where we have redeemable contracts and we link them to the blockchain, where we can link money, and goods, digital rights, and ownership into something that can't be changed: a fundamental open, honest, truthful asset -- the blockchain, that's when we are going to see real freedom in the world."

With respect to the same question, Joseph Vaughn Perling [77] reminded the audience that currently one relies on government ledgers to keep property records which tell us who owns what, and that such system is unreliable and expensive as it is financed through taxes. Nonetheless, with the new technology, all these costs can potentially be reduced as property records get stored in the ledgers of Bitcoin. Then, reflecting on the potential future conflict of interests between society and power centers, Joseph Vaughn Perling [78] added that there may come a time when:

> *"the separation between the honest politician and the dishonest one will come down to whether or not they support the use of Bitcoin for government function because it does provide that audibility and the anti-corruption tools that it can implement throughout. Government can make government become provably honest in a way that's never before been possible and provably honest government is something we have never seen" [] so that it may create that division between the people: the people within government that become more electable because they can prove the degree to which they are honest, versus the those who are competing for their office."*

The use of blockchain to secure a more transparent political arena will be an interesting development particularly in light of the practice of "legal domination" by which the rationality that the law possesses, is independent of morality. Now-a-days it is impossible to imagine a society where citizens do not demand that it is the moral argumentation that gets institutionalized by means of legal procedures. And this expectation will need to materialize results over all aspects of government including those that impact science.

Baumol (2002 [79]) stated that "*virtually all of the economic growth that has occurred since the eighteenth century is ultimately attributable to innovation.*" Given

that the blockchain is thought of as, probably, the most auspicious innovation since the coming of the internet, this invention is prophesied deliver huge financial benefits. These will result from the economic repercussions of its incorporation into processes to streamline and secure decentralized transactions in countless sectors across the world. The blockchain is specially relevant to situations when ownership histories are of essence such as in the pharmaceutical industry, land registries, real estate property, piracy and copyright matters, as well as of public services, such as health assistance and welfare payments (Tapscott et al., 2016 [80, 81]). In the limit of this innovation are self-executing contracts that can run with the assistance of AI and minimal human intervention. The use of the blockchain will provide increased efficiencies and more cost-effective solutions to current predicaments. And as the older technology is replaced, the blockchain will reduce fraud increasing trust and security, and it will improve the transparency of multi-party transactions.

Given all of these, one would expect public institutions would align to welcome and assist to facilitate the said developments. However, in the current atmosphere of political and economic deterioration, where political and status quo agendas control the rate of development, the scientific community and the entrepreneurs who are willing to finance these are at a loose in a rather hostile psychological climate.

7. Restoring trust, transparency and efficiency in government with a publicly scaled blockchain

In a letter to W. T. Barry, on August 4th 1822, James Madison [82] stated:

> *"A popular Government, without popular information, or the means of acquiring it, is but a prologue to a Farce or a Tragedy; or perhaps both. Knowledge will forever govern ignorance: and a people who mean to be their own Governors, must arm themselves with the power which knowledge gives."*

Transparency and accountability are of the two most essential principles in a free and democratic society. They are a bridge between an informed citizenry making confident electoral decisions or the widespread distrust of 'a self-serving, arbitrary, corrupt institution'. Furthermore, transparency and accountability are ever so more important as corruption keeps eroding the legitimacy and credibility of democratic governments worldwide. According to Pew Research Center, in the US public distrust of the government and elected officials has eroded to reach all-time lows [83]. This has been highlighted with the rise of civil unrest, violent protests, and frequent demonstrations against government policies, politicians, and media organizations [84, 85]. The erosion of public trust in government and news media can be attributed to numerous factors, many of which relate to the honesty, openness, and confidence, or lack thereof, in the information that is disseminated.

In 2011, the US launched a comprehensive digital government strategy aimed at building a 21st century digital government [86]. The Executive Order highlights:

> *"Government managers must learn from what is working in the private sector and apply these best practices to deliver services better, faster, and at lower cost. Such best practices include increasingly popular lower-cost, self-service options accessed by the Internet or mobile phone and improved processes that deliver services faster and more responsively, reducing the overall need for customer inquiries and complaints. The Federal Government has a responsibility to streamline and make more efficient its service delivery to better serve the public."*

However, ten years later we can still find proof of the Government's slow response to technological shifts. For instance, on December 2020, the Cyber-Security and Infrastructure Agency revealed that a yearlong hack had affected US private firms, government agencies, and critical infrastructure entities [87]. These included: the US Treasury, Department of Homeland Security, Department of State, Department of Defense, Department of Commerce, National Institute of Health, Center for Disease Control and Prevention, and the Justice Department among countless others. In total, it is estimated that 18,000 entities fell victim to the Russian hack. This relatively unknown hack is expected to cost American businesses and taxpayers over $100 billion dollars [88]. These types of attacks targeting the common citizen are so frequent that the ethical aspects of these actions blur against all the other consequences of these scandalous activities which ten-fold with time.

7.1 Building trust with bitcoin: now is the time for a blockchain reformation

Similar to the transformative nature of the internet, a public blockchain has the ability to revolutionize government processes by providing greater transparency and auditability as well as a super-efficient "Universal Source of Truth" data management platform that can be used to restore trust, authenticate data, and significantly reduce costs. This has become true after the publication of the 2008 Bitcoin Whitepaper by Satoshi Nakamoto which presented solutions to long-standing issues such as the scaling obstacles among other [89].

Bitcoin was designed to be the foundation for an open and honest system, one that is public, has a series of checks and balances, as well as an incentive for participation based on Proof-of-Work. On the Bitcoin network, every transaction is recorded on a public ledger maintained by a small-world network of specialized distributed nodes called transaction processors. As transactions are broadcasted, processors gather, validate, timestamp, and add each transaction as it is received in a series of hash-based, agreed upon chain of events, secured in blocks of immutable information.

As explained earlier, contrary to much of the popular belief, Bitcoin offers more than just a transfer or store of financial value. Bitcoin establishes a Universal Source of Truth, where information can be stored, validated, shared, protected, and authenticated. This can be used in conjunction with traditional systems or new hybrid options utilizing cloud to chain solutions. Not all data has to be stored on chain, but rather information can be authenticated simply by hashing it in the cloud and storing a copy of that hash on-chain. This would ensure that the data stored in the cloud, or elsewhere, could be simply authenticated to confirm it has not been changed.

Restoring the Bitcoin original protocol by removing the real centralization bottleneck, has allowed true innovation and unbounded on-chain scaling to occur. On May of 2020, the Bitcoin SV blockchain processed a world-record size block of 369 Mb which contained 1.3 million transactions. In fact, the network has already eclipsed almost 4,000 transactions per second (tps) and is expected to reach 50,000 tps later this year. Through scaling comes cost efficiency and Satoshi's vision remains unmatched in its ability to transfer micro – even nano-transactions with a median transaction fee of 1/100th of a U.S. cent. With safe, instant, low fee transactions of Bitcoin SV, government organizations can significantly reduce costs associated with financial and data transactions. These savings may be compounded by a reduction in the associated costs with auditing, cybersecurity, and networking hardware.

7.2 Bitcoin can help governments restore transparency and trust today

Bitcoin SV stands ready to fulfill the promises of an era of blockchain reformation by providing complete transparency and efficiency to the public sector. Although government entities would only need to begin with a common Request for Information, traditionally, the procurement stage has long been considered one of the greatest barriers to connecting government technology needs with vendors who are able to integrate the latest emerging technologies [90]. The consequence is that many small firms and industry outsiders are shut out entirely from participating due to how complex, time consuming and costly the process can be. In contrast, a myriad of transformative blockchain solutions await to contribute to a more ethical society by improving transparency and restoring trust. Some of these are:

Financial Transaction Management – As a distributed ledger, Bitcoin offers an accounting of valid transactions that occur within the network instantaneously. For a small transaction fee (.00011 per byte), transaction processors will record an entry onto the secure ledger. Compared to the cost of modern transaction management systems, Bitcoin offers unmatched savings, auditability, security, and interoperability with the integration of smart contracts and tokens. *Example:* **Tokenized** [91]

Regulatory Compliance – As transactions are validated and publicly recorded to the Bitcoin blockchain, they are secured by an immutable Proof-of-Work. This allows regulators, news media and government watch-groups real-time access to compliance-related data that can be shared and trusted. In return, this eases the burden of reporting and auditing on government agencies, reducing cost and improving transparency. Smart contracts for government procurement opportunities would ensure compliance, fairness and improve the overall speed of implementation. *Example*: **nChain** [92]

Identity Management - Unlike centralized government databases, Bitcoin provides a much more secure distributed data management platform that could empower citizens with the ability to easily sign and authenticate their identity for official government documents or benefits. This would also reduce the time and resources needed by the government to verify identities and protect sensitive data – especially across restrictive inter-agency data silos. *Example:* **Legally Chained** [93]

Registries – The ability to manage any type of record or registry through Bitcoin's unique data management network removes the overall complexity for governments to manage and authenticate data efficiently. This would remove the friction of processing land titles, company registrations as well as every other type of record including birth, marriage, divorce, criminal or death. The ledger would serve an honest, universal source of truth that can drastically reduce fraud and corruption. Example: **Elas Digital** [94]

Blockchain Voting – As we saw during the 2020 US Presidential election cycle, it is important for citizens to believe in the integrity of the voting process. Doubt in returned results, whether due to error, fraud, hacking, corruption, or lack of transparency can create an atmosphere of distrust among voters. Bitcoin's tamper-proof public ledger is perfectly suited to eliminate election fraud in the future – when combined with an identity-based token, a voter could easily cast their vote using any type of device removing barriers and increasing participation. Example: **Layer2 Technologies (B-vote)** [95]

Supply Chain Traceability – The Coronavirus pandemic has demonstrated to all how fragile our global supply chain can be during a disruption. Government agencies competed to locate, purchase, and distribute medical gear, supplies and personal protective equipment. This created panic among the populace as medical care was either denied, delayed, or compromised through the reuse of protective gear. The lack of traceability of the supply chain continues to plague COVID-19

relief. As traditional government vendors begin developing vaccine distribution and contract tracing technologies, many citizens are concerned about how their personal medical data will be stored and used in the future. Bitcoin solves these issues by improving trust and privacy among parties that need to share valuable data across an entire value chain. Example: **UNISOT** [96]**, VXPass** [97].

- **Health Care** – A public health crisis like the Opioid epidemic carry a heavy cost on communities, taxpayers, and governments alike. Patient data is usually spread across various data silos and databases that do not communicate well with one each other. This has led to gaps in the system where licensed pharmaceutical prescribers were unable to verify how many concurrent prescriptions a patient may have access to. Bitcoin has the potential to remove these data silos and improve public health through patient-controlled, auditable records. Example: **EHRData** [98]

- **Taxation** – Through Bitcoin and the power of microtransactions, government and business tax reporting become automated, audit friendly and extremely efficient. By integrating tax payment requirements into a programmable smart contract, payroll and other taxes become immediately available to the government allowing them secure payments faster, budget more accurately and decrease the risk for fraud.

- **Public Assistance** – Smart contracts on Bitcoin can also be used to create programmable tokens that could be utilized for government assistance programs such as the Food Stamp Program. These tokens can mitigate fraudulent use and prevent abuse through the ability to only approve the purchase specific needs-based items.

8. Blockchain and AI

The ancient myth of AI had developed through centuries: from the Greek, to the Age of Enlightment [99], to the 20th Century when it made initial progress in the areas of game theory and theorem proofs. The modern concept of AI began to take shape in the 1950s after the arrival of the new computers made possible the design of reasoning processes that resembled those in human behavior. In this context, Alan Turing's 1950's "Turing Test" in *Computing Machinery and Intelligence* [100] provided a key step forward with a method for determining if a machine is "intelligent." Here, rather than asking whether the machine can think, the question changed to whether it can act as a thinker [101]. Seventy years later, AI tasks still struggle to reconcile the needs of sufficient representation, an effective and efficient decision-making mechanism that can make and execute timely decisions, and control.

Immutability, accessibility, non-repudiation, and decentralization of the data are some of the properties that allow blockchain technology to be used in AI developments, such as smart-contracts. Furthermore, the integration of the blockchain with AI provides solutions that can resolve problems intrinsic to the blockchain: for instance, by reducing energy consumption [102]. AI has also proven useful to better blockchain and smart contracts' security [103], for example, by helping in the process of code verification.

AI's technological capability to install cognitive capacities in machines so these can perform functions such as learn, interpret, and adapt, is related to consumed data. These data are often gathered from the users of smart telephones, and consumers of social media, and web applications [104]. As a result private and public organizations

collecting these data, deal with issues of information centralization, legitimacy, authenticity, security, and privacy. Because data are centrally managed in AI projects, it can potentially be hacked and tampered with [105]. However, AI is also a tool that provides efficient solutions to major tasks such as in the allocation of resources, in managing large sets of data, and in procedural and repetitive tasks [106]. So the combined use of blockchain and AI addresses problems related to centralization, and offers solutions to issues related to the optimization of resources [107].

Intelligent and autonomous applications are designed to reduce human intervention in different types of processes; hence, their impact on individuals and societies raise important concerns. Harm to privacy, potential discrimination, limitation of citizenry choice and access to information, loss of skills, economic shocks, security of critical infrastructure, or long-term impacts on social well-being are just some of the key concerns these technological developments pose to society. That is the reason the development of these innovations need to be aligned with a set of defined values and ethical principles.

9. Ethical design framework

Given the ethical concerns these new technologies arise, a series of guidelines have been published by different institutions working at the crossroads of technology and social good. Here we will refer to those reported by the Beeck Center. [108] Nonetheless, others such as the *IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems* [109], have also made huge efforts to encourage ethical considerations are prioritized when devising autonomous and intelligent technologies.

Establishing the ethical approach during the earliest phases of design is key when using Blockchain and AI. The reason is that changes will be more difficult to implement in later stages, if at all possible. This framework summarizes (p.21.):

> [] (1) give decision makers an outcome-focused and user-centric tool to assess the context-specific consequences and ethical implications of their blockchain design choices; and (2) to enable them to use this understanding to make the appropriate values-based design choices to achieve better social outcomes.
>
> [] Ultimately, these ethical considerations traced broadly to six root issues: governance, identity, access, verification and authentication, ownership of data, and security.

These factors are the basis for a three-phases framework. The first phase is a five-step process which establishes the intentionality of design with a focus on ethics. The second phase (p.40) is an iterative process which examines each design decision in light of the impacts it has on each other element of the ecosystem (i.e.: users, community…). The third phase (p.48), acknowledges that the context evolves in time and the relevance of each element changes. Hence, during this last phase there is a reevaluation of the first and second phases to assess significant changes in the environment.

Even though the implementation of such objectives will require additional time and resources dedicated at the start of each project, the benefits are self-evident even if just considering the impact on the smart contract environment. The reason is that smart contracts are deployed to start working when a predefined group of conditions are met. That is, the contracts will be triggered by inputs such as external events, information system sources, or other and these processes will be automatically enforced by algorithms unconstrained by ethical or legal considerations. Thus,

in designing smart contracts, their impact beyond the realm of contract law should be analyzed. For instance, smart contracts could use ethically accepted rules when providing technological solutions and create models of governance through new social contracts. In this sense, the 2016 work of Reijers et al. [110]. analyzes how the modeling of blockchain governance reflects the key ideas of social contract theories. Their conclusions (p. 147–148) are that blockchain governance a) is justified by Rousseau's argument that it provides a solution to an existing structure of corrupted institutions; b) being non-discriminatory it reflects Rawls's "veil of ignorance," though power-relations are expressed in the public ledger; and c) acts in accordance to Hobbes idea of a "*totalitarian sovereign in terms of rule-enforcement, coupled with Rousseau's idea of decentralized governance and Rawls's idea of equal rights and liberties for all (that is, for all the nodes). Even though, it fails, to incorporate Rousseau's idea of the common good, and fails to implement conditions of distributive justice that Rawls thought to be essential for overcoming the initial situation.*" (p.147).

Although the blockchain is perceived as a "neutral" technology, the political implications of its transformative power are profound as it will reconfigure economic, legal, institutional, and political spaces [111]. The information age promises great benefits from economies of scale and more efficient use of resources, but it also comes with a huge threatening potential to create masses of excluded individuals who cannot catch up with the times. Given the disconnect among different layers of citizens that it is likely to happen, renewed social contracts are essential to protect human dignity and the rights and opportunities of all [112].

Furthermore, any changes that make our democratic processes more transparent, inclusive, and participatory will benefit society. This was noted by Melanie Swan who in her 2015 work "Blockchain: Blueprint for a new economy, [113]" assured this technology will ease the appearance of new kinds of governance models and services. As an example, she mentions an increase of granular offer by which the government will design more targeted services. And she also enumerates a number of efforts to develop systems that will increase the quality of our democracies. For instance, she explains David Chaum's idea of random-sample elections [114]. Under this system, people selected randomly are asked to vote through an election website that contains candidate debates and activist sentiments. In David Chaum's view, because of cost reduction, many more consultative processes could be generated. Also, people would have time to inform themselves on whichever matter rather than be overwhelmed by political advertising. Furthermore, no government involvement would be necessary. A third idea discussed in Swan's book, is DAS which stands for distributed autonomous society. This model develops the principles for consensus-based decentralized governance systems and for decentralized voting systems. In her work, Professor Swan discusses this project as a form of delegated democracy, where voting power is vested in representatives. An example of such service is provided by https://liquidfeedback.org/, a company that offers an open source software to help present suggestions and make decisions. This is quite a compelling proposal because, under this method, people can align with each other on the bases of specific actions rather than "ideological" theories. Furthermore, power is not held long. Rather, individuals are responsible for a specific project. Thus, if standardized, this "liquid" in Liquid Democracy, would finish with political forms of permanent power as they are practiced today. Two immediate effects one can imagine would be a redistribution of power back to the people, and an increased impediment to the exercise of political corruption. Albeit there are many potential problems with this type of proposal, i.e.: power is obtained by groups which are already organized or citizens that might not wish to exercise these responsibilities, it might in fact provide a platform for a nation-wide discussion over the responsibilities of individuals on a modern technologically advanced society.

Overall, we can be sure that any elections properly organized using a voting protocol designed with blockchain and AI could be expected to exhibit at least the following desirable properties: privacy of the vote, perfect ballot secrecy, fairness, verifiability, self-tallying feature, dispute-freeness, fault tolerance, and resistance to serious failures. The works of Kiayias and Yung [115], Groth [116], Park et al. [117], Benaloh et al. [118], and Jonker et al. [119] provide a detailed description of these. We can also be sure that much upheaval would have been prevented if this would have been the underlying technology to the recent 2020 US Presidential elections.

10. Conclusion

The State should ensure the right of each individual to be secure in person and property and enhance the citizens' opportunities to make choices. Transparency and accountability are two key requirements to ensure the citizens' wills are not replaced by the needs of supra organizations: be it the state, large corporations, or the sole owners of certain resources. This is of particular importance in the age of "surveillance capitalism" when individuals might be looked upon and used as "*raw material supplies* [120]". It is in this environment that Bitcoin came to the market after both the 2008 white paper and the code were made available by Satoshi Nakamoto.

The 2009 birth of Bitcoin paved the way for a revolutionary transformation that announced the death of outdated technologies and evidenced the effort many across sectors and government, will have to make to say at par with the latest technology. This is a truly global solution that provides better transparency, fraud protection, it is faster, cheaper, and overall more efficient. Given this solution threatens to cause a fundamental and permanent change in our societies, and that the economic repercussions of the probable developments and trades are highly significant, public opinions have often been construed over a mixed of emotions and disinformation on the workings of the technology. As the Bitcoin builds untamperable public records in an efficient manner, a fear-mongering mentality intertwined with an problem posed by underlying conflict of interests has announced the "death" of this new sector repeatedly [121]. However, in just over a decade a myriad of transformative blockchain solutions have been built. Among the many, we have listed some ready solutions that will have immediate cathartic power. Of course these and other currently existing applications deserve a longer discussion.

During the decades following World War II, ethical standards were established to help govern how science in the future could move forward while not incurring the atrocities committed in the past [122]. Technology is considered as normatively neutral, but because transactions are irreversible and they solidify economic contracts by turning code into economic law, the use of Bitcoin poses a series of ethical questions. For instance, we could wonder about issues of privacy, whether miners are acting responsibly, whether this technology enables fraud, and so on. However, these questions can be answered by studying the technology itself and the trades. Here we turned our attention to whether the use of Bitcoin contributes to "ethics" according to the justice that is achieved when a society restores transparency and prevents fraud. In this imaginable future, Bitcoin will allow citizens have a more voluntary life and, in this way, it will contribute to the moral norm of justice by helping create a fairer society.

John Fitzgerald Kennedy [123] stated that "*change is the law of life. And those who look only to the past or present are certain to miss the future*". We hope this chapter contributes by helping the reader assess the depth of change this impending Bitcoin Revolution will unfold.

Author details

Eva R. Porras[1*] and Bryan Daugherty[2]

1 Department of Business Economics, Applied Economics II, and Fundamentals of Economic Analysis at Universidad Rey Juan Carlos, Madrid, Spain

2 Bitcoin Association, Zug, Switzerland

Address all correspondence to: eva_porras@hotmail.com

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References

[1] Please note that Bitcoin refers to the protocol, while bitcoin refers to the currency itself.

[2] please see https://ramonquesada.com/ and https://es.ramonquesada.com/glossary/bitcoin-es/; https://www.mail-archive.com/cryptography@metzdowd.com/msg10142.html

[3] https://bitcoin.org/bitcoin.pdf Satoshi Nakamoto Bitcoin: A Peer-to-Peer Electronic Cash System

[4] Throughout this text we use cryptocurrency, digital money and digital currencies as synonyms. These terms refer to native digital currencies, such as bitcoin, and not to the digital version of fiat monies, such as the euro, dollar, pound, etc. We use the term "Bitcoin" to refer to the overall Bitcoin network, while "bitcoin" refers to digital money produced by this network.

[5] Paul Krugman's article "Bitcoin Is Evil" December 28, 2013 https://krugman.blogs.nytimes.com/2013/12/28/bitcoin-is-evil/?_r=1

[6] Paul Krugman's article "Bitcoin Is Evil" December 28, 2013 https://krugman.blogs.nytimes.com/2013/12/28/bitcoin-is-evil/?_r=1

[7] Charlie Stross article "Why I want Bitcoin to die in a fire" December 28ck, 2013 https://www.antipope.org/charlie/blog-static/2013/12/why-i-want-bitcoin-to-die-in-a.html

[8] William Suberg's article "JPMorgan CEO Jamie Dimon Returns to Bitcoin Bashing, Calls Cryptocurrency a 'Scam' "AUG 06, 2018 https://cointelegraph.com/news/jpmorgan-ceo-jamie-dimon-returns-to-bitcoin-bashing-calls-cryptocurrency-a-scam

[9] https://cointelegraph.com/news/jp-morgan-chase-ceo-jamie-dimon-bitcoin-is-going-to-be-stopped

[10] http://www.smh.com.au/technology/technology-news/drugs-bought-with-virtual-cash-20110611-1fy0a.html; https://upload.wikimedia.org/wikipedia/commons/0/0b/Silk_Road_Seized.jpg

[11] https://www.activism.net/cypherpunk/crypto-anarchy.html

[12] https://www.activism.net/cypherpunk/manifesto.html

[13] W. Dai, "b-money," http://www.weidai.com/bmoney.txt, 1998. http://www.weidai.com/bmoney.txt

[14] https://www.Cypherpunks.to/list/

[15] David Chaum, "Achieving Electronic Privacy," *Scientific American*, August 1992, 96-101.

[16] David Chaum, "Untraceable Electronic Mail, Return Addresses, and Digital Pseudonyms" Communications of the ACM. Volume 24 Issue 2, Feb. 1981, Pages 84-90 http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.79.7468&rep=rep1&type=pdf

[17] David Chaum, "Blind signature for untraceable payments" *Advances in Cryptology Proceedings of Crypto. 82 (3): 199-203.* doi:10.1007/978-1-4757-0602-4_18. (http://www.hit.bme.hu/~buttyan/courses/BMEVIHIM219/2009/Chaum.BlindSigForPayment.1982.PDF

[18] http://nakamotoinstitute.org/finney/rpow/

[19] Fineman, S. (1993). Emotion and organizing. In C. Hardy (Ed.), *Handbook of organization studies* (pp. 1-64). London: Sage.

[20] https://cointelegraph.com/news/94-year-old-berkshire-hathaway-vp-its-disgusting-people-buy-bitcoin

[21] https://www.cnbc.com/2018/03/05/bitcoin-more-likely-to-be-100-than-100000-in-10-years-kenneth-rogoff.html

[22] William Suberg's article "JPMorgan CEO Jamie Dimon Returns to Bitcoin Bashing, Calls Cryptocurrency a 'Scam'" Aug 06, 2018 https://cointelegraph.com/news/jpmorgan-ceo-jamie-dimon-returns-to-bitcoin-bashing-calls-cryptocurrency-a-scam

[23] https://cointelegraph.com/news/jp-morgan-chase-ceo-jamie-dimon-bitcoin-is-going-to-be-stopped

[24] https://www.theguardian.com/technology/2017/sep/13/bitcoin-fraud-jp-morgan-cryptocurrency-drug-dealers

[25] https://twitter.com/CNBC/status/907663994613354496

[26] https://cointelegraph.com/news/bitcoin-mining-thrives-in-venezuela-thanks-to-hyperinflation-and-free-electricity

[27] https://cointelegraph.com/news/bitcoin-in-venezuela-bolivar-worth-50-of-world-of-warcraft-gold

[28] https://www.theguardian.com/technology/2017/sep/13/bitcoin-fraud-jp-morgan-cryptocurrency-drug-dealers

[29] https://www.theguardian.com/technology/2017/sep/13/bitcoin-fraud-jp-morgan-cryptocurrency-drug-dealers

[30] https://cointelegraph.com/news/jpmorgan-ceo-jamie-dimon-returns-to-bitcoin-bashing-calls-cryptocurrency-a-scam

[31] William Suberg Bitcoin Price Drops After JPMorgan CEO Harsh Rhetoric SEP 13, 2017 https://cointelegraph.com/news/bitcoin-price-drops-after-jpmorgan-ceo-harsh-rhetoric

[32] https://www.theguardian.com/technology/2017/sep/13/

bitcoin-fraud-jp-morgan-cryptocurrency-drug-dealers

[33] Paul Krugman's article "Bitcoin Is Evil" December 28, 2013 https://krugman.blogs.nytimes.com/2013/12/28/bitcoin-is-evil/?_r=1

[34] Charlie Stross article "Why I want Bitcoin to die in a fire" December 28ck, 2013 https://www.antipope.org/charlie/blog-static/2013/12/why-i-want-bitcoin-to-die-in-a.html

[35] https://www.theguardian.com/technology/2018/may/21/cryptocurrencies-fad-money-bitcoin

[36] https://www.theguardian.com/technology/2018/may/21/cryptocurrencies-fad-money-bitcoin In a recent article by 2013 Nobel Laureate Robert Shiller, the economist points out that

[37] Jenkinson, G. (1918) Tulips, Bubbles, Obituaries: Peering Through the FUD About Crypto. https://cointelegraph.com/news/tulips-bubbles-obituaries-peering-through-the-fud-about-crypto. Published Jun 24, 2018.

[38] https://99bitcoins.com/bitcoin-obituaries/ collected by 99bitcoins.com

[39] https://cointelegraph.com/tags/altcoin

[40] https://digiconomist.net/?s=Ethereum+obituaries; https://digiconomist.net/new-ethereum-obituaries

[41] Following Krugman's article there are 524 comments, Charlie Stross' Comments (902)

[42] https://cointelegraph.com/news/volatility-the-necessary-evil-of-cryptocurrency-and-how-to-handle-it

[43] https://twitter.com/ErikVoorhees

[44] https://en.wikipedia.org/wiki/Troubled_Asset_Relief_Program

[45] https://cointelegraph.com/news/jp-morgan-sees-crypto-as-competition-and-risk-to-its-business-in-sec-annual-report

[46] Molly Jane Zuckerman J.P Morgan Sees Crypto As 'Competition' And 'Risk' To Its Business In SEC Annual Report FEB 28, 2018 https://cointelegraph.com/news/jp-morgan-sees-crypto-as-competition-and-risk-to-its-business-in-sec-annual-report

[47] http://investor.shareholder.com/jpmorganchase/secfiling.cfm?filingID=19617-18-57&CIK=19617#CORP10K2017_HTM_S440D20F00AA0567AADC9B36846A275C5

[48] https://cointelegraph.com/tags/bitcoin-futures

[49] https://cointelegraph.com/news/elite-investment-bank-goldman-sachs-to-clear-bitcoin-futures-for-clients

[50] https://www.bloomberg.com/news/articles/2017-12-21/goldman-is-said-to-be-building-a-cryptocurrency-trading-desk

[51] https://www.nytimes.com/2018/05/02/technology/bitcoin-goldman-sachs.html

[52] https://cointelegraph.com/news/bloomberg-goldman-sachs-to-setup-cryptocurrency-trading-desk

[53] https://www.sec.gov/Archives/edgar/data/70858/000007085818000009/bac-1231201710xk.htm

[54] https://cointelegraph.com/news/bank-of-america-our-inability-to-adapt-could-see-a-failure-to-compete-with-crypto

[55] https://cointelegraph.com/news/bank-of-america-our-inability-to-adapt-could-see-a-failure-to-compete-with-crypto

[56] https://cointelegraph.com/news/jp-morgan-chase-bans-buying-cryptocurrency-with-credit-cards

[57] https://www.sec.gov/Archives/edgar/data/70858/000007085818000009/bac-1231201710xk.htm

[58] https://cointelegraph.com/news/crypto-unlikely-to-disappear-says-internal-report-attributed-to-jp-morgan

[59] Krugman, P. R. (2013). *Bitcoin is evil*. Retrieved from http://krugman.blogs.nytimes.com/2013/12/28/bitcoin-is-evil/?_r=1

[60] https://twitter.com/CNBC/status/907663994613354496

[61] https://robertskidelsky.com/2018/05/23/why-reinvent-the-monetary-wheel/

[62] https://youtu.be/ERImeMPRFRE. 3. Donald Trump, the Cryptography Mailing List, and SIGHASH types - Satoshi Nakamoto - CSW & RXC Posted online on January 21st, 2021 minutes 00:49-1.21

[63] https://www.govinfo.gov/content/pkg/PLAW-105publ304/pdf/PLAW-105publ304.pdf Digital Millennium Copyright Act Signed into law by President Bill Clinton on October 28, 1998.

[64] Dr Craig Wright. 11 Jan 2021. An exploration of ingroup behaviour and social psychology in developing socially abhorrent behaviours in social media and financial systems. Abstract. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3763746

[65] Dr Craig Wright. 11 Jan 2021. An exploration of ingroup behaviour and social psychology in developing

socially abhorrent behaviours in social media and financial systems. Abstract. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3763746 pages 9 and 10.

[66] p322-331 R. Z. SAGDEEV] *Science and Revolutions*, The Tanner Lectures on Human Value. March 9-16, 1992. https://tannerlectures.utah.edu/_documents/a-to-z/s/Sagdeev93.pdf

[67] p322-331 R. Z. SAGDEEV] *Science and Revolutions*, The Tanner Lectures on Human Value. March 9-16, 1992. https://tannerlectures.utah.edu/_documents/a-to-z/s/Sagdeev93.pdf

[68] f p322-331 R. Z. SAGDEEV] *Science and Revolutions*, The Tanner Lectures on Human Value. March 9-16, 1992. https://tannerlectures.utah.edu/_documents/a-to-z/s/Sagdeev93.pdf

[69] p322-331 R. Z. SAGDEEV] *Science and Revolutions*, The Tanner Lectures on Human Value. March 9-16, 1992. https://tannerlectures.utah.edu/_documents/a-to-z/s/Sagdeev93.pdf

[70] https://www.washingtontimes.com/topics/parler/ ; https://www.washingtontimes.com/news/2021/jan/24/parler-provided-freedom-censorship-cost-users-data/

[71] 2013 Nobel Laureate Robert Shiller said when referring to the case of digital cash: "*statement of faith in a new community of entrepreneurial cosmopolitans who hold themselves above national governments*"

[72] https://www.lainformacion.com/mercados-y-bolsas/la-cnmv-y-el-banco-de-espana-alertan-del-riesgo-regulatorio-sobre-bitcoin/2828815/ https://www.lainformacion.com/economia-negocios-y-finanzas/economia-criptomonedas-no-tienen-garantias-otros-activos/2828975/https://www.expansion.com/mercados/divisas/2021/02/10/6023b9bfe5fdea55778b4619.html

[73] Jürgen Habermas1986, Lecture One: How Is Legitimacy Possible On The Basis Of Legality?

[74] Max Weber, Wirtschaft und Gesellschaft (Cologne, 1964), ch. 3, pp. 2, 160ff.

[75] https://www.youtube.com/watch?v=LdvQTwjVmrE&feature=emb_logo All-Star Panel: Ed Moy, Joseph VaughnPerling, Trace Mayer, Nick Szabo, Dr. Craig Wright. Presented at Bitcoin Investor Conference - Las Vegas, NV Oct. 29-30, 2015 http://BitcoinInvestor.com

[76] https://www.youtube.com/watch?v=LdvQTwjVmrE&feature=emb_logo See minutes (48:18-50:01)

[77] https://www.youtube.com/watch?v=LdvQTwjVmrE&feature=emb_logo All-Star Panel: Ed Moy, Joseph VaughnPerling, Trace Mayer, Nick Szabo, Dr. Craig Wright. Presented at Bitcoin Investor Conference - Las Vegas, NV Oct. 29-30, 2015 http://BitcoinInvestor.comsee minutes 52:22-53:42

[78] https://www.youtube.com/watch?v=LdvQTwjVmrE&feature=emb_logo All-Star Panel: Ed Moy, Joseph VaughnPerling, Trace Mayer, Nick Szabo, Dr. Craig Wright. Presented at Bitcoin Investor Conference - Las Vegas, NV Oct. 29-30, 2015 http://BitcoinInvestor.comsee minutes 63:25-63:58

[79] Baumol, W.J. (2002). The free-market innovation machine: Analyzing the growth miracle of capitalism. Princeton university press, in J.M. Rivière, Blockchain Technology And IP - Investigating Benefits And Acceptance In Governments And Legislations. *Junior Management Science,* 2018, 3(1), 1-15.

[80] Tapscott, D., Tapscott, A. (2016). *Blockchain Revolution: How the Technology Behind Bitcoin is Changing*

Money, Business, and the World. Penguin Canada.

[81] Tapscott, D., Tapscott, A. (2016). The impact of the blockchain goes beyond financial services. *Harvard Business Review*. [Accessed Dec.27, 2020] https://hbr.org/2016/05/the-impact-of-the-blockchain-goes-beyond-financial-services?autocomplete=true.

[82] James Madison, Letter to W. T. Barry, August 4, 1822. "From James Madison to William T. Barry, 4 August 1822," *Founders Online,* National Archives, https://founders.archives.gov/documents/Madison/04-02-02-0480. [Original source: *The Papers of James Madison*, Retirement Series, vol. 2, *1 February 1820–26 February 1823*, ed. David B. Mattern, J. C. A. Stagg, Mary Parke Johnson, and Anne Mandeville Colony. Charlottesville: University of Virginia Press, 2013, pp. 555-558.]

[83] https://www.pewresearch.org/politics/2019/04/11/public-trust-in-government-1958-2019/

[84] https://ycnews.com/political-polarization-continues-to-consume-the-vitality-of-the-united-states/

[85] https://www.washingtontimes.com/news/2021/jan/21/leftists-portland-protest-biden-inauguration-vanda/

[86] https://obamawhitehouse.archives.gov/the-press-office/2011/04/27/executive-order-13571-streamlining-service-delivery-and-improving-custom

[87] Cyber-Security and Infrastructure Agency revealed that a yearlong hack affected US government agencies and critical infrastructure entities

[88] American businesses and taxpayers over $100 billion dollars. https://www.rollcall.com/2021/01/11/cleaning-up-solarwinds-hack-may-cost-as-much-as-100-billion/

[89] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3440802 Bitcoin: A Peer-toPeer Electronic Cash System Dr Craig S Wright.

[90] https://www.govloop.com/community/blog/built-to-fail-why-governments-struggle-to-implement-new-technology/

[91] https://tokenized.com/

[92] https://nchain.com/

[93] https://legallychained.com/

[94] https://www.elas.digital/

[95] https://bitcoinassociation.net/ballots-on-blockchain/

[96] https://unisot.com/

[97] http://www.vxpass.com/

[98] https://ehrdata.com

[99] https://www.marxists.org/reference/archive/la-mettrie/1748/man-machine.htm

[100] https://www.csee.umbc.edu/courses/471/papers/turing.pdf

[101] https://www.historyofinformation.com/detail.php?id=4289

[102] J. Chen, K. Duan, R. Zhang, L. Zeng, and W. Wang, "An AI Based Super Nodes Selection Algorithm in BlockChain Networks." [Online]. Available: https: //arxiv.org/pdf/1808.00216.pdf

[103] T. Marwala and B. Xing, "Blockchain and Artificial Intelligence," *arXiv preprint arXiv:1802.04451*, 2018. [Online]. Available: http://arxiv.org/abs/1802.04451.

[104] K. Salah, M. H. U. Rehman, N. Nizamuddin and A. Al-Fuqaha, "Blockchain for AI: Review and Open

Research Challenges," in IEEE Access, vol. 7, pp. 10127-10149, 2019. doi: 10.1109/ACCESS.2018.2890507

[105] Diversifying Data With Artificial Intelligence And Blockchain Technology, 2018, retrieved from https://www.forbes.com/sites/rachelwolfson/2018/11/20/diversifying-data-with-artificial-intelligence-and-blockchain-technology/#71272a104dad

[106] A. Androutsopoulou, N. Karacapilidis, E. Loukis, Y. Charalabidis, Transforming the communication between citizens and government through AI-guided chatbots, Government Information Quarterly, Volume 36, Issue 2, 2019, Pages 358-367, ISSN 0740-624X, https://doi.org/10.1016/j.giq.2018.10.001

[107] Gabriel Axel Montes, Ben Goertzel, Distributed, decentralized, and democratized artificial intelligence, Technological Forecasting and Social Change, Volume 141, 2019, Pages 354-358, ISSN 0040-1625, https://doi.org/10.1016/j.techfore.2018.11.010

[108] 2019. Cara Lapointe and Lara Fishbane. The-Blockchain-Ethical-Design-Framework.pdf https://www.researchgate.net/publication/330069634_The_Blockchain_Ethical_Design_Framework#fullTextFileContent

[109] Ethically aligned design IEEE A vision for Prioritizing Human Wellbeign with Artificial Intelligence Autonomous Systems ead_v1.pdf https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/ead_v1.pdf

[110] Reijers, W., O'Brolcháin, F. and Haynes, P. Governance in Blockchain Technologies & Social Contract Theories. *Ledger*, 1, 0 (2016), 134-151. https://www.researchgate.net/publication/312244646_Governance_in_Blockchain_Technologies_Social_Contract_Theories

[111] Coeckelbergh, M., Reijers, W. "Crypto currencies as narrative technologies." *SIGCAS Computers & Society*, 45.3 172-178 (2015) https://www.researchgate.net/publication/281586152_Cryptocurrencies_as_Narrative_Technologies

[112] Mason, R. O. Four Ethical Issues of the Information Age. *MIS Quarterly*, 10, 1 (March 1986), 5-12. file:///C:/Users/Usuario/AppData/Local/Temp/mason.pdf

[113] Melanie Swan (2015) "Blockchain: Blueprint for a new economy" Published by O'Reilly Media, Inc., 1005 Gravenstein Highway North, Sebastopol, CA 95472.

[114] Chaum, D. "Random-Sample Elections: Far Lower Cost, Better Quality and More Democratic." Accessed 2021. https://www.chaum.com/publications/ Random-Sample%20Elections.pdf.

[115] Aggelos Kiayias and Moti Yung. 2002. Self-tallying Elections and Perfect Ballot Secrecy. In Public Key Cryptography, David Naccache and Pascal Paillier (Eds.). Springer Berlin Heidelberg, Berlin, Heidelberg, 141-158.

[116] Jens Groth. 2004. Efficient Maximal Privacy in Boardroom Voting and Anonymous Broadcast. In Financial Cryptography, Ari Juels (Ed.). Springer Berlin Heidelberg, Berlin, Heidelberg, 90-104.

[117] Sunoo Park, Michael Specter, Neha Narula, and Ronald L Rivest. 2020. Going from bad to worse: from internet voting to blockchain voting. https://people.csail.mit.edu/rivest/pubs/PSNR20.pdf

[118] Josh Benaloh, Ronald Rivest, Peter YA Ryan, Philip Stark, Vanessa Teague, and Poorvi Vora. End-to-end verifiability.

arXiv preprint arXiv:1504.03778
(2015). https://arxiv.org/ftp/arxiv/
papers/1504/1504.03778.pdf

[119] Hugo Jonker, Sjouke Mauw, and Jun
Pang. 2013. Privacy and verifiability in
voting systems: Methods, developments
and trends. Computer Science Review
10 (2013), 1-30.

[120] Zuboff, 2019: 87. *The Age of
Surveillance Capitalism: The Fight for
a Human Future at the New Frontier
of Power*

[121] https://cointelegraph.com/news/
tulips-bubbles-obituaries-peering-
through-the-fud-about-crypto

[122] Dorothy Roberts - *The Old Biosocial
and the Legacy of Unethical Science*
103 p.346

[123] *Kennedy, J.F. (1963). Public Papers
of the Presidents*. [Accessed Jan.25,
2021] https://www.jfklibrary.org/learn/
about-jfk/life-of-john-f-kennedy/
john-f-kennedy-quotations