
The correlation between Bitcoin, Ethereum and the United Maghreb Arab's banking and business



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The reality is that we live in a society where a small group of people think they know better than we do and how we should live our lives. They don't ever seem to realise that the power and wealth they surround themselves with is only possible because of the quiet acquiescence of the majority. They say employment is a record high, but fail to say wages have been going down in real terms for decades [4]. This wall street elites and big head of governments and pharmaceutical businesses constantly keep telling the general popula-

tion how great everything is but deep down we all know it's not true as Recent estimates for global poverty are that 8.6 percent of the world, or 736 million people, live in extreme poverty on 1.90 dollar or less a day, according to the World Bank but we know in our bones it's not true. But it could be and through technology, it will be. As the only answer to political and financial problems that assail us is to step outside the circus . That's where cryptocurrencies come in, as they offer a secure form of transferring or recording ownership of our assets and the most important part is they function completely independently of governments[4] .

1 Introduction

Whether you are with or against them cryptocurrencies represent one of the biggest bull markets in the history of finance and it's the only boom that comes close to the California gold rush . So as a future Muslim Moroccan scientific researcher in the field of Cyber security and block-chain technology i couldn't help but wonder how could we use this technology in my country to revolutionize the banking and Financial sector in it and especially after I learned that Morocco prohibited the use of bitcoin back in 2017 .

I then found myself asking the following questions : how does cryptocurrency conforms to sharia's Islamic teaching especially in Morocco? And how could the use of cryptocurrencies send shock waves across the Middle East ?

2 A brief history of money

Humans have been trading various forms of money for thousands of years. Many types of precious objects, acting as a Medium of Exchange, have been used. In the early ages, we traded grain, cattle, shells, and gems for other goods and services. This type of money, which we can touch and see, can be considered Physical Money. As civilization progressed, so did our political systems. Eventually, sparse tribes and villages consolidated into kingdoms, states, and empires. Through the transformation, we saw our money shift into Political Money; money that's governed and issued by a central body such as the King, Emperor or, as in today's society, a Central Bank. State issued coins, bills, and notes, as well as taxation, regulation, and monetary policy—all emerged from this shift.

Today, Internet technology connects us directly to each other, opening a vast range of possibilities. By dissolving pre-existing physical and political boundaries, for the first time in history, the entire planet has access to the same information. This level of access is guaranteed by the Internet's decentralized design. Without a centralized hub, there is no single point of failure or control.



Figure 2: Dorian Nakamoto on of the three people who either claimed or are suspected to be The notorious Bitcoin creator Satoshi Nakamoto.

Satoshi Nakamoto, the creator of Bitcoin, leveraged this powerful network to implement a peer-to-peer (P2P) system for exchanging virtual cash. Built on a decentralized design and protected by powerful cryptography, this new type of money is no longer physical, yet resilient against corruption and manipulation. No single group of individuals, including governments, banks, and corporations, control Bitcoin because all the peers are equal actors, participating through the same protocol. Its monetary policy is defined and self-regulated by its open network of computers. Thus, with Bitcoin we're seeing the emergence of a new phase of money. This P2P money is called cryptographic money or simply Crypto-Currency. [9]

2.1 The history of finance

The purpose of this section is to understand the innovation of our existence. Therefore, let's take a step back a few hundred years. Trading has always been present in our lives, as it is mandatory for our food chain, and probably will never go away. When you take a closer look at the basic human needs for survival, you quickly realize that the three most important requirements are: Air, Water , Food.

Because air and water can be found in many locations for free. Keizer Sözein in his book " Blockchain: Novice to Expert " took the example of food and started analysing it in further detail.

"Food items have been identified since the early ages as one of the primary human needs for survival. Therefore, we have understood that food has tremendous value. Like anything else that has value, it became part of the global trading chain, and it was one of the first early paying methods amongst humans in exchange for particular goods or services provided. Because food has always helped for basic survival, it was one of the best paying methods for an extended period. In fact, there are many locations existing in the world that still use this approach at present. As civilization has

moved on, especially with more developed villages and cities, methods of payments have begun to change. Back then we had no freezers, or fridges, and using payments such as food items like exotic fruits or any meat just went to waste. This caused lots of issues. Therefore, this problem had to be resolved. The solution was a new type of payment method, something that wouldn't easily rot or waste. However, had to be exchangeable for food or any other goods or services." says Keizer Sözein



Figure 3: Precious Shiny metal

Precious Shiny metals were introduced to the world as a new payment method, and such were silver or gold.

Of course, most people didn't like the idea at first. Still, it was implemented, and slowly it was excepted widely. It was exchangeable for food items, and other goods or services and it was truly revolutionary, and still today, when you look at the silver or gold value, they are continuously increasing. Humans have realized that it is getting much harder to mine gold and silver. Therefore, precious metal had to be discontinued as the major payment currency.

Then came Paper money.



Figure 4: Paper money

The introduction of paper money seemed ridiculous, since as humans, we are uncomfortable with change and we are hesitant to adapt to anything that we don't understand—at least at first. After a while, all sorts of paper money was implemented in a centralized form, nearly every country in the world. The new payment

method of paper money was alive and booming all over the globe.

I mean paper money is good, but we could mention countless countries where paper money has failed again and again due to its value decrease in long term. The reduction in value of paper money has other roots too, such as easily counterfeited in large scale. Additionally, like anything else in the world, we have learned that goods with limited supply have an increase in value, especially in the long term. However, the opposite happens when paper money keeps on getting printed, decreasing in value. When it comes to paper money, it's a fascinating topic.

The fact that we have learned, on various occasions, that paper money is a failure, we keep on re-inventing new ones. We believe, this time, it will be a success. Look at the example of the euro that has taken over currencies such as:

- German Mark
- Austrian Schilling
- Italian Lira
- Spanish peseta
- Slovak koruna
- Maltese lira
- Dutch guilder
- Finnish markka,
- French franc
- Greek drachma and much more (as well much more to come).

It appears paper money is still going to be present for a while. However, before jumping ahead, we had another currency introduced after the paper form in our new digital world called SWIFT.

SWIFT Society for Worldwide Inter-bank Financial Telecommunication began in 1973, and this newly created network now enabled all the financial institutions to transfer secured financial transactions in a reliable environment across the globe.

This idea was, again, truly revolutionary. Using the internet to make payments is very helpful, not to mention, that nowadays using con-tactless cards is just super comfortable. The speed of implementation, when making payments, becomes very fast. When you are looking at an international bank transaction it might take 3-5 days, but you can do this using your laptop at your home or your mobile device, anywhere. However, at first—when it was introduced—it seemed alien and most people didn't believe that it would ever work. Slowly, we have learned that certain payments can be automated: such as paying your bills or a service that you have subscribed, and of course, most large companies are now paying all their employees through bank transfers. Well, there are still many companies who pay their employees cash in hand, as they don't wish to pay taxes. These companies choose to remain anonymous instead of sharing with the banks all their assets, for various reasons. As always, people had to adapt.

The idea that all your wealth is contained on a piece of plastic card was daunting.

The world of payment has yet changed again. Centralized banks have scaled, and they have introduced many different systems that one may choose. Some of the most known of virtual payment methods are:

- Visa Debit
- Credit Card
- Debit Card
- ATM machines

Due to the dot-com boom and the revolution of the internet, other digital payment methods were introduced by various third-party companies, providing additional secure transactions for a particular fee in exchange

Such well known centralized financial systems are:

- PayPal
- Payoneer
- Alipay
- eCash
- M-Pesa and much more Digital currency



In 2008 there was a new currency introduced, but this time it was something very different. It was the first digital currency, called Bitcoin. It was not introduced by a well-known company or bank, neither any government, but in a software form—running on the protocol called Blockchain. (Blockchain: Novice to Expert - 2 manuscripts by Keizer Söze, 2017 [3])

3 Bitcoin, Altcoins, And Innovation

Bitcoin began operating in January 2009 and is the first decentralised cryptocurrency, with the second cryptocurrency, Namecoin, not emerging until more than two years later in April 2011. Today, there are hundreds of cryptocurrencies with market value that are being traded, and thousands of cryptocurrencies that have existed at some point. The common element of these different cryptocurrency systems is the public ledger ('blockchain') that is shared between network participants and the use of native tokens as a way to incentivise participants for running the network in the absence of a central authority. However, there are

significant differences between some cryptocurrencies with regards to the level of innovation displayed (Figure 5).

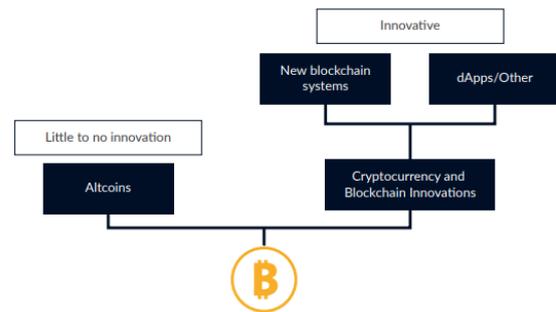


Figure 5: Bitcoin's genealogical tree

The majority of cryptocurrencies are largely clones of bitcoin or other cryptocurrencies and simply feature different parameter values (e.g., different block time, currency supply, and issuance scheme). These cryptocurrencies show little to no innovation and can be referred to as 'altcoins' [7].

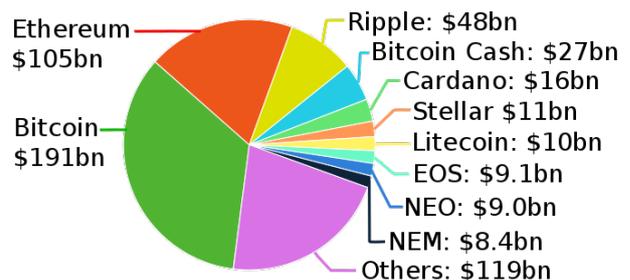


Figure 6: Top 100 Cryptocurrencies by Market Capitalization [5]

In contrast, a number of cryptocurrencies have emerged that, while borrowing some concepts from Bitcoin, provide novel and innovative features that offer substantive differences. These can include the introduction of new consensus mechanisms (e.g., proof-of-stake) as well as decentralized computing platforms with 'smart contract' capabilities that provide substantially different functionality and enable non-monetary use cases. It can be useful to distinguish between altcoins lacking any significant innovation and what we refer to as 'cryptocurrency and blockchain innovations', which can be grouped into two categories: new (public) blockchain systems that feature their own blockchain (e.g., Ethereum, Peercoin, Zcash), and dApps/Other that exist on additional layers built on top of existing blockchain systems (e.g., Counterparty, Augur).

The combined market capitalization (i.e., market price multiplied by the number of existing currency units) of all cryptocurrencies has increased more than threefold since early 2016 and has reached 27 billion

dollar in April 2017 (Figure 8).



Figure 7: ETHEREUM (ETH) Decentralised computing platform which features its own Turing-complete programming language

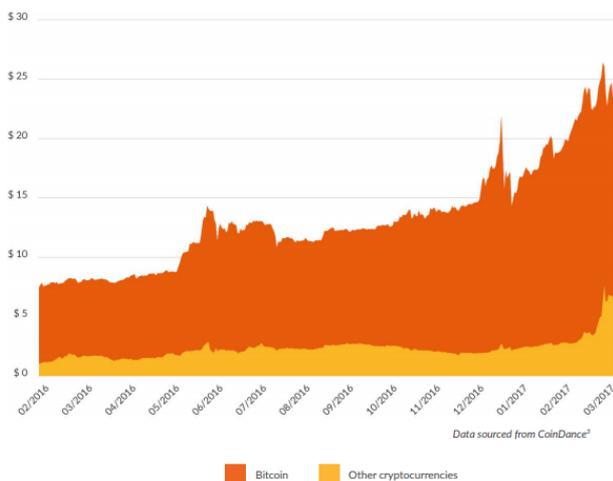


Figure 8: The total cryptocurrency market capitalisation has increased more than 3x since early 2016, reaching nearly 25 billion in March 2017

[7]

A relatively low, but not insignificant share of value is allocated to duplication (i.e., ‘altcoins’), while a growing share has been apportioned to innovative cryptocurrencies (‘cryptocurrency and blockchain innovations’)[7].

As of April 2017, the following cryptocurrencies are the largest after bitcoin in terms of market capitalization:

- ETHEREUM (ETH)



A decentralized computing platform which features its own Turing-complete programming language. The block-chain records scripts or contracts that are run and executed by every participation node, and are activated through payments with the native cryptocurrency ‘ether’. Officially launched in 2015, Ethereum has attracted significant interest from many developers and institutional actors.

- DASH



Privacy-focused cryptocurrency launched in early 2014 that has recently experienced a significant increase in market value since the beginning of 2017. In contrast to most other cryptocurrencies, block rewards are being equally shared between miners and ‘master-nodes’, with 10 percent of revenues going to the ‘treasury’ to fund development, community projects and marketing.

- MONERO (XMR)



Cryptocurrency system that aims to provide anonymous digital cash using ring signatures, confidential transactions and stealth addresses to obfuscate the origin, transaction amount and destination of transacted coins. Launched in 2014, it saw a substantial increase in market value in 2016.

- RIPPLE (XRP)



Only cryptocurrency in this list that does not have a block chain, but instead uses a ‘global consensus ledger’. The Ripple protocol is used by institutional actors such as large banks and money service businesses. A function of the native token XRP is to serve as a bridge currency between national currency pairs that are rarely traded, and to prevent spam attacks.



Figure 9: Elon Musk and others are strong candidates to Be the infamous Satoshi Nakamoto

3.1 I AM NOT SATOSHI

Supposedly, Satoshi Nakamoto was a 41-year-old man at the time of the publication of the Bitcoin white paper.

He is from Japan. However, the first code that was written for the blockchain was drafted in English that is so perfect, it just wouldn't make sense for a Japanese man to write like that. It would indicate that he must have hired someone, or was working with someone, who has perfect English, to write the code.

In 2014 there were a few newspapers that began to write about Dorian Nakamoto, who at the time lived in the United States in California. Dorian's birth name was Satoshi. Additionally, other circumstances would make him appear to be a real inventor of Blockchain.

Apparently, the first reporter who wanted to reach him, asked him, in the form of an e-mail, if he had anything to do with bitcoin. The response from Dorian was the following: "I am no longer involved in that, and I cannot discuss it. It's been turned over to other people. They are in charge of it now. I no longer have any connection."

Of course, that was suspicious, and reporters were all over Dorian's house in California. After realizing that it was very serious, he looked at his e-mail again, and tried to explain himself.

First, he has denied any involvement in regards to bitcoin. In fact, he said that he had no clue what bitcoin is until his son told him about the news, so he looked it up on the internet. He also went public and explained the following: "I have nothing to do with bitcoin. Nothing to do with developing. I was just an engineer, doing something else. If you look at the time spent in 2001, I wasn't there. I was working for the Government through a contracting company. I just believe that somebody just put that fictitious name in there."

There were also published documents on that he has been doing classified work for the United States

Government, as well the United States Military. He also has signed documents that he could not be allowed to admit any involvement in his previous works regards to secret projects. After this event, there was an unexpected message on a P2P forum where the Real Satoshi Nakamoto use to post after five years of silence. "I am not Dorian Nakamoto." (blockchain ultimate step by step guide to understanding blockchain technology bitcoin creation and the future of money by Keizer Söze,2017) [3]

4 Blockchain Technology

There is a myth going around that Bitcoin equals Blockchain. Well, that is incorrect. However, it is often referred to as the same thing. Bitcoin is cryptocurrency, digitized money, that is allowed and kept alive due to the technology called Blockchain.



When Blockchain technology began to exist, the first application that was tested on the platform was Bitcoin. Because Bitcoin was the first application on the Blockchain technology, one might say that Bitcoin is Blockchain. However, Blockchain is not Bitcoin. Blockchain is so complex that, still, there are very few human beings who understand each part of it. In fact, Blockchain is so complicated that we (humans) keep on finding more and more ideas that this technology can solve every day. We could say that Blockchain is solving problems. However, for some large Financial Organizations, it's causing certain issues. Some of these matters, of course, are getting addressed and if you keep up with the news, you realize that more and more companies are beginning to use Blockchain Technology for many purposes.

The Blockchain is truly revolutionary, as it's not for solving just one issue for some people, but can fix many problems for everyone. It has re-invented the financial institution, and the proof of that is simply because Blockchain is running and has existed for nine years already, beginning in 2008. The blockchain is a globally distributed database that is completely decentralized, meaning it has no boss, or someone that

we could blame or award. It is running on all computers, and it's unstoppable. The Blockchain is built up from multiple blocks that are un-replaceable. Therefore, it's chain system represents the single source of truth. Once there is a new block created and added to the existing blockchain, it replicates itself on its system, which resides on the internet, then just synchronizes the same details on all the computers that are running blockchain. This replication is what makes it un-replaceable. Therefore, it provides full transparency in all administration. Because there is no human intervention in the process of adding and further expanding when new blocks are created every 10 minutes, it exhibits an efficiency that no person has ever achieved. Because each time a new block becomes visible on all computers in the world, it allows full accessibility to all human beings. [3] (Blockchain: Novice to Expert - 2 manuscripts by Keizer Söze,2017)



4.1 Components of a Blockchain

The components of an open, public blockchain are (usually):

1. A peer-to-peer (P2P) network connecting participants and propagating transactions and blocks of verified transactions, based on a standardized "gossip" protocol
2. Messages, in the form of transactions, representing state transitions
3. A set of consensus rules, governing what constitutes a transaction and what makes for a valid state transition
4. A state machine that processes transactions according to the consensus rules A chain of cryptographically secured blocks that acts as a journal of all the verified and accepted state transitions
5. A consensus algorithm that decentralizes control

6. A game-theoretically sound incentivization scheme (e.g., proof-of-work costs plus block rewards) to economically secure the state machine in an open environment
7. One or more open source software implementations of the above ("clients")

All or most of these components are usually combined in a single software client. For example, in Bitcoin, the reference implementation is developed by the Bitcoin Core open source project and implemented as the bitcoind client. In Ethereum, rather than a reference implementation there is a reference specification, a mathematical description of the system in the Yellow Paper. There are a number of clients, which are built according to the reference specification.

In the past, we used the term "blockchain" to represent all of the components just listed, as a shorthand reference to the combination of technologies that encompass all of the characteristics described. Today, however, there are a huge variety of blockchains with different properties. We need qualifiers to help us understand the characteristics of the blockchain in question, such as open, public, global, decentralized, neutral, and censorship-resistant, to identify the important emergent characteristics of a "blockchain" system that these components allow.

Not all blockchains are created equal. When someone tells you that something is a blockchain, you have not received an answer; rather, you need to start asking a lot of questions to clarify what they mean when they use the word "blockchain." Start by asking for a description of the components in the preceding list, then ask whether this "blockchain" exhibits the characteristics of being open, public, etc. [10]

4.2 Security on The Blockchain

Some of you might think, "fine, blockchain is a high technology that will positively change the world." But, the question remains, "Is it secured?" The short answer is yes. But first, let's think about what the system has currently achieved. The reality is that anything can be hacked and compromised that is connected to the Internet, or connected to a system that has the connection to the web.

Sure, many devices do not use any connection and still can be broken into once you have physical access to it. Such might be a laptop or desktop computer that can be broken into using a Linux cd, and booted using that. If you want to go further, let's take banks, for example. They are getting compromised all the time;



of course, they have stopped announcing these types of incidents, as they would have no customers left if they would carry on doing so. The director of the FBI was hacked by a teenager in the end of 2015, and most people think it's funny. Still, when you think about the security within the FBI, it is very well organized, yet still hackable. The FBI might not be the best example to mention, as even Kevin Mitnick hacked the FBI for three long years, and listened to the agents' phone conversations, talking about himself. When you look at the NSA, aka The National Security Agency, you probably have heard of Edward Snowden already, who walked out with documents that are considered to be secret; that still shows that even the NSA has weaknesses. And confidential, or even secret, documents can be leaked. All those expensive Firewalls, Intrusion Prevention Systems, or Intrusion Detection Systems are worthless if they are not upgraded correctly. Also, you have to understand that having all that security does not mean anything if someone has a social engineering skill set and figures out the password to any of those devices. The result would be dramatic, and they always are, but most of the great financial institutions have stopped talking to news channels about being compromised by hackers, as it would only damage their image, and it would become an embarrassment. [3]

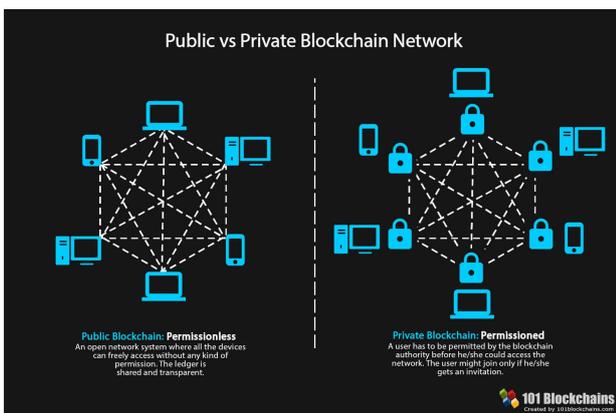


Figure 10: Permissioned Blockchains

Because companies keep all their data centralized, hackers only have to go after a specific organization to compromise its systems; that is why hackers know for a fact that anything can be broken into. To hack into any

system, it's only a matter of time and proper planning; however, when it comes to a system like blockchain, it is highly unlikely. Although experts say that it is not impossible, it still would require an enormous amount of computing power. Blockchain has no firewalls or any Detection or Prevention system that would protect it. Instead, blockchain's power comes from the fact that it is completely decentralized. What I mean by that is simple really. However, I will do my best to explain it in everyday English.

Because blockchain is an open source technology, anyone can run the software. You may choose not to ever buy bitcoins, or invest in any cryptocurrency. However, you might become part of the blockchain community by running a software called blockchain. The software itself is free to download and use, and you will have no obligation to anyone whatsoever, but once you decide to run it, you simply become part of the blockchain community. Once you become such member, your device will become part of the blockchain and each time a new block is created your device will also get a copy of that transaction.

As your device has now become part of the blockchain, this is another device that should be hacked to compromise the block chain thoroughly. Because your device is now running a blockchain software, it's now also contributing to the existing decentralized system. There are no centralized copies and every user is trusted in the same way as the rest of them. What I mean is that no master node exists, as every single device has the same replicated information, making it nearly impossible to hack. The blockchain is running for almost a decade, and it has never been compromised, not once. It is fascinating, as the blockchain has a bounty of 7 Billion dollars to anyone who can compromise the system, offered anonymously. Due to the price on blockchain's head, it has become the primary target for many black hat hackers, as well as large criminal organizations, and Cyber-gangs, for years.

Still, blockchain has not been hacked yet, not even a slowdown of any kind has ever happened. This shows that the core functions have been structured very well; but, as I mentioned before, anything can be hacked, as it's only a matter of time. IT professionals always believe that with technology expanding rapidly, in the future, anything is possible. Quantum technology defines the way how the blockchain system can be hacked. However, it would require hacking the million-plus machines currently running the blockchain software. Additionally, to actually hack all those devices, it would need to be implemented extremely quickly to be successful. (Blockchain: Novice to Expert - 2 manuscripts by Keizer Söze, 2017) [3]

Speculations about Satoshi himself are still in a shadow; moreover, as we don't know who he is and

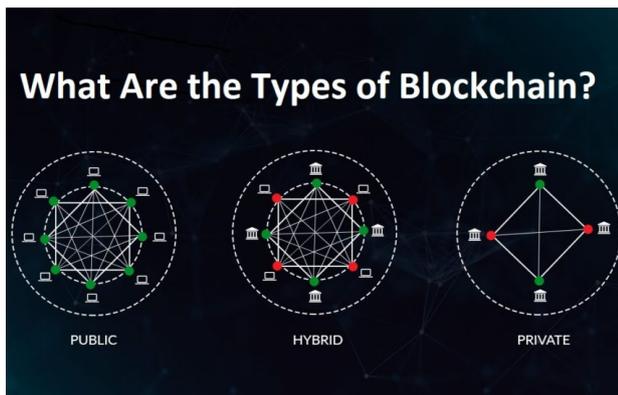


Figure 11: The Types of Blockchain

what he is capable of, one thing is for sure: he designed the system. Therefore, he would have access to the very first block that he created, and he would be able to manipulate the blockchain system if he wanted to. As time has passed, multiple blockchain technologies now exist, and bitcoin, itself, has grown its value; people have also begun to invest large amounts into various cryptocurrencies. Over the years, people have lost interest in who Satoshi Nakamoto really is, or he, just simply, has been forgotten; however, if he or she is alive and decides to manipulate the system, it could be possible, and not I'm sure that the outcome would favor most. [3]

5 Ethereum Compared to Bitcoin



Figure 12: Vitalik Buterin is a co-founder and inventor of Ethereum, described as a "decentralised mining network and software development platform"

Many people will come to Ethereum with some prior experience of cryptocurrencies, specifically Bitcoin. Ethereum shares many common elements with other open blockchains: a peer-to-peer network connecting participants, a Byzantine fault-tolerant consensus algorithm for synchronization of state updates (a proof-of-work blockchain), the use of cryptographic primitives such as digital signatures and hashes, and a digital currency (ether).

Yet in many ways, both the purpose and construction of Ethereum are strikingly different from those of the open blockchains that preceded it, including Bitcoin. Ethereum's purpose is not primarily to be a digital currency payment network. While the digital currency ether is both integral to and necessary for the operation of Ethereum, ether is intended as a utility currency to pay for use of the Ethereum platform as the world computer.



Figure 13: Cloud Computing Services provide information technology (IT) as a service over the Internet or dedicated network, with delivery on demand, and payment based on usage like the case in Ethereum

Unlike Bitcoin, which has a very limited scripting language, Ethereum is designed to be a general-purpose programmable blockchain that runs a virtual machine capable of executing code of arbitrary and unbounded complexity. Where Bitcoin's Script language is, intentionally, constrained to simple true/false evaluation of spending conditions, Ethereum's language is Turing complete, meaning that Ethereum can straightforwardly function as a general purpose computer.[10]

5.1 Ethereum's Components

Ethereum's Components are specifically:

1. P2P network Ethereum runs on the Ethereum main network, which is addressable on TCP port 30303, and runs a protocol called DEVp2p.
2. Consensus rules Ethereum's consensus rules are defined in the reference specification, the Yellow Paper .
3. Transactions Ethereum transactions are network messages that include (among other things) a sender, recipient, value, and data payload.
4. State machine Ethereum state transitions are processed by the Ethereum Virtual Machine (EVM), a stack-based virtual machine that executes byte-

code (machine language instructions). EVM programs, called "smart contracts," are written in high-level languages (e.g., Solidity) and compiled to bytecode for execution on the EVM.

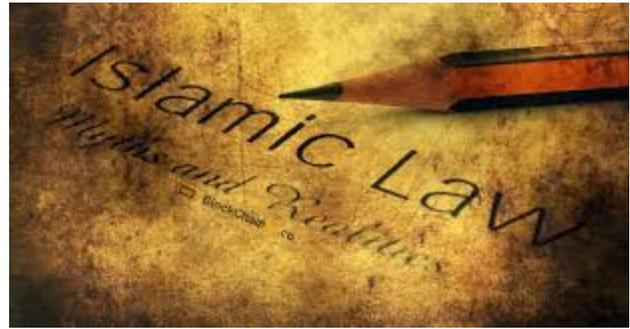
5. Data structures Ethereum's state is stored locally on each node as a database (usually Google's LevelDB), which contains the transactions and system state in a serialized hashed data structure called a Merkle Patricia Tree.
6. Consensus algorithm Ethereum uses Bitcoin's consensus model, Nakamoto Consensus, which uses sequential single-signature blocks, weighted in importance by PoW to determine the longest chain and therefore the current state. However, there are plans to move to a PoS weighted voting system, codenamed Casper, in the near future.
7. Economic security Ethereum currently uses a PoW algorithm called Ethash, but this will eventually be dropped with the move to PoS at some point in the future.
8. Clients Ethereum has several interoperable implementations of the client software, the most prominent of which are Go-Ethereum (Geth) and Parity. [10]



6 Islamic Shariah Law Analysis of Bitcoin, Cryptocurrency, and Block chain

6.1 Islamic Legal Criterion for Property (Mal)

"In Shariah, the fundamental requirement for a counter value or consideration is that it has status as mal, meaning property. Therefore, before discussing the status of cryptocurrencies in Shariah, it is important to define the concept of mal in the Sharia. There are three



sources in Shariah used to understand the origin and definition of Islamic terminologies. First and foremost source is revelation in the form of Quranic text or the ahadith (sayings) of the Prophet Muhammad (peace be upon him). For instance, the meanings of Salah (prayer), Zakah (obligatory giving to charity), Marriage, and Divorce, etc. are explained by revelation in both the Quran and ahadith.

The second source is to know the required meaning of Shariah is the Arabic language itself, which is the language of the Quran and the Sunnah. For instance, Allah (swt) has given the ruling to wash your face, hands and feet in ablution (wudhu). Using an Arabic dictionary to learn the meaning of the Arabic words used in these texts, one understands the limits and areas of these parts of the body which we need to observe to fulfill the ruling of ablution.

The third source in determining of the Shariah terminologies is urf, meaning customary practice. There are various things which are not explained by the revelation in their literal meanings, but rather they are defined by the customary practice. Shariah regards and validates customary practices in determining certain things.

When we look at the definition of mal in this context, we find the word "mal" is commonly used in the texts of the Quran and in the sayings of the Prophet Muhammad (peace be upon him). However, the definition of mal and what would be considered as mal is not explicitly explained in the text. " says Mufti Muhammad Abu-Bakar in his Islamic research paper about Shariah Analysis of Bitcoin, Cryptocurrency, and Blockchain.

He further elaborate that according to the famous Arabic dictionary Lisan al-Arab, mal Literally refers to something which can be possessed. Al-Isfahani (1992) says that mal is something which is desirable and can be transferred from one person to another person. The contemporary scholars Shaykh Yusuf al-Qardawi (2000) explains mal that according to the native speakers of Arabic, everything which is desirable for human beings and they want to store and possess it, is considered as mal.

Manzur (1975) quotes Ibn al-Athir that originally

mal was limited to silver and gold, but its definition was gradually expanded to every physical thing which is desirable for humans to store and possess. Shaykh Wahbah al-Zuhayli (2010) says that linguistically mal refers to everything which is possessed and stored by humans, whether it is a corporeal (ayn) or a usufruct (manfaha). For instance, gold, silver, animals, plants as well as riding a vehicle and living in a house are considered mal. But a thing which can neither be stored nor possessed cannot be considered as mal: a bird in the sky, a fish in the water, and unknown treasures inside the earth. In summary, everything which can be possessed and is valuable for human beings is considered linguistically as mal, or property. [12]

Then Mufti Muhammad Abu-Bakar went into details and analyzed the Definition of Mal According to Majority of Scholars and what's their Opinions on cryptocurrencies :

6.2 Definition of Mal According to Majority of Scholars

The majority of jurists and scholars (including Maliki, Shafi, and Hanbali scholars) are of the view that mal is not limited to tangible things. The majority view is that mal also includes intangible things as well as benefits and rights with certain conditions. Shakyh Zuhayli (2010) explains the majority view of scholars is that mal refers to everything which has value and be compensated if it is destroyed. Likewise, Al-Suyuti (1983) quotes the definition of mal from Imam Shafi that mal refers to something which: has value, is used as consideration in trade, must be compensated for if destroyed, and that people do not behave as if it is a valueless thing. In summary, the majority view of scholars is that mal is not limited to tangible things and it can be intangible things if it fulfills the above-mentioned conditions. [12]

6.3 Fatwas and Scholars' Opinions

Given the above mentioned rules and discussion, it becomes possible to evaluate cryptocurrency and discuss whether it fulfills the conditions of mal and currency. The most famous type of cryptocurrency is Bitcoin. Therefore, the existing literature of articles and especially fatawa (experts' legal opinions) are generally concerned with bitcoin. However, the principles and arguments to determine any type of cryptocurrency are same. Therefore, the existing literature pertaining to Bitcoin specifically has benefits broadly with regard to cryptocurrency. In general, the scholars and Shariah experts have two different opinions. The first group of scholars is of the view that cryptocurrency is haram,

meaning prohibited by Shariah. The other group is of the view that cryptocurrency is in principle halal meaning permissible.[12]



First View: Cryptocurrency is Haram

This view is supported by a number of scholars and fatawa. There are presented here, summarized. Grand Mufti of Egypt The Grand Mufti of Egypt Shaykh Shawki Allam has declared that bitcoin and cryptocurrency is haram. The Shaykh cites these primary reasons in his statement, among others:

1. Bitcoin is easily used for illegal activities; therefore, people use Bitcoin largely for illegal and non-Shariah compliant purposes to avoid and hide themselves from governments and relevant authorities
2. Bitcoin is intangible and can only be used through internet
3. Bitcoin allows for money laundering and fraud
4. Bitcoin has no central authority that monitors its system, but rather it destroys the control of central banks and governments to monitor and control the monetary system

Turkish Government:

The Turkish government's religious authority also declared that bitcoin and all other cryptocurrencies are prohibited. The fatwa states: Buying and selling virtual currencies is not compatible with religion at this time. Because of the fact that their valuation is open to speculation (excessive gharar), they can be easily used in illegal activities like money laundering and they are not under the state's audit and surveillance. Fatwa Center of Palestine The fatwa center of Palestine also issued a fatwa with regard to bitcoin and cryptocurrency. The fatwa claims that bitcoin and cryptocurrency is haram and prohibited based on the following reasons:

1. The issuer of Bitcoin is unknown, and neither a government nor a central authority is behind it. Bitcoin comes into existence with the objective of no central authority and monitoring system and therefore, it is untrustworthy and unreliable.

2. Bitcoin is a type of gambling, because people invest a lot of money to create bitcoin without a guarantee as to whether they will be successful or not.

Second View: Cryptocurrency is Permissible in Principal

Other scholars are of the view that bitcoin is permissible in principal. This view can be analysed in light of our previous discussion with regard to both the criteria and definition of property (mal) and money. There is a famous legal maxim explained by jurists .

"The original principal in transactions is permissible "



This means that original rule is permissibility in financial and business transactions. In other words, everything is permissible unless we found it clearly contradictory to Shariah principles. According to this principle, cryptocurrency is permissible principally. Likewise, anything can be considered as money if it has these attributes:

1. treated as valuable thing among the people,
2. accepted as medium of exchange by all or substantial group of people,
3. it is a measure of value,
4. and it serves as unit of accounts

Therefore, any cryptocurrency which fulfills these conditions (such as Bitcoin) is acceptable as money. The fatwa center of South African Islamic seminary, Darul Uloom Zakariyya, has taken the position that Bitcoin fulfills the conditions of mal and therefore it is permissible for trade. However, they note that to be qualified as currency, it should be approved by relevant government authorities.[12]

7 How Africa could leverage cryptocurrency opportunities particularly The United Maghreb Arab

The result of increased demand for easier access to cryptocurrency in the continent reflects the growing interest in cryptocurrencies across Sub-Saharan Africa. Expansion of the region's cryptocurrency market is spurred by opportunities in alternative finance and remittances industries. This is further supported by an increasing shift towards a 'technology first' approach to regulation, prioritising innovation while still guarding against misuse, in its leading economies.[2]

Some economists say it is a disruptive innovation that will blossom on the continent.

Cryptocurrency is not bound by geography because it is internet based; its transactions are stored in a database called blockchain, which is a group of connected computers that record transactions in a ledger in real time.

The difference between cryptocurrency and, say, Visa or Mastercard, is that a cryptocurrency is not now regulated by government and doesn't need middlemen, and transactions rely on the internet, which means they can happen anywhere in the world.

The big cryptocurrency global brands include Bitcoin, Litecoin, XRP, Dash, Lisk and Monero, but Bitcoin leads the pack in Africa. Created in 2009 by a person or people with the alias Satoshi Nakamoto, investors hope Bitcoin becomes the new mode of financial transaction in the digital age.

"Africa is rarely mentioned among the largest markets for cryptocurrency, but it may be set to steal a march over other markets," says Rakesh Sharma, a business and technology journalist.

Mr. Sharma says that citizens of countries battling high inflation are likely to opt for cryptocurrency, because "with their paradigm of decentralization, cryptocurrencies offer an alternative to disastrous central bank policies." [1]

Stealing a march

South Sudan's inflation rate was 102 percent between September 2016 and September 2017, according to the World Bank. Other countries with double-digit inflation rates include Egypt, Ghana, Malawi, Mozambique, Nigeria, Zambia and Zimbabwe. It is no surprise that some of these countries are among the main Bitcoin economies in Africa. The main Bitcoin countries are Botswana, Ghana, Kenya, Nigeria, South

Africa and Zimbabwe, according to gobitcoin.io, a website dedicated to Bitcoin news in Africa. The BBC adds that cryptocurrency is gaining ground in Uganda.

When Zimbabwe's inflation skyrocketed in 2015, forcing authorities to print 100 trillion dollar notes (each worth just 40 dollars), some Zimbabweans turned to Bitcoin.

Zimbabweans and citizens of other African countries transact in Bitcoin "as opposed to their local currencies, which are plagued with hyperinflation," comments Emmanuel Tokunbo Darko, vice president of marketing for ICOWatchlist.com, a platform that hosts cryptocurrency tokens. .[1]



There will be 725 million mobile phone subscribers in Africa by 2020, according to the GSM Association, which represents the interests of mobile operators globally. That means more Africans will have the tools to plug into the cryptocurrency ecosystem, says Mr. Sharma.

"I check my Bitcoin every day [on my mobile phone and any chance I can get. Any minute, any hour, any-time, as often as I can," Peace Akware, a Ugandan millennial, told the BBC.

Bitcoin spreads

That African governments are not now regulating cryptocurrency may be a factor spurring its growth on the continent; however, there is no guarantee that governments will not change their current mindset.

Rather than simply not wanting to, governments may be powerless to regulate cryptocurrency, the Nigerian central bank indicated recently. Currently tackling the country's 12 percent inflation rate, the Nigerian apex bank announced that it could not control or regulate Bitcoin, "just the same way no one is going to control or regulate the internet. We don't own it."

Fearing a collapse of the banking industry or arbitrary appropriation of money by the government, Africans without access to banks and who live in politically unstable countries could be attracted to cryp-

tocurrency. "Bitcoin transactions help to eliminate the procedural bottlenecks that plague traditional banking and financial services," Mr. Darko explains.

Some 15 cryptocurrency-related operations began in Africa in the past year alone, reports Mr. Sharma. But South Africa-based Luno Exchange, established in 2013 and now boasting 1.5 million customers in over 40 countries worldwide, is the first to be based in Africa.

Others, particularly cryptocurrency-based remittance services, are popping up in various countries. These services include Abra, which operates in Malawi and Morocco, GeoPay in South Africa, BitMari in Zimbabwe and London-based Kobocoin, which was launched by Nigerian entrepreneur Felix Onyemehi Ugoji.

The Plaas Application is a mobile app that enables farmers to manage their stock on the blockchain.

Launched in 2013, Kenya's BitPesa facilitates virtual remittances transfers to both African and international locations, to and from individuals' mobile wallets, where cryptocurrency is stored. LocalBitcoins.com in Kenya reported trading volumes in excess of 1.8 million dollars as of December 2017, underlining the lucrativeness of the business.

"I started mining Bitcoin in Nairobi, Kenya in September 2017 and, so far, this is the best business I have ever tried," Gladys Laboi told Africa Renewal, adding: "Under six months, I earned 800 dollars after investing in 700 dollars ."

Not to be left out, some governments are moving into the virtual currency terrain. Tunisia's eDinar is a government-issued digital currency. Senegal is in the process of creating eCFA, which, if successful, could be emulated by other Francophone countries in Africa.

There will be government-issued cryptocurrencies in Africa in the near future, predicts Shireen Ramjoo, ceo of Liquid Crypto-Money, a South Africa-based cryptocurrency consulting firm.

Industry experts believe that cryptocurrency will be around for years. That Bitcoin users can send money to just about anywhere there is an internet connection for relatively small fees and with no third-party interference is an advantage that standard government-issued currencies cannot offer.

"Every single computer device on the surface of the planet with an internet connection can access information on the blockchain and make 'transactional' inputs onto it. The information cannot be distorted, deleted, modified or destroyed, and the computer device has the same information as everybody," says Mr. Darko.

Another recommendation is that transactions are anonymous, and users' information is private and safe; there is little possibility of identity theft, which is common with other forms of digital payment.

As of December 2017, the global demand for cryptocurrency had increased to the extent that a Bitcoin sold for 20,000 dollars . Its value had been 1,000 dollars one year prior. [1]

Ponzi scheme

Nevertheless, some industry watchers refer to cryptocurrency as a risky and temperamental scheme, citing the crash to 8,700 dollars in the value of Bitcoin last February, from a high of 20,000 dollars in December 2017.

Without regulations, cryptocurrency is a double-edged sword; there may be gains from time to time, but any precipitous crash in price could leave investors with no escape route. Manasseh Egedegbe, an investment manager based in Nigeria, says that Bitcoin's frenzied prize surge seems like the dot-com bubble at the turn of the millennium.

There is also the fact that cryptocurrency can be used by criminals to funnel funds. In 2011 Bitcoin was a currency of choice for drug peddlers, according to the US Justice Department, which seized almost 48 million dollars worth of illegal contrabands that year, and discovered that the criminals involved had made transactions totaling 150,000 Bitcoins (approximately 130 million dollars).

Countries such as Bangladesh, Ecuador and Kyrgyzstan believe the risks outweigh the gains and have banned Bitcoin as well as initial coin offerings or ICOs, which are used by start-ups to evade the demand for capital by banks and other financing institutions.

Quartz Africa, an online business news publication, reported last December that a similar scheme, Mavrodi Mundial Moneybox (MMM), once had over two million users in Nigeria, while also operating in Ghana, Kenya, South Africa and Zimbabwe.

There are reports that South Africa's central bank is actively studying cryptocurrency and may institute guidelines to foster innovation. Those guidelines could be a slippery slope to regulation. The Sunday Times of South Africa reported in March that 27,500 individuals, including South Africans, lost more than 50 million dollars when they were duped into transferring their Bitcoins into an online wallet. The publication called it "one of the biggest scams to hit South Africa." [11]

Morocco officially instituted a ban on transactions using cryptocurrencies back in 2017, citing a lack of regulation as a 'danger' to users.

According to an official press release on its Office des Changes website, the country's foreign exchange regulator took a firm stance on the use of cryptocurrencies in the country. A translation from French puts it simply:

"Transactions via virtual currencies constitute a breach of regulations, punishable by penalties and fines."

The stance taken by the North-west African Kingdom's regulator spells bad news for Morocco Trade and Development Services. The digital service provider had previously announced that it would accept payments in Bitcoin a week ago.

The company has indicated that it will comply with the regulator's ruling, but the company's founder Karl Stanzik believes the regulator will struggle to curb the use of virtual currencies in the country.

Morocco's Office des Changes insists that all payments to foreign countries need to go "through authorized intermediaries and with foreign currencies quoted by Bank Al-Maghrib," which is its central bank.

Like many emerging markets, the use of cryptocurrencies is steadily growing, with estimates that close to 200,000 dollars worth of transactions are made with virtual currencies.

A sign of things to come?

Interestingly enough, the Moroccan exchange regulator said it would be watching the development of cryptocurrencies with a keen eye, alongside the Kingdom's central bank and its associates.

As more people, companies and institutions begin to use cryptocurrencies, governments and conventional financial institutions are forced to either take a hard line or legalize the use of virtual currencies.

We've seen it happen in China and Vietnam - yet people find a way to continue trading, which in time leads to a change in perception of cryptocurrencies.[8]

Banned in 2017 by Morocco's Foreign Exchange Office and central bank, cryptocurrency is still used in the country. According to a report entitled «Which Country Trades The Most Bitcoin ?», the Kingdom is the country that trades Bitcoin the most in North Africa.

The chart, produced by Local Bitcoins, a platform that facilitates over-the-counter trading of local currency for Bitcoins, ranks Morocco 36th, among the 46 countries where Bitcoin is traded. The country is positioned 4th in the African continent, behind Nigeria 7th, South Africa 10th and Kenya 23rd. In the North Africa and Middle East region, Morocco is ranked 3rd,

behind only two Arab countries, namely the United Arab Emirates 20th and Saudi Arabia 24th.



Figure 14: The chart, produced by Local Bitcoins, a platform that facilitates over-the-counter trading of local currency for Bitcoins, ranks Morocco 36th, among the 46 countries

Other African, European, Asian and American countries are also featured in the ranking, which was topped by the United States of America 1st, followed by Russia 2nd, the UK 3rd, Venezuela 4th, and China 5th. [6]

Morocco's Bitcoin volume trading is 6 Million dollars . Meanwhile, only 0.1 percent of all Bitcoin trading happened in the Kingdom, according to Local Bitcoins chart, issued in August.

On a different platform called «Cash Coin Dance», which publishes up to date information and statistics on cryptocurrency in the world, Morocco is one of the countries that still uses Bitcoin.

In an updated card that measures Bitcoin volume, one can notice that Bitcoin trading started in Morocco in November 2013, with MAD 1470. [6]

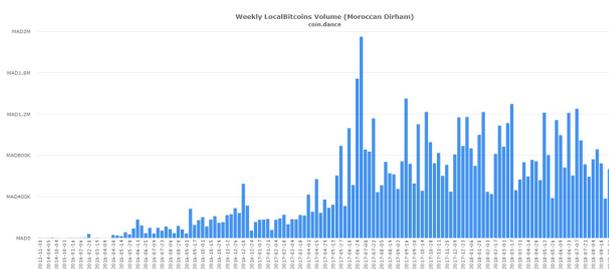


Figure 15: From A platform called «Cash Coin Dance», publishes up to date information and statistics on cryptocurrency in the world, Morocco is one of the countries that still uses Bitcoin. As seen in the chart

The practice grew since then, reaching the highest trading volume in June the 1st, 2017 with MAD 1,946,932. This number fell to MAD 445,503 in December 2017, a few weeks after Morocco announced that it is banning the use of the currency. On the week of

September, the 1st, 2018, Bitcoin trading in Morocco amounted to MAD 666.300. [6]

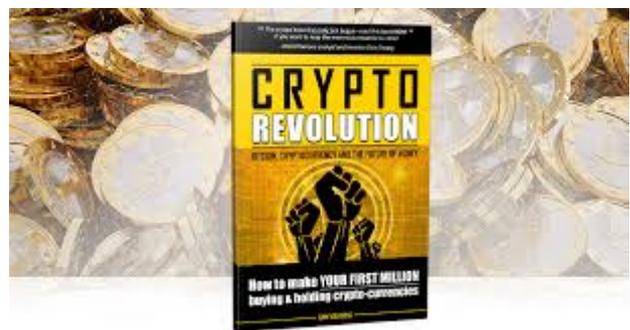
At 22 percent (the world average is 48 percent), Africa has the lowest rate of Internet usage of any region, according to a 2017 report by the International Communications Union, which may undercut optimistic projections of cryptocurrency and blockchain technology on the continent. Also, poor power supply in many countries continues to impede the internet access on which cryptocurrency largely depends.

Despite some analysts likening Bitcoin and other cryptocurrencies to a Ponzi scheme, many Africans are taking the risk to invest in them.

Other experts, such as Mr. Darko, believe Africa should warmly embrace the innovation. “Truth be told, Africa needs blockchain technology and its resultant cryptocurrencies more than any part of the world,” he says.[1]

8 Literature Survey

- **Crypto Revolution: Bitcoin, Cryptocurrency and the Future of Money by Sam Volkering .**



In under a decade, cryptos like bitcoin and ethereum have made headline news... and shot skyward from just a few cents, to thousands of dollars per ‘coin’. And in the process, have birthed a new wave of crypto millionaires. In this book Sam Volkering pose the following interesting questions : is cryptocurrency a passing financial fad? Will you see bitcoin fade into a distant memory like Myspace and Pets.com? Or are you ground-floor at a technological revolution that could rival the birth of the internet age? And if cryptos are a once-in-a-lifetime opportunity... how can you dip your toe in and take advantage? Stock market maven, financial commentator and crypto expert, Sam Volkering will answered these questions for you and more inside The Crypto Revolution.

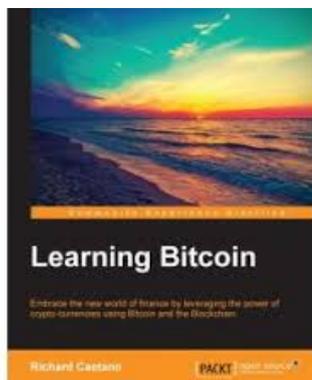
I consider this work to be very important as it inspired me to write this scientific review. It's one the

best piece of literature on cryptocurrencies and bitcoin in my opinion. One of the main reasons for the inclusion of Sam Volkering is that his book challenges contemporary thinking surrounding the 'proper' roles of the handling of money by the state. I suggest this is essential in the examination of the ideology behind most policy and legislation on currency.

"We have been through a torrid decade and more, where living standards have declined but we are constantly told this one of the longest running economic expansions in history. It's as if truly live in George Orwell's 1984 and the powers that be speak a form of doublespeak. When they say employment is at a record high they fail to say wages have been going down in real terms for decades." — Sam Volkering, *Crypto Revolution: Bitcoin, Cryptocurrency and the Future of Money*

I believe this quote alone from the book contains the nuance necessary to debunk the notion that cryptocurrencies will fade away and shine lights on the problems facing the capitalist system in the coming years as well as the inevitable economic crisis.

• **Learning Bitcoin : embrace the new world of finance by leveraging the power of crypto-currencies using Bitcoin and the Blockchain By Richard Caetano.**



This book is basically a practical step-by-step guide to break down the Bitcoin technology to ensure safe transactions. Richard Caetano describes how can we Leverage the power of Bitcoin to reduce transaction costs and eliminate fraud. This book is ideal for anyone familiar with online banking and want to expand his or her finances into a resilient and transparent currency. A basic understanding of online wallets and financial systems will be highly beneficial to unravel the mysteries of Bitcoin.

the most important aspects of this book that i learned :

1. Set up my wallet and buy a Bitcoin in a flash while understanding the basics of addresses and transactions

2. Acquire the knack of buying, selling, and trading Bitcoins with online marketplaces
3. Secure and protect my Bitcoins from online theft using Brainwallets and cold storage
4. Understand how Bitcoin's underlying technology, the Blockchain, works with simple illustrations and explanations
5. Configure my own Bitcoin node and execute common operations on the network
6. Discover various aspects of mining Bitcoin and how to set up my own mining rig
7. Dive deeper into Bitcoin and write scripts and multi-signature transactions on the network.

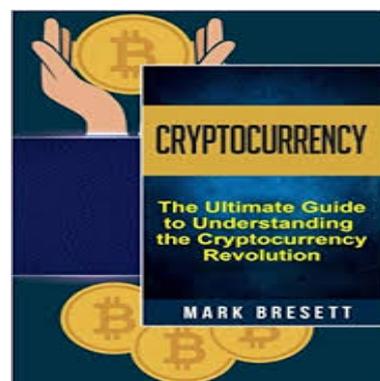
I grow up in an a family environment where business, economics and financial terms are the norm so Caetano's book helped me understand and try to grasp the notion of bitcoin among many things.

• **The suitability of cryptocurrency in the structure of Islamic banking and finance By Ibrahim Mohammed Lawal**

This important paper provide an insight into the issue of the usage and challenges of cryptocurrency from an Islamic finance perspective. Cryptocurrencies have the potential to become the future currency and maybe even backed by the government in the long run, but in order to be accepted in the mainstream Islamic finance, it has to overcome negative sentiments surrounded by the excess volatility and use in fraudulent activity and well regulated by both banking law and Shariah law.

As a muslim women in a country like morocco getting to know if bitcoin is forbidden or not is one of my first priority . Originality/value Verses of holy Quran and authentic Hadiths related to environmental sustainability concept does not show nor forbid the use of this technology as it wasn't in The Prophet's [peace be upon him (pbuh)] era .

• **Cryptocurrency: Bitcoin, Ethereum, Blockchain The Ultimate Guide to Understanding the Cryptocurrency Revolution by Mark Bresett**



Mark Bresett's book includes 3 manuscripts:

1. Bitcoin: it contains all what what you need to know about The Cryptocurrency .
2. Ethereum: What You Need To Know About The Blockchain-Based Platform .
3. Blockchain: How Technologies Behind Bitcoin Is Changing Money and Business Regardless of how much you know about the Cryptocurrency phenomenon or whether you are a new user, this book explain the concepts assuming no prior knowledge and give everything you need to know.

This is a great book for people starting to dip their toes in crypto currency like myself. It goes over all the general area as far as the history of bitcoin and the potential financial investment it has. A very informational and interesting read. I wanted to know more about cryptocurrency to dive deeper in this subject and i think the author has done an excellent job in describing what bitcoin and cryptocurrency are all about. The author discussed extensively on the advantages and limitations of cryptocurrencies, how and where one can buy them, what to keep in mind while buying them and what are the pitfalls one should avoid while trading.

- **Despite the ban, Morocco is one of the four countries that trade Bitcoin the most in Africa by LATIFA BABAS**

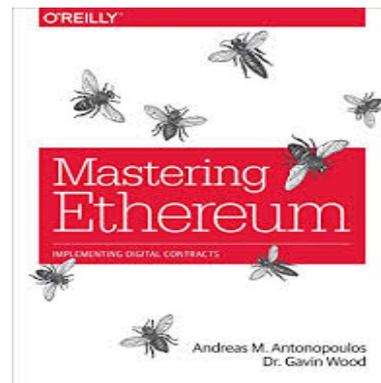
In December, 2017, Abdellatif Jouahri, the governor of Bank Al-Maghrib, commented on Bitcoin trading, during a press conference. However, a few months later Morocco opened doors for Blockchain company Soluna which is planning to build a 900-megawatt wind farm coupled with a datacenter for blockchain servers. This article discusses the ban as well as the hypocrisy of the moroccan government

I think this article is a fine piece of journalism as it shine lights on the hypocrisy of the moroccan government ; while trying to ban bitcoin and other cryptocurrencies the state is still open to do business in the realm of the same blockchain technology ;as any type of disturbance to its core fundamentals considered a lunacy .

- **Andreas' and Gav's book Mastering Ethereum**

If you're looking to get started with the Ethereum protocol—or are among the many open source developers, integrators, and system administrators already working with this platform—Mastering Ethereum is the definitive book on the topic.

Ethereum represents the gateway to a worldwide, decentralized computing paradigm. This platform enables you to run decentralized applications (DApps) and smart contracts that have no central points of fail-



ure or control, integrate with a payment network, and operate on an open blockchain. With this practical guide, Andreas M. Antonopoulos and Gavin Wood provide everything you need to know about building smart contracts and DApps on Ethereum and other virtual-machine blockchains.

Currently IBM, Microsoft, NASDAQ, and hundreds of other organizations are experimenting with Ethereum. I strong hardheadedly believe this essential guide shows you how to develop the skills necessary to be an innovator in this growing and exciting new industry.

As the authors Andreas M. Antonopoulos and Gavin Wood suggested this book is intended to serve both as a reference manual and as a cover-to-cover exploration of Ethereum. The first two chapters offer a gentle introduction, suitable for novice users, and the examples in those chapters can be completed by anyone with a bit of technical skill. Those two chapters will give you a good grasp of the basics and allow you to use the fundamental tools of Ethereum. Chapter 3 and beyond are intended mainly for programmers and include many technical topics and programming examples, as I'm Knowledgeable on programming languages I can safely say that The author did a great job explaining how it works with simple tutorials .

To serve as both a reference manual and a cover-to-cover narrative about Ethereum, the book inevitably contains some duplication. Some topics, such as gas, have to be introduced early enough for the rest of the topics to make sense, but are also examined in depth in their own sections. All in all I think this is the best Ethereum Book that is out there and one of the authors Andreas M. Antonopoulos was the first Person that got me interested in this cryptocurrency instead of its most famous counterpart Bitcoin .

This book is mostly intended for coders. If you can use a programming language Like Python , this book will teach you how smart contract blockchains work, how to use them, and how to develop smart contracts and decentralized applications with them. The first few chapters are also suitable as an in-depth introduction to Ethereum for non-coders like what i elaborated

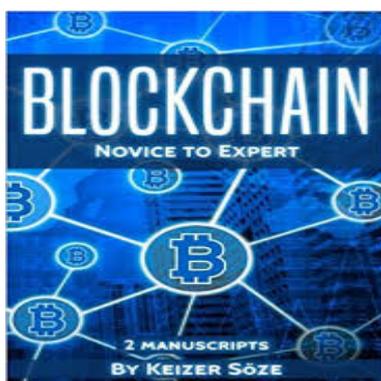
earlier but I think this will Hopefully inspire them to learn coding and dive deeper into this revolutionary decentralized computing paradigm technologie as it did for me .

Andreas M. Antonopoulos and Gavin Wood also give some great insightful Code Examples to further your understanding. The examples are illustrated in Solidity, Vyper, and JavaScript, and using the command line of a Unix-like operating system.

" Mastering Ethereum will become a must read in the future, as Ethereum is going to be as ubiquitous as TCP/IP. It will become a necessary layer under which decentralized, trustless technologies live and thrive." – Hudson Jameson, Community Organizer - Ethereum Foundation.

I couldn't agree with Jameson more this is The most important piece of literature on this technology .

• **Blockchain: Novice to Expert - 2 manuscripts by Keizer Söze**



This book has lots of in depth information that will help you to understand the blockchain technology. Detailed guide on all Blockchain attributes, and how the technology works, behind bitcoin. A Step By Step Guide To Understand the Blockchain Revolution, Learn fast about the hidden economy, Who invented the blockchain, Who are the miners, What is the Internet of Money In this book I had the privilege to learn about:

1. The history of finance, and it's revolution
2. What triggered the birth of the Blockchain
3. Who invented the Blockchain as well Bitcoin
4. Generic understanding of Bitcoin
5. What is the distributed ledger system
6. Who are the miners and what's is their responsibility
7. Understanding Step-by-step how each block gets created
8. How Blockchain works, and why can not be hacked
9. How Blockchain benefits business purposes

This outstanding book gives a comprehensive description of blockchain the technology behind bitcoin and related currencies. It covers not only the programs used inside the bitcoin system, but also gives a clear, intelligent discussion of such issues as the security risks, the incentives to maintain the system, the economics of mining and mining pools, and government regulation. It goes beyond bitcoin, with a chapter or two on applications which build upon bitcoin, development of related cryptocurrencies and future research directions. This is a serious effort, suitable as an introduction to research in the subject; each chapter includes appropriate references.

There is also a wonderful preface about how the technology behind bitcoin evolved over a couple of decades. It was really a pleasure to read as I learned a criteria of things like securing Blockchains and The different types of this technology. I used this book as foundation in this research review especially in the "Block-chain Technology " and "A brief history of money" sections for me it contains the most factual informations on this subject.

The author devolves into the history of existing financial systems and how cryptocurrency, though with its flaws can possibly be used to create more transparent and accountable monetary systems.

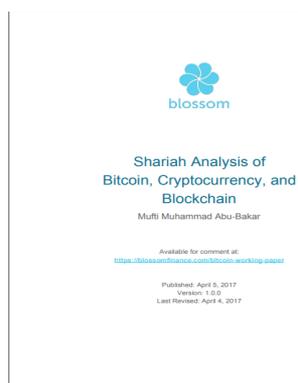
A truly good piece of literature on bitcoin, cryptocurrency, cryptocurrency investing, cryptocurrency trading and cryptocurrency technologies in general, really satisfying box set. Particularly valuable were the descriptions of digital currency systems that were created previously. Understanding them can provide critical insight into related discussions that are often badly misunderstood. It also tip tow around The motivations that shaped the success of Bitcoin and show the strong commitment of a group of people to change the world of banking and finance .

The concept of interpersonal boundaries is extremely important and there are a ton of authors out there that' ve tried to explain what it is. This book literally will saved you all that trouble.

I first found Bitcoin very complicated and wanted to know more about this topic. That's why I added this book to my collection . In this guide the author gives you everything you need to know in order to understand the system and get started, the advantages and disadvantages of digital money, the history and the future of Bitcoin. The information was very useful and impartial.

• **Shariah Analysis of Bitcoin, Cryptocurrency, and Blockchain By Mufti Muhammad Abu-Bakar**

As a strong believer in Bitcoin and Ethereum and a Muslim Moroccan researcher I needed an Islamic schol-



ars opinion on this subject and i found Mufti Muhammad Abu-Baka 's article on Shariah Analysis of Bitcoin, Cryptocurrency, and Blockchain the most neutral and objective one. As The author highlighted the following key points everyone should be asking :

- The understanding of cryptocurrency, its mining, trad ability, security and systematic impact is evolving. Therefore, it is expected that Shariah opinions must become more informed and conclusive as cryptocurrency is better understood.
- The blockchain is not only a platform for bitcoin and cryptocurrency; it is a decentralized digital ledger technology to record anything of value whether it is currency or assets. Blockchain may be considered a boon to the Shariah requirements of transparency and disclosure. Blockchain can serve to enhance the notions of trust in exchange transactions and transfers. It can serve to enforce the principle of cash transactions in exchange of currency and commodities.
- As far as the current Shariah status of bitcoin is concerned, the author agree with the second view that bitcoin is permissible in principal as Bitcoin is treated as valuable as reflected by market price on global exchanges and it is accepted for payment at a wide variety of merchants, including bakeries, restaurants, and even large e-Commerce retailers like Overstock.com. Moreover, may private individuals accept bitcoin as a medium of exchange in their private transactions. To decide the Shariah status and permissibly of bitcoin and any other qualified cryptocurrency, the following classification matters in the prevalent legal and regulatory environment. There are three Shariah Analysis of Bitcoin, Cryptocurrency, and Blockchain types of jurisdictions in terms of cryptocurrency regulations:
 - a) Jurisdictions where the usage of cryptocurrency is prohibited and banned explicitly. In such jurisdictions, it is not allowed to deal with cryptocurrency.
 - b) Jurisdictions where regulators are silent, or

have not explicitly acknowledged or disavowed cryptocurrency as permissible money; often in these jurisdictions, the regulators merely warn the public to to exercise caution and be aware of the risks involved.

c) Jurisdictions where regulators have accepted cryptocurrency either as a financial asset or as an alternative currency and have enacted specific legislation that permits the public to utilize cryptocurrency. From Shariah point of view, it is permissible in the last two types of jurisdictions to deal with bitcoin and other qualified cryptocurrencies. However, the preservation and protection of wealth is one of the fundamental objectives of Shariah (Maqasid al-Shariah). Therefore, it is necessary for cryptocurrency users to take care of its related risks. [12]

- The objective of cryptocurrency - particularly bitcoin - is to serve as an alternative currency in a peer to peer network without the control of any central authority. Cryptocurrency markets are subject to extreme fluctuation, and will likely remain volatile for the next few years. In many jurisdictions, the legal status of cryptocurrency remains unclear, further adding to the price volatility. Therefore, it is not advisable to buy cryptocurrency for investment purposes, like stocks or shares (as it is being practiced widely at the moment). As mentioned earlier, it is against the basic objective of currency whether it is fiat or crypto to treat it as a commodity or investment asset. Rather, it is advisable to utilize cryptocurrency networks as a payment system in the cases where cryptocurrency networks offer specific benefits and advantages over conventional systems.
- The swift rise of popularity in cryptocurrency and related technology, especially the rise of ICO (initial coin offering) has spawned many suspect investment opportunities. Although it is outside the scope of this paper to consider the permissibly of the ICO, all investors should exercise extreme caution. Muslim communities especially should exercise caution as recently they have become the target of scammers advertising "halal investment" opportunities using cryptocurrency. As a rule of thumb, any cryptocurrency investment opportunity that promises a fixed rate of return is likely a scam, such as a ponzi/pyramid scheme which is both illegal and haram. [12]
However the weakness in this article is that we are given no assertiveness to what if cryptocurrencies are Halal or Haram In Islam but Allah (swt) knows best.

• **GLOBAL CRYPTOCURRENCY BENCHMARKING STUDY** By Dr. Garrick Hileman and Michel Rauchs



This is the first study to systematically investigate key cryptocurrency industry sectors by collecting empirical, non-public data. The research team collected data from cryptocurrency companies and organizations across 38 countries and five world regions. Over one hundred cryptocurrency companies and organizations as well as 30 individual miners participated in one or more of the four surveys. During the survey process, the research team communicated directly with individual organizations, explaining the study's objectives. For cases in which currently active major companies did not contribute to our study, the dataset was supplemented with additional research and web scraping using commonly applied methodologies.

SOME KEY HIGHLIGHTS OF THE STUDY :

- The current number of unique active users of cryptocurrency wallets is estimated to be between 2.9 million and 5.8 million.
- The lines between the different cryptocurrency industry sectors are increasingly blurred: 31 percent of cryptocurrency companies surveyed are operating across two cryptocurrency industry sectors or more, giving rise to an increasing number of universal cryptocurrency companies.
- At least 1,876 people are working full-time in the cryptocurrency industry, and the actual total figure is likely well above two thousand when large mining organisations and other organisations that did not provide headcount figures are added.
- Average security headcount and costs for payment companies and exchanges as a percentage of total headcount/operating expenses are similar, but significantly higher for wallets. [7]

I used this paper as a foundation in my literature research review's "Bitcoin, Altcoins, And Innovation" section cause it contains factual information on the evolution of cryptocurrencies by Market capitalization .It help also that The study gathered survey data from nearly 150 cryptocurrency enterprises and firms ,The shear amount of data gathered and analyzed is staggering and the conclusion they reached at the end is really something to be hold.

Whilst looking at the nombres I concluded from this article that Bitcoin, provide novel and innovative features that offer substantive differences. These can include the introduction of new consensus mechanisms as well as decentralized computing platforms .

9 Summary

I hope that you have grasped a little of what the blockchain attributes are and how complex the system is in This Literature review . I also offered you a formative explanation on Bitcoin and Ethereum and how to invest securely and safely. Overall, what you have to understand is that blockchain and Bitcoin are not the same things. Blockchain is a technology, and its first application was on the platform named Bitcoin. Bitcoin is blockchain. However, Bitcoin itself is only a cryptocurrency that is capable of replacing fiat currencies. Nevertheless, not that many people will like the idea at first. Blockchain has solved the problem that we have always faced, that is trust, using Elliptic Curve Cryptography and a huge amount of computation power. Using blockchain technology enables us to avoid trusting third party services, by replacing them with digital signatures, and mathematical algorithms. Therefore, any payment or exchange over the internet will be between 2 parties only. This is revolutionary as we can expand the trust gap, and the market of the future not only will be faster and cheaper, but will have no limitations, such as age, race, sex, occupation, nationality, or anything like that.

Currently IBM, Microsoft, NASDAQ, and hundreds of other organizations are experimenting with Bitcoin and Ethereum and i hope Africa especially The United Maghreb Arab world catch up to speed and try to legalize them in the near future like Russia and other developed countries and open scientific research labs concerning cryptocurrencies and encourage Muslim researchers to induct experiments and issues papers on this technology .

Additionally, I touched on Cryptocurrency trading, and how to recognize the right time when to invest in Bitcoin, or any other Cryptocurrency.

I then indulged into the notion that African governments not regulating cryptocurrency now may be a factor spurring its growth on the continent; however, there is no guarantee that governments will not change their current mindset.

Rather than simply not wanting to, governments may be powerless to regulate cryptocurrency, the Nigerian central bank indicated recently. Currently tackling the country's 12 percent inflation rate, the Nigerian apex bank announced that it could not control or regulate

Bitcoin, “just the same way no one is going to control or regulate the internet. We don’t own it.”

Fearing a collapse of the banking industry or arbitrary appropriation of money by the government, Africans without access to banks and who live in politically unstable countries could be attracted to cryptocurrency. “Bitcoin transactions help to eliminate the procedural bottlenecks that plague traditional banking and financial services,” Mr. Darko explains.

It is also commonly argued By Islamic scholars in The Arab world that Bitcoin and other cryptocurrencies are widely used for money laundering and other illegal purposes. This is an external factor which does not directly affect on Islamic legal criterion of currency. In general terms, the use of something lawful for an unlawful purpose does not make the thing itself become unlawful. An example from the Hadith can be found in that the Prophet Muhammad (peace be upon him) forbade the selling of grapes to a wine merchant, since making wine is haram (impermissible), but did not forbid the production or trading of grapes for lawful purposes. On this point, it is especially noteworthy that all fiat currencies are used for illegal purposes such as money laundering, fraud, and illegal commerce. It is readily acknowledged that the US Dollar is the most widely used for currency for money laundering and other illegal purposes. but **Allah (swt) knows best.**



Currently with **COVID-19** causing severe turbulence in the stock market, the move towards investing in digital assets is increasing. **Coronavirus** has impacted all financial products whether it be traditional equities and bonds, commodities, or even cryptocurrencies.

Digital assets have the potential to disrupt entire industries and the global market. The economic impact of the pandemic has resulted in a surge of interest in digital assets, mainly Bitcoin (BTC).

With a **global recession** looming all across the glob, purchasing power of traditional currencies is bound to be impacted. For those who understand the benefits of cryptocurrency, I predict that there will be a surge in interest in owning Bitcoin and Ethereum as many

computer and data scientists already did .

This will be mainly down to cryptocurrencies’ ability to alleviate a portion of pending pressure on traditional markets as we enter a global economic downturn.

I just hope **The United Maghreb Arab** and particularly The Moroccan government can be up to date and legalize this technology as **recession in Morocco after COVID-19** is unpreventable.

10 Author Biography



Figure 16: Khaoula Hidawi

I obtained my Bachelor of Science and Associate of Science in Applied Mathematics And Computer Sciences from The Faculty Of Science Semlalia , University of Cadi Ayaad Marrakesh in 2019 and a Baccalauréat in Mathematical Sciences option B form the Technical high school Mohammed VI back in 2015. I'm currently a master degree student in Cyber security and Cyber-crime at The National School of Applied Sciences in Tangier .

My filed of interests are programming languages , networks security , python for data science , deep learning , artificielle intelligence , maching learning , Blockchain and cryptocurrencies .

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