

INTRODUCTION

Bitcoin Is Evil. —Paul Krugman (Nobel Prize in Economics)

Remember, all I'm offering is the truth. —Morpheus

You must unlearn what you have learned. —Yoda

The monetary network that is Bitcoin has been online since 2009 and yet so few have a sufficiently comprehensive understanding of what it is and what it does. A human rights advocate complains, “[n]early everyone has heard about Bitcoin, but only a tiny few are aware of the deep impact the digital currency is having around the world.” This is both frustrating and unfortunate, though understandable. Several reasons account for it.

First, despite its phenomenal growth, its civilizational importance, and the problems it solves, its network is still very young. Gold has been around for thousands of years and the current monetary system with the United States dollar as global reserve asset is already almost a hundred years old. Bitcoin, in contrast, is only more than a decade old. It’s just about ready to disrupt the incumbents.

Second, anyone who claims to fully understand Bitcoin will soon be humbled. Bitcoin is a beast that’s difficult to tame—it is a monster of an intellectual and emotional challenge, “a child of many disciplines.” Not only does it require hundreds of hours of dedicated focus to learn what’s new; it also

demands that we unlearn not a few important things about the world, some of which we hold dearly and consider crucial to our worldview. University education is not immune to this agnostic wrecking ball. A wholesale destroyer of models, it eats away at some fundamental assumptions.

It is inherently inter-disciplinary—learning the hows and whys of Bitcoin is a rabbit hole of an adventure full of long tunnels that just don't seem to end. To the open minded, it offers a rewarding dance with ideas; to the strong-willed, it's multiple gunshots to the head and heart.

Third, Bitcoin has been lumped together with so called “altcoins” as part of an industry of cryptocurrencies. Bitcoin's virtues are often falsely co-opted by the latter, while the latter's erring ways are sometimes sadly attributed to the former. This should be expected for a technology that creates massive value, but it is dangerous not least because individuals new to the space become vulnerable to rug pulls and scams. Only time and sustained education can remedy this.

Fourth, in a sense, Bitcoin is a victim of its own phenomenal growth. That it has grown from a speculative bet on a niche project of a few computer geeks to a globally-traded asset worth several hundred billion (even reaching a trillion in 2021) dollars in thirteen years also means that many of the new entrants to the space become mere traders and speculators, attracted almost solely by the price action. Many come and go as the bull and bear cycles wax and wane. This, again, is understandable. Nonetheless, its astounding success can easily distract people from taking the deep dive and understanding why Bitcoin has grown in value in the first place, and why many disregard bitcoiners' constant reminder that the more interesting thing about Bitcoin is not its price.

Fifth, many believe that Bitcoin cannot be understood if one is not a programmer or a mathematician. This isn't true. While Bitcoin is written in computer language, it's still fundamentally meant to solve practical and familiar human concerns related to money and power. On the one hand, it

is a revolutionary technology about how human beings can store and transfer value among themselves, and across time and space. On the other hand, it most certainly invites us to a transformative meditation about the nature of power and how humans and institutions should interact with it. In short, Bitcoin is about what everybody knows is important—money—even if they have little idea about its history and the technology behind it. Or, as John Oliver put it more eloquently, Bitcoin “is everything you don’t understand about money combined with everything you don’t understand about computers.”

Nonetheless, both the problems Bitcoin identifies and the solution it offers can be understood well enough with concepts and analogies that explain the code behind the technology. While there’s a steep learning curve and some of the terms are new and a few of the concepts are counter-intuitive, those who invest the necessary time to understand Bitcoin can make a reasonable judgment that it is the real deal—it is working and its promise is being fulfilled—and that its potential impact on all of us is immensely positive and awe-inspiring. It deserves to be understood. We deserve to understand it, for our own sake.

There will come a time when Bitcoin need no longer be explained as the technology matures and becomes more familiar, as more applications and use-cases are built on top of it, and as the next generation of users is simply born into its ecosystem, in much the same way nobody today needs to read a book to use the internet, email, or smartphones. Soon enough, it will become simultaneously user-friendly, widely adopted, and indispensable for all, as it is now for many in Africa, Latin America, and many others ravaged by inflation or monetary repression. For now, let us be thankful we still get to talk about the plumbing and the wirings of the system as it is being built. We are this early.

The aim of this book is to provide an introduction to some of the facets of Bitcoin for anyone curious about this remarkable invention/discovery. While this book is an introduction, it seeks to offer sufficiently comprehensive snapshots of the big

picture at various levels of granularity. The goal is to help the reader understand what an open, permissionless, peer-to-peer, immutable, censorship-resistant, decentralized, global, digital money and payments system it is and why it matters to every human being today and in the future. It also seeks to be a guide for those intellectually and emotionally ready for the journey. I hope that along the way readers will understand why bitcoiners are so excited and hopeful about this technology, why they believe we're at the cusp of a transformative revolution, and why many of them are willing to spend time to introduce others to it even at the risk of being pedantic.

Today, there is a growing revival of the debate over sound money, the role of banks, currencies, and their relationship with the State. To be sure, there was a time when this debate was the stuff of mainstream politics. Somewhere along the way, this conversation was forgotten, partly because of the remarkable growth years and the blinding asset inflation of the 20th and 21st centuries, and partly because those in charge have little incentive to let citizens know how hotdogs are made. But the ground is already shaking beneath our feet, people are feeling the pain of consistently declining real wages and/or soaring inflation, and widening inequality has become ever more apparent.

This conversation needs to happen again not because it is a cute intellectual adventure but because the pains of the stomach are inevitably felt by both the heart and mind. It is crucial for people to know that there is a fundamental cause to that pain and that nagging sense of unfairness, and they need to understand that cause. It is also important to let people know that there is already a solution: that *bitcoin fixes this*, as your bitcoiner friend will often insist.

When the operating system of your computer starts freezing or crashing more and more often, maybe it is time to start thinking of an update. Or maybe, an upgrade to a new system. If one thinks of the monetary system as an engineered solution to the problem of transferring value across space and

time, and realizes that it now has a lot of problems (an inflation bug, centralization tendency, etc.), it gets easier to understand why an upgrade may be necessary. After all, money is “the oldest social network on Earth.”

No single book can explain Bitcoin. Almost like a hydra, the more puzzles you slay, the more puzzles appear. Those who start seeking answers to the question *what is bitcoin?* will almost certainly soon hear an echo of the question *what is the matrix?* It is, however, possible to provide the proper context about the many interesting problems it solves, an introduction to its colorful history, a reflection on the features of this meta-subject, and point to a few solutions already built and some of the directions in which Bitcoin is heading. The reader can then choose his own adventure, one which bitcoiners have found meaningful in many ways. This is because Bitcoin is a framework for understanding the world, with explanatory power that just keeps on giving. Its potential to empower citizens all over the world against institutional and institutionalized abuse is a well of remarkable depth.

The organization of this book is fairly straightforward, beginning with recognizable issues with the current monetary order. Bitcoin is not a solution looking for a problem, but a solution to specific problems. It is therefore best to let the reader immediately know that we’re dealing with real life problems here, that it’s possible to articulate and label them individually and place them in one big box called “problems with the money.” It then proceeds to the history of money—what it is, how it developed in different eras and contexts, how it has emerged in various forms. After going through this exercise, the reader will understand why bitcoiners are fixated with answering the question *what is money* by urging people to go through the history of monies. The final set of chapters introduces Bitcoin—its history, its operation, its significance. Overall, the entire book can be summarized as the evolution of money.

Just for clarity, this book is about money, not making money. It is about how money arises and how it is engineered.

For the most part, it is a historical survey of the characteristics of money and why these have practical consequences for all of us. The fundamental thesis of this book is that Bitcoin exhibits many of the traditional characteristics of sound money as well as the attributes of what sound money ought to be, considering the current state of our civilization and the problems humanity confronts. Simply put, it is the best form of money humans have ever had. This changes everything.

I introduce two important mechanisms to elaborate what is happening and is about to happen in the information system that makes social exchange and human organization possible: the idea exchange protocol and the value exchange protocol. The former involves mechanisms for the exchange of ideas expressed through language, while the latter involves mechanisms for the exchange of value expressed through a monetary system. These two protocols are part of the critical infrastructure that organizes human society; any transformation involving these protocols will result in paradigmatic, structural disruptions to how we live and organize ourselves. As both these protocols are currently undergoing structural transformation, so is our civilization today. This paradigmatic shift did happen before, when European society transitioned out of feudalism and into the Renaissance.

Thus, along with the internet, which has disrupted our idea exchange protocol, Bitcoin is similarly disrupting our value exchange protocol. It is even disrupting the internet itself, as it now begins to inspire a return towards its decentralized roots and a movement away from the dangerous path of corporate and state centralization it has taken in the last two decades. Together, these two ongoing disruptions in the foundational protocols that shape humanity and civilization could lead to abundance and flourishing—a new renaissance—when people discover new freedoms and recover old ones, find relative peace instead of constant worries over looming dangers, and acquire stability grounded on fairness rather than cynicism borne of disempowerment. “Bitcoin is hope.”

As an educator and an advocate, I believe that the most important thing we can do in these early innings is to help Filipinos understand the evolution of money and why Bitcoin is its latest and most appropriate iteration. This book is written for everyone, Filipino students most especially, because they are digital natives and their generation is in the best position to immensely benefit in multiple ways from understanding this technology. Once understanding Bitcoin becomes part of their education, they will act and decide accordingly on their own, with their best interests in mind. This knowledge will connect them to what could possibly be the most important global event of their generation, if not of this century.

To be sure, understanding Bitcoin is both appropriate and necessary for the general reader considering its impact on everyday life and our material existence, and on history, politics and government, economics, banking and finance, law, philosophy, technology, to name a few subjects directly affected. On a personal note, I am floored by how Bitcoin has educated me and modified some of my foundational beliefs about many subjects whose tenets I considered already settled or simply assumed to be true. I am therefore honored and excited to introduce this technology to those seeking answers to important questions about money and society.

Some may find the subject matter of this book worrisome, or even strange, if not unsettling, especially in these troubled financial times. Many have heard about “crypto” scams, the allegations of a tulip mania, even charges of Bitcoin mining boiling the oceans. I sense the fear and the worry, for sure. But the choices are either to keep one’s distance or get close enough to understand this new thing, either of which is consequential: become handicapped by ignorance or spared by false knowledge, on one hand, and enlightened or burned, on the other. But one can only hope that fear doesn’t get to cloud our judgment and dampen our curiosity. As a favorite magistrate once said, “men feared witches and burned women.” In any case, please proceed with an abundance of caution. Be careful

listening to people with strange ideas; you just might unlearn a thing or two, and that is always dangerous. The question is, for whom?

You may find Bitcoin invisible for now, or irrelevant to your current way of life, or are skeptical but curious, even interested but wary about the speculative fervor, or for whatever reason would prefer to have some safe distance between your hard-earned salary and this so-called magic internet money. That's perfectly fine.

I can assure you, though, that if you look closely enough, you will find something quite interesting, perhaps even inspiring. It's a humble and humbling revolution happening all over the world—people and communities embracing Bitcoin for all sorts of reasons: Venezuelans, Turks, Nigerians, Ghanians, Zimbabweans escaping inflation with Bitcoin; dissidents from Russia and Canada escaping economic repression using Bitcoin; women in Afghanistan using Bitcoin to empower others against the injustices of the Taliban regime; African students and entrepreneurs excluded from mainstream payment rails using Bitcoin to pay for tuition and to export their products; New York saving the oldest working hydroelectric plant with bitcoin mining; bitcoiners electrifying a rural Kenyan village with excess hydropower using bitcoin miners; Africa's oldest protected park using its hydroelectric power station to mine bitcoin to pay for salaries and infrastructure projects; bitcoin miners stabilizing the electric grid in Texas; bitcoin donations funding solar installations in Zimbabwe; heat from bitcoin mining warming up homes and greenhouses; bitcoin miners addressing climate change by reducing methane emissions through “clean combustion of flared gas from oilfields and landfills”; women escaping the financial clutches of a husband and of the state with bitcoin; students learning about financial sovereignty in parts of Africa, El Salvador, Southern Philippines; businesses in El Zonte (El Salvador), Boracay (Philippines), Lugano (Switzerland), and many others accepting bitcoin payments; Bitcoin's lightning network connecting the world

with low fees and instantaneous payments, helping businesses and families; digital nomads traveling the world with bitcoin wallets in their phones and twelve words in their heads as a lifeline; Jack Dorsey and armies of coders all over the world (re-)building the internet to return to its decentralized origins with Bitcoin as inspiration and native currency; thousands upon thousands of anonymous human beings opting out of a broken and unfair system, asserting their freedoms, educating others, and becoming “sovereign individuals.”

Move away and scan the horizon and you might see a rising global digital architecture with a strong bias for freedom and fairness, one that could very well be the new base layer of our civilization as it wakes up from the structural inequities of the current world order. Most of the builders of this world are young people who, instead of just being rightfully angry and cynical, are full of grounded hope and enlightened optimism because they understand and believe they now have the tools to make things better for all of us. For them, Bitcoin is a peaceful, effective, people-centered, practical, global revolution to promote material rights and freedoms.

A NOTE ON THE READING. This book is a *chopsuey*, a reflection on various subjects that crosses a few sacred disciplines. They all return to Satoshi’s contribution to humanity, which I try to explain here. It is also a light, perhaps entertaining, set of essays on a very serious topic that informs our view of the past, the present, and our future. Because of the novelty of the subject, there is some deliberate and necessary redundancy in a few parts. Naturally, this book is best read sequentially, chapter by chapter. If you’re feeling impatient, you might want to start with the Bitcoin chapters beginning in Chapter 8 onwards. Then I suggest you go back to Chapter 1 and move forward till the end. If you want some adventure, it’s interesting to read the book in

the reverse order of chapters, beginning at the end, Chapter 15. Just have fun and take your time.

This book was written in the span of about a month, right before the holiday break in Silliman University last year. It came as an epiphany in a dream (seriously) and made me realize that this was the best way to avoid becoming that tiresome Bitcoin dude spouting off to family and friends, even acquaintances. I now understand that it is impossible to persuade people about the wonders of this technology in one sitting or over a one-sided conversation. For how does one easily convince others that strange things are happening with the world—that unsound money creates misaligned incentives and horribly distorts economies; and that even stranger things are underway, or that we’re living in *The Upside Down*—without sounding unhinged? Having accomplished that, how does one get to the even more difficult part—convincing others that Bitcoin fixes these problems?

In a way, the book is an attempt to show everyone the rabbit hole so that instead of people being caught unawares and just tumbling down, they are able to deliberately jump into it, avoiding a hard landing. The Bitcoin universe is immense and is still rapidly expanding. Please consider this book as just a mini guided tour. If you’re interested in digging deeper or exploring the tunnels, the notes at the end of each chapter can assist you.

I seriously avoid extended writing (it’s too draining and always seems personal) but I also realize that it’s a wonderful valve for releasing ideas from a limited brain space. As for further motive, I have wanted an additional, easy-to-read, big picture reference material on the subject and hoped to commit to print some personal insights I know I’ll surely forget. Finally, I hope to direct people’s focus on Bitcoin—towards how it helps make things better for everyone instead of merely egging others to “invest” in the hopes of shooting for the moon. Satoshi’s vision was to help

the whole of humanity by building a boat big enough for all of us, not to incite a mad scramble over who gets in first.

Given the constraints of time and temperament, this is my best shot at integrating what I've learned over the past two years since I got bitten by this nasty Bitcoin bug. It reminds me of a favorite economics teacher who told me, more than two decades ago, that I had the knack for stitching together ideas picked up from here and there to build larger frameworks on top of the old ones. I've always believed her, especially during those times when I felt it wasn't true.

Goodluck, and enjoy.

See you on the other side.

NOTES

1. “Nearly everyone has heard about Bitcoin....” For an excellent introduction to Bitcoin and its various human rights implications, see Alex Gladstein, *Check Your Financial Privilege*, 2022.
2. “A child of many disciplines.” Bitcoin is unusual in many beautiful ways. For a meditation on Bitcoin that crosses various areas of knowledge, see Gigi, *21 Lessons: What I’ve Learned from Falling Down the Bitcoin Rabbit Hole*, 2018. The book itself is a rabbit hole.
3. For issues relating to money being part of mainstream politics, see Christopher Leonard, *The Lords of Easy Money (How the Federal Reserve Broke the American Economy)*, 2022. “The politics of money used to be a charged political issue. It was once debated with the heat and passion that defined fights over taxes or gun control in 2010. Back during the presidential election of 1896, the Democratic nominee, William Jennings Bryan, made monetary policy one of his primary issues. He was a populist, and he used the topic to rile up crowds. This led to the most potent and most famous political statement ever made about American money, when Bryan proclaimed during a campaign speech, ‘You shall not crucify mankind upon a cross of gold!’ Bryan was specifically talking about the gold standard in that speech, but he was also talking about short-term interest rates and the monetary base....” at 9.
4. “The oldest social network on Earth.” Apparently, supposed Facebook co-inventors Tyler and Cameron Winklevoss were introduced to Bitcoin by a stranger as another social network. See Ben Mezrich, *Bitcoin Billionaires*, 2019.
5. For the view that the fiat system is engineered money, see Saifedean Ammous, *The Fiat Standard*, 2021.
6. “Bitcoin is hope.” See Robert Breedlove, *Bitcoin Is Hope*, at <https://breedlove22.medium.com/bitcoin-is-hope-bedce21b3648>; I’ve also heard Michael Saylor declare this powerful Bitcoin mantra quite often. Both men have collaborated in Saylor & Breedlove, *What Is Money*, 2022.
7. With almost prophetic sense, the arrival of Bitcoin was anticipated. See Davidson & Rees-Mogg, *The Sovereign Individual*, 1997. “In the Information Age, individuals will be able to use cyber currencies and thus declare their monetary independence. When individuals can conduct their own monetary policies of the World Wide Web it will matter less or not at all that the state continues to control the industrial-era printing presses. Their importance for controlling the world’s wealth will be transcended by mathematical algorithms that have no physical existence. In the new millennium, cybermoney controlled by private markets will supersede fiat money issued by governments. Only the poor will be victims of inflation and ensuing collapses into deflation that are consequences of the artificial leverage which fiat money injects into the economy.” at 24. See also, Jack Weatherford, *The History of Money*, 1997. “The rise of

electronic money will produce changes in society as radical and far-reaching as the two earlier monetary revolutions [the invention of coins, then the invention of banking] caused in their own eras. The new money will make sweeping changes in the political systems, and in the nature of class organization. Virtual money promises to make its own version of civilization that will be as different from the modern world as from the world of the Aztecs or the Vikings." at *Foreword*, xiii.

8. "Clean combustion of flared gas from oilfields and landfills...." See Daniel Batten, *Bitcoin Mining Can Prevent Climate Change*, 2022, at <https://bitcoinmagazine.com/business/bitcoin-mining-can-prevent-climate-change>.
9. "Most of the builders of this world are young people." Thomas S. Kuhn's remarks about the role of the young in scientific revolutions come to mind—"[a]ny new interpretation of nature, whether a discovery or a theory, emerges first in the mind of one or a few individuals. It is they who first learn to see science and the world differently, and their ability to make the transition is facilitated by two circumstances that are not common to most other members of their profession. Invariably their attention has been intensely concentrated upon the crisis-provoking problems; in addition, they are men so young or so new to the crisis-ridden field that practice has committed them less deeply than most of their contemporaries to the world view and rules determined by the old paradigm." *The Structure of Scientific Revolutions*, 1996, at 144.