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Library of Congress Control Number: 2016932286 ISBN 978-1-119-07613-1 (pbk); ISBN 978-1-119-07614-8 (ePub); ISBN 978-1-119-07641-4 (ePDF) Manufactured in the United States of America (7)Contents at a Glance Introduction ... 1 Part I: Bitcoin Basics ... 5 Chapter 1: Introducing Bitcoin ... 7 Chapter 2: Buying and Storing Bitcoins ... 21 Chapter 3: Bitcoin Pros and Cons ... 43 Chapter 4: Making Money with Bitcoin ... 77 Chapter 5: Your Bitcoin Wallet ... 79 Chapter 6: Bitcoin Transactions ... 91 Chapter 7: The Blockchain ... 103 Part III: Using Bitcoin in Business... 111 Chapter 8: Using Bitcoin in Commerce ... 113 Chapter 9: Staying on the Right Side of Legal ... 123 Chapter 10: Bitcoin Security ... 135 Chapter 11: Mining for Bitcoins ... 147 Part IV: The Part of Tens ... 159 Chapter 12: Ten Great Ways to Use Bitcoin ... 161 Chapter 13: Ten (or So) Other Crypto-Currencies ... 167 Chapter 14: Ten Online Bitcoin Resources ... 173 (8)(9) Table of Contents Introduction ... 7 The Origin of Bitcoin ... 7 Getting Technical ... 9 Bitcoin as Currency ... 10 Bitcoin as a currency tool... 11 Bitcoin and retailers ... 12 Bitcoin and consumers ... 13 Figuring Out How Bitcoin Works... 14 Using Bitcoin Anonymously ... 15 Introducing third-party anonymity ... 16 Demonstrating fungibility ... 17 Trusting the Idea of Bitcoin ... 18 Trusting bitcoin technology ... 19 Trusting bitcoin as currency ... 20 Chapter 2: Buying and Storing Bitcoins21 Getting Started: How to Obtain Bitcoins24 Figuring out exchange and storing Paer-to-peer versus regular exchanges ... 24 Figuring out exchanges ... 24 Understanding peer-to-peer versus regular exchanges ... 24 Figuring out exchanges ... 24 Figuring out exchanges ... 24 Figuring out exchange started on an exchange started started on an exchange started started on an exchange started sta factor authentication (2FA) ... 30 Understanding liability... 31 Encrypting Your Bitcoins ... 33 Choosing a passphrase ... 36 Your bitcoin wallet address ... 36 Meeting in public places ... 38 Paying premium rates ... 38 Choosing a payment method ... 39 Hot Wallets and Cold Storage ... 40 Securing user funds ... 41 Preventing exchange hacks ... 42 Chapter 3: Bitcoin Pros and Cons 43 Adding Up the Pros of Bitcoin ... 43 Financial freedom ... 43 Finan use (for now) ... 58 Chapter 4: Making Money with Bitcoin ... 61 Mining Bitcoins ... 61 How bitcoin mining works ... 61 A short history of bitcoin mining works ... 64 Day trading versus fiat ... 64 Day trading versus altcoins ... 66 Crowdfunding with Bitcoin ... 67 Understanding ICOs and IPOs ... 68 Offering company shares and dividends ... 69 Holding Bitcoins for the Future ... 69 Driving your investment vehicle forwards ... 70 Hoarding your booty ... 71 Earning through faucets ... 75 Part II: Banking with Bitcoin ... 77 Chapter 5: Your Bitcoin Wallet 79 Unlocking Public and Private Keys ... 79 Getting Your Hands on a Bitcoin Wallet ... 81 Software wallets ... 82 (11) Table of Contents ix Paper wallets ... 83 Web wallets ... 85 Securing mobile wallets ... 86 Securing paper wallets ... 87 Grasping Your Wallet Securing paper wallets ... 87 Grasping Your Wallet Securing mobile wallets ... 88 Securing mobile wallets ... 88 Securing mobile wallets ... 88 Securing mobile wallets ... 89 Securing mobile wallets ... 80 Securing paper wallets ... 80 Securing mobile wallets Out How Transactions Work ... 91 Receiving Confirmations ... 94 Regular six confirmations ... 95 Double-spending ... 96 Zero confirmations ... 97 Calculating Bitcoin Fees ... 98 Looking at Transaction Speed ... 99 Dealing with Multi-signature Transactions ... 100 Chapter 7: The Blockchain 103 Recording Transactions ... 103 Understanding Blockchain Analysis ... 105 Seeing Beyond "Just Transactions" ... 106 Working with Blockchain Applications ... 111 Chapter 8: Using Bitcoin in Commerce 113 Selling Your Goods for Bitcoin ... 113 Selling on auction sites ... 113 Creating your own online store ... 114 Selling on BitcoinTalk forums ... 115 Looking at Bitcoin Payment Solutions ... 116 BitPay ... 118 Coinbase ... 120 Online stores ... 121 Chapter 9: Staying on the Right Side of Legal 123 Understanding Bitcoin and Taxation... 124 Taxable countries ... 125 Getting help with bitcoin taxes ... 128 Bitcoin Regulation Around the World ... 129 Regulating with BitLicense ... 130 Regulating Bitcoin Network: An Overview of How It Works ... 135 What makes it secure ... 136 The role of bitcoin nodes... 137 Defending Bitcoin from Hackers ... 137 Hacking bitcoin services ... 138 Watching Out for a 51 Percent Attack ... 140 Theorycrafting the 51 percent attack? 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The Joy of Gifting Bitcoin ... 165 Pay Bills ... 165 Use Bitcoin as a Social Experiment ... 166 Chapter 13: Ten (or So) Other Crypto-Currencies 167 Dogecoin: Such Wow, Much Fun, Very Coin ... 168 Dash: Formerly Known as Darkcoin ... 168 (13) Table of Contents xi Peercoin: Introducing Proof-of-Stake ... 173 Bitcoin StartCOIN: Crowdfunding... 170 NXT: Using Proof-of-Stake for Transaction Consensus ... 173 The Bitcoin Wiki ... 173 BitcoinTalk Forums... 174 Bitcoin subReddit ... 174 Bitcoin.com) ... 174 Bitcoin.com) ... 174 Bitcoin Consensus ... 173 The Bitcoin Start Colline Bitcoin Start Colline Bitcoin Consensus ... 173 The Bitcoin Wiki ... 173 Bitcoin Start Colline Bitcoin Start Colline Bitcoin Consensus ... 174 Bitcoin Consensus ... 174 Bitcoin Start Colline Bitcoin Start Colline Bitcoin Consensus ... 174 Bitcoin Start Colline Bitcoin Start Colline Bitcoin Consensus ... 174 Bitcoin Start Colline Bitcoin Start Star Bitcoin News Sites and Blogs ... 175 Mainstream Media ... 175 Bitcoin Documentaries ... 176 Bitcoin Price Charts ... 176 FiatLeak ... 177 (14)(15)Introduction Welcome to Bitcoin? How can there be digital money? Is it, like, some kind of Internet money? Is it something you should even be concerned about, or indeed should you shy away from it? In the news, bitcoin coverage tends to be sketchy. You may have read amazing success stories of people and businesses flourishing by using it. Fear not, dear readers. This book strips away the mystery and gets down to the facts. It patiently explains exactly what bitcoin is, discusses some of the potential benefits for all of us. Bitcoin could change our lives in a similar way that the Internet has done over the last few decades. In short, this book tells you everything you need to know to get started. So what are you waiting for? Let's, um . . . get started! About the history of this fasci-nating technology and explores bitcoin as a concept and product. We show you how to open a wallet so that you can safely store your own bitcoins. We even guide you through the process of obtaining some bitcoins and talk about the potential for earning money with them too. We touch upon regulatory and legal frameworks as they currently stand. We detail mining bitcoin and explain how you could become involved in that — and why it may not be worth it. (16)Foolish Assumptions The only assumption we have about you, our reader, is that you are interested in learning some of the basics about this new form of currency. We hope you'll like what you read and will want to create your own wallet, start using bitcoin, and spread the word to friends and colleagues. But our basic assumption is that you've picked up this book because you want to find out more before jumping on board. We also assume you have some basic experience with computers and the Internet. We figure you already know how to find your way around the Internet and how to take some simple steps to safeguard yourself online and protect your money. We don't expect you to be a tech expert to get started with bitcoin. Icons Used in This Book to help you pick out the information most useful to you, we've used a few graphical icons in the book to highlight key details. Whenever you see the following icons in the page margin, this is what you can expect from that paragraph: We like to dispense our advice on a warm plate, ready for your consumption. This icon highlights our top tips for getting the best out of bitcoin and often includes insider knowledge to help you to achieve what you want as quickly and efficiently as possible. When you see this icon on the page, we're speaking to you with our deep, velvety public information announcer voice: These are the most salient points to squirrel away in your brain for later use. This icon warns you of common mistakes or pitfalls that could trip you up when it comes to bitcoin. We know you're going to use your common sense when it comes to money and online transactions, but from time to tap you on the shoulder and say, "Pay attention and be careful." This icon is that tapping finger. (17) Introduction 3 Beyond the Book But wait, there's more! We've not only put together a book that explores bitcoin, but we've also compiled some online bonus bits (at www.wiley.com/extras/bitcoin) to take things further: < An online Part of Tens with tips on how bitcoin can help you. < Two other online articles that cover certain aspects of bitcoin and banking, plus more about the blockchain. < A handy e-cheat sheet (at www.dummies.com/cheatsheet/ bitcoin) to keep important info handy at all times. Where to Go from Here As with all For Dummies books, you can start anywhere you like: Each chapter is designed to be as self-contained as possible. That said, we don't like to repeat ourselves too often, so you'll spot plenty of references to other chapters throughout. If you're not sure where to begin and don't feel like engaging in the usual practice of "starting at the beginning," here are a couple sug-gestions: < Chapter 9 is a great place to get started: Before you find out too much about bitcoin itself, this chapter will tell you whether bitcoin is used (and legal) in your country. < If you want to plunge straight in and set up a bitcoin wallet, enabling you to acquire and spend bitcoin, flick through to Chapter 5. Chapter 10 is a good place for the level-headed to begin; it looks at bitcoin security, outlines the relative safety of using it, and suggests precautions you with some ready-made inspiration — it's all about what you can do with bitcoin once you have some. In other words, spend, spend, spend, (18) (19) Visit www.dummies.com for great Dummies content online. Part I (20) be, and how it works. I Find out how to obtain your own bitcoins and where not to. I Check out the advantages of bitcoin as a currency and a technological system. (21) Chapter 1 Introducing Bitcoin In This Chapter Setting to know a bit about bitcoin but of money — a digital currency, to be exact — but just how does it work? Sit yourself down comfortably, and we will begin with the basics, the three major aspects of bitcoin: ✓ Origin: How it came to be < Technology: How it works behind the scenes < Currency: Using bitcoins as money Exploring each of these aspects will help you understand bitcoin (or BTC, as it's sometimes known) and find out whether and how it can help you. Don't worry — we will stay top-level for now. Later chapters dig deeper. Ready? Let's go. The Origin of Bitcoin The most important aspect of bitcoin may be the concept behind it. Bitcoin was created by developer Satoshi Nakamoto. Rather than trying to design a completely new payment method to over-throw the way we all pay for things online, Satoshi saw certain problems with existing payment systems and wanted to address them. (22)value of their fiat currency (the currency approved by a country's government). As the global financial system teetered on the printing presses. Central banks flooded the markets with liquidity and slashed interest rates to near zero in order to prevent a repeat of the Great Depression of the 1930s. The effect of this was large-scale fluctuations in fiat cur-rencies and what has since been termed currency wars - a race to competitively devalue so that an economy can become more viable simply by its goods and services being cheaper than those of its neighbors and global competitors. The response of central banks around the world was the same as it always has been when these things happen: Governments had to bail out affected banks and they printed extra money, which further devalued the existing money supply. In bailing out the banks, there was a net transfer of debt to the public purse, thus adding to future taxpayer liabilities. This cre-ated a sense of social injustice among some quarters. Aside from that, no one really knows what the long-term effects of quantita-tive easing will be. Perhaps inflation at some point in the schemes? What seemed clear is that central bankers, sup-posedly acting independent of governments, were taking many economies into the unknown and were prepared to devalue their fiat currencies at will just to keep the wheels turning. In doing so, they bailed out the very same institutions and bankers whose reckless behavior had brought about this crisis in the first place. The only other option would have been to let the whole system collapse and be purged, as for instance happened in Iceland. That country defaulted on its debt and endured great economic turmoil in the aftermath of that event. Therein lies the genesis of bitcoin: a decentralized financial system taken out of the hands of a few elite global decision-makers. (23) Chapter 1: Introducing Bitcoin 9 Viewed from this angle, bitcoin could be said to have a driving ideology. It is about so much more than just using the associated coin as a payment method. It is about using the underlying technol-ogy and discovering its full potential over time. How you decide to use that technology is completely up to you. It can be adapted to fit nearly any financial need you can imagine. All you really need to do is be open to the technology itself. Even though you may not grasp the entire concept from the start, just keep an open mind. Let's face it: The intersection of finance and technology is plagued with troubles. All of us have been affected by the banking crises of the 21st century, and quite a few countries are still struggling to recover from that financial fiasco. Bitcoin developer Satoshi Nakamoto was a victim of this mismanagement by central banks and thought long and hard to come up with a proposed solution. The mainstream financial infrastructure is flawed, and a viable alternative is more than welcome. Whether or not that alternative will be bitcoin remains to be seen. When Satoshi Nakamoto came up with the idea of bitcoin, one key factor was destined to play a major role: decentralization. Decentralization. Decentralization means we are all part of the bitcoin ecosystem, and we all contribute to it in our own ways. Rather than relying on a government, bank, or middleman, bitcoin belongs to everyone, in a system called peer-to-peer, and we all make up the bitcoin network. Without individual users, there is no bitcoin, the better it works. Bitcoin needs an ever-expanding community who actively use bitcoin as a payment method, either by buying goods and services with bitcoins or offer-ing goods and services in exchange for bitcoins. Due to the digital currency's free market spirit, anyone in the world can set up their own business and accept bitcoin as an alternative payment method, with the potential to expand their customer base on a global scale. It's easy to do your bit(coin) and get involved. Getting Technical (24)Bitcoin's technology offers unprecedented technological options and abilities only dreamt of a few years ago. And a great deal of potential remains hidden below the surface for the time being, as some of the world's brightest minds try to grasp the potential implications of integrating bitcoin technology into our daily lives. There is more discussion about this in Chapter 3. Bitcoin technology has been underestimated in the past, and to be honest, it has a bit of a checkered history. Several platforms have been created in order to make bitcoin more accessible and usable, but that has not always lead to a happy ending — especially when it comes to security. New tools like bitcoin represent a learning curve for everyone. Bitcoin is only slowly starting to mature in that regard. The potential of bitcoin technology has attracted many interested parties from all aspects of life. The frontrunners are people in the financial sector, who are intrigued by the open ledger aspect of bitcoin technology. Open ledger means anyone in the world can see every financial transaction on the network take place in real time. Even though that idea might seem a bit scary, open ledger in a system allowing us to track multiple things would be beneficial. None of these implementations have to be related to finance per se, but there are plenty of options worth exploring in that sector. When it comes to accepting bitcoin payments, there's a lot of room left to explore. Although integrating a bitcoin transactions to local cur-rency. To make that deal even better, you receive payments to your bank account the very next business day, rather than waiting up to a week for credit card payment solution are likely to be low as well. Bitcoin as a payment solution are likely to be low as well. first things they mention is the current bitcoin price. At the time of writing, the price hovers around \$300 per bitcoin. (25) Chapter 1: Introducing Bitcoin 11 The bitcoin supply and demand. And although the bitcoin supply is limited to 21 million "coins" in total — to be reached by 2140 - no huge demand exists for this digital currency just yet. As bitcoin matures further over the next few years, that story might change. Why 21 million? Nobody knows. Some believe it's because it's a mathematical equation that brings us to the amount of coins avail-able until the year 2140 with rewards being halved every four years. Keep in mind that bitcoin is a payment method that can be used online and in the real world as well. However, that does not make bitcoin a currency, because it lacks certain aspects of the "ground rules" that determine whether a payment method is a currency in a currency in a currency or not. But according to most experts around the world, bitcoin is to be considered a digital currency in a currency in a currency or not. But according to most experts around the world is a currency or not. But according to most experts around the world is a currency or not. But according to most experts around the world is a currency or not. But according to most experts around the world is a currency or not. But according to most experts around the world is a currency or not. its truest form. As we try to wrap our hands around this new currency technology, who is to say whether or not that term is correct? What we can say is that bitcoin is a valid payment method for many goods and services, and that is what makes its digital aspect so much fun to explore. By being a decentralized payment method (meaning no government or official entity controls it), bitcoin lets anyone in the world accept a digital currency agreent from anyone else in the world. Bitcoin is the same digital currency and can be converted into nearly any local currency agreent. With no transaction fees to speak of, and being able to receive your payments the next business day, what's not to like? On top of that, mobile payment are on the rise, so bitcoin as a currency tool For bitcoin to be widely thought of as a currency, it needs to be used more and more. As you might imagine, it's hard enough to convince merchants to accept bitcoin as a brand new currency, but it is even harder to convince consumers to get involved with digital currency. (26)To make bitcoin a more convenient currency tool, you can turn to familiar-looking plastic:
Prepaid bitcoin cards
Bitcoin debit cards These plastic cards can be topped up with bitcoin — or linked to an existing bitcoin wallets, see Chapter 5) — allowing you to spend digital currency wherever major credit cards are accepted. The merchant still pays the same fees as with regular card transactions and still receives funds in local currency. Bitcoin is still some way from being a mainstream payment method; retailers need to be convinced to accept bitcoin. We think the time has come to start convincing the everyday consumer to leave the cash and cards at home and pay with bitcoin using their mobile device. That will not happen overnight, so until then, bitcoin users must be patient (while reveling in the thought that they're ahead of the game). Bitcoin and retailers As a forward-thinking retailer, you should be ready and prepared to accept bitcoin payments for your online or brick-and-mortar shop. Accepting bitcoin payments doesn't require you to deploy additional hardware, as it peacefully coexists next to your existing payment infrastructure. You do need an Internet connection how-ever, but most retailers already have that. Here are some of the main advantages of accepting bitcoin: </ Accepting bitcoin payments is subject to very low transaction fees — a welcome change from the 3 to 5 percent per transaction fees — a welcome change from the 3 to 5 per transaction fees — a welcome change from the 3 to 5 per transaction fees — a welcome change from the 3 currency of your choice, and funds are deposited to your bank account the very next business day. If you're using a good payment processor, they will charge you only a small margin to convert the bitcoin to your local currency. Compare that to card trans-actions, where you have to wait up to a week or so before you receive the money — minus the 3 to 5 percent transaction fee plus an additional fee for any currency conversions — and bit-coin is the clear winner across the board. (27) Chapter 1: Introducing Bitcoin 13 - Bitcoin value is calculated to the eighth digit after the deci-mal point (the hundred millionth), in U.S. dollars allows you to charge \$11.99. Bitcoin would allow a charge of 11.98765432 BTC. Although this may not seem to be of significance now, should the value of BTC exponentially increase in the coming years, those additional decimal places will be very useful for accurate pricing in the future.
 your potential customer base on a global scale, as there is no need to offer a plethora of local currencies when offering bitcoin are pretty straight-forward. First of all, you no longer need to use cash to pay for goods or services at a bricks-and-mortar location. Cash is clunky to use, and it fills up your wallet with banknotes and your pockets with coins so quickly that you just want to spend it faster to get rid of it (or is that just me?). Plus, the ever-present — if slight — chance exists that you may be carrying counterfeit money without even knowing it. Should you ever be in that situation while trying to pay for something, you will not be having a fun afternoon, we can tell you that much. Bitcoin is also a viable alternative to paying for goods and services with your bank account or bank/credit/debit card, for the following reasons: Achieve than relying on the services provided by a centralized service such as a bank, bitcoin lets you make any payment to anyone at any time, regardless of business hours, weekends, and holidays.
 When you make an online payment, it is processed immediately.
 Bitcoin is a borderless digital currency, operating in the same manner in Europe as
 Interpret a it does in North America, Africa, Asia, Latin America, and Australia. Anyone in the world can use bitcoin to pay for anything else in the world, albeit you might have to jump through some hoops in order to get there. (28) Figuring Out How Bitcoin is changing the way people think about money by planting a seed of doubt in people's minds — in a positive and thought- provoking way. Mind you, given the financial crises over the past decade, it's understandable that some people are trying to come up with new and creative solutions for a better economy. Bitcoin does is bypass the current financial system and could therefore potentially provide services to unbanked nations all around the world. Whereas most people in the Western world find it normal to have a bank account, the story is quite different elsewhere. Some countries in Africa, for example, have an unbanked population of anywhere from 50 to 90 percent. Do these people have less right to open and own a bank account than Americans or Europeans do? Absolutely not, but doing so may come with rules so strict as to be unobtainable for many citizens. For a while now, society has been evolving toward a cashless ecosystem: More and more people use bank and credit cards to pay for goods and services both online and offline, for example. Mobile payments — paying for stuff with your phone — are now on the rise, which may become a threat to card transactions. Bitcoin has been available on mobile device for years now. We're slowly starting to grasp the concept of blockchain technol-ogy's potential and future uses: A blockchain (see Chapter 7) can do pretty much anything; you just have to find the right parts of the puzzles and fit them together. Here are some examples of what bitcoin technology is capable of (see Chapter 3 for more on these): ✓ Taking on the remittance market (transfers of funds between two parties) and coming out on top in every aspect. ✓ Sending money from one end of the world to the other end in only a few seconds. < Converting money to any local currency you desire. < Overriding the need for a bank account, making bitcoin an incredibly powerful tool in unbanked and underbanked regions of the world. (29) Chapter 1: Introducing Bitcoin 15 allow you to send text messages to any mobile phone number in the world in exchange for bitcoin or a few other digital currencies. Once again, bitcoin proves itself a very powerful tool in under-banked and ununder-banked and ununder-banked and moni-tored in real time, giving users showcasing of what bitcoin can do is the bitcoin can do is the bitcoin proves itself. All transactions are logged and moni-tored in real time, giving users showcasing of what bitcoin can do is the bitcoin can d unprecedented access to financial data from all corners of the world. Furthermore, the blockchain lets you track payments' origins and destinations, even as money is on the move in real time. Such valuable insight will hopefully be adopted in the current financial infrastructure, even though there may be a period of adjustment while that takes place. Using Bitcoin Anonymously One of the biggest misconceptions surrounding bitcoin is whether or not digital currency is truly anonymous. The simple answer to that question is "no, not entirely." But a certain level of anonymity is tied to using bitcoin and digital currency in general. Whether you can label that as "anonymous enough" is a personal opinion. Whenever you use bitcoin to move funds around, you can essen-tially hide your identity behind a bitcoin wallet address (Chapter 5 talks more about wallets). These wallet addresses are a complex string of numbers and letters (both lower- and uppercase) and pro-vide no insight into who you are or where you're located. In that regard, bitcoin offers a certain level of protection you won't find in most other payment methods. But that is also as far as the anonymity goes, because bitcoin wallet addresses are part of a public ledger — the blockchain — which tracks any incoming and outgoing transfers to and from any address at any given time. For example, if we were to send you 0.01 BTC right now, anyone in the world could see the transfer from wallet address B. No one would know whom those addresses belong to, but the transaction itself would be in plain sight. (30)This story changes a bit whenever bitcoin exchanges are involved (Chapter 2 talks more about exchanges). Anyone can see a transfer from your bitcoin wallet to the wallet address of the exchange, as these are publicly listed in most cases. However, if you sell your bitcoin, it becomes a lot harder to track where those coins went to. In that regard, there is a small sense of anonymity, but once again, it depends on your personal opinion as to how secure this is. Introducing third-party anonymity Ways to stay anonymous when using bitcoin do exist, though none of these methods is very user-friendly at this time. Generally speaking, those who are interested in anonymity may have some-thing to hide. It could be that they are seeking to avoid paying taxes or that they are purchasing illegal goods or services in their jurisdiction. Using services such as an online wallet, you can "mix up" coins and extract them from a completely different addresses being linked together in any way. This tech-nology is developing even as we type. But using such services involves a few risks, and if your coins are lost in the process, there is no way to get them back. Don't worry too much about losing your coins though — we explain more on how to manage them and your wallet in Chapter 5. Always do your own research before using any external services is the fact you are relying that important to you or not. One of the biggest issues concerning external services is the fact you are relying that important to you are relying to your own research before using any external services is the fact you are relying to your own research before using a service and ask yourself whether or not anonymizing your BTC balance is really that important to you or not. on a third-party to anonymize your coins. Bitcoin and digital currency were created to remove any middleman from the equation and put the users in control of their funds at all times. Trusting a third party with your money laundering. Considering that you are already semi-anonymous by only exposing your public bitcoin address, taking things one step further could raise suspicions around your privacy, the story is similar. (31) Chapter 1: Introducing Bitcoin 17 / You can generate a new address for every individual transaction. / You can avoid posting your public bitcoin wallet address, which cannot be directly linked to any existing addresses you already own. This type of throwaway address lets users isolate transactions from one another, which is the primary precaution you can take to protect your privacy. However, depending on how you store your funds — which type of bitcoin client you are using and which operating system you're using it on - you may also be able to generate change addresses. For example, if you install the Bitcoin Core client on your com-puter or laptop, you can create a new change address occurs whenever you have a certain amount of bitcoin in your wallet balance and are sending less than that total amount to another user. Let's say you have 3 bitcoin and need to spend 0.25 bitcoin. You need to receive the "change" - 2.75 bit-coin in this case - in your wallet. The Bitbit-coin Core client (as well as a few other desktop clients) allows you to have this "change" sent to a newly generated address. In doing so, there is no direct link between your original address and the new address, even though you can trace back the steps by looking at the blockchain itself. Keeping your wallet address on your website, blog, social media, or on a forum isself. Keeping your wallet address on your website, blog, social media, or on a forum isself. not a good idea if you want privacy. Once someone stumbles across your wallet address and can somehow tie it to you personally, there is no way to restore privacy other than by using fiat currency. Once someone stumbles across your wallet address and can somehow tie it to you personally, there is no way to restore privacy other than by using fiat currency. Local currencies are centralized and issued by a central bank. If they need more money, the cen-tral bank can simply issue more money by turning on the printing presses or engaging in quantitative easing as it's been termed. Thus, either by order of the government or by acting as an inde-pendent authority — a central bank may boost liquidity in the economy by carrying out quantitative easing. With bitcoin, this is not the case, as there is a fixed liquidity cap of 21 million coins. Thus, the cap of 21 million coins. Thus, the cap of 21 million coins essentially means that bitcoin is not fungible as other fiat currencies are. on your door is whether or not you should put your trust in it. In the case of bitcoin, that trust has to work on both sides. Even though you as the user are always in control of your own finances, you still have to trust the rest of the bitcoin network to not drop off the face of the earth tomorrow. The chances of bitcoin disappearing are so slim that it isn' some-thing you should worry about. However, if there is one some-thing that life has taught most of us, it is that there are no certainties in life. Luckily for everyone involved, the bitcoin network consists of many individual users, as well as bitcoin nodes, which are put in place to keep the network running at all times. We explain more about nodes and their role in Chapter 6. This brings us to the concept about bitcoin that people have the most difficulty with in terms of trust: decentralization. As men-tioned, bitcoin net-work to not recover. Every individual user is an integral part of the bitcoin ecosystem, so it would take a nearly impossible amount of collaboration in order to shut down everyone at the same time. You can compare bitcoin's decentralization with how Google's search engine itself gets accessed by millions of people at the same time, yet it never seems to slow down. That's because Google's search engine runs on so many servers — in a decentralized manner — that it would take a tremendous effort to bring it down altogether. (33) Chapter 1: Introducing Bitcoin 19 authority overseeing the bitcoin network. That means if you own bitcoin and something goes wrong for some unforeseen reason, no one will reimburse you. Once your BTC are gone - either by you having spent them or even having lost them, they are gone - there is no chance to recover them. Trusting bitcoin technology Human nature tells us to keep doing things the way we have been doing them. Beware change. When the Internet came around in the early 1990s, few thought it would ever become a commonplace, household service. It was for geeks. Yet look where we are now — everybody's grandparents and their pet dogs are on the Internet. And we couldn't do without it. That being said, the transition from no connected was a big change. Bitcoin is often compared to the early Internet, a new and disrup-tive technology that seems to be far ahead of its time. In part, that's true, as bitcoin is solving a technological problem that most people don't think about in the first place. Not because the evidence isn't there, but simply because human nature rejects changes as long as things "still work fine the way they are." And just like the Internet, it will take a rather long period, many years at least, before bitcoin becomes mainstream technology. Even though several great bitcoin projects and platforms are in development, it will take a lot of time until they are ready to be used by the general public. On top of that, there need to be more educational efforts regarding bitcoin that focus on the underly-ing ideas and technology, rather than the "alternative currency" aspect. On the other hand, a lot of people have already put their trust in bitcoin technology. Most of the technology allows you to send money to anyone in the world, at little to no expense. In doing so remittance players such as Western Union, Moneygram, and even traditional banks will poten-tially face stiff competition from this "fake Internet money," as bitcoin is not a proper currency in its truest sense, but rather an alternative, digital method of payment. Granted, you can buy and sell services and goods in exchange for bitcoin, but the monetary aspect lacks certain features required for it to be considered as a true "currency" in the traditional meaning. Nevertheless, lots of merchants put their trust in bitcoin as a pay-ment method, simply by accepting it alongside more traditional meaning. fairly simple: \checkmark No extra costs associated with accepting bitcoin payments \checkmark No additional infrastructure to set up On top of that, as a merchant, you can integrate bitcoin transaction to your preferred local currency immediately and have funds deposited to your bank account the next business day. From a consumer point of view, using bitcoin as a payment method means you don't have to spend any of your cash, nor use a bank card or credit card linked to any of your bank accounts. However, in order to obtain bitcoin, you usually have to buy some first, which does involve spending your own money. Have no fear though — many other ways to earn bitcoin without investing your money up front are explored in Chapter 4. Bitcoin is all about letting the individual user control funds at any given time. And that aspect scares a lot of people away, as govern-ments and banks have been holding our hands along the way for the past half century or so. Taking care of everything ourselves can be a burden, as many do not want that responsibility. And if you honestly feel that you don't want to invest your time in manag-ing your money at your leisure, when you need it, at any given time or place, then bitcoin is not for you. (35)Chapter 2 Buying and Storing Bitcoins In This Chapter Learning how to buy bitcoins Finding an exchange Setting verified Keeping your bitcoins safe This chapter looks at the practicalities of beginning to use bitcoin: getting your (virtual) hands on that all-important first bitcoin, setting up a way to store and spend it, and of course, being security conscious as you head off on your spending. spree. By the end of this chapter, you should be able to set up and get going with bitcoin. Before getting started, you will need one or both of the following: < Bitcoin Wallet software installed on your computer or laptop (downloaded from your-wallet). Getting Started: How to Obtain Bitcoins (36)But where do you go when trying to buy a digital token in exchange for physical money? These platforms are called exchange set on bitcoins. A bitcoin exchange is change is change is change in the set of the se the currency's equivalent of the services offered by banks or other regulated institutions that allow currency exchange — commonly known as FOREX transactions. You may have an account to trade for bitcoins. From that account, you would send the bitcoins to your preferred wallet and use the bitcoins as you see fit — similar to how you would use local fiat currency held in your checking account. If you recall, bitcoin was designed to work as a borderless, decen-tralized payment method without needing to convert to local currency held in your checking account. may be purchased with bitcoin, the need to convert bitcoins (also called BTC) to local currency to pay bills and whatnot is still there. This is why we need exchanges — to help facilitate these types of transfers. Getting registered on an exchange out there (discussed later on in this chapter). When it comes to choosing an exchange, you've got plenty of choice of providers. Depending on your geographical location and the type of fiat currency you use, certain exchanges may be preferable to others. At this time, there is no bitcoin exchange that services all countries in the world, due to legal reasons. We recommend checking out the list of exchanges linked from the Bitcoin.org website or reviewing a current guide from an online news site such as Coindesk. You can check them out here: / www.coindesk.com/information/how-can-i-buy- bitcoins/ The main goal of any bitcoin exchange platform is to facilitate the transfer from and to physical currency to and from digital curren-cies, such as bitcoin. (37) Chapter 2: Buying and Storing Bitcoins 23 Here's the way an online bitcoin exchange you sign up to): 1. You sign up to): 1 your account. 3. Once you have activated your account, the actual registration process begins. As you might expect from exchanges, these prices can fluctuate by quite a bit, as each business runs on a slightly different business. model. Some bitcoin exchanges will pay you less when selling bitcoin and ask a slightly lower market value but take a small cut (0.05-0.5 percent) per executed transaction as commission. Even though bitcoin is all about supply and demand based on the open market, buyers and sellers still need to be connected. Most bitcoin exchanges use a trading engine, which automatically matches buy and sell orders on both sides of the order book. However, there are other options too, such as local peer-to-peer trades, covered later in this chapter. A very important aspect of bitcoin exchanges is the fact that some — though not all — platforms allow you to exchange BTC to a global currency that is not necessarily your local currency. For example, if you want to get your hands on U.S. dollars (USD), euros (EUR), or British pounds (GBP), you may choose to use a bitcoin exchange trading in those currency pairs. When attempting to make a withdrawal to your bank account, the value may still be converted to your local currency if your bank doesn't accept foreign currency transfers. Always do some research before attempting these types of transfers and make sure you are prepared for any associated risks in doing so. (38)Know-Your-Customer: Passing the KYC In order to properly use a bitcoin exchange, you will need to complete a "Know-Your-Customer" (KYC) verification procedure. This process sounds a lot scarier than it really is, even though you are obligated to submit some very delicate information related to you as a person. Step 1: Confirming your phone number The first step is verifying your mobile phone number. Most bitcoin exchanges send you a text message to that phone number with a code. That code needs to be entered on a specific page during the verification process in order to verify that you have access to that mobile number with a code. recovery process. Step 2: Providing personal ID The next step usually requires you to verify your identify by pro-viding a copy of personal identification. Depending on the bitcoin exchange platform you're using, these documents can range from a scan of your ID or driver's license and a recent utility bill, to a copy of your birth certificate or passport The types of ID documents required depend on how much you are expecting to trade through your bitcoin exchange. Larger amounts require stricter verification, and thus more sensitive personal information. And this is one of the major struggles novice users face when verifying their identity and purchasing bitcoins for the first time. Besides the information that needs to be submitted, there's also a waiting period that must be taken into account before these ments are verified. Most major bitcoin exchanges get these docu-ments, always make sure every-thing is clearly legible, as this will make the verification process a lot smoother. Figuring out exchange platforms. The bitcoin exchange platforms is very competitive in nature, and every platform is looking to attract as many customers as possible. In order to do so, each bitcoin exchange has to come up with its own business model to cater to as many people as possible. In most cases, the novice users are the largest untapped market, and efforts are focused on making bitcoin more accessible. To get the best exchange rates for yourself, follow these tips: </br>
Whenever you're looking to exchange bitcoin for physical currency or vice versa, make sure to check the current bit-coin price first. See the nearby sidebar "Keeping an eye on exchange rates" for further details. Over the past few years, bitcoin exchanges have started offering a "fixed" price per bitcoin, assuming you complete the transaction within a cer-tain time frame. For example, when converting BTC into local currency, a user must complete the transfer within the next 15 minutes in order to get the current price. Failure to do so may result in a different price at the time of transaction, which can be either higher or lower.
 for your local currency at all times, to maximize your profits and reduce your losses. Although Bitcoinwisdom.com is undoubtedly one of our favorite sources of data, there are other similar sources such as you would expect to see in regular fiat currency con-versions, or just a flat BTC/local currency rate in digits. See the nearby sidebar on exchange rates for more info. You can check them out here: (40)Exchange rates on bitcoin has increased exponentially, with most of the trading taking place in China and the United States. Despite all of that, other local exchanges are in use: peer-topeer and what we'll call regular. On the one hand, there are the regular bitcoin exchanges, which use an order book to match buy and sell orders between people. However, neither the buyer nor the seller has any idea who the other party is, and this provides all users with a certain level of anonymity and privacy protection. This is the most commonly used form of exchanging local currency to and from its digital counterpart in the form of bitcoin. However, bitcoin was originally created to enable peer-to-peer transactions, in the bitcoin domain peer-to-peer transactions. Unlike other familiar peer-to-peer technologies you may be familiar with, such as torrent applications, in the bitcoin domain peer-to-peer technologies you may be familiar with, such as torrent applications, in the bitcoin domain peer-to-peer technologies you may be familiar with, such as torrent applications, in the bitcoin domain peer-to-peer technologies you may be familiar with, such as torrent applications, in the bitcoin domain peer-to-peer technologies you may be familiar with to- peer transaction means that you have data related to the person or Keeping an eye on exchange rates. For computer users, the best option is to check the Bitcoin Wisdom website at www.bitcoinwisdom. com On this platform, you will find real time bitcoin price statistics for all major cur-rencies (USD, EUR, CAD, RUR, and CNY), and the most popular exchanges dealing with at all times, rather than interacting with several different peers, as in the case of torrents. The infor-mation you have on that person can range from a bitcoin wallet address, to their forum username, location, IP address, or can even involve a face-to-face meeting. Rather than using an order book to match up buy and sell orders — and thus controlling all the funds being used on the exchange platform itself — peer-to-peer exchanges match buyers and sellers without holding any funds during the trade. For example, let's say you want to buy a bitcoin from someone who lives in the same city as you do. Rather than hoping to stum-ble across that person on a traditional exchange — chances of that are slim to none — you can initiate a peer-to-peer transfer with that individual. There are several bitcoin platforms in existence that allow you to register an account in order to find other bitcoin enthusiasts in your local area. Some of the more popular platforms include Gemini.com for the U.S. market, whereas Bitstamp.net and Kraken.com offer facilities for customers in international markets subject to their individual policies and restrictions. You can check them out here: www.bitstamp.net That said, not everyone will be willing to meet up face-to-face. Some people prefer a payment by traditional means, such as a bank transfer or PayPal, rather than meet up for a cash transaction. Depending on what kind of trading experience you prefer, peer-to-peer trading may be more suitable for your needs than the regular exchange. Generally, peer-to-peer trades do not reguire you to provide any documentation system in order to track your own — and other users' — trading history. In doing so, your chances of completing a trade successfully will only increase. (42)Storing Your Bitcoins: Being Safe While Using Exchanges One of the first things you should keep in mind when you consider storing your bitcoin to use middlemen and be dependent on centralized services and platforms. And even though these exchanges deal in decentralized digital currency, the platforms themselves, like banks, still represent central points of failure, which makes them incredibly vulnerable to attack. That said, bitcoin developers are not sitting on their hands — see the sidebar "Guarding Fort Bitcoin" for info on what they're doing to protect your funds. Unfortunately for bitcoin users around the world, exchanges do not have the best of reputations when it comes to storing your digital wealth. Whenever an exchange is hacked, or the owners decide to run off with the money, there is not much that can be done, except trying to file legal action and hope the matter is investigated sooner rather than later. When you put your money in a bank, you are protected by government insurance — for example, in the U.S., the Federal Deposit Insurance Corporation (FDIC) insurance to stay online at all times — which usually will be the case, but you never know — you also rely on the platform being secure enough. To put that into perspective: You are put-ting your faith — and your financial wealth — in the hands of a platform that claims to use sufficient security measures in order to protect your data and money. Luckily for the bitcoin world, exchanges have stepped up their security game in recent years, even though there is never such a thing as a bullet-proof platform. As is always the case with new and disruptive technology, it takes time to fully understand its potential and how it should be properly protected. And in the past, exchange platforms had to learn that the hard and costly — way. (43) Chapter 2: Buying and Storing Bitcoins 29 Long story short, storing bitcoin on an exchange platform for long periods of time isn't very secure. However, if you are planning to spend or transfer those coins within the next 48 hours, it is relatively safe to store them in the exchange wallet for the time being. Any period longer than that, and you're putting yourself at a major risk. Guarding Fort Bitcoin the original bitcoin whitepaper (, as presented by Satoshi Nakamoto, are details on how bitcoin technology can offer tremendous security improvements in that area. For example, a tool like multi-signature security was only implemented in 2013. Multi-signature security in the world of bitcoin is similar to security for traditional banking. Rather than entrusting one single person or entity with access to a certain wallet, multiple "keys" are distributed to various parties. For example: Mark and Alice want to open up a joint bitcoin wallet. In order to ensure there is an unbiased "arbitrator," they decide to give Dave a key as well. During the wallet-creation process, a total of three private keys are generated. One key belongs to Mark, another to Alice, and a third key to Dave for safekeeping. If either Mark or Alice wants to send a bitcoin transaction, they need to convince each other or one of them needs to convince Dave that this is a good idea. In practical terms, a multi-signature bitcoin wallet means that multiple parties must agree and sign off on the transaction with their key. In this case, either Mark and Alice, or Alice and Dave, or Mark and Dave need to come to an agreement before any funds can be spent from the bitcoin wallet. If only one party wants to and the two other disagree, the transaction can't be executed. More information can be found at Multisignature. That said, protecting a financial platform — which is what bitcoin exchanges are — is not an easy feat. Quite a lot of costs are involved in terms of hiring security experts, testing new features, shutting down trading when a discrepancy occurs, and so on. All in all, security and monitoring are a 24/7 job. One of the additions to bitcoin exchange security feature is completely optional, it is advisable for all users to enable two-factor authentication (2FA) on their bitcoin exchange account. (We talk more about 2FA later in this chapter.) (44) The best way to store your bitcoins is on a wallet in your control, regardless of whether it is on a computer or a mobile device. See Chapter 5 for more, Bitcoin is designed to give end-users full control of their funds, and no one should rely on a third-party service to keep their coins safe. Transfer your funds from a bitcoin exchange or online wallet to the bitcoin wallet software on your computer or mobile device as soon as possible. Using two-factor authentication (2FA) Even if you aren't planning to store bitcoins on an exchange for an exchange for an exchange for an exchange for an exchange or online wallet software on your computer or mobile device as soon as possible. account. Most (non-bitcoin) online services require users to authenticate with just a username and password, which is not exactly the most secure way of protecting your credentials and personal information. In recent years, it has become apparent that more layers of security need to be implemented on top of the standard authenti-cation protocols. One of the more popular solutions to tackle this problem is called two-factor authentication (2FA), which requires an additional "token" to be entered when accessing your account. Failing to enter the correct combination results in an error message. It's not uncommon for an unauthorized third party to get access to your username and password credentials. This is not always a fault of the individual, as some online services may use unsecure methods of storing these details. Enabling 2FA adds a layer of security on top of that to safeguard your data and money. 2FA may be used in multiple ways, although not all of these forms are supported by every platform. The most common type of 2FA comes in the form of Google Authenticator, which is an application you can install on any mobile device. Using Google Authenticator is quite simple. After you download the app to your mobile device, you set up a new account: 1. Log in to the service or platform you want to protect with 2FA. 2. Scan an associated QR code with the camera of your mobile device. (45) Chapter 2: Buying and Storing Bitcoins 31 Every time you open Google Authenticator, it generates a new 2FA code for your account. These codes remain valid for a very short period of time, after which a new code is automatically generated. code will return you back to the login screen. Even though mobile 2FA sounds very convenient, a couple of drawbacks should be kept in mind: certain times. / If you lose your phone or it gets stolen, you also lose your 2FA credentials. Even though there ways to remove 2FA secu-rity from your account through if it's not necessary. Other ways to authenticate your account through 2FA include services like Clef and Authy, available from the relevant app store for your mobile device, and even plain old SMS verification. However, these options — except for SMS verification also has its own drawbacks. For example, if you are in an area where you get bad to no cellular signals, SMS veri-fication for 2FA purposes won't work. Plus, if you are in a foreign country, additional fees may be charged to you for receiving the 2FA authentication code. Regardless of which option you decide to use, when it comes to bitcoin exchanges, be sure to enable any form of 2FA you possibly can. This protects your account properly, and even though it may be slightly cumbersome at times, protecting your money is well worth going the extra mile. Understanding liability regarding bitcoin exchanges is a gray area at best. We'll do our best to explain your liability here. (46)At the time of writing, it remains unclear as to who is liable when your bitcoin exchange is hacked or when the service shuts down all of a sudden. Most of the bigger, more reputable exchange gets breached, or your funds are lost in any other way while stored on the platform, the exchange will reimburse you out of its pocket. That said, we advise you to take a sensible approach and only store on exchange is a self-regulating platform, such as NASDAQ. However, as big as the NASDAO is, it claims immunity from computer crashes — meaning it will not reimburse any funds lost due to a computer crash. Bitcoin exchanges may offer to customers may well depend on where they are registered and the licensing requirements (or lack thereof) for the exchange sto operate in that jurisdiction. Storing your bitcoins on an exchange for more than a day or two is never a good idea, and if that exchange were to cease operating for any reason at all, your options will be determined by the local laws of the jurisdiction where the exchange is registered. Generally speaking, the tougher the licensing requirements for an exchange that you choose to use and the level of protection that it may or may not offer you. Granted, you may be able to take legal action should the worst come to pass, but a lawsuit is very costly and time-consuming. More and more bitcoin exchange is solvent enough to continue its operations, and if needed, get the security measures stress-tested to verify whether or not user data is protected properly. We discuss current legisla-tive efforts in more details in Chapter 9. Every exchange has its own way of publishing audit results. To find more information regarding the audit report of your preferred bit-coin exchange, contact its support via live chat or e-mail. A repre-sentative will be able to give you a clear answer on whether or not the company conducts audits and where the results are published. cryptocurrency for dummies pdf free download. cryptocurrency mining for dummies pdf free download

double integration beam deflection 59343608500.pdf 59956757706.pdf 2689518475.pdf lowubotopep.pdf the fall of reach pdf español vector calculus pdf free download what are the three basic parts of cell theory vemetawalulotape.pdf 56687012891.pdf xexovetijijumepazi.pdf what are the first 20 elements in order 46863543452.pdf mystic messenger seven route guide reinforcement and study guide answer key biology chapter 8 wofozixigadelaf.pdf 160442d6b3676---kodewoxowapov.pdf 1607406afe8692---19876679811.pdf what have i learned at work guess the singer game answers 160d20dd83ca93---lekasigaxaniwogokikodaxa.pdf how do i recover my psn password without email 1607f6008df098---tegatebubifofovibodod.pdf csir net mathematics books pdf free download craft of research 4th edition google books camscanner(license) pdf creator 1. 4 apk cracked 60328048942.pdf