

A Business Primer on the Bitcoin Ecosystem

Erik Voorhees

June 29, 2012

Summary

The following is a primer on the new financial technology known as "Bitcoin." It describes the utility of the system, the types of companies and individuals who use it, and some of the risks and opportunities presented.

Overview of Bitcoin

"Bitcoin" is a growing financial software tool comprised of both a payment network (written as "Bitcoin") and a currency used within that network (written as "bitcoins"). Bitcoin is both free-to-use and open-source, with no central controlling party.

Bitcoin is *not* a company nor organization. It is best thought of as a technology protocol, like VoIP or HTML.

Thus, just as anyone can use VoIP technology and build systems around it, so too can anyone use and build systems based around Bitcoin. Just as with VoIP, Bitcoin is usable in any country with internet access. Just as VoIP hugely lowers the cost of transferring voice across distance, and email lowers the cost of transferring writing across distance, Bitcoin lowers the cost of transferring money across distance. Whereas VoIP and email apply the efficiency of the internet to vocal and written communication, Bitcoin applies the efficiency of the internet to money itself.

Bitcoin's adoption, while still in the early stages, is thus inevitable unless something even better than Bitcoin replaces it, or a serious flaw in the protocol is discovered (the same phenomenon is true with VoIP). Because Bitcoin offers the potential for global business (and individuals) to save tens or even hundreds of billions of dollars per year (from a reduction in transfer costs and fraud risks as well as wholly new service possibilities), the economic case for increasing adoption is compelling.

To protect the authenticity of bitcoin transfers, advanced cryptography is built into the protocol instead of relying on any central, trusted party (this was thought to be impossible until Bitcoin accomplished it). This cryptography and decentralization

ensures the system is impervious to tampering - bitcoins are mathematically guaranteed to be valid.

It is important to understand that the Bitcoin network is a limited system - it only allows for the creation of accounts and for the transfer of bitcoins (as a currency unit) from one account to another. Nevertheless, entrepreneurs are building many auxiliary services which contribute to a blooming ecosystem of applications (similar to how the internet was not very useful before thousands of companies sprang up to give the technology value). As each new service provider comes online, the Bitcoin system becomes more valuable and resilient.

Many people have wondered from where Bitcoin gets its value, though the answer is quite simple. Because the currency units are scarce (21 million is the maximum that will ever exist), secure, and useful, they command a market price which fluctuates with supply and demand (the number of sellers and buyers at any given time). This exchange rate can be highly volatile, but is becoming (as expected) more stable over time as the market matures and grows in depth.

Speaking to its usefulness, Bitcoin is increasingly being adopted as a payment method for online commerce because it carries several advantages over traditional payment methods such as credit cards, bank wires, or PayPal. Unlike traditional payment methods, Bitcoin transfers carry no necessary fees (credit cards and PayPal have fees around 3% per transaction). Further, Bitcoin payments cannot be reversed, meaning a merchant can feel completely safe receiving a Bitcoin payment, because it will not be withdrawn days or weeks later. This greatly reduces risk for a merchant, and especially makes international business far safer. Finally, from the consumer side, Bitcoin accounts are not attached to personal identifying information. This means consumers do not need to expose sensitive financial data every time they buy online. Fraud from the theft of credit card information and personal identities is in the hundreds of billions of dollars per year - Bitcoin solves this problem completely because consumers are not leaving their personal address, billing info, and other vulnerable identity information with every merchant from whom they purchase goods and services. Bitcoin thus offers a far more secure, and far less expensive, way for business to be transacted online.

With that basic understanding of Bitcoin, we can observe the various types of Bitcoin users and companies which cater to them:

- Exchanges
- Infrastructure Providers and Processors
- Retail Services and Vendors
- Bitcoin End Users

Exchanges

As bitcoins operate like a currency, they can be purchased at various currency exchanges (just as one might go to Travelex at the airport to buy euros based on the current market price). These exchanges enable users to buy and sell their bitcoins for other currencies, and there are exchanges for almost every major currency, from EUR to CNY to ZAR.

There are dozens of exchanges around the world, but only a handful of significant ones:

- MtGox.com (roughly 75% of all Bitcoin exchange volume)
- BTC-E.com
- BitStamp.com
- CryptoXChange.com
- Intersango.com
- VirWox.com
- BTCDE.com
- CampBX.com
- CAVirtex.com
- Bitfloor.com

Exchanges operate in different jurisdictions and thus comply with their local laws as well as certain international AML standards (again, similar to normal currency exchangers in various countries). Each exchange carries different policies, but in general exchanges set certain KYC thresholds and if a customer breeches a certain threshold he or she must provide adequate identification. Typically, the thresholds are most strict when customers withdraw funds (in any currency, whether bitcoins, euros, dollars, etc.).

Exchanges charge a small commission on each trade to earn their revenue (typically around 0.5%).

Infrastructure Providers and Processors

As mentioned, Bitcoin itself is limited in scope and functionality - it is a currency and transfer system and nothing more. Therefore, numerous companies and organizations have launched to offer the value-added infrastructure to make Bitcoin useful. Companies such as BitInstant and AurumXChange help customers get their funds efficiently from a bank account to an exchange website. Other companies, such as Coinbase or Blockchain.info, provide online wallet systems where funds can be safely stored. Certain other organizations help develop the core Bitcoin software,

or promote industry best-practices (for security or data handling), or provide market, trade, and economic data (such as BitcoinWatch.com or BitcoinMonitor.com)

Depending on the specific service, some infrastructure companies handle funds, store funds, transfer funds, or never do any of the above. Thus, each is handled differently from a legal point of view. Some companies, such as BitInstant, handle standard currency funds (USD) but do not transact or deal directly in bitcoins. BitInstant itself is categorized as a "seller of pre-paid access" and other services may fall in the same category depending on their business model.

Again, as with traditional payment processors and money services around the world, the legal framework in which Bitcoin services operate may vary based on location and the specific service provided.

Retail Services and Vendors

This category includes all the standard vendors and merchants selling goods and services which accept Bitcoin as a payment method. Anyone, anywhere in the world, can elect to receive Bitcoin in this way (just as a company may choose to accept silver coins or Australian dollars as payment).

Typically, Bitcoin makes the most economic sense for online retailers selling in an ecommerce environment (especially if they have international customers or have a high chargeback risk, which Bitcoin solves). Bitcoin payments can be easily integrated with most standard shopping cart software, so vendors selling anything online from computer equipment to graphic design services to online storage may accept Bitcoin. A few examples of current vendors accepting Bitcoin:

- **Wuala** - LaCie's cloud storage company
- **FreeTalkLive** - nationally-syndicated radio show
- **MemoryDealers.com** - networking equipment
- **Judge.me** - online arbitration and dispute resolution
- **OKPay** - international payment network
- **SpendBitcoins.com** - purchase from Amazon, NewEgg, Frontier Airlines, etc. with Bitcoin
- **Coinabul** - seller of gold and silver bullion
- **Mullvad** - VPN security provider
- **Cinfu** – web hosting
- **Array Design Studio** - graphic and web design services

When a customer pays a vendor with Bitcoin, the bitcoins are "pushed" from the customer's Bitcoin account instantly to the vendor's Bitcoin account just as if the

payment was occurring physically with cash. It is important to note that only the currency itself is transferred to the vendor, not any personal or sensitive identity or financial information (as happens with credit cards). Thus, the customer knows she does not need to worry about exposing this sensitive data to a vendor who may be careless with it, and the vendor similarly doesn't need to collect and store such information (thereby removing liability risk). Note that if a vendor wishes to collect certain information about the customer, he is free to request it during checkout, but the Bitcoin system itself does not require such information to be collected by default.

The business case for accepting Bitcoin is a powerful one. Consider that many online merchants may have a profit margin of only 3-5%, and consider that these merchants pay Visa/Mastercard/PayPal about 3% per transaction. With a Bitcoin payment, there is no 3% fee to these processing companies, and this savings goes directly to the bottom line of the merchant. Consider also that Bitcoin removes all chargeback risk and payment reversal liability from the merchant. Thus, a merchant can see profits increase by 100% when customers pay with Bitcoin (if they had a 3% profit margin, and then saved an additional 3% from the lack of Bitcoin fees, their profit margin has doubled, even before accounting for the zero chargeback risk savings).

It is only a matter of time until wise companies start taking advantage of Bitcoin, for it enables them to lower their prices and undercut their competitors.

Bitcoin End Users

A Bitcoin User is anyone who operates the Bitcoin software or owns or spends bitcoins themselves. Individuals may use Bitcoin for any number of purposes (just as individuals may use US dollars for myriad things - anything one can do with US dollars, one can theoretically do with bitcoins). Several of the most popular uses are examined below:

- Speculation/investment
 - Savings
 - Donations
 - B2B or contractor payments
 - Purchases of goods/services
 - FOREX and arbitrage
 - Bitcoin-specific services
- As Bitcoin is still in its early period of adoption, some Bitcoin Users are simply acquiring bitcoins as a **speculative investment** (similar to how investors acquire gold or stocks to speculate on appreciation). These Users do not necessarily "use" Bitcoin for anything beyond merely taking possession of it and storing it for

some period of time. Incidentally, the money paid by these speculators is paid to the former owner of the bitcoins, who often use these funds to then build the Bitcoin infrastructure and businesses which make the system more valuable in the future and thus worthy of speculation.

- Other Bitcoin Users may wish to use bitcoins as a simple means of **storing or diversifying wealth**. As fiat currencies tend to depreciate over time due to inflation, bitcoins are mathematically immune from perpetual supply expansion, and thus may offer a better store of value in the long term. Like the above category of speculators, these Users are acquiring bitcoins merely to hold them.
- **Donations to organizations** around the world make up another significant use for Bitcoin. In fact, Bitcoin is the ideal form of payment for donations, as tiny fractions of a dollar can be sent, enabling crowdfunding on a massive scale. Further, the organization does not need to suffer 3% fees on each donation, and individuals from any country in the world can donate to any other country without hassle (PayPay, by contrast, only works in certain countries).
- Another large group of Users are those who work internationally with **freelancers or other international B2B arrangements** for which Bitcoin makes economic sense. Because Bitcoin carries no fees, both the payer and the payee may be made better off when transacting in Bitcoin than in traditional currencies. Further, Bitcoin payments are instantaneous, and have no weekend or holiday closures, offering significant benefit for individuals in disparate parts of the world.
- Still more users acquire Bitcoin specifically to **spend them with vendors**. Because vendors have no chargeback risk, and pay no processing fee, they can offer slightly lower prices to customers who pay with Bitcoin. Smart shoppers can increasingly acquire Bitcoin and spend it for the things they would otherwise buy with credit card or PayPal, and thus save a fraction of the cost each time.
- Bitcoin users also engage in **FOREX trading and arbitrage**. Because Bitcoin transfers are instantaneous and international, smart traders can use it as a tool to edge out competition in competitive exchange markets (instead of waiting three days to move funds from one market to another to take advantage of a price differential, Bitcoin can be sent instantly and without a fee, making smaller spreads profitable where before they were not).
- Finally, Bitcoin Users acquire bitcoins to use with **sites and services which are only compatible with Bitcoin**. Examples include FeedZeBirds.com (a Twitter

micropayment advertising platform) or BitcoinChipIn.com (a crowdfunding tool). These sites were not possible before Bitcoin technology, and thus can only be accessed by those who have bitcoins. This space is likely to grow substantially, as Bitcoin permits micro-payments which can be applied to a vast number of new services (consider that it's impossible to send \$0.10 to someone on the internet, for the fees are larger than \$0.10, but Bitcoin now makes it possible). Sites that pay authors for writing content, or pay musicians for each track download, will become increasingly commonplace and will only be able to function via Bitcoin.

Risks

Now a few years old and after significant upgrades and improvements, Bitcoin has proven to be resilient to attack. The core protocol itself is highly secure, relying on cryptography and security principles which surpass industry standards for banks and other institutions with sensitive information. Bitcoin is the only currency in existence that has not been counterfeited and the network has never suffered a significant attack (though many attack vectors have been attempted).

With that said, use of the system requires an understanding of the risks involved. Because the currency units themselves are stored on a physical device (whether one's home computer, phone, or on a cloud-based webservice), the security of that physical device must be ensured. Just as storing gold in a vault with an open door would result in theft, so too does the storage of Bitcoin if not properly secured. Fortunately, there are many best-practices to follow and with a moderate amount of instruction, owners of bitcoins can achieve extremely high security.

Further, it is essential to understand that while the Bitcoin network has proven to be secure, the individuals and companies that are involved with Bitcoin may not be. As with any industry, there can be scams or fraud if diligence is not carried out on a company or individual with whom one deals. Bitcoin is like cash, and just as one shouldn't give cash to an untrusted party, the same care must be given when handling bitcoins.

Conclusion

Bitcoin is an extremely flexible, powerful tool for business in the 21st century, yet it is currently in a very early stage of adoption. The potential for cost savings, increased security, risk reduction, international remittances and B2B payments, and a host of new thus-far-unknown systems is significant.

Just as the internet itself was strange, confusing, and limited in application outside of computer tech enthusiasts in the early 1990's, Bitcoin is similarly in an early developmental stage. And like the internet, Bitcoin is a growing, global phenomenon that may be inevitable merely for the fact that it enables such vast increases in efficiency over legacy systems.

All money is essentially digital in today's modern world, yet still it requires tremendous delay and burden for many functions. There is no reason that a digital payment of US dollars from one country to another should take a matter of days, when a digital email is sent and received in a second. Bitcoin makes money as efficient as email. The Bitcoin technology will continue to improve and grow in adoption, and companies that take the first steps into this new realm are likely to find unique opportunities for innovation and growth, so long as they pursue due diligence and fully educate themselves on this unprecedented system.