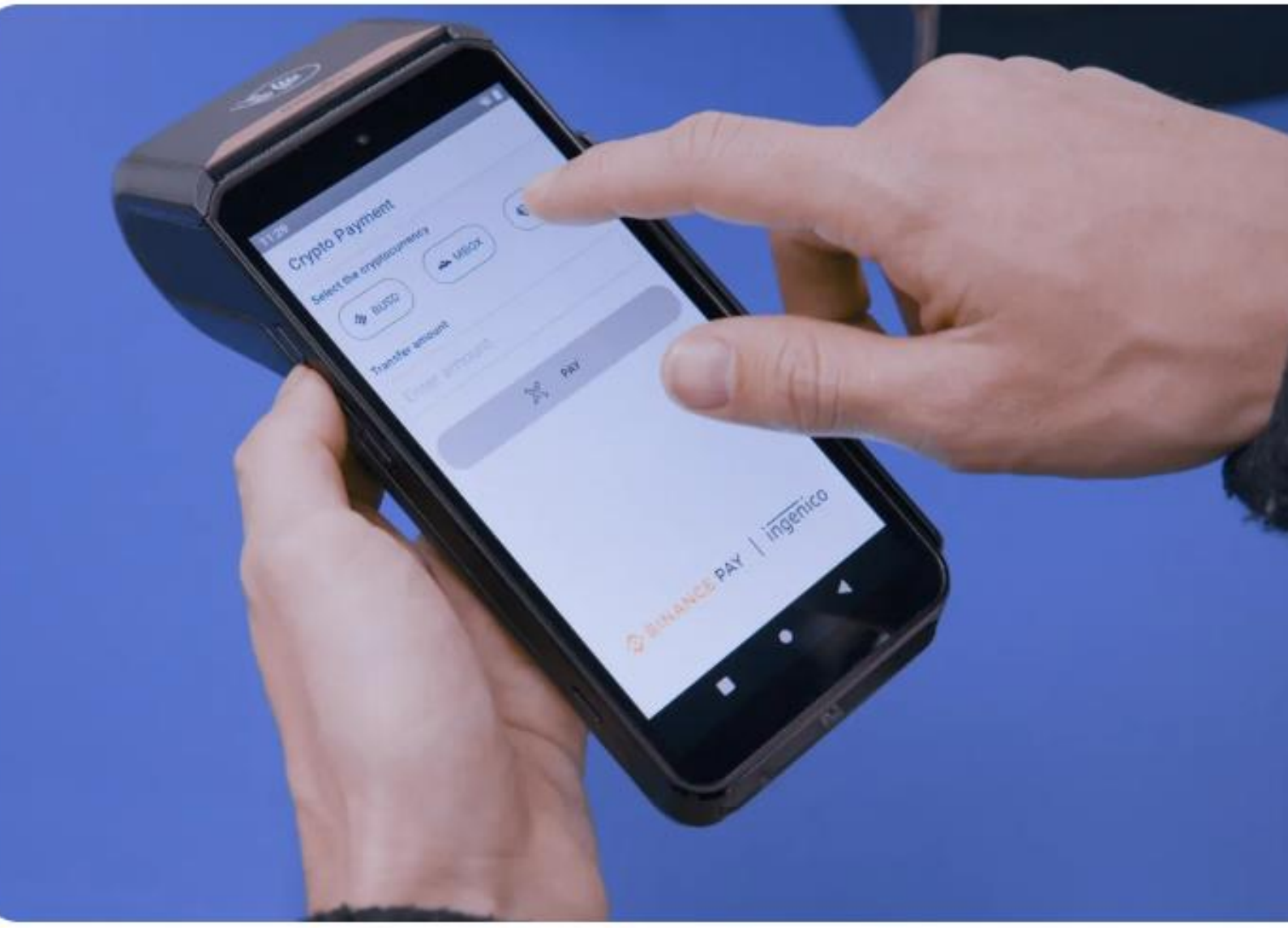
WHITE PAPER

BLOCKCHAIN AND CRYPTOCURRENCIES

Crypto Payments: From Virtuality to Real Use Case



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Introduction

On May 22nd, 2010, Lazlo Hanyecz made history by purchasing 2 pizzas in exchange for 10,000 Bitcoins.[1] This transaction not only acted as the inaugural payment using Bitcoin, but also stands as a significant milestone acting as one of the earliest known examples of mainstream crypto payment.

Bitcoin was initially designed as a "peer-to-peer version of electronic cash to allow online payments to be sent directly from one party to another without going through a financial institution"[2]. Its purpose was to decentralise currency and put purchasing power back into the hands of the people. However,14 years later, and despite this historical pizza purchase, Bitcoin, and cryptocurrency in general, has not been successful in becoming a commonly used payment method.

Although blockchain technology and cryptocurrencies have seen notable growth in the past years, their primary usage is still limited to being a speculative instrument, as well as being a safe haven currency for many countries currently facing economic issues or conflict. For example, in some countries like Argentina the usage of Bitcoin, and more generally cryptos, as currency is particularly adopted as the population is dealing with a staggering inflation rate of 100%.[3]

Even though Bitcoin and its peer-to-peer vision of electronic cash have not yet been successful in becoming a mainstream payment method, a wide variety of crypto payments have emerged over the last years with some merchants readily accepting cryptocurrencies as a means of payment. Top global brands such as Starbucks, Ralph Lauren, or Microsoft have all joined the crypto revolution by offering consumers the means to purchase goods online and within their stores using crypto wallets. However, in a more general sense, businesses operating within specific verticals such as gaming, gambling, luxury goods, travel and digital services, account for most crypto payment transactions.

[1] https://www.indiatimes.com/worth/news/us-man-pays-10000-bitcoins-for-pizza-570056.html

[2] https://bitcoin.org/bitcoin.pdf

[3] https://www.nytimes.com/2022/08/20/world/americas/argentina-cryptocurrency-value.html

With crypto adoption increasing, as well as the emergence of a clear regulatory framework with the establishment of MiCa (Markets in Crypto Assets) in Europe[4] which will be enforced by January.

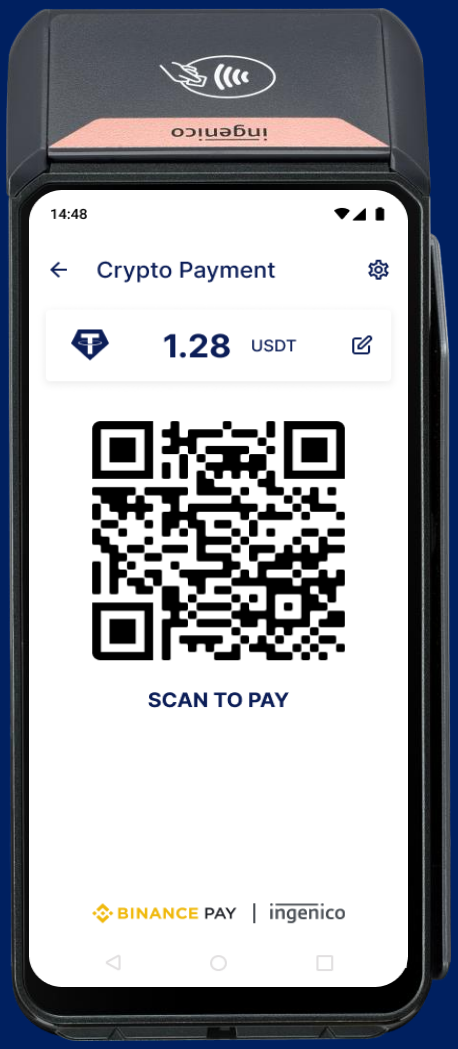
2025, traditional retailers are being primed to move towards accepting crypto payments and are in a better position than ever before to take advantage of crypto payments.

This paper will be divided into four parts:

1. The link between traditional currency and cryptocurrency.
2. The merchant's benefits when it comes to accepting cryptocurrencies
3. The different challenges to face regarding crypto payments
4. The momentum of cryptocurrency: Why is this the good time for merchants to start accepting crypto payments?

[4] https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_23_2364

Contents



Cryptocurrency and payment: The perfect match?

To understand new concepts for currency, we must first explore the long and rich history of payment, currency and transaction. In early societies, bartering was the primary means of exchange, and as societies evolved, various forms of currency began to be introduced to the masses.

One of the earliest forms of currency was the cowrie shell, which was used in Africa, Asia, Europe and Oceania. This shiny shell was valued for its unique shape and durability and started an ongoing payment trend that continued to evolve throughout history.

Around the year 800AD, notes began to emerge as a popular means of payment. This evolution allowed individuals to easily carry around a large sum of wealth without the need for heavy coins. The use of paper money then became widespread, with many governments eventually issuing their own currency.

In the 19th century, cheques became a popular means of payment, allowing individuals to transfer funds from one account to another without the need for cash. This allowed for greater convenience and an extra layer of security.

Nowadays, payment methods such as credit cards and digital payments are commonly used and are favoured by most merchants and consumers.

The usage of so many different payment methods throughout history has taught us that to achieve mainstream success a currency must have an identifiable value system and must meet different requirements. To be adopted by the masses, a currency must be divisible, easy to carry, rare to avoid any counterfeit, and non-perishable to be usable over time and to meet a consensus. Indeed, a currency is valuable when it can be confidently used within a particular group or region for purchasing goods and services. Likewise, merchants will only agree to accept a currency if they have assurance that they can spend it afterwards. In other words, currency is a social norm.

Throughout history, governments and politics have often assumed the role of establishing these social norms. People trust and use a currency because it was issued by a central entity.

However, over the past years we are witnessing an (r)evolution with the emergence of cryptocurrency usage for payment. As defined by the Cambridge Dictionary, “a cryptocurrency is a digital currency produced by a public network, rather than any government, that uses cryptography to make sure payments are sent and received safely”.[5]

Cryptocurrencies emerged with the launch of Bitcoin in 2009, introducing decentralized digital currency based on blockchain technology. Bitcoin’s success subsequently led to the development of other cryptocurrencies like Ethereum and Ripple.

Bitcoin was developed by an anonymous developer or a group of developers using the name Satoshi Nakamoto. It was designed as a potential alternative to traditional fiat-based currencies. A fiat currency is a government-issued currency that is not backed by a commodity such as gold. Fiat money gives the central bank greater control over the economy because it can control how much money is printed. Compared to fiat currencies, Bitcoin advocates for decentralization by offering a decentralized medium of exchange that operates on a complex network of cryptographic algorithms. The system was designed to facilitate peer-to-peer transactions and operate independently from central banks and financial intermediaries. Transactions using Bitcoin, and any other cryptocurrency, are verified through cryptography and recorded on a publicly distributed ledger called the blockchain.

Blockchain is a transparent and secure technology that records digital transactions in a decentralized manner. It uses a chain of blocks to ensure data integrity and relies on consensus algorithms for validation. With the potential to

[5] https://dictionary.cambridge.org/dictionary/english/cryptocurrency

reduce costs and increase efficiency, blockchain has diverse applications across industries by offering transparency and trust in digital transactions.
In summary, Bitcoin's aim was to create a fully decentralized payment system that could offer greater financial freedom and privacy to users.[6]

Bitcoin is not the only cryptocurrency that is currently being used as a popular payment method. Ethereum, which allows the creation of smart contracts enabling more complex payment transactions, or Ripple, which offers fast and low-cost international payment options, have also made their way to the mainstream.
But why would consumers choose to use crypto over payment methods they know and trust? Compared to traditional currencies, cryptocurrencies bring more security when it comes to making transactions as they rely on underlying blockchain technology. These methods also offer built-in traceability and fraud prevention.

Yet, one of the biggest barriers when it comes to Bitcoin and cryptocurrency adoption and crypto payment usage is the volatility of the medium. This is where stablecoins come into the picture.

A stablecoin is a type of cryptocurrency that is pegged to a stable reserve asset like fiat currency (US Dollar, Euro, Japanese Yen) or gold. Stablecoin's aim is to reduce the volatility associated with general cryptocurrencies like Bitcoin, Ethereum and more.

[6] https://bitcoin.org/bitcoin.pdf

The concept of combining the stability of traditional assets with the flexibility of digital assets has gained immense popularity within the payment community. Stablecoins such as USD Coin ("USDC") have attracted billions of dollars in value and emerged as highly favoured options for storing and exchanging value within the cryptocurrency ecosystem.
USDC and stablecoins have the potential to go beyond the cryptocurrency ecosystem. Thanks to its stability and the underlying blockchain technology, stablecoins offer several advantages for everyday use including payment. Some of the key benefits of using stablecoins are as follows:

- **Stability**: Unlike many other cryptocurrencies, stablecoins aim to minimize price volatility. This stability makes them more reliable for everyday transactions, as the value remains relatively constant over time. This means that users can confidently make payments without worrying about sudden value fluctuations.
- **Fast payments**: Stablecoins enable fast transactions. With the assistance of blockchain technology, payments can be processed quickly, eliminating the need for third-party intermediaries.
- **Lower transaction fees**: Stablecoin transactions often come with lower fees compared to traditional payment methods. By leveraging blockchain technology, stablecoins eliminate the need for multiple intermediaries and can reduce overall transaction costs.
- **Financial inclusion**: Stablecoins have the potential to promote financial inclusion by providing access to digital financial services for unbanked or underbanked populations. These individuals can use stablecoins without the need for them to set up a traditional bank account, they only need to create a digital wallet.
- **Transparency and security**: Stablecoins built on blockchain technology offer transparency and security features inherent to distributed ledger systems. Transactions are recorded on the blockchain, ensuring transparency and accountability. Additionally, cryptographic protocols and secure wallet systems provide a high level of security, protecting user funds from fraud.

These characteristics make stablecoin an increasingly popular option for everyday payments. While also providing the solution with the potential to reshape the future of transactions.

Stablecoins are not the only notable evolution when it comes to crypto payments. We recently witnessed the rise of layer 2 blockchains which are also interesting to investigate when it comes to the crypto payment use case.
Layer 2 blockchains such as Polygon, Optimism and Bitcoin Lightning are helping to improve blockchain scalability. In a nutshell, layer 2 refers to a secondary layer of a blockchain network that is designed to enhance the

blockchain scalability i.e., to increase the speed of transactions while reducing costs without impacting the security level.[7]

Let's illustrate layer 2 blockchain with the example of Bitcoin. Currently, the Bitcoin network is only capable of processing 7 transactions per second.[8] When this is compared to a more traditional payment avenue such as the Visa network and its 65,000 transactions per second[9], it is clear that the scalability of Bitcoin is a barrier when it comes to more widespread crypto payment adoption.
Bitcoin Lighting Network solves this scalability issue by increasing the number of transactions per second up to approximately 1 million[10].

Layer 2 blockchains help to solve the scalability issues currently facing most cryptocurrencies, which enables faster and cheaper transactions. With the wide adoption of stablecoins and the emergence of layer 2 blockchains, crypto payments are technically ready to become an important use case, but why should merchants choose to adopt these payment methods?

[7] https://academy.binance.com/en/glossary/layer-2

[8] https://www.ledger.com/academy/glossary/transactions-per-second-tps

[9] https://www.visa.co.uk/dam/VCOM/download/corporate/media/visanet-technology/aboutvisafactsheet.pdf

[10]https://www.kraken.com/fr/learn/lightning-network

The Benefits of Crypto Payment for Merchants

- **Attract new customers**

In addition to providing them with a reputation as a cutting-edge brand, accepting crypto payment would enable retailers to target new customers, helping them to broaden their customer base. According to Deloitte 93% of US retailers, which had crypto payments in place, reported growth in their customer base.[11] Forrester Consulting also confirmed this trend as according to one of their studies, 40% of customers who choose to pay with crypto are first timers to the merchant who was providing this solution[12][13]

Accepting crypto payments does more than just attracting new customers, it also helps merchants to attract younger customers and customers with high purchasing power. It has been shown in different reports that cryptocurrencies are most popular among young adults (18-29 years old).[14]Moreover, crypto-friendly customers' average basket totals tend to be higher than those of their counterparts who prefer to pay using credit card.[15]

One of the core and unique aspect of cryptocurrencies that differentiates them from traditional payment methods is their community and sometimes their fan base.

Cryptocurrencies were designed to be decentralized, meaning that they bear in their structure the capacity to avoid traditional structures that according to crypto enthusiasts withdraws value at several steps of the value chain. Fans of cryptocurrency are convinced that decentralization is a key process that will help to make the financial world more transparent and due to the nature of their disruptive design, cryptocurrencies can help to foster online and offline communities where users share ideas, discuss the latest trends and support each other.

For merchants, accepting cryptocurrencies as a means of payment not only helps them to attract new customers, but also allows them to attract and integrate an engaged community into their list of regular customers. These communities are willing to pay with purpose and often merchants will find that

[11] Merchants getting ready for crypto report by Deloitte

[13] Forrester Study Reveals Benefits of Accepting Crypto

[14] https://www.pewresearch.org/short-reads/2021/11/11/16-of-americans-say-they-have-ever-invested-in-traded-or-used-cryptocurrency/

[15] The Total Economic Impact of Accepting Bitcoin Using Bitpay, Forrester, July 2020

once they engage with members of the crypto community, they will gain customers for life.

- **Lower transaction fee**

Besides the marketing aspect, merchants can benefit from lower transaction fees by accepting crypto payments.

Usually, when a customer pays with a credit or a debit card, the merchant must pay between 1.5 – 3% of transaction fees depending on the countries and the card used. This is known as the Merchant Discount Rate (MDR).
Crypto payments and their underlying blockchain technology can reduce the number of third parties in the value chain. This reduction of third-party intermediaries in the value chain lowers the transaction fee. Therefore, merchants accepting crypto payments and equipped with a turnkey solution are usually charged 1% per transaction, which is lower than the traditional MDR.

- **Better fraud prevention**

Most cryptocurrency payments are powered using blockchain technology, which makes it impossible to change or tamper with transaction data. This makes it difficult for criminals to commit fraud. Additionally, customers can also use two-factor authentication to ensure that their payment is secure.

Current Crypto Payment Challenges

- **Regulation**

The current lack of regulatory framework remains one of the principal barriers when it comes to merchants enabling crypto payments and overall crypto adoption. Without the safety net provided by institutions, investors and retailers are taking the risk of potentially entrusting their funds to fraudulent players. They are also unprotected against significant crashes in the market, similar to the events that occurred last year when FTX, a major crypto exchange, filed for bankruptcy.

Despite certain countries establishing their own regulatory frameworks, there is still no standardized regulatory framework at the regional level. However, with MiCa passed and assurances that it will be enforced by January 2025, Europe will soon see the benefit off standardized regulatory framework. Which in turn might bring reassurance and trust to the European crypto market.

- **Technical barrier**

Another major challenge facing the payment solution is the technical barrier that may create an obstacle for some businesses seeking to adopt cryptocurrency solutions. Accepting cryptocurrency on its own involves in most cases the setting up of a crypto wallet, which may be technically challenging for smaller companies that are lacking experience with the technology. The crypto sector is known to have a relatively high learning curve, which can be a considerable barrier for the uninitatied, one that if it remains unaddressed might drive away thousands of potential users and merchants.

However, with the significant growth of crypto payment gateways and crypto service providers, merchants can now access all-in-one solutions which aimed to remove some of the complexity linked to crypto management. With such services, merchants can more easily accept crypto both in-store and online and get paid in fiat currencies directly on their bank account.

- **Volatility**

It is a sad fact that cryptocurrencies are known to be volatile. When it comes to transactions, it can become risky to use volatile assets. As cryptocurrencies tend to fluctuate more compared to traditional fiat currencies, merchants accepting crypto payment could find themselves exposed to the market risk of these crypto assets. Which can impact on their margin significantly and makes the pricing and discounting of goods a much more difficult exercise when compared to the process of using traditional payment methods.

Nevertheless, with the usage of stablecoins as well as the emergence of crypto service providers offering crypto-to-fiat payment, merchants can now easily set up crypto payment solutions while avoiding volatility issues.

Crypto-to-fiat payment solutions enable the conversion of cryptocurrencies into traditional fiat currencies. It allows businesses to accept crypto payments and convert them into fiat currency, which reduces the risk faced by the business and makes it easier for them to spend their earnings as they have received their payment in the form of tangible assets and funds.

Why Now?

- **Increasing adoption**

2022 was a tumultuous year for cryptocurrency. Despite the unstable global context with various political crises, the FTX scandal, the Terra Luna crash and the tightened regulation on the crypto sector, cryptocurrency adoption is increasing. In France, according to the latest report from KPMG and Adan, 10% of French people currently hold crypto currency in a digital wallet, which represents a 25% increase compared to 2021. The study also states that 1 out of 7 French people have already held at least one cryptocurrency, NFT or stablecoin. In addition, in 2023, 85% of French people stated that they were aware of the existence of cryptocurrencies (compared to 76% in 2022).[16]
In other European countries, cryptocurrency adoption is also flourishing. The Netherlands leads the way in Europe with 23% of respondents stating that they have previously engaged with cryptocurrencies, followed by Italy with 21%, the UK with 18% and Germany with 16%.[17]

Adoption is also coming from merchants, who are expressing a broader acceptance or willingness to accept crypto as a viable payment method. Over the past few months, the market witnessed several announcements from big retailers and brands. In the luxury industry, Gucci, Balenciaga, Tag Heuer and Breitling confirmed that they are now accepting crypto as a means of payment. Other brands such as Vueling, Flying Emirates and AMC Theatres also announced that they will accept crypto payments.
In addition to retailers and brands, merchants are also willing to take the shift toward crypto payments. According to a study released by Deloitte[18]; 73% of US-based merchants plan on internally integrating crypto payment within the next three years.

- **Traditional payment players exploring cryptos**

Crypto payment adoption is also coming from institutions and corporations as traditional payment players have rushed into the crypto market with different initiatives.

On the schemes side, Visa has launched several crypto debit cards in partnership with the biggest exchanges such as the Binance card, the Crypto.com card, and the Coinbase card. Mastercard has also developed

[16] Web 3 et Crypto en France et en Europe. Adoption par le grand public et applications dans les industries from ADAN and KPMG
[17] Web 3 et Crypto en France et en Europe. Adoption par le grand public et applications dans les industries from ADAN and KPMG
[18] Merchants getting ready for crypto by Deloitte

partnerships with crypto players such as Binance[19] or Nexo to offer a crypto debit card. In addition to the crypto card, Mastercard has created a partnership

with Immersve, to deliver web3 payment innovation in Australia and New Zealand.[20]

Payment services providers (PSP) such as Stripe, Checkout.com, Worldline and PayPal have also launched crypto initiatives the details of which can be found below:

- Stripe is active in the crypto ecosystem. Since the decision to stop offering Bitcoin processing in 2018, Stripe has reintroduced themselves into the crypto sphere with different initiatives. In 2022, Stripe partnered with Opennode to convert incoming payments to Bitcoin in real time automatically or on demand.[21] Stripe also developed a fiat-to-crypto on-ramp solution.[22]
- Checkout.com has developed a settlement solution using Fireblocks's infrastructure.[23]
- Worldline partnered with Bitcoin Suisse to facilitate cryptocurrency acceptance for payments both in-store and in e-commerce in Switzerland.[24]
- PayPal used to work with Paxos to launch a stablecoin, though the partnership has temporarily been stopped due to US regulators. In addition to the stablecoin project, PayPal has launched cryptocurrency services in the UK and in the US.[25]

[19] https://www.binance.com/en/blog/payment/binance-and-mastercard-launch-prepaid-crypto-card-in-brazil-1501690616956776269

[20] Mastercard press release

[21] https://www.opennode.com/stripe-apps/

[22] https://stripe.com/docs/crypto/overview

[23] https://www.checkout.com/newsroom/news/checkout-com-becomes-the-first-psp-to-unlock-weekend-settlement-for-merchants-powered-by-fireblocks-crypto-payouts-debut

[24] https://www.bitcoinsuisse.com/bitcoin-suisse-pay/product/worldline

[25] https://www.paypal.com/us/digital-wallet/manage-money/crypto

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Crypto initiatives from traditional payment companies are a clear indicator of the broader desire for more widespread crypto adoption.

- **Government and countries adoption**

In addition to the different initiatives that are being launched by traditional payment players, governments and central banks are also taking a closer look at cryptocurrencies.
Some governments have already embraced cryptocurrencies such as Salvador. In 2021, Salvador became the first country to make Bitcoin legal tender, requiring all businesses to accept the world's leading cryptocurrency.[26] In addition to Salvador, some other countries or states have launched crypto payment initiatives. Since September 2022, the Colorado Department of Revenue (DOR) has accepted cryptocurrencies as an additional form of payment for all state taxpayers.[27] In Europe, Lichtenstein's government publicly announced the plan to accept Bitcoin for state service payments.[28]
Central Banks are also part of the game with the development of the Central Bank Digital Currency (CBDC).

These different initiatives launched by governments and central banks could be a catalyst for crypto payments adoption as it might bring trust to the public.

- **Stablecoin maturity and Layer 2 blockchain development**

Stablecoins and layer 2 blockchains are an important technical piece regarding the crypto payments puzzle.
Stablecoins are designed to reduce volatility relative to general cryptocurrencies. Overall, they bring stability from fiat currencies, which is a real solution to the crypto volatility one of the biggest barriers when it comes to crypto payments adoption.
In parallel with stablecoins, layer 2 blockchains are also emerging. Layer 2 blockchains are a real solution when it comes to crypto payments adoption. When Bitcoin can process only 7 transactions per second (TPS) and when Ethereum can process only 27 TPS[29], layer 2 blockchains offer faster (and cheaper) transactions while keeping the same security level.
Stablecoins and layer 2 blockchains are essential to making crypto payments mainstream. With the maturity of stablecoins and the emergence of layer 2 blockchains, crypto payments are now becoming well prepared to become a commonly used payment method.

[26] https://www.hbs.edu/faculty/Pages/item.aspx?num=62068

[27] https://tax.colorado.gov/cryptocurrency

[28] https://www.reuters.com/technology/liechtenstein-allow-payment-certain-state-services-bitcoin-handelsblatt-2023-05-08/

[29] https://www.ledger.com/academy/glossary/transactions-per-second-tps

Embrace The Future of Payment

Crypto payments are still in their early stage. However, as crypto regulation is developing further and becomes more established with MiCa passed in April 2023[30], trust and stability in these payment options are both bound to improve in Europe. Blockchain technologies will increasingly support the growing demand for mobile solutions, boost online and in-store transactions and could also offer a wide array of innovative targeted value-added services that give incentives to the current community of crypto users.

Industry pioneers forecast that cryptocurrencies will transform the payment industry soon[31]. While time will tell if this technology can truly change how business payments are made, a study by Deloitte revealed that nearly 75% of retailers plan to accept cryptocurrency or stablecoin payments within the next two years.[32]

Many well-known businesses have already started to accept crypto payments, with one study finding that up to 40% of transactions from customers who use crypto as their primary payment method amount to twice that of those made by credit card users.[33] The increase in crypto transaction volume also shows that customers are beginning to trust crypto for daily transactions.

Ingenico has also explored web3 and payments to enable its customers to take advantage of crypto payment benefits.

In 2019, Ingenico partnered with Pundi X[34] a Singapore-based fintech to enable crypto transactions around the world. This partnership enables merchants to process transactions in various cryptocurrencies including BTC, ETH, BNB, DAI, NPXS and other cryptocurrencies that are part of Pundi X payment ecosystem.
Triple A is also a valued Ingenico crypto payment ecosystem partner.[35] Ingenico and Triple A have joined forces to offer a solution for merchants to accept crypto payments, volatility-free. This partnership looks at enabling merchants to reach

[30] https://www.europarl.europa.eu/news/en/press-room/20230414IPR80133/crypto-assets-green-light-to-new-rules-for-tracing-transfers-in-the-eu

[31] https://www.mastercard.com/news/perspectives/2022/how-turn-cryptocurrencies-into-everyday-way-to-pay/

[32] Merchants getting ready for crypto by Deloitte

[33] https://www.businesswire.com/news/home/20200929005406/en/Study-Shows-Merchants-That-Accept-bitcoin-Attract-New-Customers-and-Sales

[34] https://ingenico.com/latam-es/node/230

[35] https://shorturl.at/itKX8

a growing segment of 420 million crypto owners and enjoy a streamlined payment process with zero chargebacks.

Earlier this year, a partnership with Binance, the world leading crypto exchange platform, was made to deploy a crypto-to-crypto payment solution in France.[36] This partnership between these two major industry players enables consumers to pay in cryptocurrencies at physical points of sale, thanks to the power of Binance, the world's largest cryptocurrency platform, with over 200 million active users. In addition, this partnership enables merchants to easily accept cryptocurrency payments, using Ingenico payment terminals, the largest installed base of payment terminals in the world.
Besides the partnership and solutions deployed, Ingenico continues working in the crypto payment space with the aim to ease merchant life when it comes to crypto payments. This is why Ingenico has partnered with Nilos, a company specializing in payment infrastructure that enables merchants to accept crypto payments while being settled in fiat currency. Through this innovative crypto payment acceptance solution, merchants can enjoy the advantages associated with cryptocurrencies without the complexities of managing digital assets or concerns about cryptocurrency volatility.

The future of in-store payments looks promising for cryptocurrency. Cryptocurrencies could be a clever payment solution that opens up new customer bases and inspires brand loyalty. Paying with crypto could also be seen as a revendication towards more decentralization.
It is clear that the future of payment and in-store transactions is here, and it's time for businesses to embrace it.

[36] https://ingenico.com/fr/espace-presse/communiques-de-presse/ingenico-signe-un-partenariat-avec-binance-pour-deployer-en