



ACCOUNTING

CONTINUING EDUCATION

Cryptocurrency Accounting

(CRA2)

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CRYPTOCURRENCY ACCOUNTING
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Unit

1

Introduction to Cryptocurrency for Accountants

LEARNING OBJECTIVES

- **Recall** specific differences between cryptocurrency and blockchain.
- **Identify** key definitions, advantages, and challenges concerning cryptocurrency.
- **Recall** major cryptocurrencies in the current marketplace, including the manner in which they are mined as a function of validating transactions.

Blockchain and cryptocurrency are frequently confused to be the same or used interchangeably, but they are not the same. Blockchain is a form of a distributed ledger technology (DLT) where information can be stored in a decentralized manner such that there is no one single point of failure. Cryptocurrency is an application of blockchain and represents a decentralized asset that is built using blockchain technology and is made to use over the internet. The first ever cryptocurrency that was launched in 2008 is Bitcoin. Bitcoin is still the largest and most popular cryptocurrency today. To understand the features of cryptocurrency, it is important to understand the basics of blockchain which sets foundation of cryptocurrency.

BLOCKCHAIN, NODES & HASH

Today, information is stored on the computers that are connected to the servers that feed the data to a central server. In such record keeping systems, the records can be changed or edited by anyone with access and authorization, and sometimes even without appropriate access and permission. The fact that records can be changed after they have been recorded in the system can be a major issue for data integrity and reliability, and this results in a lack of trust for parties outside the organization. That is where blockchain technology is different.

In the blockchain ledger, transactions are recorded and stored in multiple computers that are connected to a single blockchain network. Once a transaction is posted on the blockchain, it cannot be changed or edited. Any subsequent changes are appended to the existing data in the form of new entries only. This makes blockchain immutable and tamper resistant.

Hash

The transaction is first broadcasted to the blockchain, and then it is relayed to computers that are connected to the blockchain network for validation. Once the other computers in the network reach a consensus based on the consensus protocol that is built into the program, the transaction is updated in the blockchain ledger, and it appears in the exact same format in all of the computers. The transaction is locked with a cryptographic signature, called hash. The hash is a system generated secure 32-character alphanumeric code that is very difficult to break.

The validated transactions are recorded in blocks and in sequence, with each block referencing to its immediate previous block's hash. These sequential blocks are cryptographically connected and create a metaphorical chain. This chain is called the blockchain.

Nodes

The computers that are connected to the blockchain network are called nodes. Each node has a copy of the entire blockchain database or ledger. The nodes provide the computing power to keep blockchain running. The system where the database is stored in each of these nodes makes the blockchain a decentralized ledger system.

To incentivize the nodes to continue contributing computing power, there are blockchains such as Ethereum that distribute their native currency, called Ether (ETH), as fuel or reward to the nodes.

Some of the popular use cases for blockchain include fighting counterfeiting, along with tracking the identity and provenance of products in the supply chain. Several companies have been exploring blockchain technology to solve business problems. While blockchain use cases and practical applications are still far from mass adoption, entities have started to understand the benefits of blockchain and findings ways to use this in conjunction with current systems.

Cryptocurrency

Cryptocurrencies enable secure digital payments without the use of third-party intermediaries. Cryptocurrencies uses various cryptographic techniques and encryption algorithms that make the transaction recorded on the blockchain secure, reliable and tamper resistant. Unlike fiat currencies, cryptocurrencies are generally not issued by a government entity, public or private entities due to which it has been difficult to use cryptocurrency as a legal tender in different financial jurisdictions throughout the world. Additionally, due to lack of a mature infrastructure and governance structure around cryptocurrency, mass adoption of cryptocurrency just becomes harder.

It all started with Satoshi Nakamoto's white paper in 2008 on "Bitcoin: A Peer-to-Peer Electronic Cash System."¹ An anonymous entity or a group of entities, Satoshi Nakamoto, published the white paper on Bitcoin in 2008, explaining how Bitcoin can facilitate peer to peer financial transactions without the need of any intermediaries. Then in 2013, Vitalik Buterin, known for building Ethereum (ETH), also impacted the cryptocurrency movement. Ethereum added to the use cases of cryptocurrencies with the creation of tokens that are built on its network called ERC-20 tokens.

¹ <https://bitcoin.org/bitcoin.pdf>

Stable Coins

A stablecoin is a form of cryptocurrency that is pegged to a relatively stable asset or a basket of assets which helps mitigate the volatility risk of crypto, and thereby maintain a stable value relative to a specific asset or basket of assets. Stablecoins have been used as a medium of exchange and a store of value within the cryptocurrency ecosystem. There are three main types of stablecoins:

- Fiat-collateralized stablecoins: These stablecoins are backed by reserves of fiat currency, such as the US dollar or Euro, held in a bank account. Examples of fiat-collateralized stablecoins include Tether (USDT), USD Coin (USDC), and Paxos Standard (PAX).
- Crypto-collateralized stablecoins: These stablecoins are backed by reserves of other cryptocurrencies. For example, MakerDAO's DAI stablecoin is collateralized by Ether (ETH) held in a smart contract on the Ethereum blockchain.
- Algorithmic stablecoins: These stablecoins use complex algorithms and smart contracts to maintain a stable value without any collateral. Terra Luna is an example of such stable coin. Basis was an example of an algorithmic stablecoin, but it failed due to regulatory concerns.

CURRENT STATE OF CRYPTOCURRENCY ADOPTION

Cryptocurrency, depending on its utility, can be used as a store of value, or a medium of exchange. It is a digital currency that uses cryptography to secure and validate transactions. A decentralized digital currency does not have any central authority issuing the digital currency. As such, a cryptocurrency is not legal tender and does not have the backing of centralized banks. Today, governments of several countries are exploring central bank digital currency (CBDC) that the government would issue, control, and manage similar to fiat currency, except that it is digital fiat on the blockchain.

These two cryptocurrencies—Bitcoin (BTC) and Ether (ETH)—make up over 60% of the total crypto market capitalization as of December 31, 2022. Tokens that are built on top of existing blockchain such as the ERC 20 tokens are generally referred to as altcoins.

According to the fintech analytics company Portfolio Insider, the current bitcoin adoption rate has been outpacing the internet's user growth rate. Cryptocurrency adoption rates will likely reach 1 billion users by 2025 (2X internet adoption). While mass adoption is not here yet, the number of companies across the world have been exploring cryptocurrency use cases and offering innovative products. Services providers like accountants, legal advisors, auditors have had to expedite their learning and know-how of how cryptocurrency works so they can advise their crypto clients on appropriate accounting, tax, or legal treatment.

Banks are also considering offering crypto products such as bitcoin custody solutions, offering settlements in stable coins, and offering interest on Bitcoin. Crypto exchanges like Coinbase, Kraken, Gemini continue to launch new crypto products outside the crypto trading services. Companies who are not in the crypto space, are also looking to get involved in some ways starting with accepting cryptocurrency as payments from their customers using crypto payment service providers like BitPay. Credit card companies like Visa and Mastercard have started bringing crypto into their platforms.

Companies are also looking to offer crypto as payroll to employees and promoting this as an attractive recruiting tool.

The year 2021 was an important year for the cryptocurrency space with several major events that increased crypto adoption. This year saw the first crypto exchange, Coinbase, go public, followed by Robinhood who also jumped into the crypto space by offering crypto on their trading platform. The year 2021 also the rise of decentralized exchanges like UniSwap that offer trade, buy, sell and swap of crypto in a decentralized manner. Lending using crypto, high-yield interest on crypto with interest rates as high as 10%+, borrowing fiat on crypto collateral seem to have caught attention of more and more users.

The year 2022 marked another important year for cryptocurrency with several events that were not favorable for the industry. As of 12/31/21, total market cap is > \$2 trillion² with over 16 thousand cryptocurrencies including altcoins and stable coins, and by 12/31/22, total market cap dropped to \$1 trillion³. The year 2021 witnessed Bitcoin at its all-time high of \$68K, and in Q2 2022, Bitcoin has its worst quarterly performance since its inception with price drop of > 50% to \$20K. It started with the collapse of Terra Luna (an algorithmic stable coin) in May 2022, followed by the crash of a major cryptocurrency hedge funds, Three Arrows Capital and then, one of the largest crypto currency lenders, Celsius – all within a few weeks. This triggered increased attention and scrutiny by regulators over cryptocurrency. Soon after, the fall of one of the largest cryptocurrency exchanges, FTX, created a contagion effect in the industry, and such that the market is still not recovered from it. Series of these events raised regulatory scrutiny and concerns, and the confidence in cryptocurrency seemed to be dropping off.

Following is a timeline of major events that occurred in 2022 that had significantly impacted the space:

- The year started with the ‘Crypto Bowl’ event during the Super Bowl in the U.S in February 2022 where companies spent millions on advertising. The Super Bowl event had 200 million viewers and, crypto firms such as Coinbase, FTX, Crypto.com, and eToro had huge presence in advertising crypto.
- In March 2022, a network that supports a popular blockchain gaming platform, Axie Infinity, became a victim of one of the largest cryptocurrency hacks of ~\$625 million, of which only \$30 million was recovered.
- In Q1 2022, the U.S. Fed started raising interest rates, which was the first time since 2018, by 25 basis points to a range of 0.25% to 0.50%.
- In May 2022, a platform supporting an algorithmic stablecoin, Terra-LUNA, crashed. Terra’s algorithmic stablecoin, TerraUSD (UST) had a market cap as high as almost US\$18 billion⁴ in April, which dropped after the crash. The stable coin was supposed to be pegged to USD at \$1, and after the depeg, UST was at \$0.355. The token associated to Terra, LUNA, which was expected to stabilize UST's price, fell from \$805 to a few cents after the crash.
- Right after the Terra-Luna crash, in June 2022, one of the largest crypto lender, Celsius froze customer withdrawals, transfers and swaps, reacting to market conditions. This was followed by a mass layoff and an attempt to restructure the company after filing for Chapter 11 bankruptcy in

² source: coinmarketcap.com.

³ source: coinmarketcap.com.

⁴ <https://www.coindesk.com/learn/the-fall-of-terra-a-timeline-of-the-meteoric-rise-and-crash-of-ust-and-luna/>

July. Singapore-based hedge fund, Three Arrows Capital (3AC) was next to fall. In the same month, another US based crypto lender, Voyager, issued a notice of default to hedge fund 3AC for failing to service a loan worth about ~\$670 million⁵. By end of the month, Voyager was ordered liquidated by a British Virgin Islands court, and soon after, 3AC filed for bankruptcy under Chapter 15. FTX proposed acquiring the bankrupt Voyager on July 28, but in a court filing, Voyager called FTX's proposal a "low-ball bid dressed up as a white knight rescue⁶."

- In July, the non-fungible tokens (NFT) market also declined in tandem with crypto. Average monthly NFT trading volumes fell from ~\$5 billion⁷ in January to under \$1 billion in June, per NFT data aggregator CryptoSlam. The value of Bitcoin had plummeted by approximately 70% from its peak in 2021, and several altcoins experienced an even more severe drop or were completely wiped out. According to Coinopsy, at least 2,400 cryptocurrency projects with their own tokens had already failed at the time by Q3 2022.
- Crypto winter continued to get worse, and in the summer of 2022, several high-profile companies announced significant layoffs. For instance, Coinbase, announced 18% reduction in force, roughly 1,100 employees. OpenSea, a marketplace for non-fungible tokens (NFTs), laid off about 20% of its staff, while crypto exchange Blockchain.com lost almost 25% of its workforce. Crypto.com also announced layoffs, with 260 employees being let go in June. Companies started reporting liquidity concerns, filing for bankruptcy and more.
- While the macroeconomic conditions showed signs of an extended crypto winter, Ethereum moved forward with their plans to upgrade the network from a proof-of-work consensus to proof-of-stake, called "The Merge". With this upgrade, the new network saved 99.99% more energy, and this was seen as a positive change in turbulent crypto industry.
- However, in October, the crypto industry saw the largest crypto hack of \$718 million⁸ according to Chainalysis from decentralized finance (DeFi) sites in 11 different hacks. DeFi accounted for almost 99% of the total losses from exploits from July to September, according to a report by Singapore-based security services platform Immunefi.
- In November, FTX, a crypto trading company, and its 30-year-old founder Sam Bankman-Fried went from industry leaders to bankruptcy with a few days. The collapse started with an announcement from the CEO of Binance, Changpeng Zhao, that his exchange would sell its holdings of the FTT token, the native currency of FTX. Zhao's announcement followed reporting from CoinDesk on November 2 that found Alameda Research, Bankman-Fried's crypto trading company, held an outsized amount of FTT on its balance sheet. Binance's sell-off announcement of FTT caused the price of the token to drop, and FTX users began to pull funds from the exchange, causing a liquidity crunch. On November 8, FTX announced it was freezing withdrawals. After a potential buy-out deal from Binance fell through, Sam Bankman-Fried declared the bankruptcy of FTX and its affiliates and stepped down as CEO. FTX filed for bankruptcy on November 11, along with over 100 affiliates. The fallout of FTX has had a

⁵ <https://www.cnn.com/2022/06/27/three-arrows-capital-crypto-hedge-fund-defaults-on-voyager-loan.html>

⁶ <https://www.marketwatch.com/story/voyager-digital-calls-ftx-alameda-proposal-a-low-ball-bid-dressed-up-as-a-white-knight-rescue-11658766295>

⁷ <https://www.cryptoslam.io/>

⁸ <https://decrypt.co/111876/stolen-crypto-total-hits-3b-hackers-reemerge-after-quiet-summer-chainalysis>

significant impact on the industry, with Bitcoin falling below \$16,000 for the first time since November 2020. This was worsened by how Bankman-Fried had bolstered his position as a major industry player over the past year, bidding and offering lines of credit to distressed assets from the Terra-LUNA collapse. Crypto lending platform BlockFi, which had taken a \$250 million loan from FTX, declared its bankruptcy on November 28. Additionally, crypto lender Genesis has paused some user withdrawals, impacting their institutional creditors, such as the Winklevoss brothers' Gemini and South Korea's GOPAX exchanges. Chainalysis estimated that the FTX collapse caused \$9 billion in losses throughout the industry.

- Following FTX's bankruptcy filing, most customers are still unable to access their frozen assets. The U.S. Commodities Futures Trading Commission (CFTC) reported that more than \$8 billion in FTX customer funds are still unaccounted for, which suggests that creditors may not recover the full amount of their losses, and it could take a considerable amount of time before they receive any compensation. In addition, Sam Bankman-Fried, faces several financial crime charges, including conspiracy to commit bank fraud and operating an unlicensed money transfer business. He had previously faced eight fraud charges, but in December, he was arrested and charged with eight counts of criminal fraud. FTX, which was once valued at \$32 billion⁹, officially filed for bankruptcy protection, and Bankman-Fried resigned in November 2022.

CRYPTOCURRENCY—KEY DEFINITIONS

Following are few key cryptocurrency terms:

Fiat

Fiat is a legal currency that is generated by a sovereign government. It is centralized and is controlled by the government like US \$, Euro, GBP etc.

Cryptocurrency

Digital asset created on top of a blockchain and is intended to be decentralized.

Token

A token is a form of digital asset that are created using the blockchain technology for certain utilities or purpose. Tokens are typically on top of another cryptocurrency blockchain like Ethereum. Tokens are also called “altcoin.” Bitcoin and Ethereum are native cryptocurrency and have made a place for itself, as such, they are not considered tokens or altcoins. The most popular tokens are the ERC-20 tokens that are built on the Ethereum blockchain.

ERC-20 is the most widely used token standard which allows tokens to be interoperable within Ethereum’s ecosystem of decentralized apps. Another popular standard is the ERC-721. These standards are being used to enable non-fungible tokens (“NFT”) that are unique and cannot be interchanged with other similar tokens. There are hundreds of different ERC-20 tokens and thousands of ERC-721 tokens in circulation.

⁹ <https://www.npr.org/2022/12/12/1142361088/bankman-fried-ceo-ftx-crypto-exchange-arrested-bahamas-charges-sdny>

The following are a few popular classifications of tokens based on their use cases:

- Non-fungible tokens (“NFT”): NFTs represent the right to ownership of a unique intangible asset on the blockchain and symbolizes a digital creation of a real-world asset. NFT is unique and one of its kind, which makes an NFT difficult to be copied, shared, or sold without appropriate permissions. Example of NFTs include NBA Top Shot for basketball video highlights, Jack Dorsey's tweet, Bored Ape Yacht, etc.
- Governance tokens: These are DeFi tokens that give the holders of the token certain rights and authority over a protocol that does not have a board of director or any central governing body. Compound is a popular savings protocol with a token called COMP that gives the token holders a right to vote on how Compound is upgraded.
- Security tokens: Types of tokens that can be analogized to securities like stocks that operate in the traditional capital market. Such tokens have been issued as an alternative way to traditional fundraising.
- Utility tokens: Tokens used for utilities like rewards, loyalty, representation of a unit of value to purchase mechanize within the ecosystem such as points in blockchain based video game app, Defi lending etc.

Node

A node is a copy of the ledger containing a complete record of all the transactions recorded on the blockchain and operated by a participant of the blockchain network.

Distributed Ledger Technology (“DLT”)

Distributed Ledger Technology (DLT) is a consensus of shared, digital data that is spread geographically spread across multiple sites, countries, or institutions. Blockchain is a type of DLT and there is no central administrator in the blockchain that is decentralized. Copies of the ledger are operated by a participant of the blockchain that are also called nodes.

Wallet, Public Key, Private Key

A wallet is where you hold your cryptocurrency, just like holding cash in a wallet, except that the crypto wallet is digital and can be connected to the internet or can be disconnected to the internet and made offline. The wallet is perpetual and once created, cannot be deleted, or closed. It can be inactive or cleared out, but not deleted or closed like we can with a bank account. To understand what a wallet is in the context of blockchain technology, let us take a piece of technology that most of us are familiar with—email.

Think about a wallet like a perpetual email address. Anyone can connect with the email address if they know the email address. They can send emails to the email but not from the email. To send email from the email address, the owner of the email address needs to access this account with his login ID and password and in some cases, go through a multi-level authentication process. The email address in this example can be analogized to a public address of the blockchain wallet, and the account password and the multi-signature authentication can be analogized to the private key of the blockchain wallet. Anyone can view the public address and send crypto to the public address of the wallet holder. The major difference here is that in the email, we get to choose the email ID, login, password etc. When creating a blockchain wallet, we do not get to choose the public and private key.

It is created using the cryptographic secure technology of the blockchain. The public and private keys are usually a long string of random alpha-numeric cryptographic code and is generated by the blockchain. Some wallets use seed word as a private key instead of the long string of alphanumeric code. A seed word is a random set of words generated upon creation of the wallet.

It is very important to protect the private key and save it such that it can be securely accessed by the appropriate people with appropriate permission and rights to the crypto. If one loses the access key to private key, they will not be able to access the wallet and the crypto assets linked to the wallet.

Blockchain wallets are primarily of two types: hot wallets or cold wallets. A hot wallet is connected to the internet. A cold wallet, on the other hand, stays offline.

Most centralized exchanges have a hosted wallet where users can store their crypto. This essentially means that the users or the owners of the crypto that have their crypto hosted in such wallets do not have access to the private key of the wallet. It like having an account with the exchange where crypto is held on behalf of the user. To access the crypto in the account, the user needs to login to their website or download their app. The risk here is that if the exchange gets hacked and crypto are stolen, they could be lost forever.

Wallets can also be self-custodial where the users own their own private keys, which essentially means they have full custody, control, access to the crypto assets in the wallet.

To keep your crypto safe

1. do not share your private key,
2. use two factor authentication, and
3. maintain the security and integrity of the device.

Consensus Mechanisms

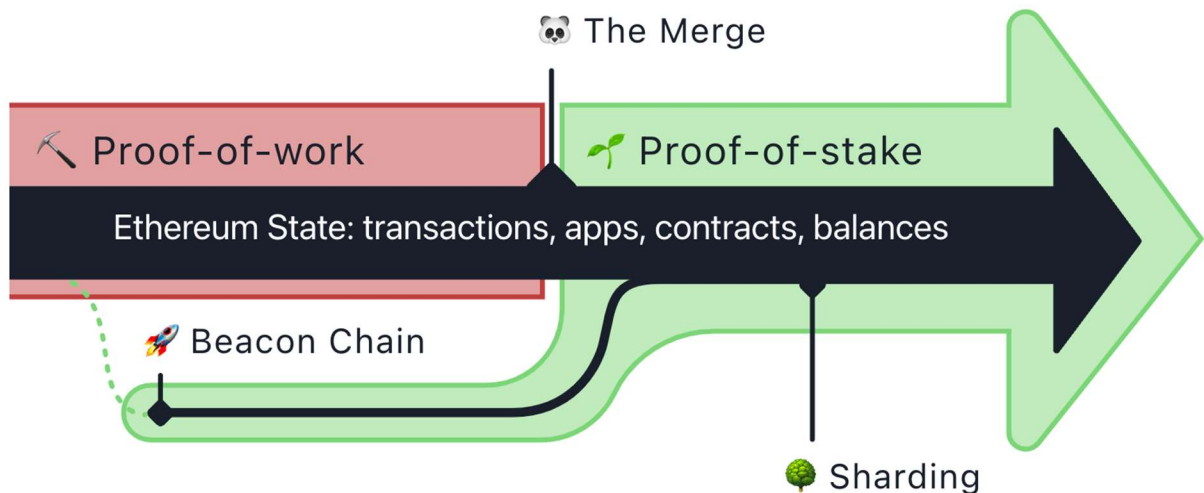
Cryptocurrencies use consensus mechanisms for validators on the blockchain to follow certain set of protocols to validate transactions before they get posted on the blockchain. Two major types of consensus mechanism are (1) Proof of work (PoW) and (2) Proof of stake (PoS). Using these protocols, new transactions can be verified and added to the blockchain, and new tokens can be created. PoW was, first pioneered by Bitcoin:

- **Proof of Stake:** Proof of stake (POS) is the mechanism where the holders of the digital assets can stake their assets to the network if they want to participate in validating the transaction, and in return for participating in the staking process, they could earn a staking income. Staking income could be in the form of a digital asset including another token. Holders of PoS tokens can earn a reward from the network that can be analogized to a dividend on staked assets.
- **Proof of Work:** Proof of work (POW) is a consensus distribution algorithm that requires an active role in mining data blocks, often consuming resources such as electricity. Miners are compensated based on the amount of work or computational power provided. These miners are essentially solving the algorithms in the blockchain to securely sequence the transaction history such that the miners cannot lie about a transaction as they are validating the transaction. Bitcoin uses the hashcash system to generate blocks of transaction. A hashcash system uses a SHA256 to produce a hash that changes significantly with change of any data. Miners create an output of the blocks by solving a puzzle (an algorithm) where they need to guess the input which

in forma of a specific hash below a target 256-bit number. Miners can freely enter and exit the network, as a result of which, the difficulty of solving the puzzle is adjusted every 2,016 blocks to keep each miner's probability of solving the block within the ten-minute interval. Due to this, the verification process is decentralized across the entire network:

- Bitcoin is the first cryptocurrency to implement a POW consensus. Currently, as of the time of this publication, mining reward of 6.25 BTC is issued approximately every 10 minutes. As Bitcoin nears its total supply of 21 million coins, the mining reward will eventually decrease to zero, according to the code written by Bitcoin's creator Satoshi Nakamoto.

In September 2022, Ethereum which used to be based on a proof-of-work mechanism, completed its transition to proof-of-stake consensus, and with this, eliminated proof-of-work and reduced energy consumption by about 99.95%. This was done via 'The Merge', which essentially joined the original execution layer of Ethereum with its new proof-of-stake consensus layer, the Beacon Chain. This allowed the network to be secured using staked ETH. This upgrade improved scalability, security, and sustainability. Prior to the merge, the Beacon Chain and Ethereum Mainnet existed separately. The Merge did not require any action from holders or users of ETH, and nothing changed for the users of ETH. The entire history of Ethereum remains unaltered and any funds held before The Merge were still accessible, and there was no need for an upgrade and wallets work the same as before.



Source: <https://ethereum.org/en/upgrades/merge/>

Smart Contracts

One of the most popular functionalities of blockchain is the ability to use smart contracts. Smart contracts are a set of codes based on a business logic that are designed to execute a computer program without manual intervention once the program is running. The code can be designed to execute anything based on what it is supposed to do and how it is written. Smart contracts are intended to automate a workflow and perform certain pre-determined actions based on the triggering events when conditions are met. Think about smart contract like "if/when...then..." function. The output of the smart contract is as good as its input. The risk of garbage in, garbage out exists just like with any other database. Some of the benefits of smart contract include:

- Increased process efficiency due to automation resulting in opportunities to save costs

- Increased trust and transparency because there's no third party involved once the contract is executed
- Increased speed of processing transactions
- Higher security because of the underlying blockchain technology

One of the successful use cases of blockchain is in retail supply chain. For example, in a typical supply chain, it could take months for larger enterprises purchasing high volume of products to reconcile the inventory received with the purchase orders and invoices. Delays in this reconciliation could delay payment to vendors, which could upset the vendor relationship and could also result in disputes.

Using blockchain, companies like Home Depot were able to solve vendor disputes by offering real-time reconciliation of inventory purchased to inventory received and transparent reporting to relevant parties. Another example is the diamond giant De Beers's supply chain management. They developed a technology at the diamond mining company level to trace how and where diamonds were extracted, and how it reaches the store. This technology allowed the owners of De Beers diamonds to easily verify the originality of the diamonds and develop trust in the seller.

Public & Private Blockchain

A public blockchain is a distributed, open, and decentralized ledger of encrypted information where participants can read, write, and view data. There is no single participant with complete control of the network or the data on the network. For example, Bitcoin, Ethereum are public blockchain. Participants can enter and exit the network anytime, and all participants in the public blockchain have equal rights.

A private blockchain is managed by a single entity or a group of entities based on certain rules or consensus, and the network is not open for anyone to participate unless permitted. This is a more energy efficient network.

On-Chain & Off-Chain

On-Chain transactions are blockchain-based transactions that occur when the transaction is processed and successfully broadcasted on the blockchain network. This requires the transactions to be validated and authenticated by the participants before the transaction is recorded in a block on the blockchain. Once this occurs, the transaction becomes irreversible. Such transactions can be reversed only after a majority of the network's hashing power comes to an agreement.

Off-chain transactions are blockchain-based cryptocurrency transactions that occur outside of the blockchain network. These transactions can be processed by using a third party or by swapping private keys to an existing wallet instead of transferred funds. Off-chain transactions typically are low cost, and real-time immediate settlement with higher level of anonymity than on-chain transactions.

Gas Fees

“Gas¹⁰ refers to the unit that measures the amount of computational effort required to execute specific operations on the Ethereum network.” Gas is the fee that is required for the Ethereum transaction to execute successfully. Gas fees are paid in ETH (Ether, Ethereum's native currency), and these are denominated in gwei. Each gwei is equal to 0.000000001 ETH (10⁻⁹ ETH). For example, gas fees of 0.000000001 ether are equal to 1 gwei.

Decentralized Platforms

Decentralized platforms refer to blockchain based platforms that operate on a decentralized network or distributed ledger where peer to peer transactions can be facilitated without intermediaries in a secure and safe manner. These platforms typically use an automated market-making (AMM) system, where trades are executed through smart contracts, and liquidity is provided by users who pool their funds together. Users can also earn fees by providing liquidity to the platform.

Examples of decentralized platforms are: Uniswap, Aave, Ribbon. Uniswap is a decentralized exchange (DEX) built on the Ethereum blockchain. It allows users to swap ERC-20 tokens directly without the need for a centralized exchange. Aave is a decentralized lending platform that allows users to lend and borrow various cryptocurrencies without intermediaries. Ribbon is a decentralized options platform that allows users to buy and sell options on various cryptocurrencies.

Decentralized platforms like Uniswap, Aave, and Ribbon offer several advantages over traditional platforms. These include:

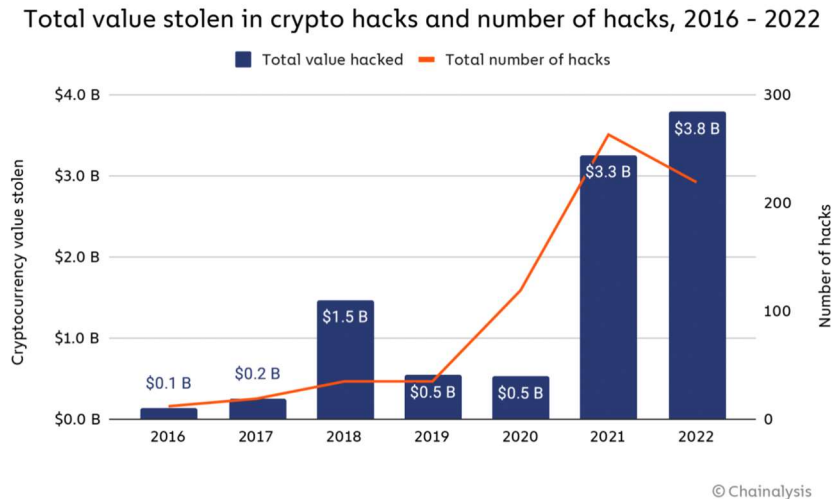
- No intermediaries
- Increased security as transactions are recorded on a public ledger, which makes them tamper-proof and resistant to hacking.
- Increased accessibility as these platforms are open to anyone with an internet connection, which makes them accessible to users around the world.
- Lower fees compared to traditional platforms, as they do not require intermediaries.
- More control as they do not rely on third-party custodians.

It is to be noted that these decentralized platforms also come with their own risks, such as smart contract vulnerabilities and market volatility.

According to a report¹¹ from Chainalysis, the 2022 saw the highest number of cryptocurrency hacking incidents, with \$3.8 billion stolen from crypto businesses, mostly in March and October. DeFi protocols were the most significant targets, with 82% of all cryptocurrency thefts from hackers, which amounted to \$3.1 billion, up from 73% in 2021.

¹⁰ <https://ethereum.org/en/developers/docs/gas/>

¹¹ <https://blog.chainalysis.com/reports/2022-biggest-year-ever-for-crypto-hacking/>



Source: <https://blog.chainalysis.com/reports/2022-biggest-year-ever-for-crypto-hacking/>

CRYPTOCURRENCY—ADVANTAGES

The following is a summary of the key advantages of cryptocurrency:

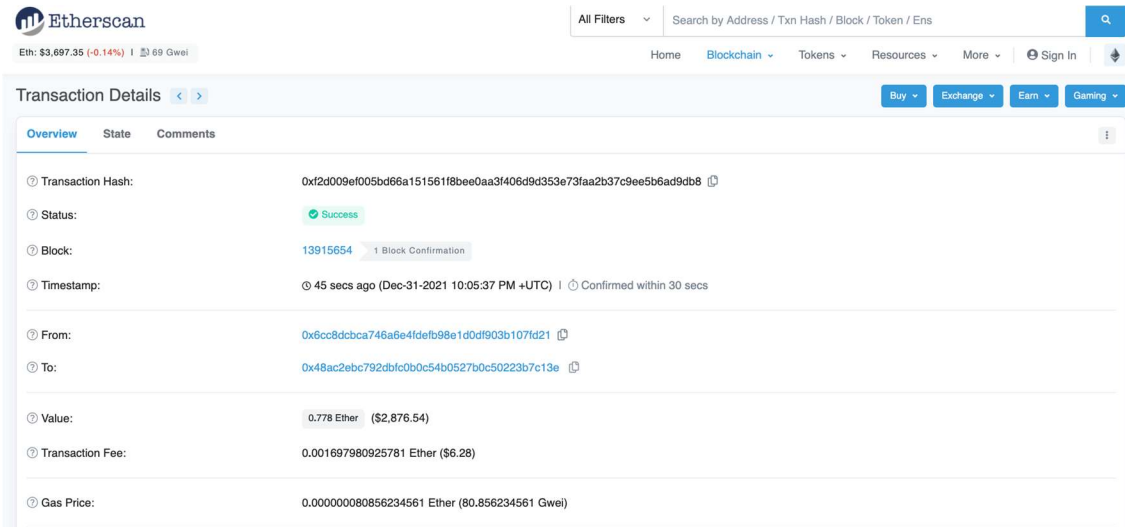
- Increased security
- Real-time transaction updates
- Tamper free and irreversible record history, increased authenticity of data
- Fraud protection
- Lower transaction costs
- Reduced processing time
- Smart contract benefits

CRYPTOCURRENCY ACCOUNTING RISK CONSIDERATIONS

As noted above, one of the primary features of cryptocurrency is the pseudo anonymity of the transactions on the blockchain. While there are cryptocurrencies that are entirely anonymous such as Monero, and such crypto can pose a higher level of risk when it comes to compliance, ensuring appropriate and legit transactions and the intent of the actors. Cryptocurrencies like Bitcoin, Ether that use the public blockchain are pseudo anonymous and there is a limited amount of transaction level information that is available to the public.

Below is a snapshot of a transaction in ETH from the ETH public blockexplorer, Etherscan. As displayed in the snapshot, information such as transaction ID, status of the transaction, block number, timestamp of when the transaction was confirmed on the blockchain, the to and from public address, the transaction fee, gas fee and the value of the transaction along with number of

ETH transacted is displayed on the public block explorer. The identity of the sender and recipient is not disclosed.

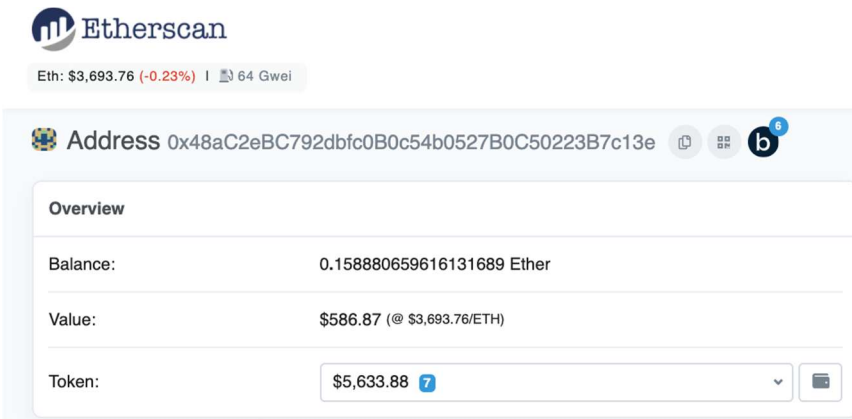


The screenshot shows the Etherscan interface for a transaction. At the top, the Etherscan logo is on the left, and a search bar with 'All Filters' and 'Search by Address / Txn Hash / Block / Token / Ens' is on the right. Below the search bar, the current ETH price is \$3,697.35 (-0.14%) and 69 Gwei. The main section is titled 'Transaction Details' and has tabs for 'Overview', 'State', and 'Comments'. The 'Overview' tab is active, showing the following details:

Transaction Hash:	0xf2d009ef005bd66a151561f8bee0aa3f406d9d353e73faa2b37c9ee5b6ad9db8
Status:	Success
Block:	13915654 (1 Block Confirmation)
Timestamp:	45 secs ago (Dec-31-2021 10:05:37 PM +UTC) Confirmed within 30 secs
From:	0x6cc8dbcba746a6e4defb98e1d0df903b107fd21
To:	0x48ac2ebc792dbfc0b0c54b0527b0c50223b7c13e
Value:	0.778 Ether (\$2,876.54)
Transaction Fee:	0.001697980925781 Ether (\$6.28)
Gas Price:	0.00000080856234561 Ether (80.856234561 Gwei)

Source: <https://etherscan.io>

The “To” and “From” address in the above picture are the public address of the wallet holders. We can search the transaction level detail and the balance in the wallet of the wallet holders based on their public address. Below is a snapshot of the balance in ETH of the recipient address as displayed in ETH public blockexplorer, Etherscan. Note that not all blockexplorers provide the balance information. For example, publicly available blockexplorers for Bitcoin may provide just the transaction level information and not the balance unless the blockexplorers are customized to add these capabilities when built in-house.



The screenshot shows the Etherscan interface for an address. At the top, the Etherscan logo is on the left, and the current ETH price is \$3,693.76 (-0.23%) and 64 Gwei. The main section is titled 'Address' and shows the address: 0x48aC2eBC792dbfc0B0c54b0527B0C50223B7c13e. Below the address, there is an 'Overview' section with the following details:

Balance:	0.158880659616131689 Ether
Value:	\$586.87 (@ \$3,693.76/ETH)
Token:	\$5,633.88

Source: <https://etherscan.io>

Below is a snapshot of the portion of the transaction history of the recipient as displayed in ETH public block explorer, Etherscan. Information such as transaction ID, to / from address, the number of ETH and value of the transaction at the time the transaction occurred, block size and age, transaction fee is visible to the public. This is what makes public blockchain and the cryptocurrencies on the blockchain pseudo-anonymous.

Also note certain challenges for accountants here—while the public blockchain displays the sender and recipient wallet address, and the transaction information, it does not display the identity of the sender and recipient, and the nature of the transaction details. Accountants will still need to document, gather, and retain supporting information to account for the transaction appropriately, and ensure proper controls to verify if the transaction was legit, valid and authorized.

Txn Hash	Method	Block	Age	From	To	Value	Txn Fee
0x63072883628639e653...	Request Access	(pending)	2 secs ago	0x48ac2ebc792dbfc0b0c...	StrongBlock: Service	0.00355952380952381 Ether	(Pending)
0x3a88504d244f69312b7...	Multicall	13915669	59 secs ago	0x48ac2ebc792dbfc0b0c...	Uniswap V3: Router	1.236828437642768 Ether	0.00888857980
0xf2d009ef005bd86a151...	Transfer	13915654	3 mins ago	0x6cc8dcbca746a6e4fd...	0x48ac2ebc792dbfc0b0c...	0.778 Ether	0.00169798082
0xa4f36791938914e5075...	Claim All	13915652	3 mins ago	0x48ac2ebc792dbfc0b0c...	StrongBlock: Service	0.000934526644335 Ether	0.01490845856
0xa75b458b775c843771...	Approve	13881478	5 days 7 hrs ago	0x48ac2ebc792dbfc0b0c...	OpenDAO: SOS Token	0 Ether	0.0008245547c
0xf4bb1cf1f68b078b332...	Swap Exact Token...	13881343	5 days 7 hrs ago	0x48ac2ebc792dbfc0b0c...	SushiSwap: Router	0 Ether	0.00721424833

Source: <https://etherscan.io>

As noticed above, the transactions as reported on the public blockchain raise certain reporting risk considerations that accountants need to be aware of. For example, without proper controls and supporting documents, there could be increased fraud risk or unauthorized transactions that could get processed without being caught in a timely manner. It is very easy for a wallet holder with access to the private key to direct crypto to any wallet address, and once the crypto is sent, it cannot be recovered.

Without proper oversight and policies on who has and should have access to the wallet, the risk of proper use of the crypto assets is even higher. As such, proper segregation of duties between record keeping, custody and payment processing is critical for strong internal controls over financial transactions and protections of entity's assets.

Below are few considerations for accounts that increases the risk of incomplete data:

- Existence of off-chain transactions where the transactions may be outside of the blockchain network
- Disintegrated systems that do not connect with blockchain without significant customization / integration
- Lack of adequate technology to perform real time reconciliation and monitoring (even though blockchain allows real time reconciliation, due to several disintegrated systems and data hosted in multiple places including on-chain and off-chain, real time reporting becomes harder)

Additionally, integrity of smart contract and vulnerabilities in the underlying code can increase the risk of data that cannot be relied on, and risk of inaccurate information.

Data once posted on blockchain, remains on blockchain as is. As such, there is a risk of unreliable, inaccurate, incomplete data output due to “Garbage in, Garbage out.” It is also to be noted that blockchain cannot fix risk due to collusion with counter party and weak internal controls. There is a need for a strong risk and internal control framework to ensure proper controls are in place to ensure data integrity, completeness, and accuracy. Lack of adequate technology to perform real time

reconciliation and monitoring (even though blockchain allows real time reconciliation, due to several disintegrated systems and data hosted in multiple places including on-chain and off-chain, real time reporting becomes harder).

Due to lack of standardized laws and regulations, and lack of accounting, audit and tax guidelines, inconsistency in valuation approach and lack of guidance in this area, accountants are having to take certain accounting and tax positions and propose a defensible justification of the way transactions are recorded and disclosed. A well-defined framework for enterprise risk, general information technology and governance risk with mitigating controls identified and implement can reduce the overall business risk along with ensuring a strong financial reporting framework.

NOTES

Unit 2

Cryptocurrency Current Use Cases & Latest Trends

LEARNING OBJECTIVES

- **Identify** common use applications for cryptocurrency in the business world.
- **Recall** recent cryptocurrency trends, including regulatory pronouncements, and how this impacts organizations and accounting professionals.

CURRENT USE CASES OF CRYPTOCURRENCY

Since the Bitcoin whitepaper publication in 2008, cryptocurrencies have been used as a digital representation of some form of value that is not issued by a central bank or a government body. While it is still not widely accepted as a legal currency (except in El Salvador), it has been used as a medium of exchange and a store of value. Some of the most popular use cases of cryptocurrency are:

Banking the Unbanked

The premise of Bitcoin was to facilitate peer to peer financial transactions without any intermediaries such as banks. This opened opportunities for financial inclusion for people around the world who do not have access to a bank account. For countries that are struggling with hyperinflation, lack of banking opportunities and political instability, Bitcoin and cryptocurrencies have opened doors to new ways of doing business and having people participate in the financial ecosystem.

Crypto for Balance Sheet & Crypto for Payments

More and more companies have started accepting cryptocurrency as payments. Example: Gucci, Microsoft, Newegg, Twitch, AT&T, Virgin Galactic, AMC, Gyft, and more. HSB survey released in January 2020 shows that one-third of U.S. small businesses accept cryptocurrency as payment.¹² The

¹² <https://www.businesswire.com/news/home/20200115005482/en/HSB-Survey-Finds-One-Third-Small-Businesses-Accept>

survey also showed 36%¹³ of the small and mid-sized businesses accepted cryptocurrency, while 59%¹⁴ of those companies purchased digital currency for their own use as well. Companies like Wikipedia accept donations in cryptocurrency. Merchants like Newegg have reported increase in their sales volume because of accepting crypto as payments and opening a new market base.

Cryptocurrency is also a great use case for cross border payments, due to the speed of processing and low cost. International wires take days to process and come with bank charges greater than 5% plus the currency conversion risk associated with these transactions. While cross-border ecommerce continues to grow, the remittance space is also picking up due to challengers and starts ups exploring this space. BitPesa, an exchange that provides cryptocurrency-based remittances across Africa, has transacted \$235 million¹⁵ Bitcoin to date.

Companies have also started paying Bitcoin as payroll and bonus to offer creative employee benefits; which serves as an attractive recruiting tool. In 2021, public listed company, MicroStrategy started paying its board directors in Bitcoin.¹⁶ MicroStrategy is also the first corporation to directly purchase Bitcoin for its balance sheet as an investment. As of November 2021, they hold approximately 121K BTC¹⁷, and by the end of 2022, they held 132K BTC¹⁸. Many other companies have been following suit and adopting Bitcoin as a treasury reserve asset inspired from MicroStrategy.

Companies like Eight Sleep had promotional offerings where they offered rebates in Bitcoin.

Utilities of Tokens

With the launch of Ethereum, its smart contract abilities, and the introduction of the ERC20 standard for tokens, the Ethereum network has taken the use cases of cryptocurrency to a level beyond digital payments. Depending on how the ERC 20 tokens are designed, they could bring various utilities or offer security interest to the user. The user or the token holder could obtain the right to use decentralized applications or access services of the crypto company, participate in the crypto ecosystem in some form, or just earn the interest / dividend or receive some form of equity in the company. Tokens that are built on top of existing blockchain such as the ERC 20 tokens are generally referred to as altcoins. Each of the tokens are designed to have a specific use case or function. For example, Storj tokens allow people to share files across a decentralized network,

¹³ <https://www.businesswire.com/news/home/20200115005482/en/HSB-Survey-Finds-One-Third-Small-Businesses-Accept>

¹⁴ <https://www.businesswire.com/news/home/20200115005482/en/HSB-Survey-Finds-One-Third-Small-Businesses-Accept>

¹⁵ <https://www.forbes.com/sites/danielwebber/2021/04/21/cryptocurrency-in-cross-border-payments-after-coinbases-success-can-crypto-flourish-beyond-assets/>

¹⁶ <https://markets.businessinsider.com/news/currencies/microstrategy-mstr-pay-board-directors-entirely-bitcoin-btc-michael-saylor-2021-4#:~:text=MicroStrategy%20said%20it%20is%20paying,as%20a%20store%20of%20value.>

¹⁷ <https://cointelegraph.com/news/microstrategy-purchases-414-4-million-worth-of-bitcoin-with-total-btc-balance-eclipsing-3-5-billion>

¹⁸ <https://news.bitcoin.com/microstrategy-buys-more-bitcoin-companys-crypto-holdings-grow-to-132500-btc/#:~:text=Microstrategy%20is%20now%20holding%20approximately,said%20Microstrategy%20founder%20Michael%20Saylor.>

Namecoin provides decentralized Domain Name System (DNS) service for internet addresses, Cardano is building a financial operating system based on DeFi products like Ethereum with the goal to provide solutions that support interoperability of blockchain, voter fraud, contract tracing, and more.

There are crypto that are created with no specific utility goal such as memecoins like Doge, Shiba Inu. Although due to gaining popularity of memecoins and an active community that supports these coins, these coins are popularly being accepted as form of payment for goods and services.

Below are additional examples of use cases around the utility of altcoins:

- **Tokenizing real-world assets:** These assets include copyrights, real estate, art, and more in form of a cryptocurrency token. Fractional ownership in real estate where someone could own a fraction of a real estate property is a popular use case. For example, we can tokenize a luxury property worth \$20 million, and divide that into micro denominations of 20 million tokens each worth \$1. By doing this, the property owner adds more liquidity opportunities, and the buyers who would not be able to afford a \$20 million property can now own a fraction of the unit. Blockchain also allows real-time tracking and real-time reconciliation that is more transparent, and this makes record keeping for maintaining cap tables on the blockchain possible.
- **Non-fungible tokens:** 2021 has been a year of non-fungible tokens (“NFT”), although this market did slowdown in 2022. The journey of Nyan-Cat meme NFTs paved way to major auction house like Christie's selling Mike Winkelman's collage for a whopping \$69 million.¹⁹ That success has inspired more innovative ways to convert real-world art into NFTs. A recent example is that of Banksy's 'Love is in the air' that was purchased for \$12.9 million and subsequently cut into 10,000 pieces [literally] and sold off as individual NFTs.²⁰ Digital cats called Crypto Kitties are one of the most famous examples of blockchain-based NFTs.
- **Gaming:** Crypto tokens are also used in the gaming world, where these tokens, mostly NFT's, represent a unique digital asset inside a game. That unique asset can then be used to exchange within the gaming environment for goods or services, or perform certain gaming actions, and more. This experience gives the player an authentic in-game item because they are the only ones who hold those NFT gaming token.
- **Storage:** Platforms like Filecoin allow users to rent their unused free space on your disk and earn passive income on it. People who opt to buy the storage space would pay the storage platform's native cryptocurrency. In such a system, anyone can rent out their free storage space which is an option that does not exist today in centralized storage systems.
- **Decentralized Finance (“DeFi”):** While NFTs were the frontrunner of 2021 crypto race, DeFi was not that far behind. There are over 2 billion unbanked individuals around the world and blockchain DeFi promises to bring them onto the financial landscape. Perhaps, DeFi's current lure comes from the fact that they provide yields that are 10 times better than traditional markets. For comparison, stablecoin yield at crypto lender and crypto wealth management platform such as BlockFi and Celsius, provides 9% APY while traditional financial institutions

¹⁹ <https://www.nytimes.com/2021/03/11/arts/design/nft-auction-christies-beeple.html>

²⁰ <https://www.nytimes.com/2021/12/01/arts/design/banksy-nft-loic-gouzer-particle.html>

offer a maximum of 5%. NASDAQ listed crypto exchange, Coinbase, tried to bring services like those offered by BlockFi and Celsius and faced headwinds from the SEC. However, this could be a temporary hurdle that prompts a clearer guideline for the DeFi space in the coming years. What we could see in future may be merging of traditional finances with crypto. Recently, Gemini entered a partnership with Bancolombia to provide crypto trading. This could pave ways to provide DeFi services to customers of traditional institutions, provided legal clarity is made available.

- **Other trends:** As exciting as NFTs and DeFi have been so far, it may not be long before we see these becoming integral components of a macro trend that we are in the midst of, of course we are talking about Metaverse. Metaverse is essentially physical reality in an interoperable virtual world with foundation of digital economy where participant can buy, sell, create, swap digital goods and services. Today, such digital platforms exist where one can create a digital asset, like an avatar, on the platform, however, that Avatar is tied to only that platform. In metaverse, one can create an avatar and use it on any platform.

Metaverse received global attention when Facebook re-branded itself to Meta and committed an eye-watering \$10 billion²¹ a year funding to bring metaverse to mainstream. This could be good news and bad news for crypto.

What future really holds is anyone's guess but whatever it is—it is turning out to be exciting for sure.

CONSIDERATIONS FOR COMPANIES TRANSACTING IN CRYPTO

Companies looking to transact in crypto need to consider the following factors.

Accounting & Audit Considerations

As of the date of this publication, there is no authoritative accounting guidance in the United States for cryptocurrencies. Associations like AICPA have put together a taskforce to develop practical non-authoritative guidance on digital assets, and peers in the industries have come together informally to discuss accounting implications of various crypto related matters. The non-authoritative accounting guidance and informal peer discussions have served as a basis for companies in crypto to take certain accounting positions. Accounting will greatly differ depending on the business of the company, how they are using crypto (or even how they acquire and dispose the crypto). Understanding the entity, its environment, its crypto positions, intent, and its utility—all these factors need to be considered to determine proper accounting treatment. Companies should also be prepared to have adequate supporting back up and information for proper audit trail, that may be requested by the auditor. In addition, process documentation, internal control documentation, technical memo on accounting positions helps with preparing for an audit.

One of the primary accounting challenges for crypto is cost basis tracking, especially for entities using multiple wallets and exchanges where the crypto information is disaggregated. To obtain accurate cost basis, it is important to aggregate complete population of crypto transactions in a set of population and apply the appropriate cost basis approach. There are software vendors that offer this service of aggregating data from all sources and calculate cost basis, realized gain / loss. Companies

²¹ <https://www.theverge.com/2021/10/25/22745381/facebook-reality-labs-10-billion-metaverse>

should consider using a software or an automated tool that can assist with the gain/loss calculation to prevent manual calculations and increase risk of manual error. This is an example of what accountants should consider when accounting for crypto transactions—that is, think beyond financial impact, consider operational process and control frameworks.

Tax Impact

The IRS has issued few clarifications on tax implications of crypto currencies, however, depending on the use case, and the nature of the business, the tax implications could differ even if it is for the same type of crypto asset. One of the primary differences between tax accounting and accounting under non-authoritative GAAP is the recognition of digital assets as an intangible asset for accounting purposes where the crypto is recorded as lower of cost or market, and the downside adjustment to the cost is recorded as an impairment expense. For tax purposes, the impairment is disregarded as an expense. For US tax purposes, unrealized gain / loss on crypto assets is also disregarded. Following are a few tax considerations that companies or individuals with crypto should consider:

- Cryptocurrency is treated as a property and crypto transactions are subject to taxation just like any other property or investment.
- Cryptocurrency transactions are required to be reported on the taxpayers tax returns, including sales, exchanges, and mining.
- Crypto-to-crypto exchanges are considered taxable events, meaning gains or losses must be reported, and 1031 exchange does not apply for crypto-to-crypto swap.
- The timing of cryptocurrency transactions can affect their tax implications, as gains or losses may be considered short-term or long-term based on the holding period.
- It is highly recommended to retain detailed records of cryptocurrency transactions, including the date, cost basis, sales proceeds, and purpose of each transaction.
- Cryptocurrency received as payment for goods or services or as compensation is also considered income and is subject to income tax. Likewise, cryptocurrencies used to pay for expenses are considered expenses for tax purposes.
- Taxpayers who fail to report cryptocurrency transactions or misreport their gains and losses may face penalties and interest charges.
- Cryptocurrency held in overseas accounts or exchanges may trigger additional reporting requirements and taxes under foreign asset reporting rules.

Information Security Risk

In the context of cryptocurrency, information security risk arises from the inherent vulnerabilities in cryptocurrency exchanges and wallets, making them susceptible to attacks such as hacking, phishing, and ransomware. Such attacks can result in the loss of private keys, theft of cryptocurrency, and compromise of personal information, insider threats, 51% attacks, smart contract vulnerabilities, leading to financial and reputational damages. Most entities that are transacting in crypto are likely using third parties in several ways, such as third-party software to track their crypto transactions, third party hosted wallets, exchanges where the crypto may be held, third party payment processors

and more. If the company uses an external service provider or a product, it is important for the company to consider performing adequate due diligence on the reliability and integrity of information obtained from the third party and consider obtaining SOC 1 or SOC 2 depending on the risk environment and reliance on the external party.

Smart Contract Vulnerabilities:

Smart contracts are self-executing programs that are coded to perform certain specific actions and these actions are executed when certain conditions are met. While it may seem like smart contracts are 'smart', it is to be noted that they are as good as the logic and security built in the program. While smart contracts offer a high level of security, they are not foolproof. There are several vulnerabilities that accountants should be aware of, and here are a few common ones:

- Reentrancy: This is when an attacker can repeatedly enter and exit a function in a smart contract to drain its funds.
- Integer overflow and underflow: This vulnerability can occur when a number is too large or too small for the data type it is assigned to and this could lead to inaccurate results
- DoS attacks: Attackers can overload the system with transactions, leading to slower processing times and higher transaction fees.
- Timestamp dependence: Smart contracts that rely on timestamps can be manipulated by attackers who change the time on their devices.
- Gas limit vulnerabilities: The gas limit is the maximum amount of gas that can be used in a transaction. Attackers can manipulate the gas limit to their advantage.
- Authorization vulnerabilities: Smart contracts can be vulnerable if there are no proper authorization checks in place.
- Dependency vulnerabilities: Smart contracts can be vulnerable if they rely on external code that is not secure.

Accountants should be aware of these vulnerabilities when auditing smart contracts and should work with developers to ensure proper security measures are in place to mitigate these risks.

Alternative Ways of Accepting & Transacting Crypto Without Any or Material Impact on Books, Taxes & Information Security Risk Considerations

One of the easiest ways for companies to get started with being involved in the crypto community is to for them to accept crypto as payment. They could either be the party receiving the crypto directly from their customers in exchange for the merchandise or they could use a third-party software provider like BitPay who can act as a crypto payment processor to accept crypto and settle back to them in fiat currency. The latter approach seems to be more preferred with companies as there is no material impact in the accounting, audit, IT risk and tax of the companies using third party payment processes to accept crypto. This is because they do not take the crypto on their balance sheet, and do not deal with the crypto volatility or related IT considerations.

HIGHLIGHTS OF MAJOR RECENT REGULATORY CHANGES

Office of the Comptroller of the Currency (OCC)

The OCC is charged with regulating national banks and has been playing an active role in the crypto space. They have provided interpretive letters and guidance clarifying that banks can custody cryptocurrency and stablecoins, as well as engage in stablecoin activity.

In 2020, the OCC confirmed the authority of a national bank to provide cryptocurrency custody services. In 2021, the OCC confirmed that a national bank may use new technologies, including independent node verification networks (INVN) and related stablecoins, to carry out bank-permissible functions, such as payment activities. All these movements have been great, however, the new OCC chief signals greater caution on crypto.

In Q3 2022, OCC highlighted crypto assets as a “special topic” in its “Semiannual Risk Perspective for Fall 2022.” In this report, the OCC highlighted several risks associated with cryptocurrency activities and engagement with crypto firms. As the crypto currency space continues to mature, so does the industry's risk management practices which need to be adjusted for hacks, outages, fraud, scams, and confusion over ownership rights. In light of the fall out of Terra Luna, the report also warns that stablecoins may be unstable, and that most stablecoins remain vulnerable to run risk.

Securities and Exchange Commission (SEC)

The SEC Has Been Cracking Down on Crypto, especially after the Terra Luna fall out. SEC along with other U.S. market regulators have increased their efforts to regulate the cryptocurrency market. The Biden administration responded to the Terra Luna fall out by outlining a framework for crypto development. This framework included nods in the direction of crypto regulation. SEC Chair Gary Gensler continues to be vocal in his disapproval of the current state of crypto regulation and believes that cryptocurrencies are securities based on the four criteria laid out in the Howey Test. If a crypto meets the definition of a security, it should be registered with the SEC under federal securities laws.

The SEC has been actively pursuing enforcement actions against crypto activities in 2022. They doubled their crypto assets and cyber unit. The SEC, Commodity Futures Trading Commission (CFTC), and Department of Justice (DOJ) have been more active in crypto enforcement since May. There have been charges against several crypto-related activities, including the failure to disclose compensation for promoting an unregistered sale of crypto assets and violations of the Commodity Exchange Act and CFTC regulations.

Recently, two high-profile cases were mentioned in their enforcement actions – a celebrity, Kim Kardashian, settled \$1 million fine to SEC for promotion of “EMAX tokens” that SEC considered a security, and Ripple over the sale of its cryptocurrency XRP. The Ripple case is expected to be settled soon.

Bloomberg had also reported that the SEC was investigating Coinbase for allowing its users to trade unregistered securities, and identified nine cryptocurrencies as securities, although Coinbase insists it doesn't list securities.

²² <https://www.occ.gov/publications-and-resources/publications/semiannual-risk-perspective/files/pub-semiannual-risk-perspective-fall-2022.pdf>

Infrastructure Bill & Its Impact on Crypto Companies

President Joe Biden signed a \$1.2 trillion²³ bipartisan infrastructure bill on November 15, 2021. The bill has provisions that would allow IRS to tax cryptocurrency trades, which would generate an additional ~\$2.8 billion²⁴ in tax revenue. The projected date of the enforcement is 1/1/2023. The policy on cryptocurrency titled "Information Reporting for Brokers and Digital Assets" mandates that cryptocurrency brokers report transfers of digital assets (like a traditional broker would report the sale of a stock or bond). Unfortunately, the definition of 'brokers' is too broad and unclear. Based on the definition, the new guidance could include any kind of cryptocurrency transaction, including miners, stakers, and software developers.

The bill would require crypto brokers to report activity to the IRS and businesses to disclose trades of digital assets over \$10,000. This additional reporting would require crypto companies to track the cost basis of the crypto as accurately as possible, such that it reconciles with the reports that exchanges would submit to the IRS. Cryptocurrency "brokers," including some wallets and exchanges, will have to report customers' activity to the IRS each year using Form 1099-B.

In some cases, there is still lack of clarity on who is expected to report on the end consumer in the cases where the company is operating in a decentralized environment where it merely offers a platform for peers to connect and transact. It is expected more clarifications and guidance may be issued in the coming months before the reporting deadline. Form 1099-B ("Proceeds from Broker and Barter Exchange") requires the following information for each sale or disposition of a cryptocurrency:

- Date you initially acquired the asset
- How much you initially spent on the asset (cost basis)
- Date you disposed / sold of the asset
- How much you disposed / sold the asset for (sales proceeds)

The requirements above are effective annually beginning in 2024, which means, the information for the forms that need to be submitted in January 2024 will be for the prior year's transactions. As such, companies will need to start tracking the information beginning on January 1, 2023.

Tax reporting may be challenging as there may still be gaps in Form 1099-B due to difficulties in obtaining the required information, such as in the case of DeFi exchanges and cold wallets. It is also unclear how brokers will handle missing information for coins acquired prior to 2023. Companies that are considered cryptocurrency brokers will need to collect personal information such as full name, address, Social Security Number etc, some of which is not required in DeFi and NFT ecosystems due to anonymity of the user. Finally, the Treasury Department who is responsible for interpreting the law still needs to clarify who is not considered a broker. The IRS has stated that it

²³ <https://www.whitehouse.gov/briefing-room/statements-releases/2021/11/06/fact-sheet-the-bipartisan-infrastructure-deal/>

²⁴ (Source: <https://www.bloomberg.com/news/articles/2021-11-17/how-taxing-crypto-got-changed-by-infrastructure-law-quicktake?sref=gni836kR>)

won't target non-brokers. However, true brokers, like cryptocurrency exchanges and wallets, should plan to implement the required information returns after December 31, 2023.

Examples of Global Adoption:

In June 2021, El Salvador's President, Nayib Bukele, declared that Bitcoin as a legal tender in El Salvador. Effective September 7, 2021, businesses in El Salvador are required to accept Bitcoin for all payments. An official Bitcoin wallet, Chivo, was launched by the country to support this effort with a promotional offer for new users to receive a bonus of \$30 in Bitcoin. 200 Chivo ATMs were deployed.

While this is great and bold move on the country's part, it did not come without some issues. The country faced technical challenges such as server capacity, disabled app installs, and transaction failure at launch. The price volatility of Bitcoin did not help with adoption of the new legal tender. Money laundering problem was not necessarily addressed with Bitcoin in place. El Salvador's credit rating S&P Global was also adversely impacted. Despite these issues, the country continues to promote and push for Bitcoin adoption. Other countries have drawn inspiration from them, and it will not be a surprise if they follow suit.

Tax Standards—IRS

Virtual currency is treated as property for U.S Federal tax purposes and rules for property tax applies for digital assets. The IRS has issued a few clarifications on forked assets and tax reporting. There are still no plans for a specific voluntary disclosure program, however, it is encouraged to all digital currency holders to self-report. IRS added a yes-or-no question to the front page of the 1040 income tax form asking whether filers had sold or exchanged virtual currencies recently. IRS has also started collecting vast amounts of data on blockchain transactions, has subpoenaed crypto exchanges and has been working on coordinating enforcement with foreign governments. The IRS is asking exchanges like Coinbase, Kraken and crypto companies like Circle to turn over customer information on cryptocurrency trades, and transfers over \$10,000 or more to be reported to the IRS.

Accounting—FASB / AICPA

As noted earlier, there is no authoritative accounting standards in the United States for cryptocurrencies. The AICPA has issued a practical guide for digital assets addressing several frequently asked questions and matters that crypto companies experience. One of the most debatable topics from an accounting perspective is whether and when to treat digital assets at fair value versus as an intangible asset. In October 12, 2022, the FASB tentatively decided to:

- Require all entities (public and private) to initially measure crypto assets at fair value in accordance with ASC 820.2. Any subsequent changes in fair value would be recognized in comprehensive income under the fair value guidance.
- Not comment or provide any alternatives for situations to measure crypto assets where the crypto asset does not have a quoted price in active markets.
- Require entities to expense commissions and other transaction costs related to the acquisition of crypto assets as incurred unless industry-specific guidance states otherwise.

FASB considers crypto assets that are treated as an intangible asset that (1) is secured by cryptography residing on a distributed ledger, (2) is fungible, and (3) does not provide the holder with an enforceable right to, or claims on, goods, services, other assets, in the scope of this proposal.

The FASB is still in the process of reviewing standards for accounting treatment of crypto assets as of December 31, 2022. Decisions on presentation, disclosure, and transition are still pending. Until the decision is made, entities that are not investment companies or broker-dealers continue to measure their crypto assets as an intangible asset, i.e. at lower of cost or market, with the adjustment to reduce the value recorded as impairment.

More about this in Unit 3.

Unit 3

Practical Accounting Applications of Cryptocurrency

LEARNING OBJECTIVES

- **Recognize** select factors that accounting professionals should be mindful of when classifying cryptocurrency assets for financial reporting purposes.
- **Recall** best practices that organizations should adopt to properly account for digital assets.

CLASSIFICATION CONSIDERATIONS OF DIGITAL ASSETS ON THE BALANCE SHEET

For accounting purposes, first let's define what a crypto asset or digital asset is.

As defined in the practice aid called "Accounting for and auditing of digital assets"²⁵ published by AICPA's Digital Assets Working Group, *"The term crypto asset is specific to the type of digital assets that*

- a. function as a medium of exchange and*
- b. have all the following characteristics:*
 - i. They are not issued by a jurisdictional authority (for example, a sovereign government).*
 - ii. They do not give rise to a contract between the holder and another party.*
 - iii. They are not considered a security under the Securities Act of 1933 or the Securities Exchange Act of 1934."*

Examples of crypto assets are Bitcoin, Bitcoin cash, and Ethereum. The above characteristics are not all-inclusive. There may be other facts and circumstances related to the entity and its environment that need to be considered.

²⁵ <https://www.aicpa.org/resources/download/accounting-for-and-auditing-of-digital-assets-practice-aid-pdf>

Step # 1: The first step for the entity to assess accounting treatment of a crypto asset is to determine if the crypto asset meets the definition of an “asset” under US GAAP or IFRS or other applicable accounting standard. Under U.S. GAAP, an asset is recognized when its cost or value can be measured reliably. The probability of receiving future economic benefit from the asset is not a recognition requirement under U.S. GAAP. Under IFRS, an asset is an item that is controlled by an entity because of past events and from which future economic benefits are expected to flow to the entity.

Step # 2: Once the crypto asset meets the asset definition, second step is to determine what type of asset would it be classified based on the definition of various asset classes that exist today under accounting standards. The following are four major classes of assets under current accounting guidance: cash or cash equivalents, inventory, financial instruments, and intangible assets.

- **Cash or cash equivalents:** Cash or cash equivalents are defined as a legal tender issued and backed by a government and accepted as a medium of exchange.

Because digital assets are not legal tender issued by the government, they do not qualify under this definition. As such, digital assets are not considered cash or cash equivalents. Note that the definition requires the asset to be issued by the government to qualify for this classification. Central bank digital currencies (CBDC) such as e-yuan could qualify under this definition. Bitcoin is a legal tender in El Salvador, however; it is not issued by a government organization. As such, Bitcoin in El Salvador would not meet the US GAAP definition of cash or cash equivalents.

- **Inventory:** Inventory represents assets purchased and held in the ordinary course of business with the intent to sell.

Under US GAAP, these assets need to be tangible. Under IFRS, inventory can be intangible assets. Under IFRS and U.S. GAAP, inventory is recorded at the lower of cost and net realizable value.

- Because digital assets are not tangible, they do not qualify under this definition under US GAAP.
- Under IFRS, inventory does not need to be tangible, hence, a case can be made that digital asset may meet this definition; however, the trading volume needs to be considered to see if it qualifies as “held in the ordinary course of business.”
- There may be exceptions for commodity broker-dealers that are buying or selling cryptocurrencies within the normal course of business, where cryptocurrencies could be measured at fair value, less costs to sell. Any changes in the value would be adjusted in profit and loss.

- **Financial instrument:** A financial instrument provides the holder with a contractual right to receive or exchange cash or a financial instrument.

Under IFRS and U.S. GAAP, financial instruments allow measurement of the asset at fair value and recording of changes in fair value in profit and loss.

- Digital assets are not legal tender and generally do not have a contract backing any contractual right to receive or exchange cash or a financial instrument and hence, do not fall under this definition.

- Depending on the contractual terms, certain crypto arrangements may be considered a financial instrument. For example, cryptocurrency futures that settle in cash could be considered derivatives, and thereby, accounted for as financial instruments based on the definition.
 - Companies holding cryptocurrency as an investment and that fall within the scope of investment company status under ASC 946 could fall under the financial instrument definition.
- **Intangible Assets:** Assets that are not physical in nature are classified as intangible assets. Intangible assets can have definite lives or indefinite lives.

Under U.S. GAAP, indefinite-lived intangibles are initially measured at cost and need to be tested for impairment annually or more frequently based on triggering events. Under IFRS, intangible assets are accounted for either at cost or revaluation at fair value at the date of the revaluation if an active market exists, less any subsequent accumulated impairment losses.

- Being purely digital in nature and indefinite in life, cryptocurrencies may meet the definition of “indefinitely lived intangible assets” under both U.S. GAAP and IFRS.
- Accounting treatment of digital asset would follow the intangible asset guidelines under ASC 350 under U.S. GAAP. ASC 350 which requires the asset to be initially recorded as intangible assets at cost. A decline below cost in a quoted price on an exchange may be an event indicating that it is more likely than not that the digital asset is impaired.

Currently, digital assets involve measuring them as indefinite-lived intangible assets at historical cost less impairment, which some stakeholders argue does not accurately represent their economic value. As a result, the FASB has considered accounting for some or all digital assets at fair value, with crypto assets in the proposal to be measured at fair value at each reporting period. The FASB decided against providing application guidance for fair value measurement but concluded that it better reflects the economics of crypto asset holdings. The board also decided against a fair value option to maintain comparability among entities. However, the FASB has not completed its standard-setting process, and entities not classified as investment companies or broker-dealers should continue to measure crypto assets at historical cost less impairment. More clarity on this will be issued in 2023.

ACCOUNTING CONSIDERATIONS DEPENDING ON HOW DIGITAL ASSETS WERE ACQUIRED & THE PURPOSE OF THE ASSETS

Amongst other factors, accounting for digital assets depends on how these assets were acquired, and what does the entity plan on doing with them (i.e., buy and hold for sale or sell, buy, and hold for investment / gains, buy and stake, buy and lend, etc.).

Digital assets could be acquired in several ways, and each of the ways may have a different accounting treatment and may require application of other accounting guidance such as ASC 606 (Revenue from Contracts with Customers), ASC 815 (Derivatives and Hedging), ASC 610-20 (Other Income—Gains and Losses from the Derecognition of Nonfinancial Assets), ASC 845 (Nonmonetary Transactions).

What follows are a few ways of acquiring digital assets:

- Purchased directly with fiat currency from an exchange or a third-party platform selling cryptocurrencies such as crypto ATM brokers
- Purchased a cryptocurrency in exchange for another cryptocurrency
- Received the cryptocurrency concurrently as a form of consideration for the sale of goods or services
- Right to the cryptocurrency in the future as a form of consideration for the sale of goods or services
- Received as a donation, gift, reward or marketing incentive
- Received as a form of compensation for services such as payroll, bonus, etc.
- Received as part of a token fund raise, crowdfunding

For example, an entity that is not a broker-dealer or an investment company and is in the business of buying and selling crypto currencies from their crypto inventory build-up, is taking the crypto inventory risk, credit risk and has the possession of the crypto until disposed, should consider the gross versus net principles of revenue recognition in accordance with ASC 606. If the response is gross, then the company would recognize the gross value of the crypto sale as revenue, and the corresponding cost as cost of services. This entity would also recognize the crypto asset as an intangible asset on its balance and the crypto asset would be subject to impairment.

ACCOUNTING CONSIDERATIONS FOR DIGITAL ASSETS TREATED AS INTANGIBLE ASSETS

As noted previously, U.S. GAAP does not currently directly address the accounting for cryptocurrencies, however, based on the definition of an indefinite-lived intangible assets under ASC 350, cryptocurrencies qualify for the accounting treatment under this guidance. There may be limited circumstances in which cryptocurrencies that are held for sale in the ordinary course of business may be considered as inventory (as in the case of a broker) or accounted for as an investment by an investment company.

- **Initial recognition:** Entities that record digital assets as intangible assets need to follow the intangible asset guidelines under ASC 350 under U.S. GAAP, i.e., record the asset as an indefinite-lived intangible asset at cost with evaluation for impairment.
- **Subsequent measurement:** An indefinitely lived intangible asset is not subject to amortization. It is subject to annual impairment or more frequent impairment if a triggered event occurs that causes more likely than not impairment of the asset. Crypto assets will follow the same treatment. If the carrying amount of the intangible asset exceeds its fair value, an entity should recognize an impairment loss. The adjusted value becomes the new basis of the asset. If the value of the asset increases subsequently, no adjustment will be made to the cost even if the value was recovered within the same reporting period. If the digital asset is impaired, the entity should determine the new fair value in accordance with FASB ASC 820, Fair Value Measurement. For impairment assessment, an individual unit of a digital asset with the same carrying value and same acquisition date can be batched.

Some of the challenges in accounting for crypto assets as intangible assets are as follows:

- **Tracking cost basis of the acquired assets:** One of the challenges in tracking cost-basis for acquired crypto assets is ensuring completeness of the crypto population from all sources, such as wallets, exchanges, cold storage etc. There are accounting software vendors that assist with aggregating the data, however, the accounting software may not be integrated with the entity's primary ERP / accounting system, and this could increase the effort to reconcile transactions for financial reporting purposes. Also, one of the issues to consider is ensuring that the accounting software or the tool used to aggregate all the crypto data is pulling all transaction level information accurately, and all inter-wallet / inter-exchange movement are captured accurately. Movement of crypto from one wallet to another that is held by the same entity is not considered a disposal and it is important to ensure that the tools used to track this do not treat inter-account activities as disposals (which triggers realized gain / loss), or consider manual adjustments to such data.
- **Value of acquired asset:** The value of acquired crypto asset is based on accounting principles for valuation of assets under FASB ASC 820, Fair Value Measurement. This typically corresponds with the consideration paid for the acquired asset, however, for illiquid asset or assets that are thinly traded and do not have a primary market, there may be adjustments to the cost basis based on characteristics of the acquired assets. Some of the features included liquidity restrictions, whether the assets have lock-up period, is the entity a token issuing entity and is the asset that needs to be valued its token that it created and more such factors.
- **Determining what makes up an individual unit of a digital asset:** Entities should analyze and document what makes up a unit of asset for impairment purposes. Units of assets with same price purchased at the same time can be batched together as one unit.
 - Defining the triggered events for impairment, especially considering the volatility and the frequency of the reporting period for measuring impairment
 - Fair value measurement of the crypto asset to determine the adjusted cost basis after impairment, and the value of impairment.

ACCOUNTING CONSIDERATIONS FOR DIGITAL ASSETS TREATED AT FAIR VALUE

- **Qualification criterion:** Entities that are considered as investment companies regulated under the Investment Act of 1940, investment companies that are not regulated by the 1940 Act but fall under the definition of ASC 946, broker-dealers that fall under the definition of ASC 940, can account for crypto assets at fair value.
- **Recognition:** Entities that account for crypto assets at fair value are subject to valuation considerations as per ASC 820. The entity records the digital asset at fair value on balance sheet, and any subsequent changes are reflected in the profit and loss as unrealized gain / loss with adjusted fair value on the balance sheets. Note that for tax purposes, such unrealized gain / loss is disregarded in the US.

Some of the challenges in accounting for crypto assets at fair value are same as accounting for assets as intangible assets. The following key considerations:

- Tracking fair value of crypto assets in a manner such that the population of the crypto asset is complete and accurate
- Fair value adjustments based on valuation principles where significant management judgment needs to be used
- Track value of assets at cost basis or other basis for tax purposes, hence, the need for additional accounting efforts

PRACTICAL ACCOUNTING BEST PRACTICES FOR DIGITAL ASSETS

- Define what the triggering events are and the frequency of the assessment. This will require management judgment and a well-documented policy. Consider having a CPA review and obtain auditors approval
- Ensure completeness and accuracy of the digital asset population that aggregates the data in one place. Include fiat and non-fiat acquisition of the crypto from all sources (exchanges, wallets), disposals, interwallet transfers (where crypto is transferred from one internal wallet to another internal wallet), interexchange transfers (where crypto is transferred from an internal wallet to an account or a wallet with the exchange and vice versa, or transfers between internal exchange accounts).
- Adhere to a consistent and reasonable approach to apply cost basis to the disposed asset (such as FIFO).
- If the entity is using a third-party platform to aggregate the data, then ensure that all the information is pulled accurately, and the data is complete (need to ensure that Application Programming Interfaces “API’s” work).
- Consider adjustments to the carrying value of the asset if the software is not set up to track and record impairment.
- Reconcile crypto transactions as part of month-end close, along with daily tracking.
- Valuation considerations:
 - Define and document what the entity considers as primary market that is used as basis for valuation. If a primary market does not exist, analyze other alternatives
 - If the entity is using third-party sources, ensure the third-party source is reliable. Consider obtaining and reviewing SOC 1 and SOC 2, based on risk assessed
 - Review features of the crypto asset, its utilities, rights, and restriction, etc., as part of determining valuation

IMPACT ON ACCOUNTING OF DIGITAL ASSETS BASED ON HOW THEY ARE HELD

Are the digital assets held in the wallets that are hosted by third-party, i.e., held in a third-party custody? Or are the digital assets held in self-custodial wallets?

The above question is critical in determining who has control of the digital assets, and based on the response to this question, the entity (both the digital asset custodian and the depositor) can figure out accounting treatment.

How to Determine Who Has Control of the Digital Assets?

Below are some of the factors that need to be considered to assess control of digital assets:

- Legal analysis to understand who has legal ownership of the digital assets
- Terms of condition in the contractual agreement or the online terms of use during initial sign-up between the depositor and the custodian
- What are rights and obligation of the custodian and the depositor under the arrangement? Who has the ability to sell, buy, transfer, manage, etc.?
- Existence of side agreements
- Who holds the private keys of the wallets?
- Who can execute a transaction from the wallet based on who has the private key access in a multi-signature wallet?

Depending on responses to the above questions, digital assets may be treated as off-balance sheet item and require financial statement disclosures.

IMPACT ON ACCOUNTING PROFESSION

- The accounting profession will evolve as the crypto currency industry matures and there is more clarification from peers and standard setting bodies on accounting treatment
- Accounting professionals have an opportunity to expand their services to consulting, advisory and project-based work such as internal control framework buildout, drafting internal control narrative and flow charts, drafting technical accounting memo etc.
- Reducing the knowledge gap between accountants and IT professionals will require greater collaboration and adoption of a cross-functional skill set
- A deep dive in the industry and its environment will include understanding how blockchain and crypto works operationally and how the entity is using crypto in their business
- Professionals should work closely with auditors, legal counsel, valuation experts and other crypto SME to learn more about existing business operations and develop a control framework that will help with building accounting policy and guidelines

Conclusion

Accounting for cryptocurrencies will continue to evolve as the industry evolves and matures, and there is more regulatory clarity. Peer groups have come together and are discussing practical application to record transactions, while we wait on the accounting standard setting bodies to formalize accounting guidance.

With the help of trusted advisors and crypto SME, we are seeing more consistent application in financial reporting and disclosures than we saw two years ago. Entities are realizing the importance of proper accounting from day one and setting appropriate processes including automation.

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