Blockchain and Cryptocurrencies

LINK TO PRESENTATION: NBP Lesson 2

Section 1: Introduction to Blockchain and Crypto

What is Blockchain?

- Blockchain is a public, unchangeable ledger that facilitates the process of recording transactions and tracking assets in a business network.
- Best known for maintaining secure and minimal risk transaction records, especially in regards to cryptocurrencies.
- Collects and organizes data into "blocks," which each have unique storage capacities. These blocks connect together to form a chain of information.
- This chaining pattern allows for perfect chronological tracking and serves as the foundation for records that cannot be edited or deleted.

How does Blockchain work?

Ledgers

- At its core, blockchain uses a public ledger that functions as a record-keeping system.
- Ledgers are spreadsheets of all the transactions that have been recorded in a blockchain, used as a record book of all genuine transactions between network participants.
- Maintains secure and anonymous identities for network participants.
- Its main use is recording transactions of cryptocurrencies (a type of virtual, decentralized currency that can be bought, sold, and traded at for monetary value), where security is incredibly important.
- There are always multiple copies of a ledger, so it is easy to spot potentially fraudulent activities.

Hashes

- A hash is a unique identifier for each block of data within a blockchain, acting as an encrypted password.
- Blocks contain both its own hashes and that of the previous block, which makes it near impossible for users to input false information as the hash changes depending on the time and nature of the transaction.

How does Blockchain relate to cryptocurrencies?

- Cryptocurrencies such as Bitcoin depend on blockchain technology to ensure the security of transactions and stability of currency circulation.

- Individuals can buy, trade, mine, or even create cryptocurrencies, and blockchain is crucial for all stated purposes.

Keys and Security

- The wallet that cryptocurrencies are stored in is a blockchain.
- By using a "public key," an individual can receive cryptocurrency transactions.
- By using a "private key" (the wallet's password), an individual can prove ownership or spend the funds of the wallet. The private key is typically a large number in order to prevent theft.
- Cryptocurrency transfers are sent to the public key and then securely "unlocked" by the private key to finalize the transaction.

Mining

- Most applicable to Bitcoin, mining is the process in which new coins can be entered into circulation.
- Miners dedicate a computer (or multiple computers) to analyze transactions on their individual ledgers.
- The process of mining refers to the analysis process, which the computers do by attempting to solve extremely complex computational problems.
- If a computer is the first to solve a given solution, it receives a block of Bitcoin (1 Bitcoin) as a reward.

Creating Crypto

- Throughout the past few years, many new cryptocurrencies have surfaced on the market, many of which are "meme" coins.
- Creating a cryptocurrency could be achieved by creating a new blockchain, modifying an existing blockchain, establishing a coin on an existing blockchain, or hiring a blockchain developer.
- Requires significant time, money, and advanced knowledge of both technology and finance.

What are the advantages of Blockchain?

- Decentralization allows data to be more securely stored.
- All individual transactions are efficient and private.
- Eliminates the need for human and third-party verification, which is both inaccurate and costly.
- Public nature allows ledgers to be transparent.
- Paves way for technologies such as cryptocurrencies, supply chain management, banking, and asset tracking.

What are the disadvantages of Blockchain?

- Mining practices tend to induce significant technology and energy costs.
- Regulatory measures are still fairly unclear.
- Limited data storage per block.
- Transaction speed is generally slower than other tracking technologies.
- Easy to use to protect illegal activities and black markets.

How has Blockchain been used in business practice?

- Over the last decade, blockchain has experienced a significant boom in popularity.
- Total market capitalization is projected to exceed $67.4 billion USD by 2026.
- Has over 80 million users worldwide.
- Popular blockchain topics include cryptocurrencies, virtual reality platforms, and non-fungible tokens (NFTs).
- Being used by various corporations, such as Visa, IBM, Walmart, Ford, Delta, etc.

ECommerce Industry

- Blockchain innovations have drastically improved supply chain management and customer data protection.
- Digital identification of users can now be stored as hashes within blocks.
- Example: Fluz App, a platform that allows users to receive cash back for purchases in their favorite stores. Blockchain helps this company record gift card spending and the growth of its social networks.

Virtual Reality Industry

- Blockchain has forged the possibility for the ownership of items in virtual reality, a trend that began with cryptocurrencies.
- Example: The Metaverse, a virtual world designed by Meta that will provide its users with immersive digital experiences. Digital assets such as NFTs (a unique digital identifier stored inside a blockchain) enables the creation of a virtual economy.

Real Estate Industry

- Blockchain has assisted developments in investor/tenant identification and property management.
- Companies are able to automate their transactions and increase data accessibilities for all sales.
- According to Forbes, blockchain could also improve the automation of real estate contracts and connect directly to a more seamless transition when purchasing property.

Other Uses of Blockchain

- One of the main advantages of blockchain is its transparency and trust, meaning that almost any platform that incorporates the elements of trust can use blockchain to better their systems

    - Voting
    - Contracts
    - Healthcare
    - Property Records
    - All things money

Section 2: Blockchain and Dumpling Delight

Question: Given its benefits and features, how can blockchain be integrated into Dumpling Delight's company operations?

*Note, please review Lesson 1 for a better understanding of Dumpling Delight.

Possibility 1 — Establishing Alternate Payment Systems

Currently, Dumpling Delight operates on a standard cash and digital payment system similar to the vast majority of restaurants in the world. This means that Dumpling Delight often needs to wait several days for bank settlements and constantly incur costs to credit card companies. The cost of this transfer can range from 2 to 5% of the transaction volume, which accumulates over time and can greatly affect profits and revenues.

Blockchain based technologies such as IOTA and RaiBlocks have the potential to both reduce these transaction costs and improve existing payment speeds. While the specific mechanisms to realize these changes are still in the development phase, such an update would prove invaluable to the long-term success of Dumpling Delight's financial operations and also enhance existing customer service. This ties specifically into blockchain's strengths of security and efficiency.

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- Blockchain-based technologies can:
    - reduce transaction costs
    - improve existing payment speeds
- Helps Dumpling Delight's long-term financial operations and also enhance existing customer service this ties specifically into blockchain's strengths of security and efficiency.

Possibility 2 — Tracking Ingredient Quality

Dumpling Delight is incredibly well known for its selection of premium and authentic ingredients. However, given the rampant spread of food fraud, ensuring the quality of ingredients has become an increasingly difficult task for the company's chefs and executives. The deliberate misrepresentation of edible products costs the global food industry over $40 billion per year, and Dumpling Delight constantly spends time and effort checking their ingredient sources.

Luckily, data gathering processes have been expedited by the usage of blockchain, as multiple technology companies have begun digitizing the supply chain for food. For example, Ripe.io, a recently founded agritech blockchain firm, has created a service that tracks food supplies throughout each step of the supplying process. By using the transparent and automated nature of blockchain, Ripe can track everything from expiration dates, to factory conditions, to farm environments. These features will allow Dumpling Delight to easily select high quality ingredients and also further build its foundation of consumer trust.

Possibility 3 — Using Utility Tokens

In Dumpling Delight's main case study, we discussed the potential of a loyalty program for the restaurant's frequent customers. While introducing a typical loyalty program might not be considered a unique selling proposition in the eyes of interested consumers, the usage of utility tokens, an item frequently used in cryptocurrency management, could potentially make the difference.

On any given blockchain network, the owners of utility tokens receive special rights, such as the right to use a service or claim a product free of charge or at a discounted price. This perfectly fits the concept of a loyalty program, where special guests could purchase or be awarded with utility tokens that give them special perks when dining. Dumpling Delight could especially benefit from this idea, as these seemingly futuristic utility tokens could easily improve the restaurant's already-excellent brand image while serving their practice purposes.

Blockchain explained in simple terms

- Selling something
    - No blockchain: Payments could be processed through a bank which will cost you, or the other person money.
    - Blockchain: Payments are processed directly to whoever you are selling it to. There is no middle man that will cost you money or time.
    - Since it's public, everyone sees the transaction, making sure that no one is being scammed.
- Apply this same logic on a larger scale.
    - Since everyone sees and knows, scams are almost impossible.

Summary:

- Not synonymous with Bitcoin and other cryptocurrencies.

- Public history of transactions that cannot be altered, making it safe and transparent.
- Decentralized nature makes sure that there isn't a middleman that can alter your transactions, building on its transparent nature.
- Valuable management tool in some of the world’s largest industries.
- Will undoubtedly be a fundamental aspect of tomorrow’s technology.