INNOVATING BLOCKCHAIN THROUGH DIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

Tsinghua University

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Blockchain & W3 Tech
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INNOVATING BLOCKCHAIN THROUGH DIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

The world of social commerce is constantly evolving, and block-chain technology is positioned to completely revolutionize the way we interact and transact online. With the emergence of Web 3 applications, we are seeing a new era of decentralized platforms that offer greater security,transparency,and user control.

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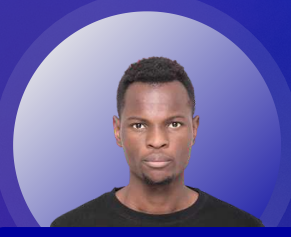
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Abstract

INNOVATING BLOCKCHAIN FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

The world of social commerce is constantly evolving, and block-chain technology is positioned to completely revolutionize the way we interact and transact online. With the emergence of Web 3 applications, we are seeing a new era of decentralized platforms that offer greater security,transparency,and user control.

In today's digital age, social commerce has become an integral part of our daily lives. With the rise of e-commerce, social media platforms have become a hub for online shopping, allowing businesses to reach a wider audience and customers to easily discover and purchase products. However, this process is not without its challenges. Fraudulent activities, lack of transparency, and data privacy concerns are just a few of the issues that continue to plague the industry. But what if there was a solution that could revolutionize social commerce and overcome these challenges?

Integrating block chain technology - a decentralized, secure, and transparent system has a tremendous potential to transform the way we buy and sell online. In this comprehensive guide, we will explore the concept of web 3 applications and how block-chain can be used to create a safer, more efficient, and trustworthy social commerce ecosystem. Get ready to dive into the world of web 3 applications and discover how block-chain is changing the game for online shopping as we know it.

But what exactly is Web 3. and how can block-chain technology transform social commerce? In this comprehensive paper, we will explore the key concepts and applications of Web 3 and how it is changing the face of social commerce. From decentralized marketplaces, coin tokenization, incentive buying and social networks to group purchasing & identity management and payment solutions; We will examine the cutting-edge platforms and technologies that are fueling the Web 3 revolution.

This paper will offer priceless insights into the world of block-chain and Web 3 applications, whether you are a marketer, entrepreneur, or merely interested in the future of social commerce. So let us get started and investigate the fascinating potential of this new technology.

INNOVATING BLOCKCHAIN THROUG HDIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

01

BLOCKCHAIN & WEB3

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ONE: BLOCKCHAIN & WEB3

I : WHAT IS BLOCK–CHAIN AND HOW DOES IT WORK?

Block-chain technology is an advanced database mechanism that allows transparent information sharing within a business network.Block-chain is essentially a distributed ledger of records or public ledger of every digital event or transaction that has ever taken place and been shared among involved parties. The consensus of a majority of the system's users verifies each transaction in the public ledger. As a result, it makes changing, hacking, or manipulating the system impossible or difficult.

A block-chain database stores data in blocks that are linked together in a chain. The data is chronologically consistent because you cannot delete or modify the chain without consensus from the network. As a result, you can use block-chain technology to create an unalterable or immutable ledger for tracking orders, payments, accounts, and other transactions. The system has built-in mechanisms that prevent unauthorized transaction entries and create consistency in the shared view of these transactions.

Block-chain is an important component of information technology that is popular worldwide and regarded as valuable in peer-to-peer decentralized distributed ledger-based systems. It is useful in digital asset transactions because there are no third-party intermediaries or brokers in this technology.

Block-chain technology is being used in a variety of fields and industries, including business and commerce, education and training, health and medical systems, government and administration, entertainment, banking and trade, and so on. As a result, Block-chain Technology is a type of fraud-resistant system with the potential to revolutionize many sectors in general in a transparent and advanced manner.

Blockchain is a decentralized digital ledger that records transactions on a secure and transparent network. It is a distributed ledger technology, which means that the database is stored on multiple computers, and any changes made to the ledger are verified by all the computers in the network. This makes it virtually impossible to hack or alter the data, ensuring a high level of security and transparency.

The blockchain is made up of blocks that contain a set of transactions. Each block is linked to the previous block, forming a chain of blocks, hence the name

blockchain. These blocks are verified and added to the chain by a network of computers, known as nodes or miners, who are incentivized to do so through a reward system.

One of the key features of blockchain is that it is decentralized, meaning that there is no central authority controlling the network. Transactions are validated by the network, and once a transaction is added to the blockchain, it cannot be altered or deleted. This makes blockchain an ideal

technology for applications that require trust, security, and transparency.

When a new transaction occurs on the blockchain, a record of that transaction is added to each copy of the ledger that is maintained by each computer in the network. These transactions are verified by network participants through cryptography and recorded on a public digital ledger.

BLOCK-CHAIN IS AN IMPORTANT COMPONENT OF INFORMATION TECHNOLOGY THAT IS POPULAR WORLDWIDE AND REGARDED AS VALUABLE IN PEER-TO-PEER DECENTRALIZED DISTRIBUTED LEDGER-BASED SYSTEMS.
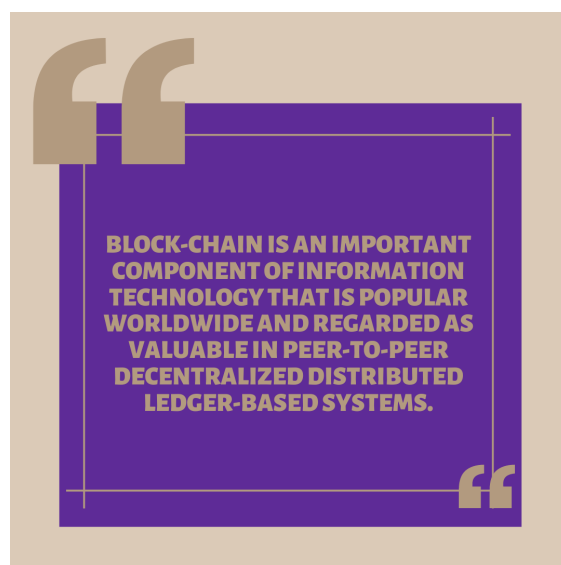
Blockchains are secured against tampering and revision through the use of cryptographic hashing and encryption algorithms. Once a block of data has been added to the blockchain and verified by the network, it cannot be altered or deleted, making the blockchain an inherently secure and reliable method of recording and verifying transactions.

Blockchains have the potential to be used in a wide range of applications beyond financial transactions, such as in supply chain management, voting systems, and digital identities.

Benefits of Blockchain

Blockchain technology offers numerous benefits, some of which include:

1. Enhanced Security: Blockchain uses powerful encryption techniques to create a secure and tamper-proof method of storing and transferring data. Because the system is decentralized, no single person or group has control over or can modify the data.

2. Greater Transparency: Because blockchain transactions are open and transparent, they bring greater accountability and trust. Each transaction is recorded in a distributed ledger that everyone in the network can access.

3. Instant Traceability: Blockchain provides a transparent record of all transactions that have occurred. It allows for the tracking and tracing of the origins of any asset or transaction.

4. Increased Efficiency and Speed: By removing intermediaries, such as banks or brokers, blockchain transactions can be processed more quickly and efficiently. Additionally, smart contracts can automate processes, further improving speed and efficiency.

5. Lower Costs: Blockchain eliminates the need for intermediaries, which can significantly reduce transaction costs.

6. Decentralization: Blockchain is decentralized, meaning that no single authority or entity has control over the data. This enhances security and resilience, reducing the risk of data breaches or system failures.

7. Immutability: Once data is recorded on a blockchain, it cannot be altered or deleted, creating an immutable audit trail.

> **BLOCKCHAIN INCREASES TRUST, SECURITY, TRANSPARENCY, AND THE TRACEABILITY OF DATA SHARED ACROSS A BUSINESS NETWORK — AND DELIVERS COST SAVINGS WITH NEW EFFICIENCIES.**

How Blockchain Technology Works?

A user requests for transaction

The transaction is broadcasted to a peer-to-peer *(P2P)* network that consists of Computers *(Nodes)*

The Network of Nodes uses known algorithms to validate the transaction & User's status

A verified transaction can involve Cryptocurrency, Contracts, Records or other informations

The transaction is combined with other transactions, once verified, to create a new Block of data for the ledger

The new Block is added to the existing blockchain *(which is permanent & unadulterable)*

The transaction gets verified & executed

Blockchain is a decentralized, distributed ledger technology that is used to record transactions. It operates as a chain of blocks, where each block contains a hash of the previous block, a timestamp, and transaction data. This creates a secure and tamper-proof record of all transactions that have occurred on the blockchain.

When a new transaction is added to the blockchain, it is first verified by a network of computers called nodes. These nodes use complex algorithms to validate the transaction and ensure that it meets certain criteria. Once the transaction is validated, it is added to a block along with other transactions that have been validated around the same time.

Once a block is created, it is digitally signed and broadcast to the network. Once the other nodes have verified the block, it is added to the existing chain of blocks. The chain itself is a public record of all the transactions that have occurred on the network, and it is maintained by a distributed network of nodes, rather than a single central authority.

Because of this decentralized nature, blockchain technology is highly secure, transparent, and resistant to malicious attacks. Additionally, the use of smart contracts on the blockchain makes it possible to automate various processes, reducing the need for intermediaries and increasing efficiency. These characteristics have made blockchain technology a

Increasingly important tools in areas such as finance, healthcare, supply chain management, and more

II : KEY COMPONENTS OF BLOCKCHAIN TECHNOLOGY

The key components of blockchain technology include:

1 . **Distributed ledger:** This is a decentralized database that is maintained and updated by multiple parties at the same time. Each block in the ledger contains transaction data and a unique cryptographic hash that links it to the previous block.

Consensus mechanism: This is a process used to achieve agreement among the nodes in a blockchain network on the state of the ledger. Different consensus mechanisms include proof of work, proof of stake, and delegated proof of stake.

Cryptography: This is a technique used to secure and protect the data in the blockchain network. It involves the use of complex mathematical algorithms to encrypt data and create digital signatures.

Smart contracts: These are self-executing contracts with the terms of the agreement between buyer and seller being directly written into code. They help to automate complex transactions.

Virtual machine: This is a software environment that can execute smart contracts in a blockchain network. It allows for the creation of decentralized applications (DApps) that can run on top of the blockchain.

Overall, these components work together to create a secure, transparent, and decentralized system that can be used for a variety of applications, including cryptocurrencies, supply chain management, and voting systems.

Centralized vs Decentralized vs Distributed Network: An Overview

Centralized Network
All the nodes are connected under a single authority

Decentralized Network
No single authority server controls the nodes, they all have individual entity

Distributed Network
Every node is independent and interconnected with each other
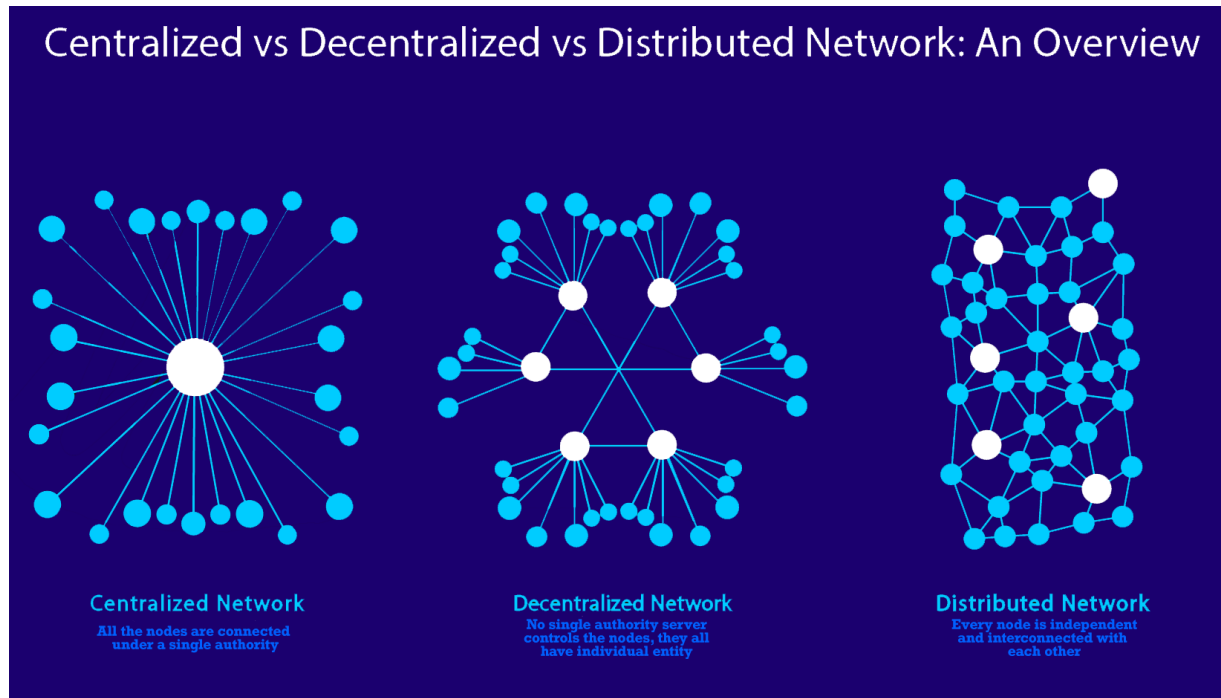
III : WHAT ARE WEB 3 APPLICATIONS AND HOW DO THEY WORK?

Web3 applications are decentralized applications (dApps) that run on the blockchain or other decentralized networks. They allow users to interact with each other and with the network without the need for a central authority or intermediary. Web3 applications use cryptographic protocols to ensure security, privacy, and autonomy for participants.

Web3 works by combining the decentralization of Web 1.0 with the interactiveness of Web 2.0 in a user-friendly interface . It aims to decentralize the internet and give users more control over their data . Web3 applications are built on blockchain and other decentralized networks and use cryptographic protocols to ensure security, privacy, and autonomy for participants. Users can interact with these applications through their crypto wallets, which store their data securely on the blockchain. Overall, Web3 provides a more open, flexible, and resilient internet that empowers users and gives them greater control over their digital lives. However, it is important to note that Web3 is still a work in progress and its development is ongoing.

Web 3.0: From Data*base* to Data*bank*

Web 1.0 — **Global Library**
- Existing information was gathered into a single database
- Brick and mortar libraries were disrupted

Web 2.0 — **Global Publishing**
- Individuals gained the ability to create information in a global database
- Companies like Facebook and Google monetized data

Web 3.0 — **Global Databank**
- Individuals have the potential to monetize their own data
- Cryptocurrencies and blockchains are the foundation of the global data*bank*

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These applications are designed to be decentralized, meaning that they are not controlled by a central authority. They are built on top of blockchain technology, which provides a secure and transparent platform for transactions. Unlike traditional applications, which are hosted on centralized servers, web 3 applications are hosted on a blockchain network.

This means that the data is stored on multiple computers, and any changes made to the data are verified by the network. This makes web 3 applications more secure and less susceptible to hacking. Web 3 applications are designed to be user-centric, meaning that the users have control over their data and can interact with the application directly. This eliminates the need for intermediaries and creates a more efficient and transparent system.

Numerous uses for these apps include social networking, internet shopping, gaming, supply chain management, and others. They are constructed using Web3 technologies including tokenization, smart contracts, and decentralized storage. A more open, adaptable, and resilient internet that empowers people and offers them more control over their digital lives is the overall goal of Web3 apps
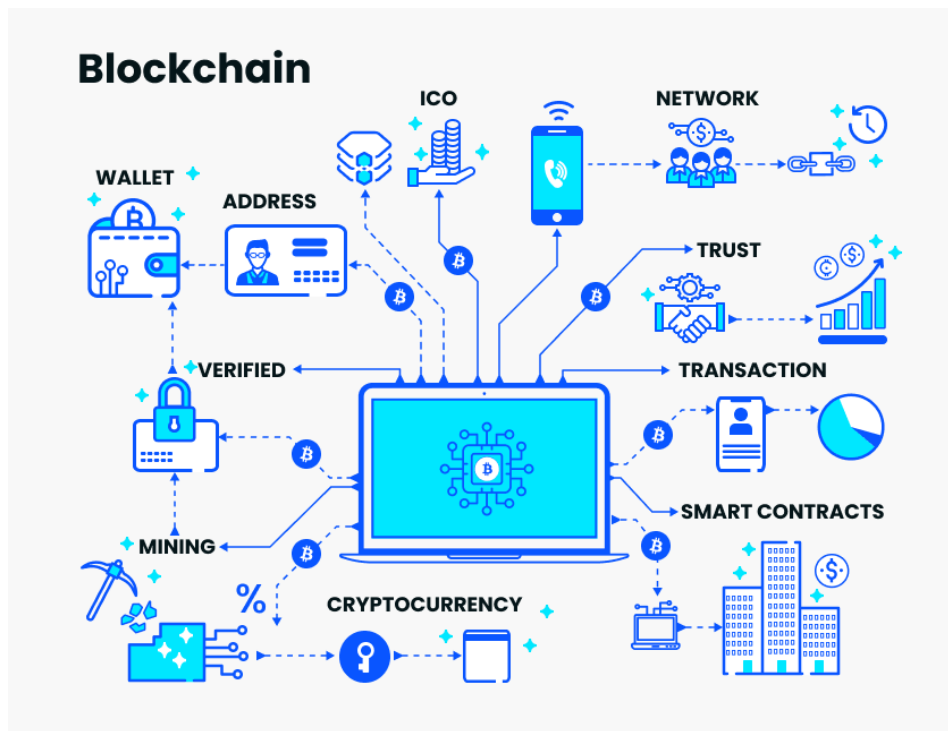
IV: WEB 3.0 AND DAPP ARCHITECTURE

A. Web3.js

Web3.js is a JavaScript library that provides an API for interacting with the Ethereum blockchain network. To interact with the Ethereum blockchain, you need to connect to a network node, which can be done by running a node on your computer or by connecting to an external node. Once connected, you can use Web3.js to read from and write data to the blockchain, execute smart contracts, and send transactions. The architecture of a Web3 dApp involves a frontend that interacts with Web3.js and a backend that runs on the blockchain network and consists of smart contracts. This allows for a decentralized and trustless application that can be used for a variety of purposes, such as finance, voting, gaming, and more.

B. Smart Contracts

Smart contracts are programs that run on the blockchain and can be used to execute complex transactions and operations without the need for intermediaries or centralized authorities. They are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. Once certain predetermined conditions are met, the smart contract will execute the agreed-upon terms automatically, in a transparent and tamper-proof manner. Smart

contracts can facilitate a wide range of applications, including financial transactions, supply chain management, voting systems, and more. They are a key feature of many blockchain networks, including Ethereum, and have the potential to disrupt traditional legal and business practices by reducing the need for intermediaries and increasing efficiency and security.

C. Ethereum Virtual Machines (EVM)

A crucial component of Ethereum that supports the blockchain and smart contracts is the Ethereum Virtual Machine (EVM). In order for Ethereum to attain user adoption and decentralization, it is crucial. In this guide, we'll examine the EVM in-depth to find out what it is and how it works. Then, we'll go over a few crucial topics to help us comprehend.

The compute engine for Ethereum that controls the blockchain's state and makes smart contract functionality possible is called the Ethereum Virtual Machine (EVM). The client software you require to run an Ethereum node, such as Geth, Nethermind, and others, includes the EVM. The EVM processes transaction data from nodes on Ethereum to update the distributed ledger. In general, the EVM is natively supported by Ethereum nodes because the client software handles this functionality.

Block formation and transaction execution are both done by the EVM. The EVM establishes guidelines for controlling the state from block to block during block formation. The ground truth state for Ethereum is contained in these states, which are kept in a Merkle Patricia Trie.

The EVM interprets Opcodes, or low-level machine instructions, used in transaction execution to carry out activities (such function calls to smart contracts), but the data is formatted as bytecode. You can compile and deploy the smart contract using bytecode using a programming language like Solidity, which is the native programming language for smart contracts, to get the data into bytecode.

It should be noted that the EVM's task completion is constrained by the gas provided by the transaction and the EVM's overall restrictions. On Ethereum, the term "gas" refers to a unit of computing power.

V : LAYERS OF THE WEB 3.0 ARCHITECTURE

A. dApp Navigator

We can access the decentralized application using a dApp browser. It is not possible to browse through the new decentralized applications that are sweeping the globe using a standard browser like Firefox or Chrome.

You can access some dApp browsers with a desktop browser's user interface. The new web3 apps are accessible alongside the traditional web, which is the only change.

One of the more well-known ones is the MetaMask. Actually, you can add it as a plugin to Mozilla, Chrome, and Brave. Its efficiency is due to the fact that you won't need to run a full node in order to use it.

Other browsers are Trust browser and Cipher. These also have a great output when it comes to web3 browsers. Cipher is for mobile devices and allows you to browse through all the decentralized applications and choose from them.

B. Application Hosting

It is very important for this layer to host the following layer (dApp). Have you ever wondered how all those apps you download function in practice? The hosting, however, merely makes the application accessible via cloud storage.

The software as a service (SaaS)-based decentralized network will serve as the app's host in this manner.

This layer is necessary for the decentralized application because it offers a lot of user support. All of the dApps are made simple to access and integrate with any devices by the layer.

V :BLOCKCHAIN & WEB3 SERVICES AND COMPONENTS

A. Tokens

The IT stack infrastructure for web 3.0 includes tokens as well. It is a fact that these will be included in the decentralized web system. Digital currencies that operate on their own blockchain networks are known as tokens, primarily crypto tokens.

It is an asset that may be used on the network to access the features it provides. These are also utilized to start the development of any new project and to fund new projects.

B. Off-chain Computing

The computational operation takes place outside of the blockchain application layer. In comparison to on-chain calculation, it is less expensive and saves time. Off-Chain computing will guarantee not just the veracity of the values but also their inevitability.

Off-chain compilation offers a higher level of secrecy and serves as the ideal backup for creating decentralized applications. Systems using virtual memory are the ideal illustration for this section.

C. Data Feeds

The data feed is also known as a web feed and is one of the important aspects of a web3 blockchain stack. It's a mechanism used for receiving updated data information from credible sources. In the new profound tech, the data feeds will obviously be decentralized. And most importantly used for nodes to update their information accordingly.

D. Governance

It's actually quite necessary for the certain infrastructure of the web3 IT stack. In this case, there won't be a need for any human managerial character. A decentralized autonomous organization is perfect for developers to utilize for their projects. These organizations deal with smart contracts. A DAO initially runs on the protocol of decentralization for blockchain technology stack.

E. Digital Assets

By wallet in blockchain application architecture, I mean digital wallets or cryptocurrency wallets. They are programs that store public and private keys of a user and interacts with other blockchain networks. With these, you'll be able to monitor your digital assets such as bitcoin, Ethereum, Lite coin and many more.

F. Digital Identity

Digital identity is extremely crucial for the web 3.0 blockchain application architecture, as everyone will be connected through online. So, it's necessary to have a digital id that defines you or authorizes you where it's needed.

We can have multiple digital ids in various platforms where it's required. Nevertheless, a digital identity will ensure your security and privacy altogether. A digital identity will have some certain attributes, such as: Your username and password. Date of birth. Your online activity. Social security number. Transaction history Medical records. A digital Id can be used to link to other assets such as domains, emails, URLs, etc. In a world, where cybercrime is rising it's definitely a necessity.

G. Distributed File Stores

A distributed file Store or System is a server location where data is stored. You can access the data as you please as you would have with your computer. The process is more convenient though. The server will require authentication to access and after that give full control to that authorized client only.

H. Consensus Algorithms

There are many developers currently experimenting with the algorithm nonstop. The goal is to make one that offers the most effective to the users. Let's see what few of the blockchain technology offer nowadays.

- ASIC-optimized proof of work (POW) – Bitcoin and Bitcoin Cash
- ASIC-resistant POW – Ethereum 1.0, Zcash, Monero, others
- POW and POS with fallback – Thunder
- Proof of elapsed time (POET) and proof of space and time (POST) – Chia
- POST with useful data – Filecoin
- Braided POW – Kadena
- Casper TFG proof of stake (POS) – Ethereum 2.0
- Hybrid POS/ POW – Decred
- Byzantine agreement with leader election (BA★) – Algorand
- Honeybadger POS – Polkadot
- Delegated proof of stake (DPOS) – EOS

- DPOS variant – Tezos
- DPOS variant – Tendermint
- Proof of history (POH) – Solana
- Stellar Consensus Protocol
- Ripple Consensus Protocol
- Leader-centered blockchain consensus

I. Virtual Machine

The virtual machines main focus is maintaining the security and execute unreliable code source from all the computers on the network. In simple terms, EVM is now here, to prevent the most common threat of the crypto world, which is a Denial-of-service attack. This kind of cyber-attack is quite deadly as it can make the resources of a network unavailable to its user. It can also, ensure that no programs can interfere with each other tasks and that everything keeps on running smoothly. This environment was constructed to enable a runtime environment for smart contracts so that users can benefit from the service. You must be well aware of the fact that smart contracts are insanely popular nowadays.

J. RLPx

RLPx is a network and protocol suite created to aid in general purpose transportation between two peers. It also enables an interface for applications so that users can communicate within the network. It was designed for decentralized applications and currently, Ethereum is using it. The newer version of RLPx is providing a network layer for Ethereum. The main features of this awesome technology are to discover nodes and form the overall network. Other than then it also encrypts handshakes and transports between two users.

V : THE ROLE OF BLOCK-CHAIN IN WEB 3 DAPPS

Blockchain technology plays a crucial role in the development of web 3 applications. It provides a secure and transparent platform for transactions, making it ideal for applications that require trust and security. The decentralized nature of the blockchain also makes it more resilient to attacks, as there is no central point of failure.

Blockchain technology is a fundamental building block of Web3 DApps. It is used to store data in a decentralized and secure way that is resistant to tampering, making it an ideal solution for applications that require trust and transparency. With blockchain, DApps can be built without the need for a centralized authority, which eliminates the need for intermediaries and middlemen. This results in more autonomous, decentralized, and secure applications.

In addition to blockchain, Web3 DApps also utilize other technologies such as smart

contracts and decentralized storage to create a more open, flexible, and resilient internet that empowers users and gives them greater control over their digital lives. These technologies enable the creation of decentralized marketplaces, social networks, gaming platforms, and other types of applications that allow users to interact with each other and with the network without the need for a central authority or intermediary.

Overall, blockchain technology plays a crucial role in the development of Web3 DApps, providing a secure and decentralized foundation for creating next-generation applications that can operate without the need for intermediaries.

In web 3 applications, blockchain is used to store data and execute smart contracts. Smart contracts are self-executing contracts that are programmed to execute when certain conditions are met. They are used to automate processes and enforce agreements, eliminating the need for intermediaries. Blockchain also provides a platform for the development of cryptocurrencies, which can be used as a means of payment in web 3 applications. Cryptocurrencies are digital assets that are secured by cryptography and are designed to be decentralized.

Web3 DApps use blockchain technology as a resource to ensure data independence. The decentralized cluster renders users the ultimate owners of their content by

removing intervention from centralized authority in data verification. Additionally, DApps are altering the paradigms of community engagement and governance by granting users the ability to vote and make ideas. Users have an equal opportunity to participate in the project implementation and decision-making process by casting votes. The suggestion that receives the most community votes is the one that the developers decide to work on.
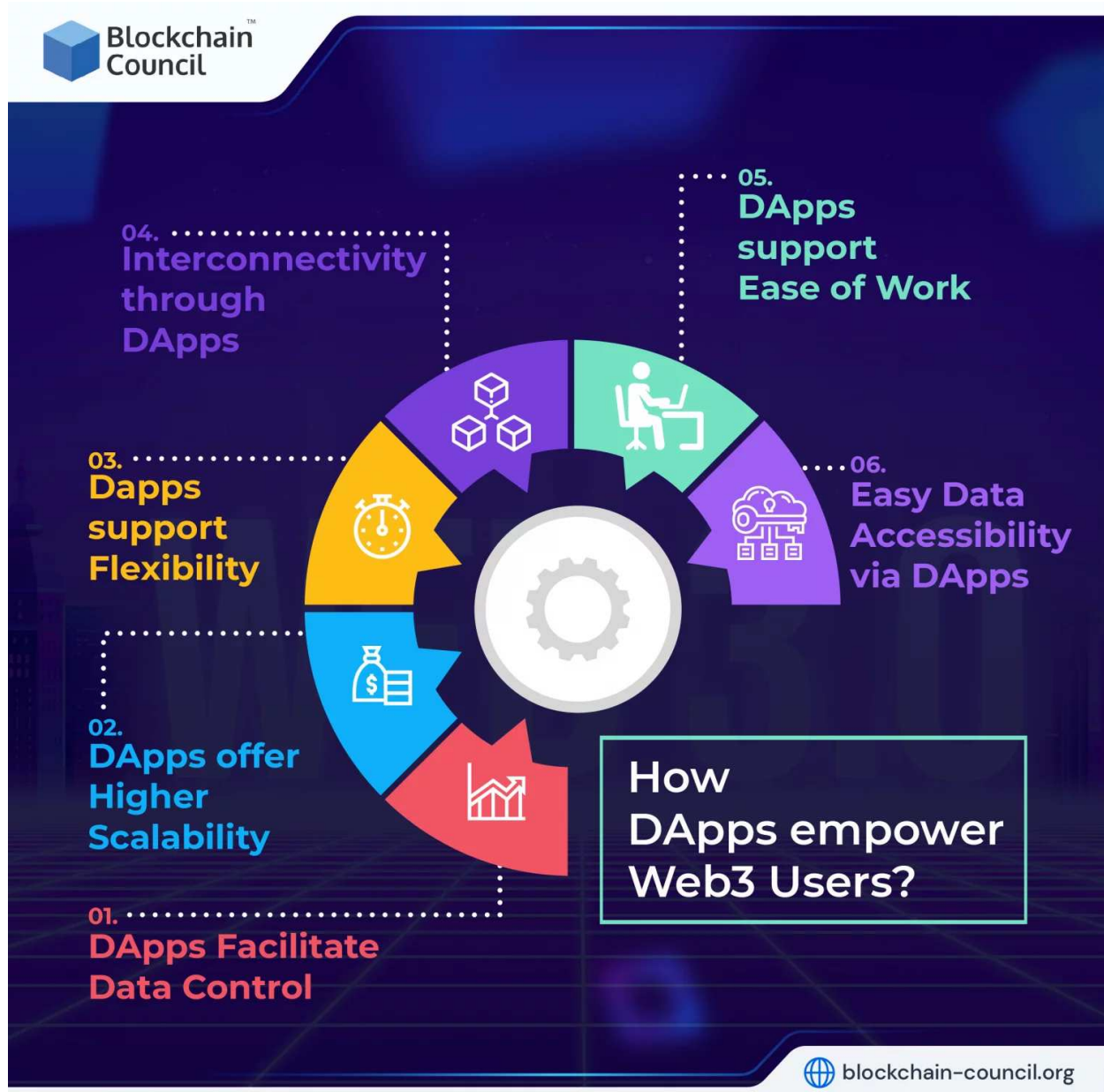
Digital protocols or programs known as "decentralized applications" (DA) operate best on a blockchain or peer-to-peer (P2P) network of computers. To avoid being constrained by a single regulating body, these apps use a decentralized infrastructure. DApps are currently

often created through the Ethereum portal using smart contract technology. DApps are advancing web 3 development and transforming a variety of business sectors, including as gaming, social media, and banking. With the help of DApps, users and developers can feel more connected to one another, creating a new owner-user connection that was not conceivable with centralized Web 2.0 portals. Users can take ownership of their DApp projects through asset tokenization.

The number of crypto tokens an individual user has directly correlates to their voting power on a Dapp platform. Along with their voting rights, these apps usually offer token users exclusive incentives, privileges, and loyalty benefits.

VI : CHALLENGES & SOLUTION OF BLOCKCHAIN

There are several challenges associated with blockchain technology, including:

Lack of adoption: Despite the growing interest in blockchain, many businesses and individuals have yet to fully embrace it, which could slow down its adoption and development.

High cost of implementation: Implementing blockchain technology can be costly, especially for small and medium-sized businesses, which may not have the resources to invest in the necessary infrastructure.

Scalability: While blockchain technology is great for small-scale applications, it currently faces challenges in scaling to meet the needs of large enterprises and networks.

Security and privacy: The security of blockchain technology is based on cryptographic protocols, but there is always the risk of a breach or attack. Additionally, privacy can be a concern, particularly when it comes to public blockchains.

Regulatory oversight: The lack of regulatory oversight in the blockchain industry can be a challenge for businesses and consumers, as it makes it difficult to ensure compliance with existing laws and regulations.

Interoperability: Different blockchain platforms are not always compatible with each other, which can limit the usefulness of blockchain technology in certain contexts.

Energy consumption: Many blockchain platforms require a significant amount of energy to process transactions and maintain the network, which can be an environmental concern.

There are ongoing efforts to address these challenges and improve the scalability, security, and functionality of blockchain technology, but they remain areas of concern for many stakeholders.

Overall, these challenges will need to be addressed in order for blockchain technology to realize its full potential and become widely adopted in various industries.

INNOVATING BLOCKCHAIN THROUG
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CHALLENGES

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T⚛A⚛S

TWO: ITERATION OF COMMERCE

I: EVOLUTION OF COMMERCE BASED ON DEVELOPMENT

Commerce has evolved significantly throughout history, from simple trade of goods to complex global supply chains and e-commerce. In the early centuries of trade, markets functioned as a new meeting place where people used shells , metals, and paper currency to exchange goods. Later, ships allowed merchants to trade goods across much greater distances, leading to the rise of international trade. The Industrial Revolution brought about new manufacturing processes and mass production, which helped fuel further growth in commerce. The internet and e-commerce have revolutionized commerce in recent decades, allowing businesses to reach customers all over the world and facilitating new modes of payment and delivery. In addition, new technologies and business models, such as blockchain and the sharing economy, are continuing to shape the evolution of commerce.

The iteration of digital commerce has come a long way since the bartering system and monetary system. Today, the rise of e-commerce has revolutionized the way consumers shop and businesses operate. With the advent of the internet, the world has become a smaller place and digital commerce has become the norm.

The transition from the bartering system to the monetary system was a significant milestone in the history of commerce. It allowed people to exchange goods and services using a common currency, which made trading more efficient. However, the evolution of digital commerce has taken this efficiency to a whole new level.

In the early days of e-commerce, online transactions were limited to a few products and services. However, with the passage of time, e-commerce has expanded to include almost every category of product and service imaginable. Today, consumers can buy anything from groceries to cars online. This has transformed the retail industry and created a new age of digital commerce.

One of the biggest advantages of digital commerce is the convenience it offers. Consumers can shop from the comfort of their homes and have their purchases delivered to their doorstep. This has made shopping more accessible and has removed the need to physically visit a store.

Another advantage of digital commerce is the access it provides to a global market. With the internet, businesses can reach customers from all over the world. This has opened up new opportunities for businesses and has created a level playing field for entrepreneurs.

The iteration of digital commerce has also resulted in the development of new technologies and business models. For example, the sharing economy has emerged as a new way of doing business. Companies like Uber and Airbnb have disrupted traditional business models and have created new opportunities for consumers and entrepreneurs.

A. Bartering System Commerce

The first and ancient stage of trading is what is commonly known as a barter system. It is a type of trade in which people use one object for another object. It is an exchange of objects.

A barter is a transaction in which two or more parties exchange products or services without exchanging cash or other forms of payment like credit cards. In its simplest form, bartering entails the exchange of one party's good or service for another party's good or service.

It is true that trading, which dates back to prehistoric times, is the earliest form of commerce. But since then, business has greatly changed, moving from the bartering system to contemporary e-commerce. Although some communities and circumstances still employ bartering, it is no longer the main means of transaction in the majority of economies. Business has grown increasingly sophisticated and complex as a result of the rise of money and globalization.

Digital transactions have improved in efficiency and security. With only a few clicks, customers can now buy goods and services from all over the world, while businesses can handle transactions and keep track of inventories thanks to cutting-edge systems and software. Consumers' buying experiences have become more convenient thanks to e-commerce, which has also created new markets and opportunities.

B. Monetary System Commerce

The monetary system, which offers a way to exchange goods and services, is a crucial part of commerce. The monetary system makes transactions easier by offering a widely utilized medium of exchange that may be used to make purchases, settle debts, and store value. Modern central banks, which are in charge of issuing currency, controlling the money supply, and preserving financial stability, oversee the monetary system.

Commercial banks play a crucial role in the financial system since they offer a variety of services to individuals and companies, including deposit accounts, loans, and wire transfers. Because monetary policy changes can have an impact on interest rates,

inflation, and economic growth, the monetary system can also have a big impact on the economy.

C. E commerce

E-commerce has come a long way since its inception in the early 1990s. The term "e-commerce" itself was coined by IBM in 1996, and since then, there have been several significant milestones in the evolution of e-commerce. One of the most significant of these milestones was the introduction of Web 2.0.

Web 2.0 was a term coined in 2004 by Tim O'Reilly, the founder of O'Reilly Media. It referred to a new generation of web applications that were more interactive, user-friendly, and collaborative than their predecessors. Web 2.0 marked a significant shift in the way we use the internet, and it had a significant impact on e-commerce.

Before the advent of Web 2.0, e-commerce sites were largely static and transactional. Customers would visit the site, browse the products, add items to their cart, and check out. There was little interaction between the customer and the site beyond this basic transactional process.

Web 2.0 changed all of that. With the introduction of social networking sites like Facebook and Twitter, users became accustomed to interacting with websites in a more dynamic and collaborative way. This trend spilled over into e-commerce, and online retailers began to incorporate social features into their sites.

The invention and development of internet technology has brought e-commerce, which uses the internet to revolutionize the course of trade and commerce. The main challenge of trade has been solved by e-commerce. Before the advent of E-commerce, the limitation of location had been a long-standing issue in trade. Trade was restricted to a single location.

However, the emergence of E-commerce has eliminated the issue of distance between trade players. All three stages of trade have a market system that is relatively centralized. During these stages, the government or a small group of merchants determine the prices and volume of sales.

Shortcoming Of Traditional E Commerce In Web 2: The traditional e-commerce model has been around for many years and has served businesses well. However, with the advent of Web 2.0 and mobile devices, this model has faced numerous challenges and problems.

Security: One of the significant challenges faced by e-commerce in Web 2.0 is the issue of security. With online transactions becoming more prevalent, cybercriminals

are constantly finding new ways to steal personal and financial data. This poses a significant risk to e-commerce businesses that must ensure the safety and security of their customers' data. Many e-commerce websites have implemented various security measures, such as encryption and secure payment gateways, to mitigate these risks.

One of the most difficult difficulties in eCommerce is security breaches. When dealing with eCommerce, there is a lot of information/data involved, and a technical issue with data can cause severe damage to the retailer's everyday operations as well as brand image.

Online Identity Verification: When a shopper visits an eCommerce site, how would the retailer know if the person is who they say they are? Is the shopper entering accurate information? Is the shopper genuinely interested in the eCommerce products?

In the world of e-commerce, online identity verification is an essential step to ensure the security of transactions and prevent fraud. However, there are several challenges and shortcomings that businesses face when implementing this process.

One of the biggest challenges is the issue of privacy. Customers are often reluctant to share their personal information online, especially sensitive data such as social security numbers or passport details. This reluctance can lead to a lack of trust in the e-commerce platform, which can ultimately result in lost business.

Another challenge is the difficulty in verifying the authenticity of the information provided by customers. Fraudsters have become increasingly sophisticated in their methods, making it harder for businesses to identify and prevent fraud. This can lead to financial losses and damage to the reputation of the e-commerce platform.

Furthermore, the use of multiple devices and platforms for online transactions makes it challenging to maintain a consistent identity verification process. Customers may use different email addresses or mobile numbers, making it harder to track their online activity and verify their identity.

In addition to these challenges, there are several shortcomings in the current state of e-commerce in Web 2. One such issue is the lack of standardization in the online identity verification process. Each e-commerce platform has its own set of rules and requirements, which can be confusing.

Trust: Another challenge faced by e-commerce in Web 2.0 is the issue of trust. Customers are often hesitant to shop online due to concerns about fraudulent websites, unscrupulous sellers, and the quality of products. This lack of trust can lead to a decrease in sales and revenue for e-commerce businesses. To overcome this

challenge, e-commerce businesses must work on building trust with their customers by providing quality products and services, transparent pricing, and reliable customer support.

Competition: Another notable challenge faced by e-commerce in Web 2.0 is the issue of competition. With the rise of online marketplaces, it has become increasingly challenging for e-commerce businesses to stand out from the crowd. Online marketplaces such as Amazon and eBay dominate the e-commerce space, making it difficult for smaller businesses to compete. To overcome this challenge, e-commerce businesses must focus on providing unique products, personalized customer experiences, and effective marketing strategies.

D. New Age Digital Commerce

New Age Digital Commerce is a revolutionary development in the world of commerce, combining cutting-edge technologies such as AI (Predictive Recommendation, NLP, Generative AI), Blockchain, Web3 Infrastructure, and AR. This new stage of commerce offers an immersive shopping experience that is community-driven, secure, and reliable. With the potential to disrupt the digital economy, New Age Digital Commerce has quickly become an industry game-changer.

By harnessing the power of AI (Predictive Recommendation, NLP, Generative AI), businesses can better understand their customers' needs and preferences in real-time. This allows for more personalized recommendations and a tailored shopping experience that fosters loyalty and customer satisfaction.

Blockchain technology provides unparalleled security and transparency in transactions. It ensures that every transaction is recorded on a tamper-proof ledger, making it virtually impossible for fraud or corruption to occur.

Web3 Infrastructure enables peer-to-peer transactions without intermediaries. This means that buyers and sellers can interact directly with each other without the need for third-party involvement.

AR technology enhances the shopping experience by providing users with a virtual try-on feature for clothing and accessories. This immersive experience improves customer engagement leading to higher conversion rates.

In this stage of commerce the shopping experience is immersive, community driven, secure, reliable, and has the potential to disrupt the digital economy since commerce and trade is the foundation of any nation's market.

II: EVOLUTION OF COMMERCE BASED ON CHARACTERISTIC & ATTRIBUTE

A. The shift from private commerce to community-driven commerce.

The Shift From Private Commerce Into Community Powered Commerce is the transition from privately led commerce—which is primarily visible in web 2 e-commerce platforms—to community-driven commerce.

The future belongs for the people. This implies the future is for the community rather than an extremely privatized platform. We believe any industry that does not evolve into a community powered system will diminish or will be stagnant. We can learn from history and observe recent industry developments.

Once again the future belongs to the people, and it is imperative that all industries recognize this fact. In order to thrive, an industry must evolve into a community-led system rather than remaining solely privatized. History has shown us that industries which fail to adapt to changing times will either diminish or become stagnant. Recent developments in various industries have demonstrated the power of community-driven systems. From open-source software development to crowdfunding platforms, communities have proven themselves capable of driving innovation and fostering growth. We believe that any industry which fails to embrace this shift toward community-led systems will ultimately be left behind. The future is for the people, and we must work together as a community to ensure that we are able to shape it in a way that benefits us all.

Let's take the education sector as an example.In the previous ages, education in the education sector was highly institutionalized and limited to specific places or organizations. However, as time has progressed, this trend has shifted towards making education more widely available to all. Companies that have adopted a community-first approach to ensure accessibility and availability of education are thriving in the market.

We can also see technology firms, specifically software development companies that release their product open sourced, are getting popular. Just to mention some Meta's (Facebook) Front End development framework called React is getting popular across global developers . The same is true for the company Alphabet's(Google) application development tool called Flutter is becoming popular worldwide and accepted and

maintained by worldwide developers. Those are just a few examples and signs that indicated the future belongs for the community and people, not for individualism.

Overall we can say the future belongs to the community, not just for individualism. Education is becoming available for all, and technology firms are getting popular with their open-sourced products. Platforms such as React and Flutter are becoming popular worldwide and accepted and maintained by developers. These are examples of how the future belongs to the community and people. This scenario applies for most industries and digital commerce is not an exception.

B. Digital community-led commerce

As we mentioned earlier , the new age digital commerce is characterized by its sociality and community driveness. And it is also powered by cutting edge technologies such as blockchain, AI. This takes community shopping into another dimension and level by enabling consumers to find, search and buy together and get incentive in the form of social crypto tokens.

While the world is yet to fully transition to web 3.0 and a more decentralized system, major e- commerce giants like Amazon, Walmart, and Alibaba, to mention a few, have dominated the internet commerce industry in the existing web 2.0 iteration. We are working towards decentralizing and democratizing the market system through maximizing and outsourcing the potential of data, internet and machine learning. Reducing the centralization and monopoly of market decisions in internet commerce will be one of the objectives of our project. The decentralization based internet has disrupted the financial system in the last decade.

Some of the outcomes of this technology are Cryptocurrencies, DAO, smart contracts and defi(Decentralized Finance). The e-commerce industry is at an early stage in adopting the new transition technology of the internet. In the e-commerce industry, the invention of the internet didn't only open the door of possibility for consumers to be able to buy products without keeping the protocol of physical places and addresses. There, in the technology of the Internet, lies some hidden potentials, values, possibilities and advantages that can be added to the current e-commerce, so that it can help the economy of the consumers, sellers and other stakeholders simultaneously. We are on a mission to create a market system of the people, by the people, and for the people through the democratization and decentralization of data contribution of consumers and sellers over the internet.

Tsinghua University

03

ITERATION OF THE WEB (INTERNET)

Tsinghua University

TAPS

THREE: ITERATION OF THE WEB(INTERNET)

The iteration of the web (internet) are Web 1.0, Web 2.0, and Web 3.0. Overall, the evolution of the internet has brought about significant changes in how we consume and create content online, transforming it from a static platform to a dynamic ecosystem that continues to evolve with cutting-edge technologies such as AI and blockchain.

The iteration of the web, commonly known as the internet, has gone through three major phases: Web 1.0, Web 2.0, and Web 3.0.

The Evolution of Web: A Comparative Analysis

1.0

Simple Banner Ads were seen

Basic Content Delivery Networks (CDN) were introduced

Personal websites were rare

Page views and screen scrapping were introduced

Contents had directories or taxonomy system

2.0

Automatic texts, graphical and Interactive ads replaced the simple banners
-----
B2B and P2P file sharing protocols were invented

Blogging became extremely popular

Cost per Click (CPC) and web services replaced the older methods
-----
Website, image and video tagging (folksonomy) replaced taxonomy system

3.0

Artificial Intelligence (AI) will personalize the ads

Cloud-based file sharing system will prevail

Semantic web will take place of Wikipedia

User-centric live streams will replace blogs

Artificial Intelligence (AI) based search engines will sort out the search results
-----
P2P user engagement will replace their ancestors

static web pages. Web 2.0 represents the current version of the web, which is characterized by user-generated content and interactive applications. Web 3.0 is the next iteration, and it is expected to be decentralized, open, and of greater utility, with the potential to fundamentally change the way the web works. Web 3.0 is currently in development and it will incorporate concepts such as decentralization, blockchain technologies, and artificial intelligence.

Web 1.0 was the first iteration of the web , which was mostly a collection of read-only

I. Web 1

Web 1.0 was the first version of the internet, characterized by static HTML pages with limited interactivity. It was primarily used for sharing information and accessing resources online.

Web 1.0 only had one way. For people to read, corporations and large businesses produced material. The data flow was seldom ever interacted with. But everything was just so monotonous. The information didn't mention the people. The websites featured protracted monologues that included just linear content.

The data could only be read by the users. The contents could only be edited and written by content curators. It was therefore similar to perusing books at a library. Users had few rights because they were merely consumers.

II. Web 2

Web 2.0 emerged in the early 2000s and introduced dynamic websites with interactive features such as social media platforms, online marketplaces, and video-sharing sites. The focus shifted from accessing information to user-generated content and collaboration.

After the introduction of Web 2.0, the end users benefited. Users can now write data in addition to reading it. People became aware of a severe constraint with a framework that can only support a million users. Web 2.0 can support a huge user base. Ajax and

JavaScript-based frameworks are used in Web 2.0. Blogs have taken the place of dull static site material.

Video streaming and online gaming were also introduced by Web 2.0, marking the beginning of everything going online. Websites began to develop more life and interactivity. The global economy began to be dominated by online retailers. It might be considered a real revolution. The development of web applications offered a new era.

III.   Web 3

Web 3.0 is the current iteration of the internet, also known as the semantic web or intelligent web. It uses artificial intelligence (AI) technology to deliver personalized experiences, advanced search capabilities, and machine-to-machine communication. With its ability to understand natural language processing (NLP), it enables users to interact with machines in a more human-like way.

Peer-to-peer technology is the main component of the Web 3.0 IT stack. It will thereby eliminate the middleman. We won't need to rely on the enormous data servers run by a private corporation. Our personal information will be much safer and more private. We'll eliminate the need for the term "middle-man" in the online world. While the terms "Simply Web" and "Social Web" are used to describe Web 1.0 and Web 2.0, experts frequently refer to the Web3 IT stack as the "Semantic Web."

04

THE FUTURE OF DIGITAL COMMERCE

Tsinghua University

FOUR: THE FUTURE OF DIGITAL COMMERCE

I: DIGITIZED SOCIAL COMMERCE

What is digital social commerce? In what way does it differ from the current e-commerce platforms?

First things first: let's define social digital commerce with the most recent definition. While traditionally it was defined as the use of shopping activity across social media or networks, if we carefully analyze and observe in this context of definition, the level of sociality is very low. It is similar to sharing a link of an e-commerce platform, which does not carry the weight of its name - social commerce.

To address this issue, a new model for social commerce has emerged. This model goes beyond simply using social media as a platform for sales and instead focuses on creating a truly social experience for customers. Social commerce now encompasses everything from user-generated content to personalized recommendations and social proof.

In essence, the new definition of social commerce is all about leveraging the power of social networks to create a more engaging and interactive shopping experience. By tapping into the wisdom of crowds, brands can build trust and credibility with their customers while also driving sales and increasing brand awareness.

As technology continues to evolve, so too will the world of social digital commerce. But one thing is clear: by embracing this new model of social commerce, businesses can stay ahead of the curve and reap the benefits that come with a truly engaged customer base.

II: DIGITAL COMMERCE POWERED BY WEB 3

Web 3.0 is for everyone. digital commerce in web 3.0 which is on the third iteration of the internet is decentralized. Specifically, by eliminating central authority, and lowering the extra cost of interfacing with middlemen or gateway services, Commerce 3.0 aims to build an open economy for creators and ensures alike.

Now that we have an understanding of web iteration, how has online commerce fit into the respective web iteration? For decades, the global economy has thrived on the internet, and for the better part of that time, it has been subjected to a centralized

system. While the world is yet to fully transition to web 3.0 and a more decentralized system, major e-commerce giants like Amazon, Walmart, and Alibaba, to mention a few, have dominated the internet commerce industry in the existing web 2.0 iteration.

Notably, this set of corporations have enormous influence across most aspects of online commercial experience and have gained major grounds over the years. The reason for this, however, is not far-fetched, considering that the existing internet iteration – web 2.0 – provides a conducive environment for monopoly to thrive.

However, with the latest web 3.0 iteration, which is open, trustless, secure, and decentralized, this is going to change. Before we look forward to the future of e-commerce beyond the existing heavyweights, it is important to take a step back to understand the evolution of web technology. Each web iteration introduces a unique online commerce experience. With web 1.0 comes commerce 1.0, while commerce 2.0 and 3.0 is applicable to web 2.0 and 3.0 iteration respectively.

The first commerce experience happens to be a hybrid of text and physical stores. Then, because of the boring nature of the internet, only a few people had access to commerce online, and those that do were limited by the kind of activity they can do online. For instance, they could send text, and make reservations for a product in the physical store, but cannot necessarily complete a purchase online.

While big brands like Walmart and Costco were the biggest winners in this era, they leveraged their chain of physical stores and were able to reach customers residing in the immediate communities. Ultimately, the first commerce experience can be classified as a centralized retail experience.

Commerce 2.0, on the other hand, ushers in a new era of centralized e-commerce, as well as a more interactive online shopping experience. According to various industry analysts, this iteration of commerce thrived on a low-cost, high-scale model, implying that there is a low entry barrier, coupled with a seamless onboarding process.

Sadly, one of the drawbacks of this era of commerce is that it concentrated power in the hands of a few players (Walmart, Alibaba etc.), making it nearly impossible for small firms to prosper. The major killer for commerce 2.0 is a monopoly which, on the other hand, thrives on centralized authority. This also means that this era of commerce is largely based on "first come first serve policy" where the people who arrive earliest get served or treated with high-level preference before the people who arrive later.

Interestingly, the narrative is about to change with commerce 3.0 on the third iteration of the internet which is decentralized. In its own case, commerce 3.0 wants to re-engineer the overall online commerce experience. Specifically, by eliminating

central authority, and lowering the extra cost of interfacing with middlemen or gateway services, Commerce 3.0 aims to build an open economy for creators and ensures alike.

While an open economy thrives on trust, transparency, and borderless exchange, it also creates a conducive atmosphere for buyers and sellers to interface directly with one another without any form of restriction or third party interference. Ultimately, the future of e-commerce is far from monopolization and while the existing commerce model is favorable to few, the future of e-commerce is favorable to all.

05

NEW MODEL OF SOCIAL COMMERCE

FIVE: NEW MODEL OF SOCIAL COMMERCE

In Order to to define social commerce in its most recent context, which is the new model of digital social commerce, we have to take a look into markets where most dynamic digital commerce take place, which is the Asian E commerce market.

Even though many disruptive technologies were developed by western countries, South East Asian and other Asian countries are leading the way in terms of e-commerce market penetration, scalability, and efficiency. China's Ecommerce sector in particular is highly vibrant. Everything about their Web and Apps is interesting the moment you open them, including the user interface, live streaming, real-time contents, red pocket money rewards, and so on. They are very engageful. And they have a very high traffic and social activity.

As we discussed earlier, the old definition of social commerce is the use of social media platforms to sell products and services. Actually, it's not really a social commerce when we compare it with the new model of social commerce.

Because in order for any commerce to be complete it has to touch the finance component. So basically with the old definition of social commerce there is no difference with sharing a link of typical e-commerce into your social media. In order for any commerce to be called a social commerce, the searching, shopping, buying and the finance component also must be powered by community and the social network not by individuals. The new concept will be more explained in the next portion of the paper.

The new model of social commerce is becoming increasingly popular in recent years, in the Asian digital commerce market. This new model of social commerce has lately been developed and is very popular among Asian E commerce users. This model was pioneered by Pinduoduo, a Chinese mobile-first social commerce business that has seen remarkable growth in just five years, surpassing a $100 billion market cap this year. This new model of social commerce is highly characterized by **"Team or Group Buying & Purchasing"(which is one of the main characters of social commerce).**

A recent blog post by YC (YCombinator) explained this new trend model of social commerce like this;

Creating Community via Team Purchase: The core of the Pinduoduo experience is team purchase, where buyers form a group in order to receive discounts from suppliers. The user experience, as laid out in the graphic below, is as follows: (1) for each item, merchants decide two prices – one for individual purchase and one for team purchase. If the user opts for a team purchase, he or she may either (2.1) initiate a team purchase, or (2.2) join an existing team purchase. If the user has initiated a team purchase, he or she may use social platforms such as WeChat to proactively encourage friends to join their team (3.1) or more passively wait for other buyers to join the purchase on the Pinduoduo (Pinduoduo) platform (3.2). A team needs to be formed within 24 hours to have the order confirmed. Once a team is formed, the purchase is confirmed and the product is shipped within 48 hours.

Nearly all Pinduoduo transactions are completed using team purchase. In the early days, the size of many groups was large (e.g., 10+), but as Pinduoduo has scaled the group size requirements have declined. Team purchase is beneficial to both buyers and manufacturers; buyers benefit from better prices for goods they want and sellers benefit from increased demand and better visibility of future demand. In addition to driving down prices, team purchase helps solve the "trust deficit" of retail in China's developing cities, where more than 80%) of retail is unorganized and consumers rely heavily on social recommendations to initiate transactions.

Pinduoduo's team purchase is often compared to Groupon in the US because they both enable a form of group buying. But the models are actually very different. First, Pinduoduo deals are designed by sellers, but initiated by consumers (i.e., users must create or join a group of a certain size to access a deal) whereas Groupon deals are designed and managed by sellers. Second, Pinduoduo's team purchase is used for everyday goods (e.g., fruits/vegetables, apparel) that are valuable to consumers vs. one-off products/experiences that haven't sold well elsewhere. Third, products on Pinduoduo are offered by geographically diverse merchants from across China and increasingly from all over the world. This is in contrast to the mostly local sellers that leverage Groupon to drive customers to their stores/locations. This results in a much stronger consumer value proposition as users are getting discounts on goods they might need to purchase anyway vs. letting sellers dictate discounts by aggregating demand on low-value goods or excess inventory.

Team or group buying refers to a practice where a group of people join together to purchase a product or service in bulk, with the intention of receiving a discounted price or other benefits that would not be available if they purchased individually. This type of purchasing can be beneficial for both the buyers, who can receive discounted prices or other perks, and the sellers, who can increase their sales volume and customer base.

In a team or group buying scenario, one person typically takes on the role of the organizer and coordinates the purchase with the seller. Team or group buying can be used in a variety of contexts, from buying in bulk for a business or organization to purchasing discounted tickets for a concert or sporting event. Online marketplaces like Pinduoduo in China and Groupon and LivingSocial In the US market, have also popularized the concept of collective buying and offer deals on products, services, and experiences that are only available to a group of buyers.

So one of the main components of this new model of social commerce is the market and the pricing of a product can be determined by the community, not by individuals. This will also lead to a stable market. Because products can be available cheaper. Which is beneficial for all parties but especially for the consumer.

I: SHOPPING IN REAL WORLD IS SOCIAL

Shopping in the real world is social, people like to go to shopping malls in a group, discuss in a group about the product, for instance a buyer can ask his/her friend, family for feedback if the product is good for them. Shopping involves family, friendship, and fun in the real world. Even buyers can negotiate about the price of the product in the real world. So if we walk into a shopping mall or open marketplace every thing is social in it. But to find the same experience in the current typical e-commerce is quite difficult. In the current typical e-commerce platforms, you are most likely to search, choose, or buy products privately.

But humans are social creatures. We are wired to connect and rely on social interactions for emotional, psychological, and physical well-being. Our social nature has played a crucial role in our survival and development as a species. We live in families, work in teams, and form communities based on shared interests and values. Our ability to communicate and collaborate with others has allowed us to accomplish incredible things, from building complex societies to exploring space.

Whereas the current e-commerce model is primarily driven by privacy concerns, which means that there is little to no emphasis on social interaction. These e-commerce platforms are designed to make shopping a private experience, with a focus on protecting the personal information of the user.

However, it's important to recognize that shopping in the real world is inherently social. Whether we're browsing through a store with friends or discussing potential purchases with family members, there's always an element of social interaction involved.

As such, we must find ways to integrate social elements into the existing e-commerce model. This will allow users to connect with one another and share their thoughts and opinions about products and services. By doing so, we can create a more engaging and fulfilling online shopping experience that combines both privacy and social interaction. It's time for e-commerce platforms to evolve beyond their current limitations and embrace the power of social commerce.

II: COMMUNITY POWERED COMMERCE

In today's digital landscape, technology has become an integral part of every aspect of our lives. From the way we communicate to the way we shop, technology has transformed the way we interact with the world around us. One area where technology has made a significant impact is in facilitating user-generated shoppable content creation.

User-generated shoppable content refers to any type of content that is created by users and can be monetized by brands. By leveraging user-generated content, brands can tap into their customers' creativity and enthusiasm for their products, resulting in more engaging and authentic marketing campaigns. The new social commerce model is set to revolutionize the way we shop online. It is a community-driven commerce platform that brings consumers together in one place, facilitating collaboration before, during, and after product purchases.

This new community powered social commerce builds relationships between consumers and businesses. In this environment people can discover new products and services, connect with like-minded individuals, and foster long-lasting relationships with their favorite brands. By leveraging a community-driven approach to commerce consumers.

III: THE RISE OF USER-GENERATED SHOPPABLE CONTENT IN SOCIAL COMMERCE

A. How User-Generated Content Affects Social Commerce Performance

User-generated shoppable content is a rising trend in the world of social commerce. it's becoming easier for users to create and share their own shoppable content.

Studies have shown that user-generated content (UGC) is more authentic and trustworthy than branded content. This means that UGC can lead to higher levels of engagement and conversions. When users create shoppable content, they are able to showcase products they love and share them with their followers in an organic way.

The rise of user-generated shoppable content also benefits brands who are looking to grow their social media presence. By encouraging users to share their own shoppable content, brands can tap into a wider audience and increase their reach.

B. Challenges of Generating High-Quality Shoppable Content and Ways to Overcome Them

User-generated shoppable content has a significant impact on social commerce performance. Here are some ways in which UGC affects social commerce performance:

● Boosts engagement and conversions: User-generated shoppable content is more authentic and trustworthy than branded content, leading to higher levels of engagement and conversions.

● Builds trust and encourages brand loyalty: UGC helps to build trust with customers as they can see actual customers enjoying and using the products. This can encourage brand loyalty as customers feel more connected to the brand.

● Leads to competitive advantage: Effective use of user-generated shoppable content can lead to a competitive advantage for brands, as it sets them apart from their competitors and helps to establish a more personal connection with customers

C. The Role of AI Technology in Facilitating User-Generated Shoppable Content Creation

One of the key drivers behind the trend of user-generated shoppable content is AI technology. With advancements in machine learning and natural language processing, AI is helping brands better curate and manage user-generated content across various channels.

Another way AI is driving the trend of user-generated shoppable content is through its ability to personalize recommendations based on users' browsing history and

preferences. By analyzing data such as past purchases or items added to a wishlist, AI algorithms can make more accurate product recommendations that are tailored to each individual shoppe

D. Advancements in AI and Machine Learning Are Making Shoppable Content Creation More Accessible

Advancements in AI and machine learning are also driving the trend of user-generated shoppable content creation. These technologies make it easier for brands to identify and curate UGC, ensuring that only the highest quality content is promoted. Additionally, AI and machine learning can also help to suggest products and content to users based on their browsing and purchasing history, creating a more personalized shopping experience.

E. Leveraging Social Influencers for Effective Shoppable Content Generation

Partnering with social influencers can be an effective strategy for generating high-quality shoppable content. Influencers are individuals with a significant following on social media who have established credibility in a specific industry or niche. When selecting influencers to collaborate with, it is important to choose those whose values and aesthetic align with the brand's. The influencer's audience should also be relevant to the brand's target market.

Influencers can help to amplify a brand's message, increase reach and engagement, and drive conversions. By using their creativity and social media influence, influencers can create authentic and engaging shoppable content that resonates with their audience. Brands can also leverage micro-influencers, who may have a smaller following, but who can have a more targeted and engaged audience.

Micro-influencers can be more cost-effective, and their content may have a higher conversion rate due to their relationship with their audience. When working with influencers, it is important to establish clear expectations and guidelines for content creation and compensation. Brands should also ensure that influencer partnerships comply with FTC guidelines for sponsored content.

INNOVATING BLOCKCHAIN THROUGHDIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

06

CHALLENGES OF DIGITAL SOCIAL COMMERCE

Tsinghua University

IEDE 2023 SPRING PROGRAM
ADVISOR : PROFESSOR KRIS

TALS

SIX: EXISTING GAP & CHALLENGES OF DIGITAL SOCIAL COMMERCE

I: LACK OF SOCIAL SHOPPING COLLABORATION TOOLS

Unfortunately , social commerce also faces many challenges. One of the biggest challenges is the lack of transparency and trust. Customers are often hesitant to purchase products from social media platforms, as they are unsure about the authenticity of the products and the reliability of the sellers. Another challenge is the issue of data privacy.

Social media platforms collect a vast amount of data about their users, which can be used for targeted advertising. However, this data also poses a risk to users' privacy, and there have been many cases of data breaches and misuse.

II: LACK OF APPLICATION OF REAL TIME COMMUNICATION(RTC) TECHNOLOGIES

The lack of application of real-time communication (RTC) technologies in social commerce has been a major hindrance to the growth and success of online businesses. RTC refers to the ability to communicate with customers in real-time, allowing for faster response times and more personalized interactions. Real-time communication allows for immediate problem resolution and personalized recommendations based on individual customer needs.

In addition, RTC technologies can also help businesses build stronger relationships with their customers by providing opportunities for direct engagement and feedback. This can lead to increased customer loyalty and repeat business.

III:EXTREMELY PRIVATIZED COMMERCE

Extreme privatization and centralization in e-commerce can result in several issues, including:

Reduced competition: If a single company or a few players hold a dominant position in the e-commerce industry, it can limit competition and stifle innovation.

Limited choices: When e-commerce platforms are controlled by a few players, consumers may have limited choices when it comes to products, prices, and sellers.

Data privacy concerns: Centralized e-commerce platforms can collect and store vast amounts of consumer data, raising concerns about data privacy and security.

Lack of transparency: When e-commerce platforms are extremely privatized, it can result in a lack of transparency, making it difficult for consumers and small businesses to understand how the platform operates and how decisions are made.

Monopolies: Extreme privatization and centralization in e-commerce can result in monopolies, where a single company dominates the market and determines prices, setting the stage for potential abuses of power.

Inequality: Privatization of e-commerce can result in unequal access, where consumers who cannot afford to pay high prices or who lack the infrastructure to access e-commerce are excluded from the benefits.

IV: INADEQUATE SHOPPING EXPERIENCE COMPARING WITH REAL WORLD SHOPPING

You head into a clothing store, hoping to browse through some new outfits. But as you flip through racks of clothes, you notice that many of them are poorly made or don't quite fit right. The mannequins in the window display might look stylish, but the actual garments on offer seem cheap and flimsy.

Next up is an electronics store. You're in need of a new laptop for work, so you head straight over to the computer section. But as you try out various models, none of them seem quite fast enough or powerful enough for your needs. You ask one of the sales associates for help, but they seem uninterested in assisting you beyond pointing out a few basic specs.

Finally, you hit up a grocery store to stock up on some essentials. But as you wander through the aisles looking for bread and milk, you realize that many items are missing or out of stock. The produce looks wilted and sad, and there's a strange smell coming from somewhere in the back
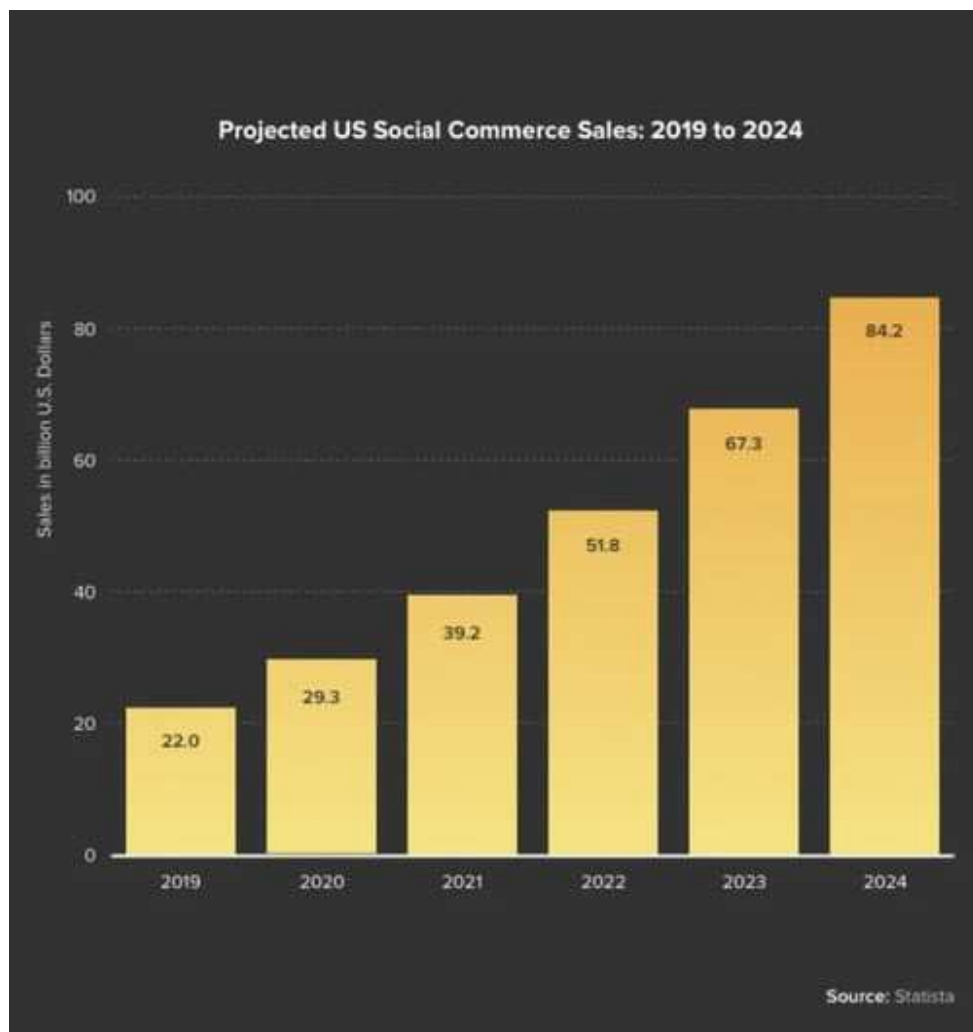
Projected US Social Commerce Sales: 2019 to 2024

SEVEN: SOLUTIONS FOR THE SOCIAL COMMERCE INDUSTRY

I. INNOVATIVE BLOCKCHAIN TECHNOLOGY FOR COMMUNITY POWERED COMMERCE

As the world becomes increasingly digitized and connected, blockchain technology is gaining popularity as a tool for innovation and disruption. One area where blockchain has already shown significant potential is in social commerce.

One of the key benefits of blockchain technology is that it allows for the creation of "smart contracts," which are self-executing contracts with the terms of the agreement written directly into code. This means that transactions can be carried out automatically, without the need for intermediaries like banks or payment processors.

II. CONSUMER INCENTIVE AND MONETIZATION

Social crypto tokens in e-commerce can be used to incentivize and monetize consumer behavior in various ways. Here are some examples:

Loyalty programs: Social tokens can be used to incentivize customer loyalty by rewarding them with tokens for repeat purchases or other desired behaviors. These tokens can then be used to unlock exclusive benefits or discounts, providing a monetary incentive for customers to continue doing business with the e-commerce platform.

User-generated content: Social tokens can also be used to reward users for generating and sharing content, such as product reviews or social media posts. This incentivizes customers to engage with the platform and share their experiences, which can generate valuable word-of-mouth advertising for the e-commerce platform.

Community participation: Social tokens can be used to incentivize community participation, enabling users to earn tokens for participating in discussions, providing feedback or suggestions, or contributing to the platform in other ways. This can strengthen the sense of community around the platform and increase customer engagement.

Decentralized marketplaces: Social tokens can be used in decentralized marketplaces to incentivize users to buy, sell, and trade products and services. These tokens can be used as a means of exchange, allowing users to purchase products and services within the marketplace without the need for traditional currencies.

III.   INTRODUCING AR FOR IMMERSIVE SOCIAL COMMERCE

Integrating AR (augmented reality) into social commerce can offer immersive and engaging experiences for customers, providing new opportunities for social commerce platforms to incentivize and monetize consumer behavior. AR can be used to showcase products in a more interactive and personalized way, allowing customers to see how products would look or fit in real-time. AR can also be used to enable virtual try-ons, which can help reduce returns and increase customer satisfaction.

For example, a social-commerce platform could use AR-powered shoppable lenses on social network platforms to showcase products in a fun and interactive way, allowing users to try on virtual makeup or clothing items. This can increase engagement and incentivize consumers to make purchases.

IV.   CREATING DYNAMIC PRICING FOR SOCIAL COMMERCE

Dynamic pricing is a pricing strategy used by digital commerce businesses to adjust the prices of products in real-time based on a variety of factors such as demand, inventory levels, and competition. To create dynamic pricing for social commerce, retailers can leverage the vast amount of customer data available on shopping platforms through user behavior analysis and AI-based algorithms.

This data can be used to create personalized pricing incentives, such as time-limited promotions, or reward programs based on customer loyalty. Dynamic pricing can also be combined with AR/VR technologies to offer real-time, interactive pricing for in-store and online shopping experiences.

Additionally, retailers can use dynamic pricing as a tool to optimize profitability by increasing prices when demand is high and lowering prices when inventory levels are high. Dynamic pricing needs to be carefully implemented to avoid alienating customers, and providing transparency around pricing increases, reasons, and reductions is important.

V.   CREATING DECENTRALIZED AND DISTRIBUTED MARKETPLACE

Creating a decentralized and distributed marketplace can be done using blockchain technology. Blockchain technology allows for the creation of a decentralized, secure, and transparent platform for transactions without the need for a centralized intermediary.

Additionally, incentivizing buyers and sellers with cryptocurrency tokens can promote a self-regulating marketplace that rewards good behavior and discourages bad behavior. However, building a decentralized and distributed marketplace can be complex and requires an experienced development team.

08

INNOVATIVE BLOCKCHAIN ARCHITECTURE FOR SOCIAL COMMERCE

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ADVISOR : PROFESSOR KRIS

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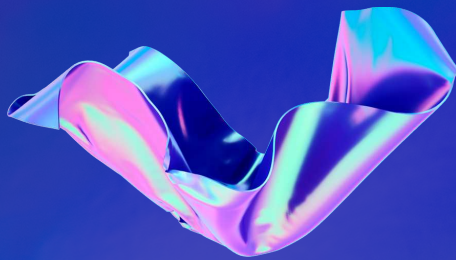
EIGHT: INNOVATIVE BLOCKCHAIN ARCHITECTURE FOR DIGITAL SOCIAL COMMERCE

I. INTRODUCTION TO BLOCKCHAIN FOR SOCIAL COMMERCE

Blockchain technology is a decentralized system for recording and verifying transactions. It is best known for its use in cryptocurrencies like Bitcoin, but its potential applications extend far beyond that. In social commerce, blockchain technology can be used to create more secure and transparent transactions, as well as to provide incentives for users to create and share content.

II. TOKENIZATION AND ITS BENEFITS

A. The Potential Of Social Content Tokenization

Tokenization is the process of converting real-world assets or rights into digital tokens that can be traded on a blockchain. In the context of social commerce, tokenization can be used to reward users for creating and sharing content. For example, a social commerce platform could create a token that represents a user's contribution to the platform, such as a user generated content. Other users could then use these tokens to access premium content or to make purchases on the platform.

Tokenization has several benefits for social commerce. First, it provides a way to reward users for their contributions to the platform, which can help to incentivize more active participation. Second, it creates a more secure and transparent system for transactions, as all transactions are recorded on the blockchain. Finally, it creates a more efficient system for payments, as transactions can be carried out automatically without the need for intermediaries.

B. Challenges Of Tokenization In Social Commerce

While there are many benefits to tokenization in social commerce, there are also several challenges that must be addressed. One of the biggest challenges is the need for a standardized system for tokenization. Without a standardized system, it can be difficult for different platforms to interoperate, which can limit the benefits of tokenization.

Another challenge is the need for a secure system for storing and managing tokens. If tokens are not stored securely, they can be vulnerable to theft or other types of attacks. Finally, tokenization can be a complex process, and it can be difficult to create a system that is easy for users to understand and use.

C. Solutions To Overcome Tokenization Challenges

There are several solutions to the challenges of tokenization in social commerce. One solution is to create a standardized system for tokenization that can be used across different platforms. This would help to ensure interoperability and make it easier for users to understand and use tokens.

Another solution is to create a secure system for storing and managing tokens. This can be achieved by using a combination of encryption and distributed storage systems, which can make it much more difficult for tokens to be stolen or compromised.

Finally, it is important to create a user-friendly system for tokenization. This can be achieved by providing clear instructions and tutorials for users, as well as by creating intuitive interfaces that are easy to use.

I. INTRODUCTION TO SOCIAL TOKEN CRYPTO

A. How Social Crypto Tokens Are Revolutionizing Social Commerce

Social token crypto, also known as ecommerce crypto, is a type of digital currency that is specifically designed for use in ecommerce transactions. These tokens can be used to make purchases or to earn rewards for loyalty or engagement.

Social token crypto is built on blockchain technology, which ensures that all transactions are secure and transparent.

Social crypto tokens are revolutionizing social commerce by providing a new way for retailers to incentivize engagement and loyalty. These tokens can be used to reward consumers for sharing content, making purchases, or engaging with the brand in other ways. This can help to increase customer loyalty and engagement, which can ultimately lead to increased sales and revenue.

B. Benefits Of Using Social Crypto In Digital Commerce

There are several benefits of using social crypto in ecommerce. Firstly, it can help to increase customer loyalty and engagement, as consumers are incentivized to interact with the brand

Secondly, it can help to reduce the cost of customer acquisition, as retailers can leverage social media and other channels to promote their tokens. Finally, it can help to increase the efficiency of supply chain management, as all parties can track the movement of goods from the manufacturer to the end consumer.

I. SOCIAL CRYPTO TOKENS VS. TRADITIONAL LOYALTY PROGRAMS

Social crypto tokens offer several advantages over traditional loyalty programs. Firstly, they are more secure and transparent, as all transactions are recorded on a tamper-proof ledger. Secondly, they are more flexible, as they can be used across different platforms and channels. Finally, they are more cost-effective, as they eliminate the need for physical rewards and other expenses associated with traditional loyalty programs.

II. BEST PRACTICES FOR IMPLEMENTING SOCIAL CRYPTO IN DIGITAL COMMERCE

When implementing social crypto in social commerce, there are several best practices that retailers should follow. Firstly, they should ensure that their token is easy to use and understand. Secondly, they should promote their token across multiple channels, including social media, email marketing, and other channels. Finally, they should ensure that

their token is integrated with their existing ecommerce platform, to provide a seamless user experience.

III.   BLOCKCHAIN FOR USER VERIFICATION AND AUTHENTICATION

Blockchain technology can be used for user verification and authentication. By leveraging the distributed ledger technology, blockchain can create a decentralized and secure system for verifying users' identities.

This can be achieved through the use of digital identity verification, where users are assigned unique digital identities that are stored on the blockchain. These digital identities can be used to authenticate users for various services, without the need for a centralized authority.

Additionally, blockchain-based authentication can help prevent fraud, identity theft, and other malicious activities. There are already several blockchain-based identity verification projects and companies that are currently providing decentralized and secure identity authentication and verification services.

09

BLOCKCHAIN IN DIGITAL SOCIAL COMMERCE

Tsinghua University

NINE: APPLICATION OF BLOCKCHAIN IN SOCIAL COMMERCE

I: WEB 3 APPLICATIONS AND THEIR ROLE IN REVOLUTIONIZING SOCIAL COMMERCE

Web 3 applications have the potential to revolutionize social commerce by creating a more efficient and transparent system. By eliminating intermediaries and creating a direct connection between buyers and sellers, web 3 applications can reduce costs and increase efficiency.
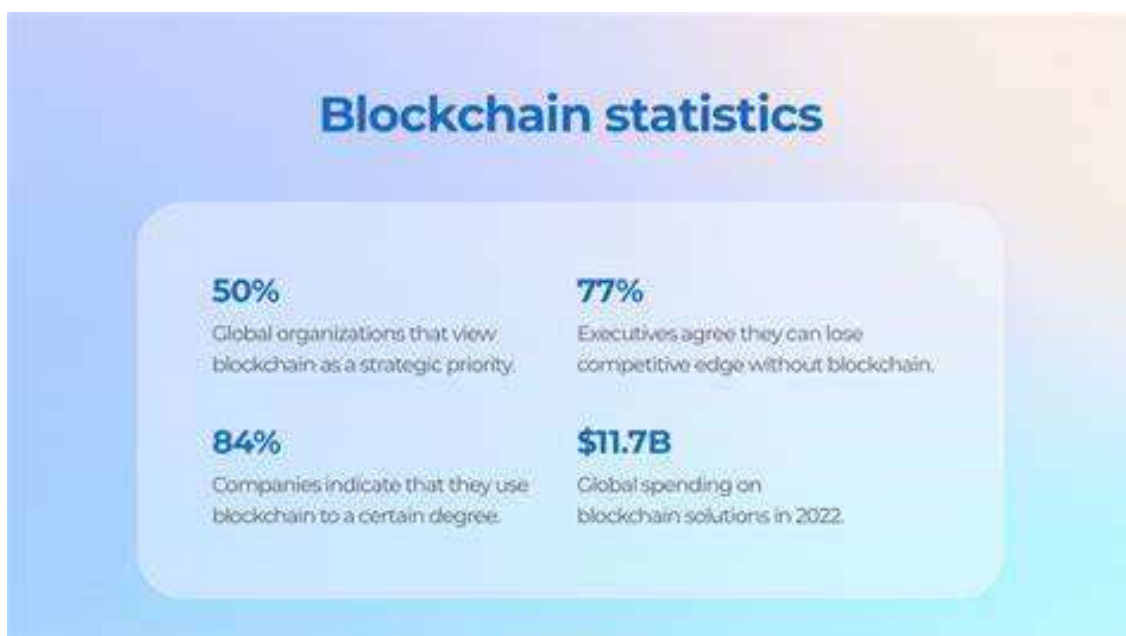
One of the key features of web 3 applications is their ability to create a user-centric system. Users have control over their data and can interact directly with the application, creating a more personalized and engaging experience.

This can lead to increased engagement and conversion rates. Web 3 applications can also create new revenue streams for businesses. By using blockchain-based tokens, businesses can create new forms of value, such as loyalty points and rewards, that can be traded on the blockchain network. This creates a more flexible and efficient system for managing rewards programs.

II : THE BENEFITS OF BLOCK-CHAIN FOR SOCIAL COMMERCE

Blockchain technology has the potential to overcome many of the challenges faced by social commerce. Its decentralized and transparent nature makes it ideal for creating a more secure and trustworthy social commerce ecosystem. One of the key benefits of blockchain is its ability to verify the authenticity of products. By storing transaction data on a blockchain network, it is possible to track the entire supply chain of a product, from its origin to its final destination.

This creates a more transparent and trustworthy system, reducing the risk of fraud and counterfeiting. Blockchain also provides a more secure platform for transactions. By eliminating the need for intermediaries, such as banks and payment processors, blockchain reduces the risk of payment fraud and chargebacks. Transactions are executed directly between the buyer and seller, with no intermediaries involved.

INNOVATING BLOCKCHAIN THROUG HDIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

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10
CHALLENGES &
OPPORTUNITIES

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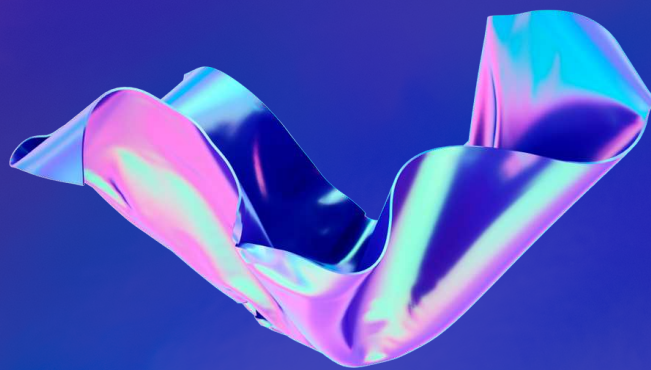
TEN: CHALLENGES AND OPPORTUNITIES

I: HOW BLOCKCHAIN CAN IMPROVE TRANSPARENCY AND TRUST IN SOCIAL COMMERCE

There are numerous intersections between blockchain and social commerce. Just take DID (decentralized identity) for example. For traditional digital identity, there are mainly three issues.

First, the identity data are scattered, which need repeated verification in different agencies. Second, those personal identity data are easily stolen or falsely used. Third, under the traditional framework of digital identity, personal information is liable to be leaked on a catastrophic scale. With DID, nonetheless, the identity information stored by social commerce platforms would be safer in three ways.

Blockchain
- Greater transparency
- Enhanced security
- Improved traceability
- Increased efficiency and speed
- Reduced costs
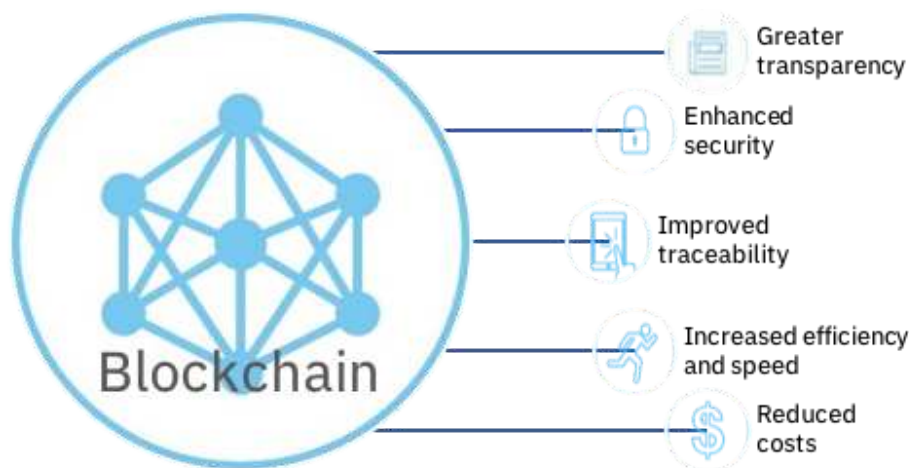
First, owing to blockchain, DID is stored in a distributed manner, which prevents the identity data to be controlled by the sole centralized authority. Even if the data are stored in a sole centralized node, the retrieval process can also be set to be recorded. Second, since DID is based on DPKI, users of social commerce platforms applying DID can autonomously control and manage their own identity data. Third, the data exchange based on DID is trustworthy. As the identity data is anchored in blockchain, the verification process is easy and credible, greatly denting the chances of data theft. Meanwhile, with the aid of DID, the data can be transmitted freely between different social commerce platforms, with repeated verification omitted.

Blockchain technology can improve transparency and trust in social commerce by creating a more secure and transparent system. By storing transaction data on a blockchain network, it is possible to track the entire supply chain of a product, from its origin to its final destination. This creates a more transparent and trustworthy system, reducing the risk of fraud and counterfeiting. Blockchain also provides a more secure platform for transactions.

By eliminating the need for intermediaries, such as banks and payment processors, blockchain reduces the risk of payment fraud and chargebacks. Transactions are executed directly between the buyer and seller, with no intermediaries involved.

II: PARTS OF REGULATION OF BLOCKCHAIN IN CHINA

Globally, major economies including China, the United States, Canada and Japan take a proactive approach in developing and applying blockchain. The authorities in the US and Singapore have already promoted the application of blockchain in public services. As for the regulation of blockchain, I want to take China for example. Enterprises applying blockchain are categorized into blockchain information service providers in China, which are liable to the Regulation on Blockchain Information Service Management promulgated by Cyberspace Administration of China. And these enterprises bear obligations both internally and externally.

For internal obligations, there are mainly eight points to comply with:

1. MECHANISMS. They should establish and improve management mechanisms concerning user registration, emergency response, information verification and so on.

2. TECHNICAL STANDARDS. They need to be equipped with technical standards corresponding with the service they render, and the technical formula should be in accordance with state requirements.

3. PLATFORM RULES. They should formulate and make Management Rules & Platform Convention open to the public. Also, they should enter into service agreements with blockchain information service users.

4. INFORMATION RECORDING AND BACKUP. They should record the information of the users, and should keep the information for no less than six months.

5. DISCLOSURE. They should put the number of their registration filing on a conspicuous place in their websites or apps.
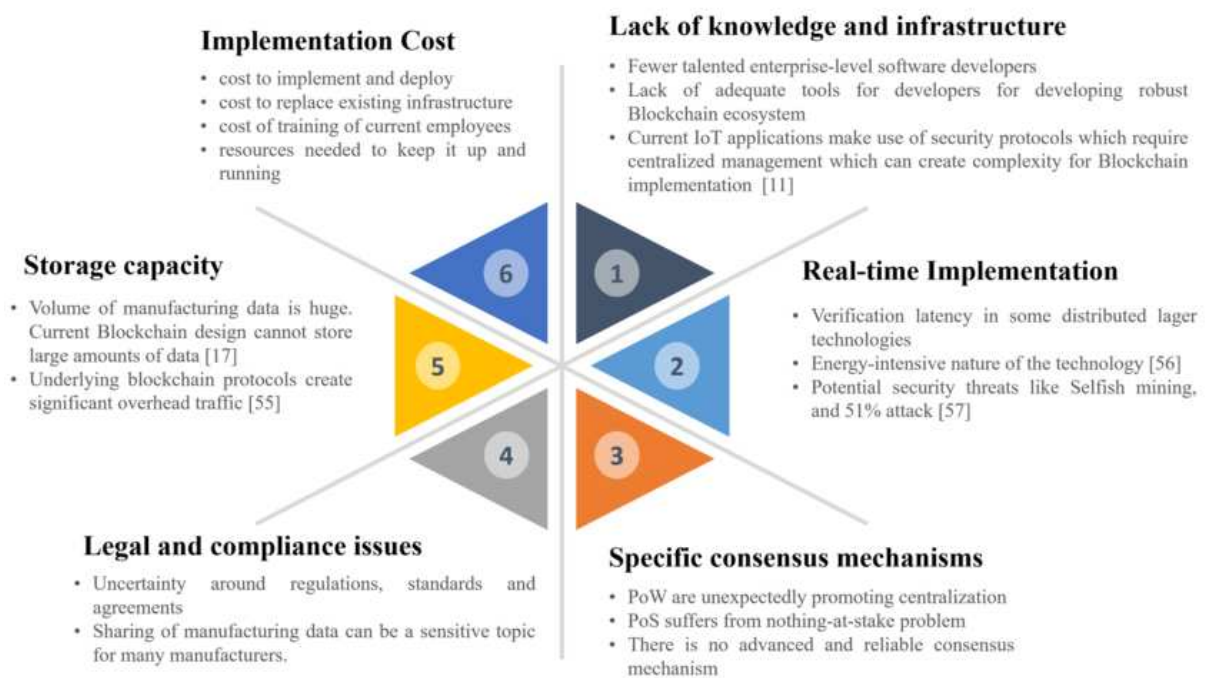
6. SAFETY ASSESSMENT. If they want to develop new products, new applications or new functions, they should carry out a safety assessment of it.

7. USER INFORMATION VERIFICATION. They should verify user information such as the number of ID cards and the telephone number.

8. COMMUNITY MANAGEMENT. For users breaching rules, they should take measures against these users and the unlawful content they generated.

For external obligations, they are responsible to the regulatory organs in mainly two realms. First, they have to file to the regulatory authorities when they start the services, alter the items of services or end the services. If they start to engage in blockchain information service prior to the promulgation of the law, they have to go through the formalities de novo. Second, during the regular inspection of the information registration system by the Cyberspace Administration of China, they have to provide relevant information as stipulated.

III: CHALLENGES AND LIMITATIONS OF IMPLEMENTING BLOCKCHAIN IN SOCIAL COMMERCE

Implementation Cost
- cost to implement and deploy
- cost to replace existing infrastructure
- cost of training of current employees
- resources needed to keep it up and running

Lack of knowledge and infrastructure
- Fewer talented enterprise-level software developers
- Lack of adequate tools for developers for developing robust Blockchain ecosystem
- Current IoT applications make use of security protocols which require centralized management which can create complexity for Blockchain implementation [11]

Storage capacity
- Volume of manufacturing data is huge. Current Blockchain design cannot store large amounts of data [17]
- Underlying blockchain protocols create significant overhead traffic [55]

Real-time Implementation
- Verification latency in some distributed lager technologies
- Energy-intensive nature of the technology [56]
- Potential security threats like Selfish mining, and 51% attack [57]

Legal and compliance issues
- Uncertainty around regulations, standards and agreements
- Sharing of manufacturing data can be a sensitive topic for many manufacturers.

Specific consensus mechanisms
- PoW are unexpectedly promoting centralization
- PoS suffers from nothing-at-stake problem
- There is no advanced and reliable consensus mechanism

The truth is that the development of the Web 3 industry is still at an elementary level, and it is still a long way to go to enter the era with coming-of-age W3 techs. Many W3 applications based on consortium blockchain or private blockchain do not realize the decentralization. High risks in terms of safety and legal issues lurk in these fledgling techs. Behind the mask of "decentralized organizations", the DAOs are actually stipulated by big capital or powerful consortiums, which take in monopoly profits in the form of highly centralized organizations.

In this day and age, social commerce app developers may find it luring to apply W3 techs such as blockchain to empower and enhance their platforms. The hurdles and limiting factors are primarily manifested in these four ways.

First, although the application of blockchain enhances the safety of personal data and assets, it is still not uncommon to see data being hacked or assets being stolen. Indeed, digital assets theft is still the most widespread issue impeding the blockchain's full application in social commerce. To some extent, there is anarchy in the world of W3. If your virtual assets based on W3 are stolen, there is no way for you to seek remedies. Neither the judicial organs or government will assume the responsibility of helping retrieve your lost assets on Dapps, nor the developers of Dapps are capable of lending you a hand. On the users' part, the absence of remedial actions concerning their digital assets or data will make their loss irreparable. On the side of social commerce platforms bolstered by blockchain, once there occurs a single blockchain accident, the impotency to offset their users' loss will deliver a fatal blow to the fragile bond between users and businesses.

Second, plenty of countries are attaching great importance to currency sovereignty, which impedes social commerce platforms from introducing cryptocurrencies as an alternative payment method. Nonetheless, for some countries in Africa and South America which have little claims to legal tender, cryptocurrencies may be promoted as a payment method in social commerce platforms.

Third, from the standpoint of countries, if social commerce platforms adopt W3 techs such as blockchain, the regulation of content would be fiendishly hard. Since all data is stored on the public blockchain, it would be difficult for either the government or the developers to weed out content which may pose a threat to the healthy ecosystem of social commerce platforms. So, how to regulate its use in different scenarios such as social commerce is a tricky issue for all parties to concern.

Fourth, on businesses' part, costs and the risks of compliance and regulation are two main factors to consider. As blockchain empowers social commerce platforms with enhanced safety and transparency, the platforms based on blockchain have to shoulder exorbitant prices of introducing, maintaining and updating the tech in the platform, and have to keep a tight rein

on the application of blockchain to make it conform to laws and regulations. Hence, for those medium- or small-sized social commerce platforms, the developers and policymakers have to consider whether it is financially viable to introduce w3 techs such as blockchain into their platforms. The decision requires extra investigation by professionals providing accounting, legal or audit services.

IV LESSONS TAKEN FROM THE MOVES OF BLOCKCHAIN TITAN – THE END OF LEBRA AND ZUCKERBERG'S SHIFTS TO W3 AND METAVERSE

One case we want to highlight here is the shutdown of encryption project Novi by Meta. Novi, the encryption project, was taken out of service on September 1, 2022. That means Meta (Facebook)'s cryptocurrency project Diem, or Lebra, came to an end. Libra, a Stablecoin project announced by Facebook and its Allies in 2019, was scheduled to launch in 2020, along with Calibra, its own crypto wallet. Nevertheless, owing to intense regulatory pressure, its key Allies pulled out, and in the end the project was renamed Diem and the wallet Novi. Even though CEO Zuckerberg made it clear to regulators that he would never launch his Stablecoin project without regulatory approval.

In the end, he couldn't change the skepticism of the public, and his cryptocurrency project was forced to transform. Now, Facebook has changed its name to Meta and entered the metaverse. It is rolling out multiple VR devices to build products that pass the "visual Turing test" to the point where virtual reality is indistinguishable from the real world. Meanwhile, Zuckerberg took to social media to introduce Meta Pay and the Metaverse digital wallet, indicating that the focus was on building a "metaverse wallet" that will allow users to securely manage their identities, digital items and payment methods in the digital world of the future.

As a listed company launching encryption projects, it must pursue legal compliance. Therefore, other people in the early Stablecoin projects were not affected except Zuckerberg and relevant personnel.

INNOVATING BLOCKCHAIN THROUG
HDIGITAL ASSETS FOR SOCIAL
COMMERCE: OPPORTUNITIES &
CHALLENGES

11
CASE STUDIES

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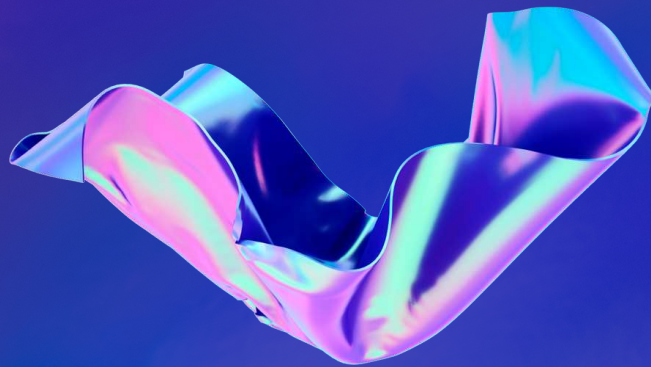
ELEVEN:CASE STUDIES

## I: CASE STUDIES: COMPANIES USING BLOCK CHAIN FOR SOCIAL COMMERCE

There are many companies that are using blockchain for social commerce. One example is VeChain, a blockchain-based platform that is used to track the supply chain of luxury goods. VeChain uses blockchain technology to ensure the authenticity of luxury goods, reducing the risk of fraud and counterfeiting.

Another example is OpenBazaar, a decentralized marketplace that allows users to buy and sell products directly with each other, without the need for intermediaries. OpenBazaar uses blockchain technology to create a more transparent and secure marketplace, reducing the risk of payment fraud and chargebacks.

II : HOW BUSINESSES CAN INTEGRATE BLOCKCHAIN INTO THEIR SOCIAL COMMERCE STRATEGY

Businesses can integrate blockchain into their social commerce strategy by using blockchain-based platforms and applications. There are many blockchain-based platforms available that can be used to create a more secure and transparent social commerce ecosystem. One of the key things businesses need to consider when integrating blockchain into their social commerce strategy is the user experience.
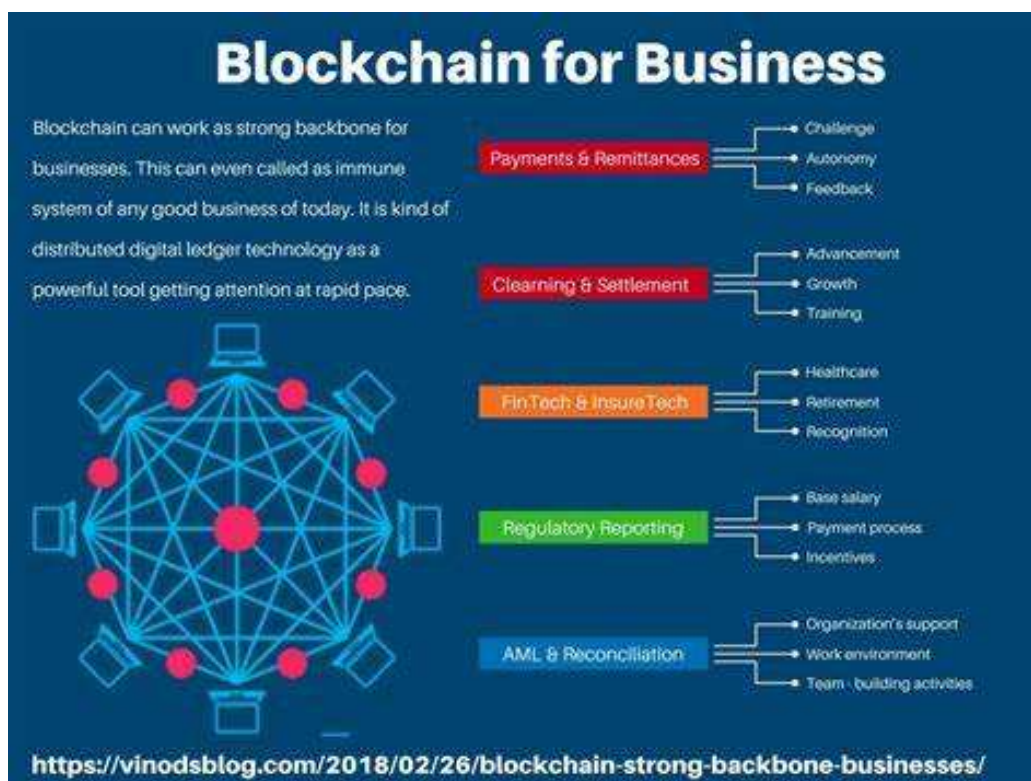
Blockchain-based applications can be complex and difficult to use, so it is important to create a user-friendly interface that makes it easy for customers to interact with the application. Another important consideration is the cost. Blockchain-based applications can be expensive to develop and maintain, so businesses need to carefully consider the costs and benefits of integrating blockchain into their social commerce strategy.

III : SUCCESSFUL APPLICATIONS OF BLOCKCHAIN IN SOCIAL COMMERCE

Blockchain technology has been successfully used in many social commerce applications. One example is the use of blockchain for food traceability. By using blockchain to track the entire supply chain of food products, it is possible to ensure the safety and authenticity of the food.

Another successful application of blockchain in social commerce is the use of blockchain-based tokens for rewards programs. By using blockchain-based tokens, businesses can create new forms of value that can be traded on the blockchain network.

12

INTEGRATION OF AI & AR FOR DIGITAL SOCIAL COMMERCE

TWELVE:INTEGRATION OF AI & AR FOR DIGITAL SOCIAL COMMERCE

I. APPLICATIONS OF AI IN BLOCKCHAIN FOR SOCIAL COMMERCE

In addition to tokenization, another area where blockchain technology can be used to innovate social commerce is in the application of AI. AI can be used to create more personalized and engaging experiences for users, as well as to create more efficient and effective systems for managing transactions.

One application of AI in blockchain for social commerce is in the creation of chatbots. Chatbots can be used to provide personalized recommendations and support to users, as well as to automate certain tasks like order processing and customer service.

Another application of AI in blockchain for social commerce is in the creation of predictive analytics systems. These systems can be used to analyze user behavior and preferences, and to provide personalized recommendations for products and services.

II. AI FOR VALIDATION AND VERIFICATION OF CONTENT

In addition to tokenization, another area where blockchain technology can be used to innovate social commerce is in the application of AI. AI can be used to create more personalized and engaging experiences for users, as well as to create more efficient and effective systems for managing transactions.

III. ANALYSIS OF CUSTOMER BEHAVIOR AND PREFERENCES ON SOCIAL COMMERCE

There are numerous studies that analyze customer behavior and preferences on social commerce platforms. Many of these studies examine factors such as product type, social influence, pricing strategies, and user experience.

One recent study, which used the PLS technique on a sample of 230 millennials who are regular social commerce users , found that social influence had a significant impact on purchase intention. Specifically, recommendations from friends and influencers on social media platforms played a crucial role in shaping consumer behavior and preferences.

Other studies have found that social commerce platforms can improve the user experience by providing personalized product recommendations, interactive features such as shoppable AR lenses, and seamless payment processes.

Pricing strategies are also a key factor in customer behavior on social commerce platforms. Dynamic pricing, which adjusts prices in real-time based on demand and other factors, can be an effective tool to optimize profitability while incentivizing customers with personalized discounts and promotions.

Finally, cross-cultural settings are an important consideration in analyzing customer behavior and preferences on social commerce platforms. Globalization and the rise of e-commerce have led to increasingly diverse markets, and understanding cultural differences is essential to providing effective social commerce experiences for customers worldwide.

Overall, there is a wealth of research available on customer behavior and preferences in social commerce. By analyzing these factors, brands and retailers can develop effective strategies to create engaging and profitable social commerce experiences for their customers.

IV. EXTREMELY PERSONALIZED PRODUCT RECOMMENDATIONS FOR CUSTOMERS

Extremely personalized product recommendations can be highly effective in engaging customers and driving sales. By leveraging data and analytics, businesses can create personalized product recommendations that are highly relevant to each individual customer's preferences and behaviors.

To create highly personalized product recommendations , businesses can utilize a variety of data sources, such as browsing and purchase history, social media activity, and demographic information. Machine learning and algorithms can then be employed to analyze this data and generate recommendations that are tailored to each customer's unique needs and interests.

Personalized recommendations can be delivered in a variety of ways, such as through email, social media, or personalized landing pages on a company's website or mobile app. By creating an engaging and highly personalized experience for each customer, businesses can increase the likelihood of conversion and build long-lasting customer loyalty.

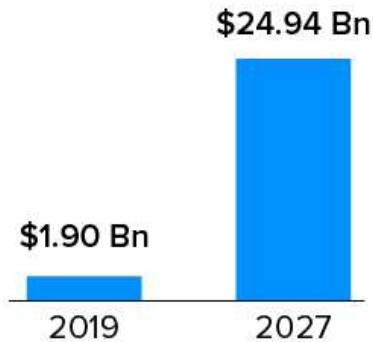# INNOVATING BLOCKCHAIN THROUG HDIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

13
MARKET ANALYSIS

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ADVISOR : PROFESSOR KRIS

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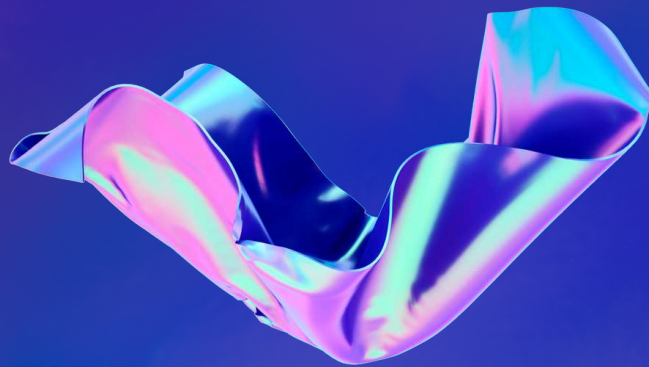
THIRTEEN:MARKET ANALYSIS

Blockchain-as-a-Service Market

Global Blockchain-as-a-Service Market Size, 2019-2027

$24.94 Bn

$1.90 Bn

2019   2027

North America Blockchain-as-a-Service Market, 2019 (USD Billion)

$1.01 Billion

Global Blockchain-as-a-Service Market Share, By Industry, 2019

BFSI 40.6%
Telecom, Media & Entertainmnet
Healthcare & Life Service
Retail & Consumer Goods
Travel & Transportation
Energy & Utilities
Manufacturing
Government
Others

The market analysis of blockchain commerce shows that this emerging sector is poised for significant growth in the coming years. Blockchain technology is increasingly being applied to the e-commerce industry to enhance security, transparency, and efficiency throughout the supply chain.

According to a report by Research and Markets, the global blockchain market size is projected to grow at a CAGR of nearly 69% from 2020-2025, with the e-commerce segment expected to contribute significantly to this growth. This growth is attributed to the advantages that

blockchain technology offers, including increased traceability, reduced fraud, and improved supply chain management.

Blockchain commerce also holds significant promise for businesses looking to expand into new markets or streamline their operations. For example, blockchain can be used to facilitate cross-border payments, streamline supply chain logistics, and improve inventory management.

However, the adoption of blockchain commerce is still in its early stages, and businesses will need to navigate a range of technical and regulatory challenges in order to successfully implement and benefit from this technology. Nevertheless, the rapidly growing interest in blockchain commerce indicates that it has the potential to transform the entire e-commerce industry and revolutionize the way that businesses operate on a global scale.

Global Blockchain Identity Management Market

Market to Value >
$3.5 Billion by 2026 end

Base Year
2018

CAGR 80.5%
(2019 -2026)

Largest Market
North America

Fastest Growing
Market
APAC

INNOVATING BLOCKCHAIN THROUG HDIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

14

INDUSTRY ANALYSIS

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FOURTEEN:INDUSTRY ANALYSIS

The social commerce industry is a rapidly growing sector of the e-commerce market, driven by the increasing use of social media platforms for shopping and purchasing goods and services. As of 2022, the global social commerce market size was valued at around $727 billion , and is predicted to reach $7.03 trillion by 2030 , with a CAGR of 30.8%.

The growth of the social commerce industry is being fueled by a variety of factors, including the increasing popularity of social media platforms, the growing use of mobile devices for online shopping, and the increasing demand for personalized and engaging online shopping experiences.

Businesses across industries are looking to capitalize on the growth of the social commerce industry by leveraging social media platforms to connect with customers, build brand awareness, and drive sales. Social commerce can take many forms, including in-app purchasing on social media platforms, shoppable posts, and social media marketing campaigns designed to drive traffic to e-commerce websites.

As the social commerce industry continues to grow and evolve, businesses will need to stay up-to-date with the latest trends and technologies in order to build successful social commerce strategies and capitalize on the many opportunities offered by this rapidly growing market.

INNOVATING BLOCKCHAIN THROUG HDIGITAL ASSETS FOR SOCIAL COMMERCE: OPPORTUNITIES & CHALLENGES

15
FUTURE OF
S- COMMERCE
WITH
BLOCKCHAIN

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FIFTEEN:FUTURE OF SOCIAL COMMERCE WITH BLOCKCHAIN IN THE ERA(SEASON) OF WEB3

I: FUTURE OF SOCIAL COMMERCE WITH BLOCKCHAIN TECHNOLOGY

The future of social commerce with blockchain technology is bright. As blockchain technology continues to evolve, we can expect to see more innovative applications of blockchain in social commerce. Blockchain has the potential to create a more secure, transparent, and efficient social commerce ecosystem, reducing the risk of fraud and counterfeiting and creating new revenue streams for businesses.

II: BEST PRACTICES FOR BUSINESS LOOKING TO INTEGRATE BLOCKCHAIN IN SOCIAL COMMERCE

Businesses looking to integrate blockchain in their social commerce strategy should follow best practices to ensure a successful implementation. Some of these best practices include:

- Conducting thorough research to ensure that blockchain is the right technology for their business needs
- Creating a user-friendly interface that makes it easy for customers to interact with the blockchain-based application
- Ensuring transparency and accountability in the blockchain-based application
- Investing in security measures to protect data and assets
- Considering the cost and benefits of integrating blockchain in their social commerce strategy

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AI'S ROLE IN W. BLOCKCHAIN TECHNOLOGY

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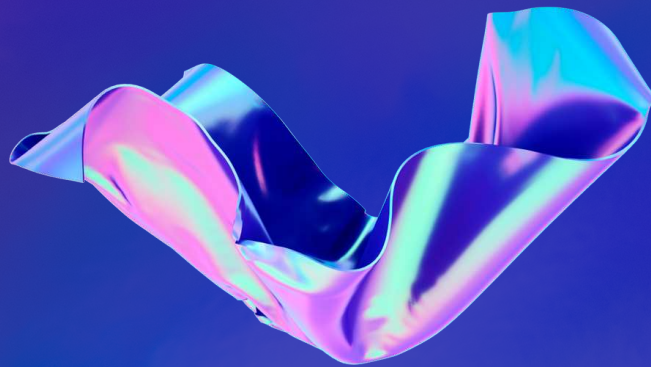
SIXTEEN: AI'S ROLE IN THE FUTURE AND HOW IT COMPLEMENTS WITH BLOCKCHAIN TECHNOLOGY

Blockchain and AI are the two most important and emerging technologies. Blockchain is versatile and is easy to apply whereas AI has surpassed all its limitations of experimenting performances in the labs. Both are embedded with the recent technological developments, though both have different roots. Blockchain is considered a shared and permanent ledger that will be used for the encryption of data in the future. AI engine, on the other hand, enables an individual to analyze and make decisions from the collected data. It is worth mentioning that each technology has its multiple complexions, but artificial intelligence and blockchain together will provide many benefits.
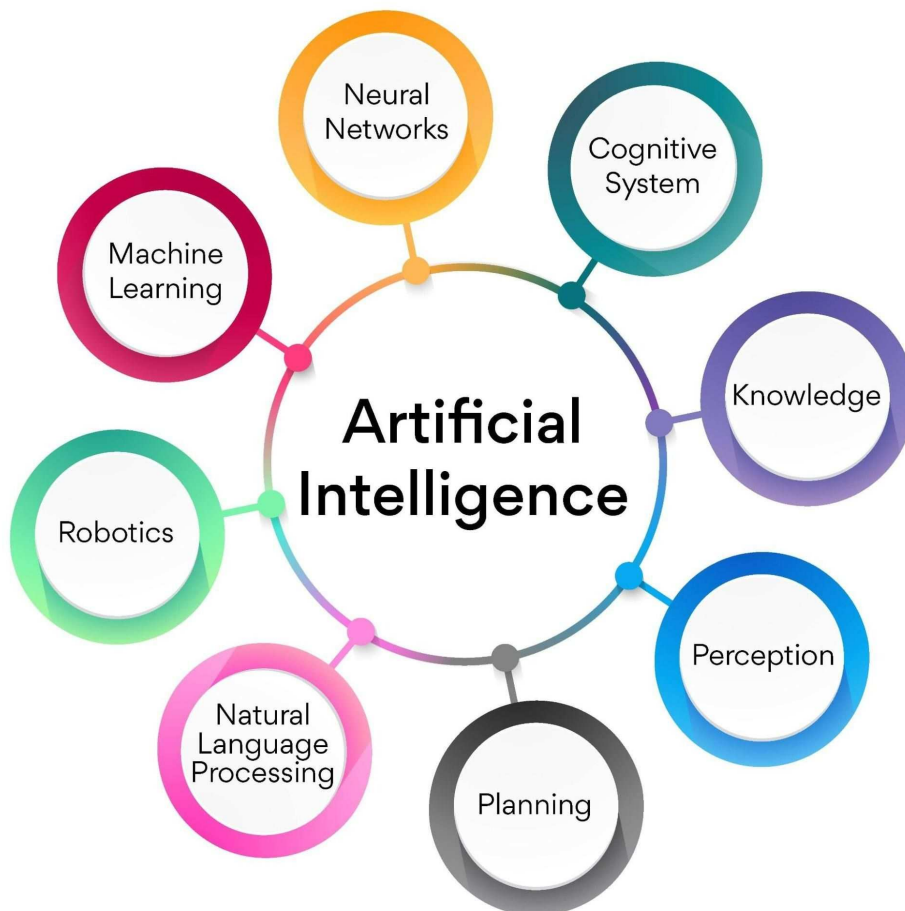
Interlinking of the blockchain technology and AI:

Blockchain technology is interlinked with AI in many ways. Below are the major integrations:
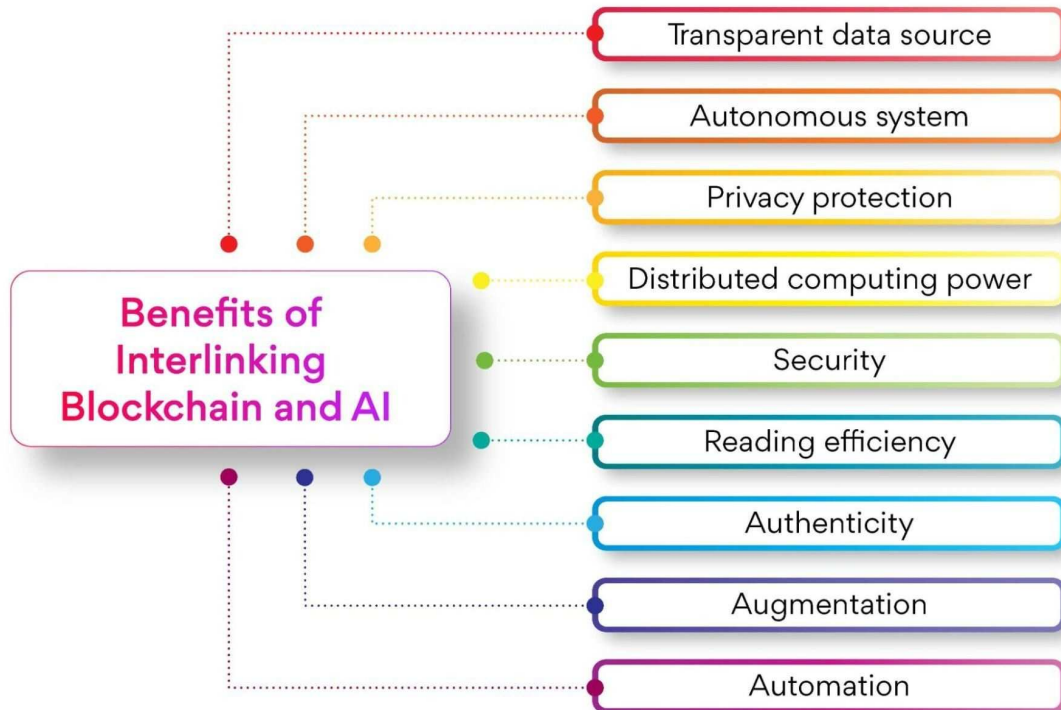
1. Transparent data source

You need ample data to train an AI application. As blockchain is the most transparent technology, it is a reliable source of refined data. Due to the traceability of nodes, the source of data can be verified efficiently.

2. Autonomous system

The decentralized ledger technology ensures that no single server handles all the operations of the AI application. The autonomous system drives the decentralization for managing the AI training and operations without being supervised.

3. Privacy protection

Cryptographic techniques strengthen privacy throughout the network which runs AI training

and operations. When you have a robust privacy system you can train and supply AI systems as they are competitive and have higher complexity.

4. Distributed computing power

To train and maintain AI, you require a lot of firepowers. Blockchain technology takes that responsibility and helps to get through it. It also takes care of the space requirements like hardware and software, storage, and maintenance cost.

5. Security

Blockchain's smart contracts are not secure enough. The blockchain revolves around the rigidness of the contract, when there are loopholes you can exploit and harm the applications easily. For minimizing such vulnerabilities, AI is used to generate more secure and smart contracts.

6. Reading efficiency

The low query performance often limits blockchains as they have limitations in their data storage modes. The blockchain applications sacrifice the reading efficiency for achieving a more write-intensive approach with level DB-a write-intensive DMS.

While using AI, the data storage methods help to enhance the usage of blockchain. A proposed novel TTA-CB protocol lowers the issues of data storage through PSO algorithms. When you do rigorous testing and training, AI eventually helps in improving the speed of data queries.

7. Authenticity

Blockchain's digital record provides insights into the AI framework and the provenance of the data which is used, it also addresses the challenges of explainable AI. It helps you in improving your trust in data integrity and the recommendations the AI provides. When you are using blockchain for storing and distributing AI modes it provides an audit trail, and pairs blockchain and AI to enhance data security.

8. Augmentation

AI reads data comprehensively and rapidly. It also understands and processes the data at a great speed by bringing higher intelligence to the blockchain-based business networks. When you provide access to larger data within or outside the organizations, blockchain will help the

AI scale and provide more actionable insights, manage model sharing and data usage, and create a transparent and trustworthy data economy.

9. Automation

Automation, AI, and blockchain will bring newer values to business processes that span different parties like adding, removing friction, and increasing speed and efficiency. AI models embedded in smart contracts execute on blockchain to resolve disputes and select the most sustainable shipping methods.

How do AI and blockchain technology complement each other?

Blockchain is an expensive medium of storing vast data in a complicated method. When you are keeping larger files on the Bitcoin blockchain, it is prohibitively expensive as they are the one-megabyte size per block. For addressing this issue, data is stored on a decentralized storage medium, which hashes the data and connects it to the blockchain blocks or uses the smart contract code from within. When you merge artificial intelligence and blockchain technologies, decentralized AI apps and algorithms are built with access to an identical vision of a trusted and shared data platform for storing your knowledge, records, and decisions. This platform is useful when you keep reliable records of all the AI algorithms before, during, and after the learning and decision-making process.

A decentralized AI system is a concept that will provide processor independence without any cons of sharing aggregate data. It will let the user process the information independently across different computing devices. With that process, you can get different findings, which you can then evaluate and find out fresh solutions to problems that a centralized system will not be able to solve.

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CONCLUSION

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SEVENTEEN:CONCLUSION

I :CONCLUSION:THE POTENTIAL OF BLOCKCHAIN IN REVOLUTIONIZING SOCIAL COMMERCE

Blockchain technology has the potential to revolutionize social commerce by creating a more secure, transparent, and efficient ecosystem. By eliminating intermediaries and creating a direct connection between buyers and sellers, blockchain-based applications can reduce costs and increase efficiency. However, there are also many challenges and limitations to implementing blockchain in social commerce, and businesses need to carefully consider the costs and benefits before integrating blockchain into their social commerce strategy. Overall, the potential of blockchain in revolutionizing social commerce is enormous, and we can expect to see more innovative applications of blockchain in the future.

Blockchain technology has been gaining traction in recent years due to its ability to create a secure and transparent ecosystem. While the technology was initially developed for the financial sector, it has since expanded into other industries, including social commerce. Blockchain technology has the potential to revolutionize social commerce by creating a more secure, transparent, and efficient ecosystem.

One of the most significant benefits of blockchain technology in social commerce is its ability to create a secure ecosystem. Blockchain technology uses encryption techniques to store data in a decentralized network of computers. This means that the data is not stored in a central location where it can be easily hacked or stolen. Instead, the data is distributed across the network, making it nearly impossible for a hacker to access it.

In addition to its security benefits, blockchain technology can also create a more transparent ecosystem in social commerce. With blockchain, all transactions are recorded on a public ledger that is accessible to everyone on the network. This means that buyers and sellers can see the entire history of a product, from its origin to its current owner. This transparency can help eliminate fraud and counterfeiting in social commerce.

Finally, blockchain technology can create a more efficient ecosystem in social commerce. With blockchain, transactions can be completed instantly, without the need for intermediaries such as banks or payment processors. This can help reduce transaction fees and increase the speed of transactions, making social commerce more accessible to people around the world.

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