MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
UKRAINIAN-AMERICAN CONCORDIA UNIVERSITY

School of Management and Business
Department of International Economic Relations, Business & Management

Bachelor's Qualification Work

Blockchain as an innovative technology in operational management: the transformation of traditional business

(based on Inncarbon Technology Ltd. case)

Bachelor's student of
Field of Study 07 – Management and Administration
Specialty 073 – Management
Educ. program – Management

Alisa Zharchynska

Research supervisor

Natalia Chaplynska
Ph.D. in Economics

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Abstract

This bachelor's thesis investigates the impact of blockchain technology on operational management and its capability to transform traditional companies. Using the COO role in Inncarbon Technology Ltd. as a case study, the research aims to explore the advantages and disadvantages of implementing blockchain in an operational system. This study adopts a mixed-method technique, which includes both qualitative and quantitative studies methods, to analyze the facts amassed from surveys, interviews, and literature evaluation. The findings advocate that blockchain technology can improve efficiency, transparency, and safety in operational management and can be a powerful tool for transforming traditional businesses. However, the successful implementation of blockchain technology requires careful planning, investments, and a significant change in organizational lifestyle. The studies offer valuable insights for companies and policymakers to make informed choices about the adoption of blockchain technology in operational management.

Keywords: Blockchain technology, Operational Management, Traditional Business Model, Innovation, Cryptocurrency, NFT, Inncarbon Technology Ltd.

Анотація

У цій бакалаврській роботі досліджується вплив технології блокчейн на операційний менеджмент та її здатність трансформувати традиційні компанії. Використовуючи роль головного операційного директора в Inncarbon Technology Ltd. як тематичне дослідження, робота спрямована на вивчення переваг і недоліків впровадження блокчейну в операційну систему. У цьому дослідженні використовується змішаний метод, який включає як якісні, так і кількісні методи дослідження, для аналізу фактів, зібраних під час опитувань, інтерв'ю та оцінки літератури. Результати свідчать про те, що технологія блокчейн може підвищити ефективність, прозорість і безпеку операційного управління та може бути потужним інструментом для трансформації традиційного бізнесу. Однак успішне впровадження технології блокчейн вимагає ретельного планування, інвестицій і суттєвих змін у способі організації компанії. Дослідження пропонують компаніям і політикам цінну інформацію, щоб зробити обґрунтований вибір щодо впровадження технології блокчейн в операційному менеджменті.

Ключові слова: технологія блокчейн, операційний менеджмент, традиційна бізнес-модель, інновації, криптовалюта, NFT, Inncarbon Technology Ltd.

PHEE-institute «Ukrainian-American Concordia University»

School of Management and Business
Department of International Economic Relations, Business and Management

Educational level: **bachelor degree**
Specialty: 073 "Management"
Educational Program "Management"

APPROVED
Head of Department Prof. L. Zharova
"____" _____ 202___

TASK
FOR BACHELOR'S QUALIFICATION WORK

Alisa Zharchynska
(Name, Surname)

1. Topic of the work:

Blockchain as an innovative technology in operational management: the transformation of traditional business (based on Inncarbon Technology Ltd. case)

Supervisor of the work ***Natalia Chaplynska, Ph.D. in Economics***.

Which approved by Order of University from "22" September 2022 № 22-09/2022-3c

2. Deadline for bachelor's qualification work submission "***23" April 2023***
3. Data-out to the bachelor's qualification work_
Materials from internship received during consultation with representatives of the company. Information from open resources in the Internet, official reporting of financial and economic activities of the enterprise.

4. Contents of the explanatory note (list of issues to be developed).

The next issues a student should develop in this work:
- *develop an understanding of blockchain technology, its origin, and potential;*
- *learn to understand how these new crypto-technologies affect old-fashioned/ traditional business' functionality as well as each area of the business model;*
- *study the impact of blockchain technology on a concrete business (Inncarbon Technology Ltd.);*
- *provide an understanding of modern operational development by completing an internship in an English company (Inncarbon Technology Ltd.) and analyzing its strategies and competitiveness;*

- *conduct research into understanding how blockchain technology can help to further improve traditional businesses and operational management;*
- *find out the peculiarities of the implementation of smart contracts into corporate sale agreements.*
- *to investigate the further potential of blockchain technology for operational management in traditional businesses and provide recommendations for Inncarbon Technology Ltd. to effectively leverage this technology in their operations.*

5. List of graphic material (with exact indication of any mandatory drawings)

Graphs and figures for analysis of economical and statistical information on the company and its development, visualization of mechanism of development, etc.

6. Consultants for parts of the work

Part of the project	Surname, name, position	Signature	
		Given	Accepted
1	*Natalia Chaplynska, Ph.D. in Economics*	+	+
2	*Natalia Chaplynska, Ph.D. in Economics*	+	+
3	*Natalia Chaplynska, Ph.D. in Economics*	+	+

7. Date of issue of the assignment

Time Schedule

№	The title of the parts of the bachelor's qualification work	Deadlines	Notes
1.	I chapter	*31.12.2022*	*In time*
2.	II chapter	*20.02.2023*	*In time*
3.	III chapter	*11.04.2023*	*In time*
4.	Introduction, conclusions, summary	*23.04.2023*	*In time*
5.	Pre-defense	*27.04.2023*	*In time*

Student _____ (signature)

Supervisor _____ (signature)

Conclusions:

The Bachelor's qualification work is designed at the high level, and its content and structure fully meet the methodological requirements. The study provided a meticulous analysis of the blockchain technologies as an innovative type of technologies in operational management. The work contains all the necessary parts of scientific research with empirical and theoretical recommendations. The paper includes a well-developed theoretical approaches to the question of blockchain in real companies on the example of Inncarbon Technology Ltd. This work is unique. The practical recommendations were formulated correctly and focused on the main goal and tasks of the work. In general, if successful defense, the thesis can claim to be "excellent".

Supervisor _____ (signature)

CONTENT

Introduction

The interest in Blockchain technology and the fundamentals of its usage have increased in recent years, and it is now frequently employed for business purposes. This technology's efficacy and accessibility provide new opportunities for business development and operational effectiveness. By making various types of transactions easier to manage, secure, and monitor, blockchain technology has fundamentally altered how we currently think about centralization. Decentralization, immutability, transparency, and peer-to-peer connectivity help respond to changing trends, improve corporate operations, strengthen the financial system, and clarify complex business models. This paper presents theoretical and practical approaches to implementing blockchain technology into the operations of a traditional business in the example of Innncarbon Technology Ltd. and its recent operational modernization.

Modern technology such as blockchain has the ability to lay the groundwork for the development of innovative business models. Models that promote security above performance and those that eliminate intermediaries in an ecosystem of third parties are of special relevance. This modification to a venture's business model has a significant effect on a variety of sectors. For instance, current blockchain solutions in the banking sector allow for direct trades between trading partners without the need for reconciliation or intermediaries. Additionally, blockchain technology offers a security paradigm that is fault-tolerant, flexible, and always available, enabling its users to track their assets continually and settle transactions independently. Out of all industries, the mining and service-based sectors can majorly benefit from blockchain technology because of these features, as did Inncarbon Technology.

Blockchain technology can be implemented in a traditional business on different levels, from financial to operational. To begin with, a straightforward use of blockchain technology that was carried out by the aforementioned

organization is accounting enhancement, which is a classic example of a sector that may benefit from it. The overly complicated tax legislation and the imperative requirement for accuracy and precision are just two of the many difficulties that face the accounting industry. The blockchain can help with all of these problems. The time auditors spend sampling and confirming transactions may be cut down because of the transparency offered by the blockchain. The auditors might concentrate on controls and other important responsibilities if they had more time.

The supply chain was another area where blockchain improved Inncarbon Technology. From the blocks of the concentrate to the hard coal, commodities may be tracked using blockchain throughout the mining value chain. Stepwise values from the source to the end client can demonstrate this. Furthermore, for joint partners, blockchain may also offer transparency and reliability, instead of using a standardized bank accreditation system. The value chain of the majority of mining enterprises is fragmented, with transactions taking place between many partners. Additionally, blockchain may enable automated invoice reconciliation, which usually can take more than a month and considerably prolong the deadlines. For assurance, the client sends the coal for lab testing after assigning it a quality certificate. The pricing and purity of the coal may or may not be under question. The three parties engaged in this process (the producer, the buyer, and the third-party agent) can all benefit from Blockchain technology. In order to better safeguard the real-time data created during delivery, Inncarbon Technology implemented a project utilizing Blockchain to track the movements of bulk coal and briquet samples.

Before going into more examples, it is crucial to understand the terms that are widely used in this paper and address certain technical features of blockchain that are used by the company. Smart contracts and NFT technology are successfully used in the operational strategies of Inncarbon Technology. On a blockchain, smart contracts are stored programs that are only activated when

certain criteria are satisfied. They are frequently used to automate the execution of an agreement so that all parties may be certain of the outcome immediately, without the need for a middleman or further delay. They can also automate a process so that it only takes action when specific conditions are met. Second, a digital asset known as an NFT might be anything, including music, movies, and in-game items, but in real-world commercial scenarios, it could also include intellectual rights or manufacturing equipment. They are often encoded using the same software, and they are frequently bought and sold online in exchange for cryptocurrencies. The NFT process includes the development of a smart contract to execute a deal, but also makes it non-fungible, meaning that there is only one right of using or owning, for instance, a certain property.

Therefore, smart contracts may also be utilized, allowing for the automated transfer of assets whenever specific requirements are completed. Conflicts might be settled quickly and directly, saving time for courts, attorneys, and clients. The use of escrow accounts, in which legal services hold funds until the predetermined criteria are satisfied, may also be eliminated by blockchain technology. These are the main aspects of blockchain that this paper addresses. The relevance of this work is defined by the extensive and rapid growth and development of blockchain technologies that are taking place in the world right now as well as the impact that it has had on various areas of not only IT but also traditional business, among which lies business operations management.

The aim of the bachelor thesis is to study and analyze how blockchain technologies, including smart contracts and NFTs can be implemented in different areas of traditional business, enhancing its operational effectiveness and business development.

In order to achieve this aim, the following **tasks** were set:

- develop an understanding of blockchain technology, its origin, and potential;

- learn to understand how these new crypto-technologies affect old-fashioned/ traditional business' functionality as well as each area of the business model;
- study the impact of blockchain technology on a concrete business (Inncarbon Technology Ltd.);
- provide an understanding of modern operational development by completing an internship in an English company (Inncarbon Technology Ltd.) and analyzing its strategies and competitiveness;
- conduct research into understanding how blockchain technology can help to further improve traditional businesses and operational management;
- find out the peculiarities of the implementation of smart contracts into corporate sale agreements.
- to investigate the further potential of blockchain technology for operational management in traditional businesses and provide recommendations for Inncarbon Technology Ltd. to effectively leverage this technology in their operations.

The methodological basis for this work is comprised of peer-review journal articles, acclaimed internet publications, monographs, personal data analysis, induction, deduction, SWOT analysis, PESTEL analysis, and calculations.

The research objects are blockchain technology and operational management within its context.

The research subject is the implementation of blockchain technology and its impact on operational management in traditional businesses: a case study of Inncarbon Technology Ltd. Bachelor thesis consists of an introduction, 3 chapters, a conclusion, and list of references. Work is carried out on 103 sheets, containing 17 figures. References include 80 literature sources.

CHAPTER 1. THEORETICAL FUNDAMENTALS OF THE BLOCKCHAIN TECHNOLOGIES AND DECENTRALIZED FINANCE

1.1. Blockchain technology: origin and development

In 1991, the study scientists W. Scott Stornetta and Stuart Haber had their first conversation about the blockchain technology (Haber, 2021). In order to prevent backdating or tampering, they sought to create a computationally feasible method for time-stamping digital documents. To store the time-stamped papers, they create a system based on the idea of a cryptographically secure chain of blocks. Merkle Trees were added into the design of the blockchain in 1992, increasing its effectiveness by enabling several documents to be concatenated into a single block. To make a "secured chain of blocks," Merkle Trees are employed. In a set of data records that were maintained, each one is connected to the one before it. The chain's history is contained in the most recent record. However, this method was never used, and the patent ran out in 2004.

Hal Finney, a computer scientist and proponent of cryptography, created a protocol known as Reusable Proof Of Work (RPoW) in 2004 as a working model for electronic money. In the early history of cryptocurrencies, it was a crucial step. To create an RSA-signed token that might be transmitted from one person to another, the RPoW system needs a non-fungible or non-exchangeable Hashcash-based proof of work token. By maintaining token ownership logged on a trusted server, RPoW was able to tackle the double-spending issue. This server was created to enable users from all over the world to instantly confirm its accuracy and integrity.

A distributed blockchain hypothesis was also developed by Satoshi Nakamoto in 2008. In a novel method, he enhances the design to allow for the addition of blocks to the initial chain without the need for their certification by reliable parties. The altered trees would hold a safe record of information

exchanges. Each exchange's timestamp and veracity are checked using a peer-to-peer network. Blockchains now serve as the foundation for cryptocurrencies as a result of these improvements. A public ledger for all bitcoin transactions is being maintained using the approach.

Blockchains have been steadily and optimistically evolving. In Satoshi Nakamoto's first paper, the phrases "block" and "chain" were used individually, but by 2016, they had become synonymous as "the Blockchain." The blockchain file size for cryptocurrencies, which keeps track of all network transactions, has increased recently from 20 GB to 100 GB (Haber, 2021).

Governments and businesses are making significant investments in Blockchain technology as they strive to encourage breakthroughs and uses, which bodes well for the technology's future. There will eventually be a public blockchain that anybody can use, it is becoming more and more obvious. The majority of work carried out by experts across all industries should be automated, according to proponents of the technology. The cloud computing sector and supply management are both already heavily utilizing the technology. In time, the technology ought to find its way into commonplace items like internet search engines. According to Gartner Trend Insights, as the technology advances, at least one blockchain-based business will be valued at more than $10 billion by 2022. According to the research firm, the blockchain digital revolution will increase corporate value to exceed $176 billion by 2025 and approach $3.1 trillion by 2030 (Iredale, 2022). The rapid advancement of technology has increased the demand for Blockchain knowledge. Businesses are utilizing blockchain apps as well to benefit from them. With time going by, the usage of blockchain for business purposes has been increasing along with its development for several reasons. To begin with, the entire trade process may be streamlined and made simpler with the use of blockchain technology, which can also create an automated deal lifecycle in which all parties involved have access to the same information about a deal. In this situation, technology would greatly reduce the cost of the

infrastructure, allowing for effective data management, transparency, faster processing times, less reconciliation, and even the elimination of some middlemen, like brokers. One of the first reputable firms in the finance industry to create a blockchain-based product was the Nasdaq corporation. Its capitalization tables, which private corporations use to handle shares in their companies, are powered by blockchain technology and are known as Nasdaq Linq (Ozair, 2022).

Secondly, by reducing costs, simplifying the process, and doing away with many of the present middlemen, blockchain technology has the potential to significantly improve cross-border payments. As a result, money transfers would become less expensive. Remittance fees have previously ranged from 5% to 20%. Blockchain technology may allow for assured, real-time cross-border transactions while lowering expenses to 2% to 3% of the total (Cyberbahn Federal Solutions, 2022). In order to send real-time foreign payments via a mobile app, Santander was the first bank in the UK to employ blockchain. The solution makes use of Ripple's technology, which it created in order to create the blockchain-based Ripple exchange network and payment system.

Finally, if online identity is moved to a blockchain-enabled infrastructure, consumers will have more choice over how and with whom their identity is shared. Users still need to register their identities on a blockchain, but as long as those service providers are also connected to the blockchain, they don't need to do so again. This use of blockchain technology may be utilized, for example, for know-your-customer needs where a digital single source of identifying information might enable more smooth account opening, and decreased resources, and expenses, all while respecting the privacy of data. Indeed, several startups are creating solutions for identity management.

Now as we look closer to the forecasts and projections for the blockchain technology market, it is clear that it will only increase. According to Grand View Research, the market for blockchain technology is anticipated to develop from

2022 to 2030 at a compound annual growth rate (CAGR) of 85.9%, from a market value of USD 5.92 billion in 2021 as you can see in Figure 1.1. The market expansion is caused by the increase in venture capital funding for blockchain technology businesses. For instance, Circle Internet Financial Ltd., a provider of blockchain technology, disclosed in May 2021 that it had raised USD 440 million from institutional and strategic investors (Grand View Research, 2022). The firm used this money to expand both inside and externally. The legalization of cryptocurrencies in countries like El Salvador and Ukraine is expected to create new opportunities for business growth.

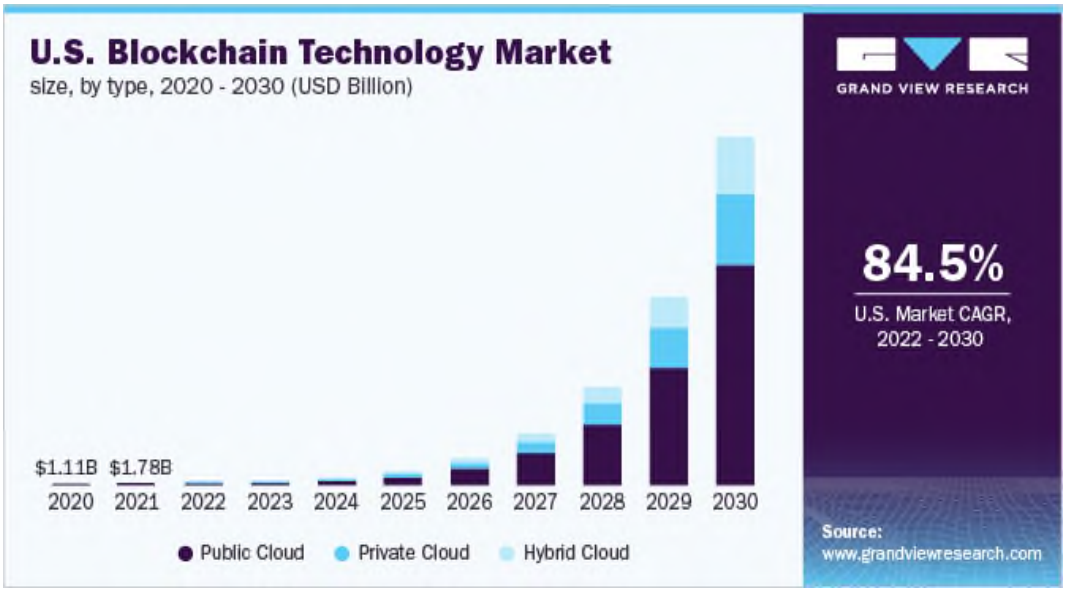


Figure 1.1. *U.S. Blockchain Technology Market size, by type; Grand View Research, 2022*

Blockchain technology investment is on the rise as a result of cryptocurrency's legality. Additionally, it motivates market participants to put in more effort to enhance their services in order to stand out from the competition. In the near future, it is anticipated that the firms' efforts will increase the effectiveness and efficiency of blockchain technology. Blockchain-based developing financial technology called DeFi lessens the amount of control banks have over financial services and money. Expanding strategic initiatives in the decentralized financial domain are likely to be the key driver of market growth

throughout the projected timeframe. For instance, the payment giant Square declared in July 2021 that it will use bitcoin to build a DeFi-specific company. This action is predicted to improve the company's standing in the market. The acceptance of cryptocurrencies as payment by companies like PayPal and Xbox is expected to lead to market development. Some restaurants are working with cryptocurrency solution providers to enable bitcoin-based payments for their customers. For instance, the digital asset marketplace Bakkt Holdings, LLC, and the quick-service restaurant (QSR) Quiznos announced their agreement to start their physical location trial in August 2021. (Espinel, 2021). Customers of Quiznos were able to use bitcoin to make payments in select locations thanks to this pilot scheme.

To improve their offers and open up new potential for market expansion, several businesses are working to merge blockchain technology with Artificial Intelligence (AI) capabilities. For instance, in September 2019, the RegTech firm Signzy Technologies Private Ltd. announced its collaboration with Primechain Technologies, a developer of blockchain technology (Ejohansson, 2019). The goal of the partnership was to develop AI-enabled smart banking solutions for banks and other financial organizations. With the help of blockchain and AI, back-office processes were digitalized and automated in this smart banking system.

In 2021, the financial services industry dominated the market and generated more than 38.0% of total revenue like is shown in Figure 1.2 (Grand View Research, 2022). Blockchain technology is used by the financial sector to manage business-to-business financial transactions. Blockchain technology enables safe and effective transactions, which is increasing demand for it in the financial services industry. It is projected that this industry would employ the technology heavily because of the rising popularity of cryptocurrencies, the technology's high compatibility with the industrial ecosystem, swift transactions,

Initial Coin Offerings (ICOs), and lower total cost of ownership. Furthermore, healthcare is expected to see the fastest CAGR growth over the forecast period.

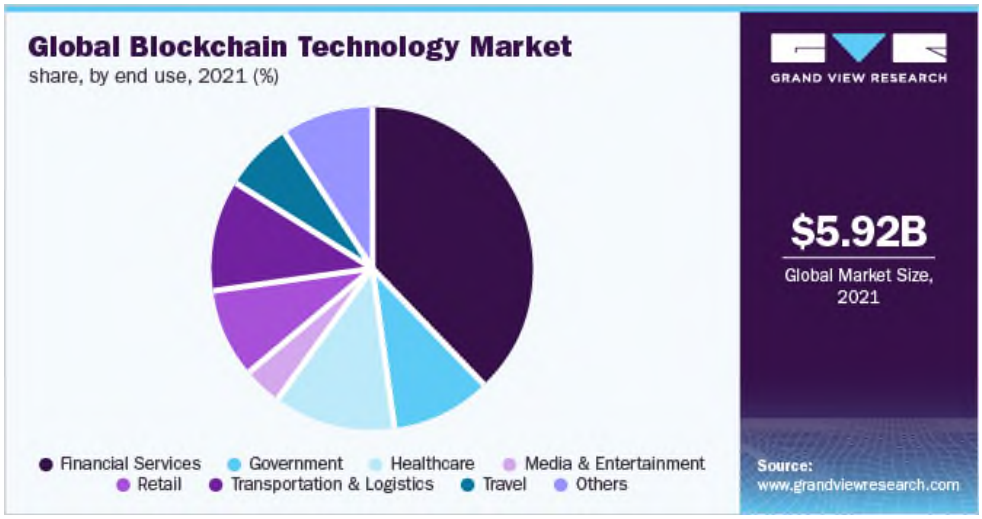


Figure 1.2. *Global Blockchain Technology Market Share, by end-use; Grand View Research, 2022*

In conclusion, blockchain technology became a big success across a lot of industries. It allows the ledger to become more secure and decentralized. The technology is gaining traction across a variety of industries, including cryptocurrency, infrastructure and hardware, financial technology, Internet and mobile, and so forth because it is not restricted to bitcoin and is not controlled by the government, businesses, or banks. The more technology grows, the more countries and businesses use its perks to improve operations, transactions, and systems. And the forecasts for the blockchain technology market are rather positive. As a result, this technology is regarded as an excellent technique for operational management in the company.

1.2. Bitcoin & Ethereum: cryptocurrencies and token economy

Cryptocurrency are always mentioned first when discussing blockchain technology. Cryptocurrencies are a subset of digital or virtual money that

employs encryption to safeguard their value and make them almost hard to duplicate or double spend. Many cryptocurrency-decentralized networks are built on blockchain technology, which is a distributed ledger maintained by a dispersed network of computers. Cryptocurrencies may be immune to government intervention or manipulation since they are frequently not issued by a centralized authority. If explained in depth, cryptographic technologies act as the basis for digital or virtual currency. They enable secure internet transactions without the need for middlemen. In order to protect these inputs, a variety of cryptographic methods and encryption algorithms, including hashing operations, public-private key pairs, and elliptical curve encryption, are utilized. These methods are together referred to as "crypto." Bitcoin and other cryptocurrencies may be produced through mining or purchased on exchanges. Not all online shops accept bitcoin payments.

In practice, cryptocurrencies—not even well-known ones like Bitcoin—rarely come into play when making retail transactions. Due to their rising value, cryptocurrencies are increasingly often employed as trading instruments. They are used, albeit seldom, for international transactions as well.To begin with, the most well-liked and valued cryptocurrency is bitcoin. It was developed by the anonymous Satoshi Nakamoto and made public in a white paper in 2008. Numerous cryptocurrencies are now available. Every cryptocurrency makes the claim to have a specific specification and objective. As an illustration, Ethereum's ether coin positions itself as gas for the core smart contract platform. To facilitate international payments, banks use Ripple's XRP. Numerous cryptocurrencies are now available. Every cryptocurrency makes the claim to have a specific specification and objective. As an illustration, Ethereum's ether coin positions itself as gas for the core smart contract platform. Following the popularity of Bitcoin, other "altcoins"—alternative cryptocurrencies—have been introduced. Some of them are forks or copies of Bitcoin, while others are brand-new coins that were created from nothing. They consist of EOS, Solana, Litecoin, Ethereum,

and Cardano. Bitcoin accounted for over 41% of the entire value of all cryptocurrencies by November 2021, when it had risen to almost $2.1 trillion (Frankenfield, 2022).

Fiat money power comes from governments or monetary authorities. For instance, each $1 note was backed by the Federal Reserve. Cryptocurrencies are not, however, backed by either a public or private organization. It has been difficult to defend their legal position before several financial authorities throughout the world as a result. It doesn't help that most of the present financial infrastructure hasn't been used by cryptocurrencies to operate in the past. The usage of cryptocurrencies in regular transactions and trading is impacted by their legal status. In June 2019, the Financial Action Task Force (FATF) suggested including cryptocurrency wire transfers under the Travel Rule, which calls for AML compliance. Only El Salvador and the Central African Republic accepted Bitcoin as legal currency for banking transactions as of May 2022. Different jurisdictions throughout the world have different cryptocurrency laws. The Payment Services Act of Japan classifies Bitcoin as legal property (Kawai et al., 2022). The nation's cryptocurrency exchanges are required to compile customer and wire transfer information. Within its borders, China has outlawed mining and cryptocurrency trading. A framework for cryptocurrency was reportedly being developed in India in December.

In the European Union, cryptocurrencies are accepted. The usage of derivatives and other cryptocurrency-based products will necessitate certification as "financial instruments." The Markets in Crypto-Assets (MiCA) regulation created guidelines and security measures for businesses or suppliers offering financial services using cryptocurrencies, and it was announced by the European Commission in June 2021 (Pausch-Homblé, 2022). The largest and most intricate financial market in the world, the United States, provides cryptocurrency derivatives like Bitcoin futures through the Chicago Mercantile Exchange. Bitcoin and Ethereum were not considered securities by the Securities and

Exchange Commission (SEC) before September 2022. However, Gary Gensler, the SEC's chair, stated that he now believes that cryptocurrencies are securities (Cox, 2022). This viewpoint indicates that cryptocurrency's legal status may be regulated.

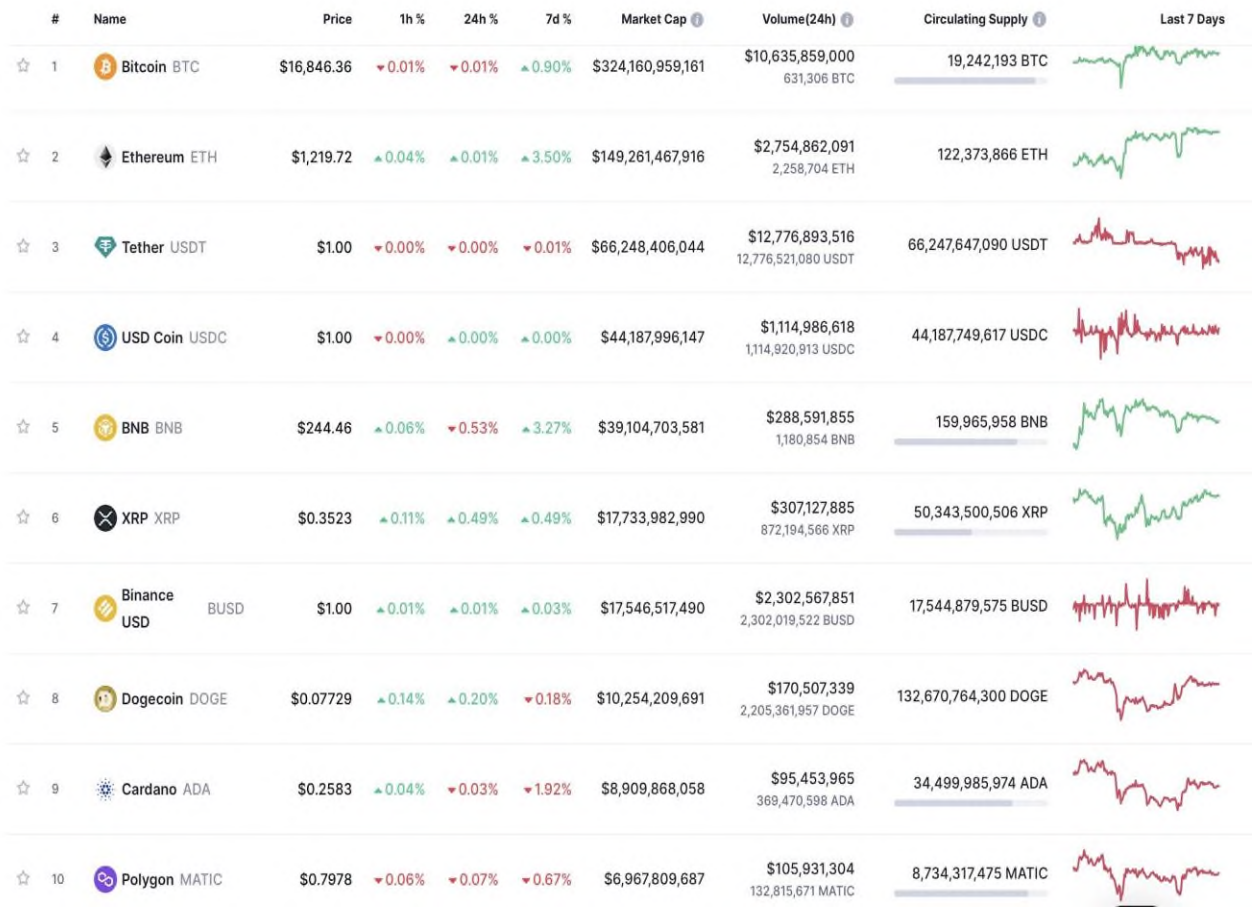
In an effort to transform the financial system, cryptocurrencies were first presented. Tradeoffs are necessary, as with every revolution, though. At the present level of cryptocurrency development, there are a number of differences between the theoretical ideal of a decentralized cryptocurrency system and its actual execution. The following list includes both the benefits and drawbacks of cryptocurrency. Regarding benefits, cryptocurrencies represent a whole new, decentralized paradigm in terms of money. In this arrangement, rather than centralized intermediaries like banks and financial institutions, transactions between two parties are controlled by the trust. In light of this, a cryptocurrency-based system avoids the possibility that a single point of failure, such as a big bank, could trigger a global chain reaction of crises, such as the one that was sparked in 2008 when American institutions failed. Second, the remittance sector is testing one of the most well-known use cases for cryptocurrencies. To speed up international money transfers, cryptocurrencies like Bitcoin now serve as intermediate currencies. Thus, a fiat currency is turned into Bitcoin (or another cryptocurrency), sent across international borders, and then changed back into the intended fiat currency. With this method, the cost and complexity of money transfers are reduced.

Furthermore, comparing bitcoin transfers to traditional money transfers, they are quicker since they do not involve any third parties like middlemen. Decentralized transfers of this kind can be seen in decentralized finance through flash loans. These loans, which are employed in trade and processed without supporting collateral, can be carried out instantly.While cryptocurrencies portray themselves as being anonymous, they are really inherently pseudonymous. An agency like the Federal Bureau of Investigation could look into the digital trail

they leave behind (FBI). This enables governments or federal agencies to keep an eye on everyday citizens' financial activity. Cryptocurrency exchanges and wallets are particularly susceptible to hacking, despite the fact that the blockchains that underpin cryptocurrencies are quite secure.

Numerous cryptocurrency exchanges and wallets have been breached over the years, occasionally resulting in the theft of "coins" worth millions of dollars. When speaking of cryptocurrencies, it is crucial to identify their types of them: tokens and coins. In the cryptocurrency industry, the phrases "coins" and "tokens" are frequently used interchangeably, although they really relate to separate ideas (Zeroin, 2022). Given that they both fall under the general category of cryptocurrencies, it is simple to mix them up. To put it simply, a cryptocurrency is a digital asset built on the blockchain, and both tokens and coins fall under this category. From the perspective of the average user, coins and crypto tokens are virtually the same, but their technological construction differs. Understanding this distinction may enable cryptocurrency users to make more intelligent judgments.

An indigenous cryptocurrency to the blockchain it uses is referred to as a coin. In order to compete with or outperform Bitcoin and other current public ledgers, several blockchains are built from the ground up. With an open-source blockchain that has already been established, it is also feasible to create a blockchain, although this process still takes time and requires some amount of technical knowledge. It is challenging to establish a coin since you cannot create a cryptocurrency without creating a blockchain. Coins like Bitcoin, or BTC, are a great illustration of these. It is used to cover transaction costs on the network and is supported by its own, identical blockchain. Currencies that have developed since Bitcoin (BTC) are known as altcoins, or alternative coins because BTC was the first widely used cryptocurrency. As shown in Figure 1.3, the most traded coins are Ethereum and Bitcoin (CoinMarketCap, 2022).



#	Name	Price	1h %	24h %	7d %	Market Cap	Volume(24h)	Circulating Supply	Last 7 Days
1	Bitcoin BTC	$16,846.36	0.01%	0.01%	0.90%	$324,160,959,161	$10,635,859,000 631,306 BTC	19,242,193 BTC	
2	Ethereum ETH	$1,219.72	0.04%	0.01%	3.50%	$149,261,467,916	$2,754,862,091 2,258,704 ETH	122,373,866 ETH	
3	Tether USDT	$1.00	0.00%	0.00%	0.01%	$66,248,406,044	$12,776,893,516 12,776,521,080 USDT	66,247,647,090 USDT	
4	USD Coin USDC	$1.00	0.00%	0.00%	0.00%	$44,187,996,147	$1,114,986,618 1,114,920,913 USDC	44,187,749,617 USDC	
5	BNB BNB	$244.46	0.06%	0.53%	3.27%	$39,104,703,581	$288,591,855 1,180,854 BNB	159,965,958 BNB	
6	XRP XRP	$0.3523	0.11%	0.49%	0.49%	$17,733,982,990	$307,127,885 872,194,566 XRP	50,343,500,506 XRP	
7	Binance USD BUSD	$1.00	0.01%	0.01%	0.03%	$17,546,517,490	$2,302,567,851 2,302,019,522 BUSD	17,544,879,575 BUSD	
8	Dogecoin DOGE	$0.07729	0.14%	0.20%	0.18%	$10,254,209,691	$170,507,339 2,205,361,957 DOGE	132,670,764,300 DOGE	
9	Cardano ADA	$0.2583	0.04%	0.03%	1.92%	$8,909,868,058	$95,453,965 369,470,598 ADA	34,499,985,974 ADA	
10	Polygon MATIC	$0.7978	0.06%	0.07%	0.67%	$6,967,809,687	$105,931,304 132,815,671 MATIC	8,734,317,475 MATIC	

Figure 1.3. *The most traded cryptocurrencies (live); CoinMarketCap, 2022*

Without exception, every cryptocurrency uses its own blockchain to operate. Coins are native cryptocurrencies that are active on their original chains as well as on their forks (new chains produced as a consequence of protocol updates). As an illustration, when Bitcoin was divided into Bitcoin and Bitcoin Cash, BTC continued to be the native token of the original chain while BCH, a brand-new coin, emerged on the forked chain (Graham, 2017). An autonomous blockchain enables the development of new features and provides exceptional technological solutions. The coin's inherent worth is influenced by a number of elements, including the effectiveness and security of the underlying blockchain technology. As the most traded coin, BTC continues to grow in popularity and in the amount of usage, as is shown in Figure 1.4 (Fleck & Richter, 2022).

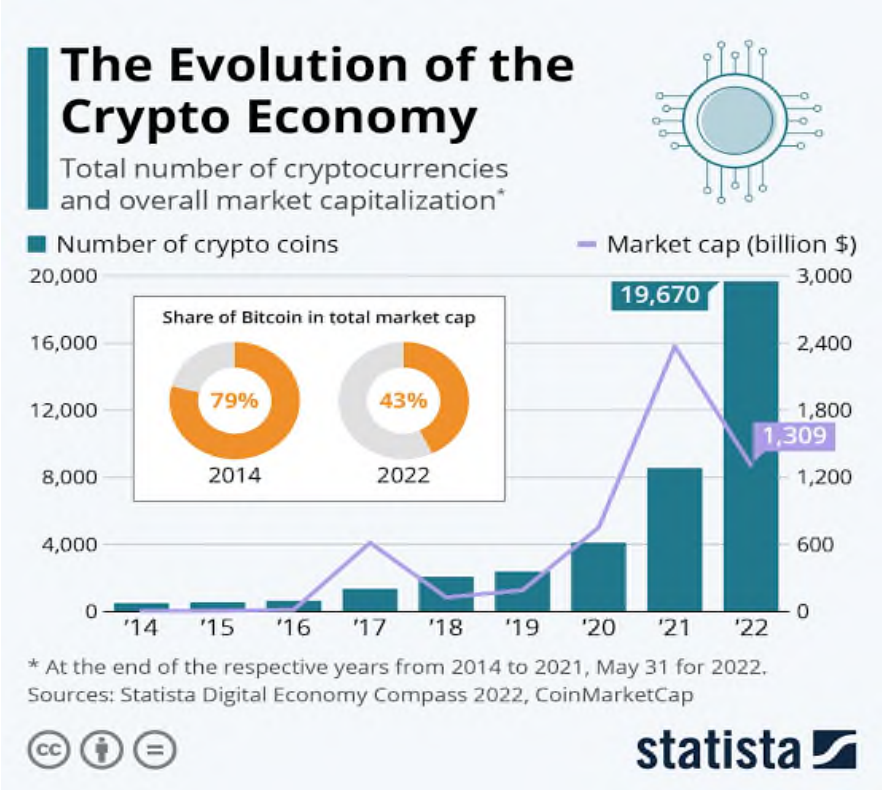


Figure 1.4. *The evolution of crypto economy; (Fleck & Richter, 2022)*

Coins can serve as digital money because they possess the characteristics of conventional money, such as security, scarcity, longevity, mobility, and a capacity to hold value. Companies including Microsoft, PayPal, Starbucks, Virgin Airlines, and others have already accepted some crypto currencies as a form of payment. The majority of blockchains use a method called mining to create a new currency. The network users who approve transactions receive brand-new coins as payment. Users also pay a network charge each time they do a transaction on the network, which is used to purchase incentives. Although there are many other methods for confirming transactions, proof of work (PoW) and proof of stake are the most popular (PoS). PoW networks' validators utilize colossal amounts of processing power to validate transactions. Staking coin holdings is necessary for the PoS technique to validate transactions.

A token is a digitally stored unit of value that stands in for an object or service. Tokens, unlike currencies, are issued on top of existing networks and do

not have their own blockchain. Tokens are not mined during the transaction validation process as coins are. They are instead minted. The total quantity of tokens issued is subject to the requirements that the issuing project has specified. Tokens can serve a variety of functions. They may be employed to provide access to certain services or to raise money. Some tokens can even serve as a substitute for currencies on another network. These tokens, sometimes known as "wrapped tokens," move in lockstep with the value of the underlying asset. A stablecoin, for instance, is a sort of token that closely tracks the price of the US dollar, and it is also fairly common.

On already-existing blockchains, tokens are always produced. Utilizing pre-made systems designed specifically for token creation is the simplest option. To utilize these platforms, you don't need to be a programmer. Making your own website using a website builder can be all that is required. But additional technical know-how will be needed to create a token with sophisticated capabilities. A smart contract must first be deployed. Smart contracts, to put it simply, are digital contracts that automatically execute themselves and are kept on a blockchain. In some networks, you may obtain a smart contract's source code from the repository of a software development platform (e.g. Github).

In the crypto world, there is even a token culture or token economics. Token economics is a branch of economics that focuses on the institutions, laws, and moral principles that govern the creation, exchange, and consumption of tokenized products and services (Voshmgir, 2019). Blockchain technology looks to be the driving force behind the Web3.1 standard, which many regards as the next generation of the internet. Without the need for middlemen, Web3 enables tokenized economic exchanges. It offers a distinct collection of information, a global state layer, often known as the ledger, which is jointly controlled by a network of unreliable computers. We may completely communicate digital assets in the form of tokens peer-to-peer (P2P), avoiding the issue of double spending, thanks to this special state layer.

Digital value transmission over the internet has therefore become as accessible and affordable as email transmission. CoinMarketCap lists more than 2,200 openly traded tokens as of April 2019; moreover, the Ethereum main network has more than 175,000 token contracts. The world's largest social network, Facebook, said in June 2019 that it is developing its own token, the Libra token, and Web3 infrastructure (the Libra network) (Constine, 2019).

Therefore, tokens as a use case for blockchain and related technologies might prove to be just as revolutionary as the introduction of the World Wide Web as a use case for the internet. Anyone could now "surf" the web by clicking links rather than using command-line interfaces because to Tim Berners-introduction Lee's of a new standard in the early 1990s called HTML, which made it possible to produce aesthetically pleasing web pages with just a few lines of code (Dennis, 2022). However, the majority of individuals at the time had little knowledge of HTML coding and had no idea how to design websites that were useful, accessible, and appealing. As technologies continue to improve, their history of them makes a clearer understanding of what to expect in the future.

In conclusion, the emergence of the cryptocurrency sector has been characterized by instability since the invention of Bitcoin back in 2009, with both significant advancements and failures. Cryptocurrencies may have advantages and disadvantages but they nevertheless represent the future of the global economy. As can be seen in the previously illustrated Figure 4, the market valuation of the most popular cryptocurrency (coin), Bitcoin, is rising exponentially and portends further better news for the future (Fleck & Richter, 2022). Bitcoin and Ethereum are developing into helpful and efficient tools to enhance financial company procedures, put into practice good tactics, and expand opportunities.

1.3. NFT, tokenizing technology, and other blockchain-based assets

Another important and significant part of the blockchain technology world are NFTs. A digital asset known as an NFT might be anything from music to films to in-game goods. They are regularly purchased and traded online in exchange for cryptocurrencies, and they are typically encoded using the same software as many other cryptos. NFTs have been around since 2014, but they are just now becoming well-known since they are a more and more common means to acquire and trade digital art (Creighton, 2022). A startling $41 billion was spent on the NFT market in only 2021, which is almost as much as was spent on the whole world's fine art market (Dailey, 2022).

NFTs often have unique identification numbers and are one-of-a-kind or part of a very small run. Arry Yu, managing director of Yellow Umbrella Ventures and head of the Cascadia Blockchain Council for the Washington Technology Industry Association, claims that NFTs essentially produce digital scarcity (Thomas, 2021). This contrasts sharply with the majority of digital productions, which nearly always have an endless supply. In theory, if an asset is in demand, reducing its supply should increase its value.

However, a lot of NFTs, at least in the beginning, were digital works that were securitized copies of digital artwork that was already popular on Instagram or classic video clips from NBA games that were previously available somewhere else. The most well-known NFT of 2021 may have been "EVERYDAYS: The First 5000 Days," which was created by well-known digital artist Mike Winklemann, best known by his stage name "Beeple," and sold at Christie's for a world-record-breaking $69.3 million (Brown, 2021). The individual photographs, as well as the full collage of images, are available for free internet viewing by anybody. So why do people want to pay millions for something they can just download or take a screenshot of? Since an NFT enables the buyer to retain ownership of the original item. Additionally, it has built-in authentication that

acts as ownership confirmation. The "digital bragging rights" are nearly more valuable to collectors than the actual object.

NFT is an acronym for non-fungible tokens. The similarities between it and cryptocurrencies like Bitcoin or Ethereum end there, despite the fact that it is typically developed using the same type of programming. Both conventional currency and cryptocurrencies are "fungible," which means they may be traded or converted into one another. In terms of value, they are also equivalent: one dollar is always worth another, and one bitcoin is always worth one bitcoin. The fungibility of cryptocurrencies gives them a reliable method for carrying out blockchain transactions. NFTs are distinct. Due to the digital signatures on each, NFTs cannot be traded for or held to be equivalent to one another (hence, non-fungible). For instance, just because two videos are NFTs does not make one NBA Top Shot video comparable to another.

On a blockchain, a distributed public ledger that stores transactions, NFTs are a type of currency. As the fundamental mechanism that enables cryptocurrencies, blockchain is perhaps what you know best. NFTs are specifically stored on the Ethereum blockchain, while other blockchains also support them. An NFT is produced, or "minted," using digital representations of both physical and intangible goods, such as graphic art, GIFs, movies and sports highlights, collectibles, video game skins and avatars, designer shoes, music, tweet counts, and even the rights to the equipment and real estate assets. The first tweet ever sent by Twitter co-founder Jack Dorsey was sold as an NFT for more than $2.9 million (Bienasz, 2022).

In essence, NFTs are digital versions of tangible collectibles. Therefore, the purchaser receives a digital file rather than a real oil painting to put on the wall. Furthermore, they are given sole ownership rights. Due to its usage of blockchain technology, NFTs only allow for one owner at a time and make it simple to transfer tokens between owners. The metadata of an NFT can also be

customized by the author. Artists, for instance, can sign their work by putting their signatures in the file.

Artists and content producers have a rare opportunity to monetize their works thanks to blockchain technology and NFTs. For instance, selling art is no longer limited to galleries or auction houses. As an NFT, the artist may instead sell it directly to the buyer, allowing them to keep a larger portion of the proceeds. Additionally, when an artist sells their work to a new owner, royalties can be programmed into the system so that the artist receives a share of the transaction. This is a desirable feature since, after their initial sale, artists typically do not earn more revenue. As we can see in Figure 1.5 (Opensea, 2022), the sales of NFTs have grown exponentially during the last few years.

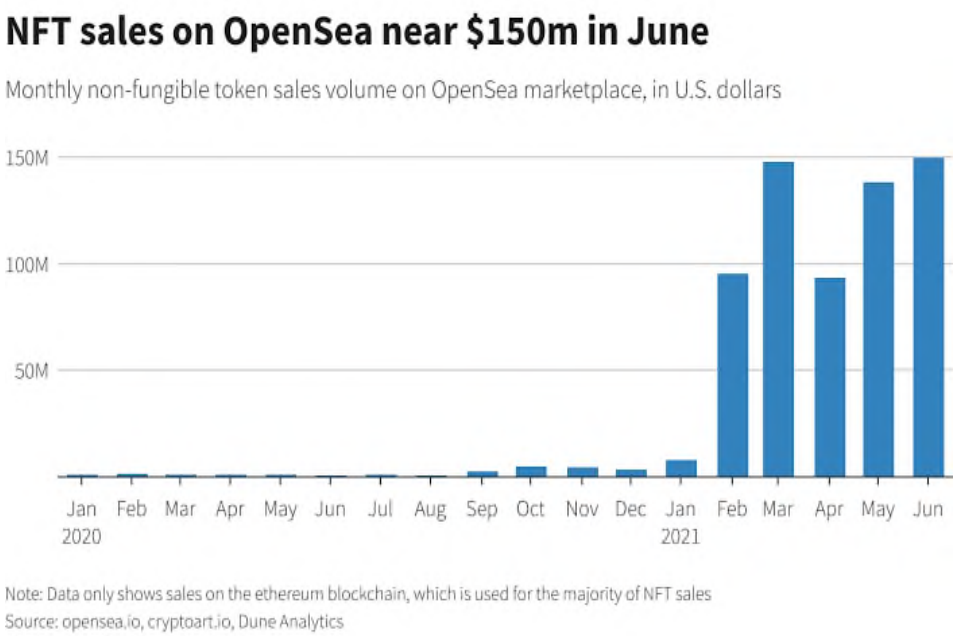
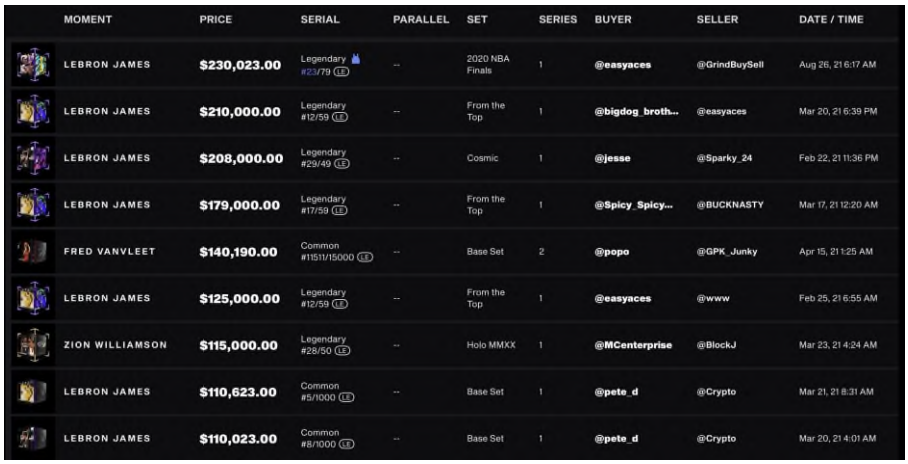


Figure 1.5. *NFT sales on OpenSea; OpenSea 2022*

NFTs may be used for more than only the creation of art. A themed NFT art auction has been held by companies including Taco Bell and Charmin to benefit charities. Taco Bell's NFT art sold out in a matter of minutes after Charmin announced it as "NFTP" (non-fungible toilet paper), with the top bids coming in at 1.5 wrapped ether (WETH), which, at the time of writing, is equal

to $3,723.83 (US). A 2011 GIF depicting a cat with a pop-tart body named Nyan Cat sold in February for close to $600,000 (Conti, 2022). As of the end of March, NBA Top Shot has sales of more than $500 million. LeBron James's single highlight NFT brought well over $200,000 in sales (Young, 2021). Even famous people are hopping on the securitized NFT bandwagon, releasing original memories, works of art, and moments as NFTs. A 2011 GIF depicting a cat with a pop-tart body named Nyan Cat sold in February for close to $600,000. As of the end of March, NBA Top Shot has sales of more than $500 million. LeBron James's single highlight NFT brought well over $200,000 in sales. The newest prices prior to the date of this work can be seen in Figure 1.6 (NBA TopShot, 2022). Even famous people are hopping on the securitized NFT bandwagon, releasing original memories, works of art, and moments as NFTs.



MOMENT	PRICE	SERIAL	PARALLEL	SET	SERIES	BUYER	SELLER	DATE / TIME
LEBRON JAMES	$230,023.00	Legendary #23/79 LE	--	2020 NBA Finals	1	@easyaces	@GrindBuySell	Aug 26, 21 6:17 AM
LEBRON JAMES	$210,000.00	Legendary #12/59 LE	--	From the Top	1	@bigdog_broth...	@easyaces	Mar 20, 21 6:39 PM
LEBRON JAMES	$208,000.00	Legendary #29/49 LE	--	Cosmic	1	@jesse	@Sparky_24	Feb 22, 21 11:36 PM
LEBRON JAMES	$179,000.00	Legendary #17/59 LE	--	From the Top	1	@Spicy_Spicy...	@BUCKNASTY	Mar 17, 21 12:20 AM
FRED VANVLEET	$140,190.00	Common #11511/15000 LE	--	Base Set	2	@popo	@GPK_Junky	Apr 15, 21 1:25 AM
LEBRON JAMES	$125,000.00	Legendary #12/59 LE	--	From the Top	1	@easyaces	@www	Feb 25, 21 6:55 AM
ZION WILLIAMSON	$115,000.00	Legendary #28/50 LE	--	Holo MMXX	1	@MCenterprise	@BlockJ	Mar 23, 21 4:24 AM
LEBRON JAMES	$110,623.00	Common #5/1000 LE	--	Base Set	1	@pete_d	@Crypto	Mar 21, 21 8:31 AM
LEBRON JAMES	$110,023.00	Common #8/1000 LE	--	Base Set	1	@pete_d	@Crypto	Mar 20, 21 4:01 AM

Figure 1.6. *NBA Sales volume and prices, NBA TopShot, 2022*

One of the most important features of NFTs in business is tokenization. Tokenization is the process of turning sensitive information into anonymous, non-sensitive data that may be utilized in a database or internal system without putting it at risk (TokenEx, 2022). The original data's length or format are retained by the tokens, despite the fact that their values are unconnected, allowing for continued business processes. The original sensitive information is then securely kept off of the company's internal systems. Data that has been tokenized, as opposed to data

that has been encrypted, cannot be read or changed. This distinction is crucial because tokens cannot be transformed back into their original forms without the existence of extra, independently stored data since there is no mathematical connection between the token and its original number. As a consequence, the original sensitive data will not be compromised in a tokenized environment breach.

A token, as previously mentioned, is a piece of data that substitutes for a different, more valued piece of data. Tokens are only helpful because they stand in for something significant, such a main account number (PAN) for a credit card or a Social Security number. They are essentially worthless on their own (SSN). A poker chip is a useful comparison. Players utilize chips as stand-ins for cash rather than covering a table with it (cash is easily misplaced or stolen). Even if they are taken, the chips cannot be used as money. For their representational worth, they must first be traded. Tokenization is essential for many firms and extremely successful in operational management because of this.

In order for tokenization to operate, the useful data in your environment must be removed and replaced with these tokens. Whether it's credit card information, personal health information, Social Security numbers, or any other type of sensitive data that has to be secured and protected, the majority of organizations store at least part of this information in their systems. By using tokenization, businesses may continue to use this data for their operations without running the risk of breaking compliance regulations by keeping sensitive data on-site.

Tokenization is used to safeguard private information while maintaining its usefulness for corporate purposes. Contrary to encryption, which modifies and stores sensitive data in a way that prevents its ongoing use for commercial purposes, this approach does not achieve any of those things. The analogy between encryption and poker chips is that of tokenization. Moreover, with the right key, encrypted integers may be unlocked. The inability to reverse a token is

due to the fact that there is no meaningful mathematical connection between the token and its original number.

On the other hand, in the opposite operation, detokenization, the original data is exchanged for the token. The initial tokenization mechanism alone is capable of detokenization. The original number cannot be found using simply the token in any other manner. Tokens can be single-use (low-value) for activities like one-time debit card transactions that don't need to be maintained or they can be persistent (high-value) for items like a returning customer's credit card number that has to be saved in a database for recurrent transactions.

An efficient tokenization platform will take all sensitive financial and personal data from your company systems, swap out each data set for an uncrackable token, and keep the original data in a secure cloud environment that isn't connected to your business systems. For instance, tokenization in banking secures cardholder information. Only the original credit card tokenization system has the ability to swap the token with the matching main account number (PAN) and submit the information to the payment processor for authorization when you process a payment using the token stored in your systems. Only the token is recorded, sent, or stored by your systems; never the PAN.

Finally, and most importantly for business operations, there are blockchain-based assets. Digital assets, such as cryptocurrencies, include blockchain assets. Some are ownership interests in a certain business or project. Some, like Bitcoin, are just meant to be used as a form of payment and do not reflect ownership of any one company. Most individuals just possess rights to traditional assets, such as Apple shares, on paper; they do not genuinely own these things (Castagnoli, 2022). This asset must be transferred or sold by a third party acting on your behalf. Blockchain assets, on the other hand, are digital, yours alone, and instantly transferrable to anybody at any moment. Your asset keys are stored securely offline and encrypted on your computer's hard drive by the Exodus wallet.

Unfortunately, a common understanding of what blockchain assets are is lacking. Blockchain assets are essentially a state of information that is kept in a database. And even though the information isn't typically regarded as a form of property in Canadian law (apart from the intellectual property), blockchain assets are informational items that are similar to private property in that only the owner (the person who has the private key) can exercise exclusive control over them. Different jurisdictions throughout the world define these assets in different ways. Remittances are a blockchain asset in the Philippines, legal cash in Japan, and property or commodities in the US (Armstrong & Trivun, 2021). But even including a number of disadvantages, blockchain assets provide a lot of opportunities in terms of safety and efficiency, through execution of the smart contracts. Therefore, businesses definitely should utilize this opportunity.

In conclusion, NFTs and tokenization technology work to decrease compliance scope and related expenses while simultaneously enhancing security for sensitive data. Because tokenization and execution of smart contracts are flexible, businesses may design specialized solutions that match their data utility demands with data security concerns. And all above-mentioned is powered by blockchain technology and blockchain-based assets logic.

CHAPTER 2. BLOCKCHAIN TECHNOLOGIES IMPLEMENTATION INTO THE TRADITIONAL-BASED BUSINESS BASED ON INNCARBON TECHNOLOGY PRACTICES

2.1. The Inncarbon Technology's advantages and disadvantages of using cryptocurrency and corporate crypto bank accounts

Inncarbon Technology Ltd is a company that provides a range of services to the coal mining industry. The company specializes in carbon technology and coal mining consulting services, engineering consulting services, and sales agent services in the coal mining industry. In addition, the company has recently started using blockchain technology in its traditional business operations. From a financial analysis perspective, Inncarbon Technology Ltd's turnover of 1 million euro indicates that the company is a small business operating in the coal mining industry

Carbon technology is an important aspect of the coal mining industry, as it involves the processing and refinement of coal products to create high-value products. This includes the production of activated carbon, which is used in a wide range of applications, including water treatment, air purification, and chemical processing. Inncarbon Technology Ltd has significant expertise in this area, and is able to provide its clients with advice and support on how to optimize their carbon technology processes.

In addition to its carbon technology services, Inncarbon Technology Ltd also provides a range of coal mining consulting services. This includes advice on mine planning and design, equipment selection, and operational management. The company has a team of experienced consultants who are able to provide tailored solutions to meet the specific needs of its clients. As a result, the business is better able to assist its customers with cost- and efficiency-saving mining operations optimization.

Engineering consulting is another important service provided by Inncarbon Technology Ltd. The company has a team of skilled engineers who are able to provide advice and support on a range of engineering issues, including mine design, equipment selection, and operational management. As a result, the business is better able to assist its customers in streamlining and improving their mining operations while lowering expenses.

As a sales agent in the coal mining industry, Inncarbon Technology Ltd is able to provide its clients with access to a range of coal products. The company has relationships with a number of coal mines and is able to source high-quality coal products for its clients. In addition, the company is able to provide advice and support on coal product selection, which helps its clients to select the right coal products for their specific needs.

Recently, Inncarbon Technology Ltd decided to research blockchain technology in traditional business operations in order to take into consideration the application of this technology. The company found out that it could leverage the power of blockchain to improve the transparency and traceability of the coal mining supply chain. This would allow the company to ensure that its clients are receiving high-quality coal products that have been ethically and sustainably sourced. The use of blockchain technology would also allow Inncarbon Technology Ltd to track the movement of coal products throughout the supply chain. By doing so, the possibility of fraud is decreased, and the items are delivered to the correct location. By using blockchain technology, Inncarbon Technology Ltd would be able to provide its clients with even greater confidence in the quality and integrity of the coal products that they are purchasing.

Inncarbon Technology Ltd offers conventional services in addition to participating in R&D projects. The company is focused on developing new and innovative solutions for the coal mining industry, which will help its clients to improve their operational efficiency and profitability. By investing in research

and development, Inncarbon Technology Ltd is able to stay at the forefront of technological innovation in the coal mining industry.

Overall, Inncarbon Technology Ltd is a company that provides a range of valuable services to the coal mining industry. The company's expertise in carbon technology, coal mining consulting, engineering consulting, and sales agent services makes it a valuable partner for any business operating in the coal mining industry. In addition, the company is making a research on adoption of blockchain technology that could help it to provide even greater value to its clients, by improving the transparency and traceability of the coal mining supply chain.

According to a report by Adroit Market Research, the global mining consulting services market size was valued at USD 3.08 billion in 2020 and is expected to reach USD 4.60 billion by 2028, growing at a compound annual growth rate (CAGR) of 5.0% during the forecast period. According to the study, a number of reasons are propelling the market for mining consulting services, including increased environmental concerns, expanding metal and mineral demand, and the requirement for the mining sector to operate at peak operating efficiency.

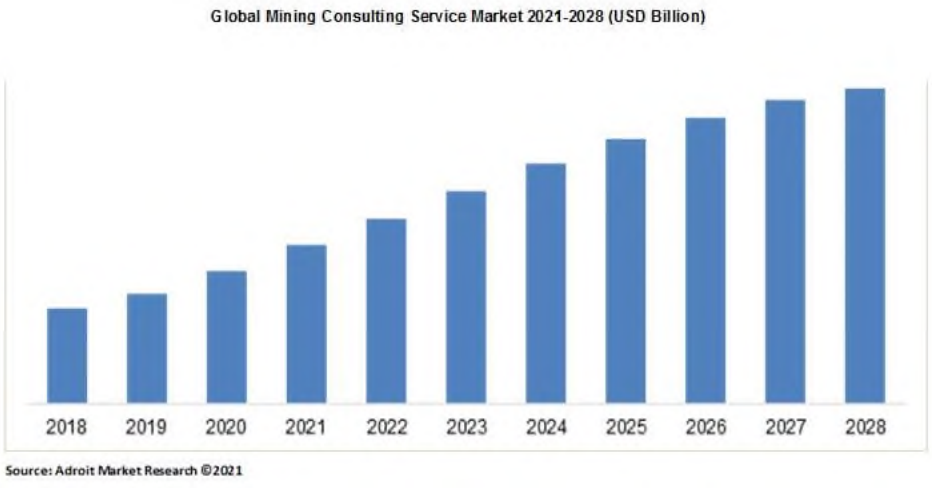


Figure 2.1. Global mining consulting service market 2021-2028 (USD billion) by Adroit Market Research

The data in Figure 2.1. highlights the opportunities for companies operating in the mining consulting services market, including engineering consulting, financial consulting, and operational consulting services. Given Inncarbon Technology's expertise in carbon technology and coal mining consulting services, the company is well-positioned to capitalize on the opportunities presented by the growing mining consulting services market. In addition, we can see that the adoption of digital technologies such as blockchain and artificial intelligence is expected to create further growth opportunities in the mining consulting services market, which could potentially benefit Inncarbon Technology as the company has recently started using blockchain technology in their traditional business.

Markets have seen a significant evolution historically, with financial markets in particular. In order to facilitate trade transactions as much as possible, the instruments utilized as exchange tools have also undergone change and evolved in line with the demands of the market. Money is the name for the objects that serve as a middleman in the trade of goods. According to the majority of economists, money is a unit of accountancy, a means of exchange, and a store of value (Friedman, 2023). The emergence of cryptocurrencies has completely transformed the world of international payments in ways that were unthinkable only a few years ago. Digital or virtual money, like cryptocurrencies, are secured by cryptography. Cryptocurrencies are hard to counterfeit because to this security characteristic. One of a cryptocurrency's unique features, and maybe its most attractive beauty, is its biological structure, which makes it theoretically resistant to manipulation or government interference (Boshkov, 2018). Both advantages and disadvantages of cryptocurrencies exist.

The primary advantages of using cryptocurrencies are that they simplify the process of transferring money between two parties involved in a transaction (N26, 2022). Public and private keys, which are utilized for security, allow for these transactions to be made. Users can avoid the high fees levied by the majority of banks for internet-based transactions since these financial transfers are

completed with little processing costs. Hacking is the biggest risk to the bitcoin payment system. For instance, over 40 thefts, some of which topped $1 million USD in value, have occurred in Bitcoin during its brief existence (Bunjaku et al., 2018). Nevertheless, despite the potential dangers, many observers still see cryptocurrencies as a possible solution to the problem of a currency lacking the control of governments and central banks but with the ability to promote exchanges and maintain value.

Therefore, before making a final decision, Inncarbon Technology Ltd. made deep research on cryptocurrencies, their advantages, and disadvantages, and found out there are more benefits and opportunities on this matter than risks. Speaking of the advantages of using cryptocurrencies, first of all, BTC uses the same algorithms as online banking and uses open-source code for mining cryptocurrency (Selmanovic, 2015). Internet banking merely differs from traditional banking in the way that customer data is disclosed. The BTC network shares all relevant transactional details (such as how and when they took place), but neither the sender nor the recipient of the coins is identified (the owner's wallet cannot be accessed for this reason), which provides business with significant informational safety and anonymity, of course. It is totally transparent and anonymous at the same time. Without using a person's name, address, or any other personal information, any business may generate an endless number of bitcoin addresses. With just 21 million Bitcoins ever in circulation, there is also no inflation (Phillips, 2022). There is no chance of inflation developing in the system since neither political forces nor companies are able to disrupt this hierarchy.

Secondly, a master server that oversees all activities does not exist in peer-to-peer bitcoin networks. Information is sent between a minimum of two and three software clients (in this example, money). A bitcoin network connects all software wallets that users have installed. The total quantity of bitcoins in each wallet, together with all committed transactions, are stored by each client

(Antonopoulos, 2015). Numerous distributed servers process transactions. The flow of money between parties cannot be regulated by banks, taxes, governments, or any other third parties. In addition, there are limitless transaction options - each wallet user has the freedom to send money to anybody, anywhere, for any amount. A company can send money to anybody in the world who has a Bitcoin wallet since the transaction cannot be stopped or controlled, which eliminates major transaction issues that may occur with banks.

Moreover, there are no limitations. It is not possible to reverse payments made using this method. There is no way to duplicate, copy, or counterfeit the coins. The system's overall integrity is ensured by these capabilities. Every month, there are more and more online stores, resources, and businesses that take Bitcoin. And while spreading in use, BTC still has minimal operating costs. The BTC cryptocurrency combines e-commerce features and operates as actual money. There is no requirement to pay banks and other entities commissions or fees. Mathematics, which doesn't cost money, is the main component of such a procedure. This method has a lower commission cost than any other. It represents 0.1% of the transaction's total value. In Figure 2.2 below we can see the average transaction fees made with BTC and ETH. The operation interest fees are sent to Bitcoin miners' wallets. Transaction fees for Bitcoin and Ethereum have averaged over $5 and $0.60 during the last 12 months, with peaks of over $20. As a result, several big retailers and payment processors, including Microsoft, Steam, and Stripe, stopped supporting Bitcoin payments and started using Ethereum more (Zochowski, 2019).

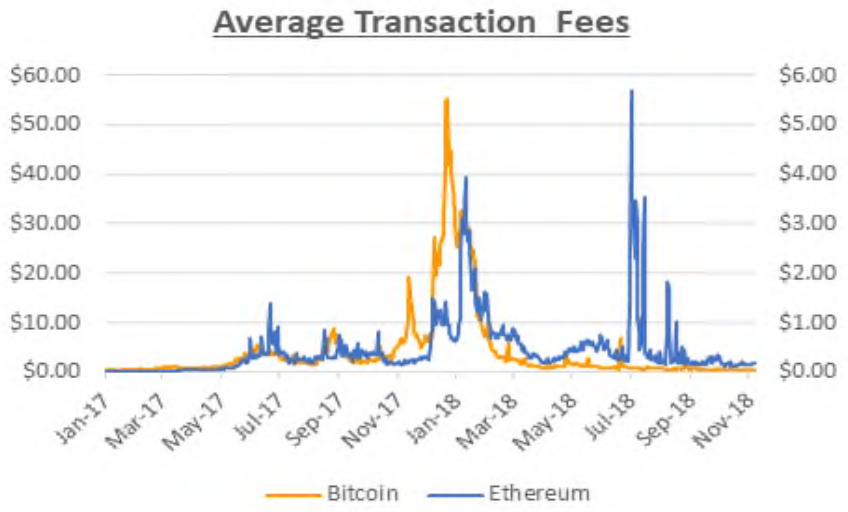


Figure 2.2. *LTM average transaction costs for Bitcoin and Ethereum were $5.00 and $0.60, respectively. (Zochowski, Crypto transaction fee economics primer 2019)*

In comparison with regular small business bank expenses, business crypto accounts require a twice smaller budget. As shown in Figure 2.3, small business spending on accounting and payments services sums up to $531.20 billion (Shevlin, 2020). While average business transaction fee (depending on type and country) is from $5 to $45 in banks, as shown in Figure 2.4 (Fuscaldo, 2023). So a $100,000 outgoing wire transfer done through the bank from Inncarbon Technology to its client will cost $45 plus service fees that would be applied later and may require additional documents to complete a transaction, while in Ethereum it would cost only $6, and would be processed immediately, with no additional documentation or fees required.

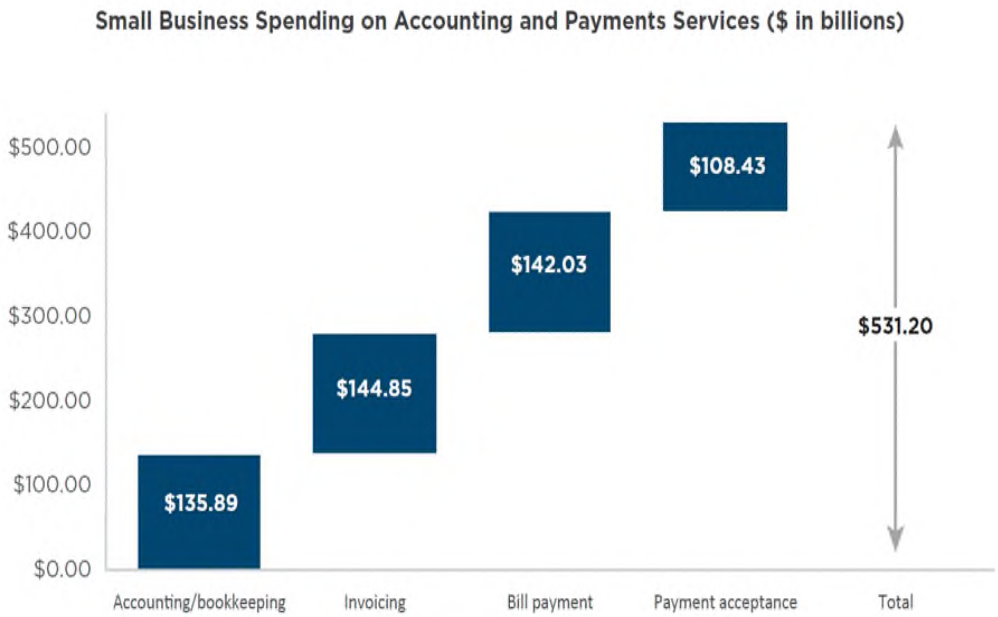


Figure 2.3. *Small Business Spending on Accounting and Payment Services (Shevlin, Banks' $370 billion small business opportunity 2020)*

Wire transfers all accounts In addition to any fees, the exchange rate used when we convert one currency to another includes a markup.[3,4,5]		**Domestic**	**International**	
			U.S. currency	**Foreign currency**
	Incoming	$15 each	$16 each	$16 each
	Outgoing	$30 each	$45 each	$35 each
	Repetitive outgoing	$25 each	$40 each	$30 each
Wire transfers analyzed accounts In addition to any fees, the exchange rate used when we convert one currency to another includes a markup.[3,4,5]	Wire in via correspondent bank - U.S./foreign currency		$7 per transfer	
		Outgoing domestic	**Outgoing international**	
			U.S. currency	**Foreign currency**
	Branch	$30 each	$45 each	$35 each
	Voice	$30 each	$45 each	$35 each
	Voice repetitive	$25 each	$40 each	N/A
	Voice drawdown	$20 each	N/A	N/A
	Auto standing	$18 each	$30 each	N/A
Wire transfer fee additional charges for analyzed accounts In addition to any fees, the exchange rate used when we convert one currency to another includes a markup.[3,4,5]	Fax/email advice		$5 per wire	
	Fax/email wire report monthly base		$37 per account	
	Outgoing wire returned		$55 each	
	Voice wire monthly base		$6 per month, per account	
	Wire investigation		$65 per wire	
	Wire repair surcharge – incoming/outgoing		$9 each	
Wire transfer fees charged by third parties or other banks	Third parties or other banks may charge fees in addition to those described above			

Figure 2.4. *Business banking fees on wire transfers for business accounts (Fuscaldo, Business banking fees: Why Banks Limit Transactions 2023)*

The most well-known crypto advantage is decentralization. Each computer that mines bitcoins is a component of this system; there is no single entity in charge of it. This implies that the central authority lacks the power to impose regulations on bitcoin owners (Bains et al., 2022). Furthermore, the payment mechanism will continue to function reliably even if a portion of the network goes unavailable. Along with it, crypto is simple to use. Using BTC is practical for businesses given that the process of creating an account for the firm in Ukrainian or English banks is cumbersome and might be rejected without a reason. A BTC wallet may be created by the business in around 5 minutes, after which it can be used right away without any delays or fees, while also getting faster and easier transactions. The power to instantly send money to anybody, anywhere, and through any payment method through the BTC network and the opportunity to invest money in an open, valuable resource - these are all significant advantages of using business crypto wallets.

Speaking of benefits, security, and safety play a big role, speaking of transparency. The BTC keeps a history of every transaction which has ever taken place. The term "blockchain" refers to this organized sequence of blocks. Information about everything is stored in the blockchain. Anyone may see how much Bitcoin is owned if the business has utilized the BTC address in a public setting. If the business address is not disclosed publicly, no one will ever be aware that it belongs to this corporation. Businesses typically use a different BTC address for each transaction in order to maintain total anonymity. Furthermore, only the wallet owner has access to it. The account belongs to the owner alone under a special electronic payment system. For instance, on PayPal, the system has the authority to immediately freeze any funds on an account if the firm determines for any reason that the account holder is using the account improperly (Gerencer, 2020). The owner is not even notified of this action. Owners are entirely responsible for ensuring correct account usage. With Bitcoin, the owner

possesses a private key and a matching public key, which together make up the wallet's address. Bitcoins cannot be withdrawn by anyone than the owner.

Lastly and most importantly, there is no possibility of using some personal information fraudulently. It's crucial to note this. Credit cards are now often used for purchases. They are erratic. Customers must provide the card number, expiration date, and code when filling out forms on websites, paying for products and services with corporate cards. There aren't many payment methods that are less secure. As a result, credit cards are frequently stolen. No personal information is required for BTC transactions. It substitutes two keys instead: public and private. The private key is solely known to the owner, but the public key, which is the BTC wallet's address, is accessible to everyone. The transaction must be signed using two private keys that are in communication and a mathematical operation.

These are all advantages that were found by Inncarbon Technology after in the research process, but the disadvantages and risks were not overlooked either, like strong volatility. Practically all of the BTC value's ups and downs are directly related to the remarks made by the governments of other nations. Short-term problems are caused by this instability. Moreover, investing in cryptocurrencies has significant risks that should be taken into account over the long run (Erinfolami, 2021). According to company's research, there are many more drawbacks to cryptocurrencies (like bitcoin), including the potential for money laundering, the financing of terrorism and other illegal activity, the lack of a central issuer (which means there is no formal legal entity to guarantee in the event of bankruptcy), and others. Although it is very difficult to forecast, many industry experts on the subject believe that cryptocurrencies have a bright future because they will eliminate trade barriers and middlemen, lower transaction costs, and therefore stimulate commerce and the economy. However, the company should take into account the negative statements in the academic community that

claim that the future of cryptocurrencies is not particularly positive because to the high risk of volatility, hacking concerns, and a lack of institutional backstop.

2.2. Five ways blockchain will transform Inncarbon Technology's processes through strategic plan

There are many ways in which blockchain can transform several branches of operations in a traditional business like Inncarbon Technology Ltd., but several of them are about to be implemented this year (2023).

Supply chain financing methods are one of the industry's main obstacles. In the port-driven coal supply chain, there are two main financing options: accounts receivable financing for downstream dealers and inventory pledge finance for upstream suppliers (Liu et al., 2022). One of the financial options for downstream coal dealers is accounts receivable finance, which may be further broken down into factoring financing and accounts receivable financing. Right now, the coal supply chain's coal dealers are increasingly frequently using accounts receivable finance, which makes it even more complex for sales agents like Inncarbon Technology, always being the third party in such deals (Yin & Li, 2022).

The primary transaction process goes like this: after the resale deal is initiated, the downstream SME's agent asks for financing using the accounts receivable that the power plant issued as a financing-guaranteed asset to apply for financing from banking institutions (Beyene et al., 2022). Banking firms entrust the port to confirm the legitimacy of the transaction and the accounts receivable. The agent of the power plant guarantees to expire the acceptance receivables when the transaction information has been validated, and financial institutions offer financing services for downstream businesses. The bank of the agent validates and secures the deal with the letter of credit that is sent to all parties of

the deal (Martin, 2021). Figure 2.5 depicts the financing strategy for accounts receivable commitments in the ports-led coal supply chain.

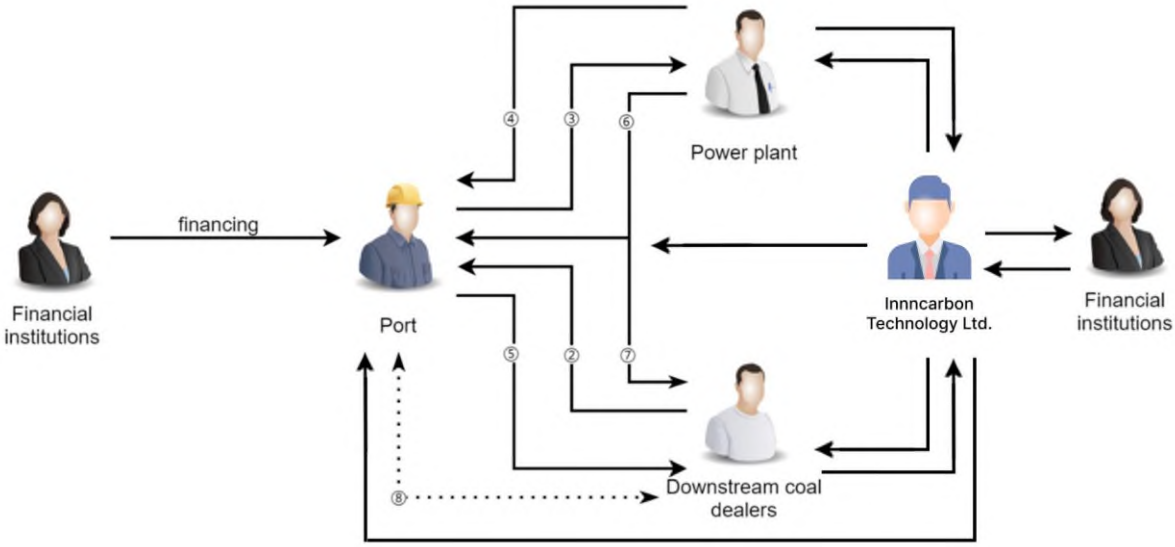


Figure 2.5. *Traditional accounts receivable financing procedures in conventional coal ports resale deals.*

When providing traditional accounts receivable financial products and services, the agents of port invest a lot of time, money, and resources into confirming the legitimacy of the receivables and evaluating the financial standing and credit risk of the financing enterprise and the core enterprise that will be conducting the transaction. The lengthy and difficult verification procedure and the lengthy assessment of financing applications decrease the effectiveness of funding and raise its cost (Garner & Suthakar, 2021). The secondary supply chain, which includes core businesses, has a limited risk resistance capability, transparent supply chain transaction records, expensive port verification costs, and significant risks are among the factors that make it difficult for SMEs to secure financing.

The application of blockchain technology may significantly increase the financing efficacy of accounts receivable finance in the coal distribution chain led by ports because it can provide data encryption, information exchange, and

credit transmission of essential businesses (Ari, 2022). The finance researchers from China integrated blockchain technology into the accounts receivable funding platform in order to create energy accounts receivable financing mechanisms based on blockchain technology. Participants at all stages of the downstream coal supply chain, led by ports, including ports, downstream coal dealers (DCDs), key businesses, and financial institutions like banks, can voluntarily opt to join based on their financing requirements. Figure 2.6 displays the blockchain-based financing scheme for Agent's coal receivables.

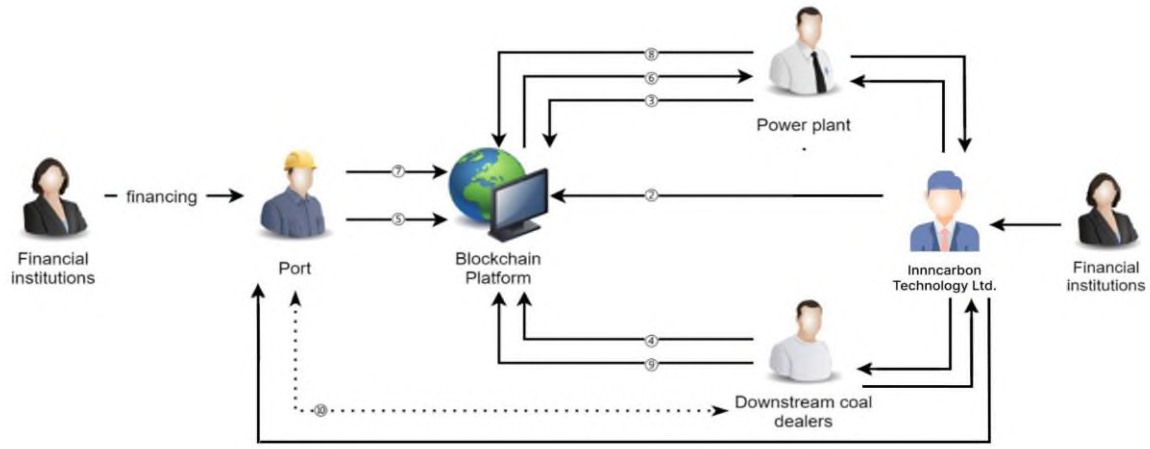


Figure 2.6. *Blockchain-based financing of the agent accounts receivable for the coal port.*

Transactions between DCDs and core companies are completed, after which DCDs borrow money from the port with the commitment to reimburse it when due using the uncollected receivables accounts. The openness and transparency features of the blockchain make it difficult to try to interfere with data because the core agent firm, small and medium-sized businesses, and the port area all use the same blockchain platform (Gokoglan et al., 2022). However, mutual trust and traceability between nodes can significantly reduce the cost of ensuring the validity of transaction context in the process of financing receivables for all parties involved. This can shorten the time it takes to apply for financing

and assist in easing the financing challenges faced by sales representatives like Inncarbon Technology.

The growth of supply chain financing in the coal sector is significantly aided by the use of blockchain technology to successfully establish a trusted network among businesses (Kaya & Turgut, 2019). The key benefit of blockchain technology for the sustainable growth of supply chain finance is that its underlying technology can remove the obstacles preventing its development at the moment. Time stamps and digital signatures assist auditing organizations in validating transaction information, asymmetric encryption maintains the confidentiality of transaction data while it is being transferred, and intelligent contracts reduce human involvement. The consensus technique can facilitate the exchange of transaction information and remove communication obstacles between companies in the chain.

Every company in every sector has been digitally transformed by blockchain. Cryptocurrency can be stored and transferred securely thanks to blockchain's digital ledger and encryption technologies. In business transactions, revisions to designs, papers, and other business agreements, blockchain offers security and transparency. Blockchain is practical and pertinent to the mining sector because of these features (Caplin, 2022). With that being stated in the company's recent research, Inncarbon Technology also has made a strategic plan that includes the use of blockchain technology and how it will transform the company. As the company is mainly doing trading and engineering consulting services, it can also consult mining companies with the usage of blockchain and increase the value of the provided services.

First of all, structured and unstructured forms of sophisticated geographical and engineering information in the given industry are produced by the Engineering, Construction, and Handover (ECH) business activities. Costs go up because it takes more work to manage and maintain the correctness of this vast amount of data (Mitchell, 2022). This added expense might delay the company's

run rate and overall goals if it is not properly and promptly accounted for. Throughout the difficult management procedures of rules and standards, blockchain makes transactions traceable, promoting confidence and assuring work compliance, which can help Inncarbon Technology to cut more costs for their clients and gain more profit while providing more value.

Another area for service improvement is mining lease management and compliance. Resource/reserve estimation, mine design, and planning procedures all produce documentation that needs to be managed for approval by mining corporations (DEECA, 2021). Proof will be incorporated into papers that have received approval in an effort to strengthen the system of custody and control. Blockchain would enhance the traceability of resource estimation for securities trading reporting as well as the inventory tracking into the ERP for resource/reserve inventory management. Smart contracts might be used internally by blockchain and then extended to other parties (such as stock exchanges for the release of resource/reserve estimations) via the technology. The workflow/audit of the tasks and results used to calculate the reserves and resources may be verified using blockchain. This area may be particularly useful in Inncarbon Technology's services reshaping process.

Another "pain" that company solves for the clients is supply chain issues. From blocks through concentrate to metal (also known as gold, SW/EX copper plating, etc.), the mining value chain may be tracked using blockchain technology (Clarke-Potter, 2019). For something like the provenance to the ultimate client, this may be demonstrated using stepwise values. JV partners may benefit from blockchain's transparency. A value chain that is fragmented and involves several partners is typical of mining enterprises. Blockchain may provide automated reconciliation of invoices. For assurance, the client sends the ore for lab testing after assigning it a quality certificate (Cosgrove, 2023). The pricing and purity of the ore may or may not be under question. The three parties engaged in this process—the miner, the consumer, and the arbitrator—can all benefit from

Blockchain technology. In order to better safeguard the real-time data created during delivery, BHP initiated a project utilizing Blockchain to track the movements of wellbore rock and fluid samples.

Furthermore, blockchain can have a big impact on the provenance of minerals. Concerns concerning the origin of minerals exist among manufacturing enterprises. Apple and other firms have made the decision not to utilize minerals from war zones or mines with subpar labor conditions and environmental standards (Kopp, 2022). For instance, it has been claimed that a pilot program is being established to monitor cobalt output in the Democratic Republic of the Congo, from artisanal miners to batteries for high-tech devices (Verbrugge et al., 2021).

Nonetheless, Inncarbon Technology decided to reshape its services by advising clients of the mining industry with a new method of mining. For instance, Michelle Ash, the chief innovation officer at Barrick, has spoken on the future of the digital mine at recent conferences (Rolfe, 2017). One of the hypothetical situations that were put out was finding the valuable material in the earth rather than excavating the ore at all. Blockchain was thought to offer the remedy in this situation. Investors purchase digital tokens under Barrack's plan that reflect the amount of "green gold vault" (i.e., gram/oz of gold in the ground) that will never be mined but is instead sold on an exchange employing digital tokens. They consider this to be the "real" original green gold idea of capital monetization without any mining involved. A part of the money raised in the initial round may be donated to the community and monitored on a blockchain for investors. The gold market, as well as how investors see and interact with gold assets, might be severely disrupted by this concept. This mining concept is very revolutionary. This will need a huge amount of faith to get to.

The last but not least, the company can help its clients with mining equipment OEM. Equipment used in mining OEM collaborates in a high-performance setting while sourcing parts from diverse vendors (Varriale et al.,

2022). In a typical supply chain paradigm, only the OEM is informed of the various vendors in the event of a major failure. A request to the Manufacturers might be made by a mining maintenance department looking at the history of part failures. The OEM contract-related part might have a blockchain tied to it that could provide permission to read the part's pertinent data. The client and Manufacturer may collaborate, and the final buyer is guaranteed that the used components and systems are of a high caliber. Using Blockchain, it is simpler to tell which portion came from which seller.

Tu sum up, Inncarbon Technology already started reshaping its processes by embodying blockchain into its strategic plan, including the change in service value. This shift might be more significant than some could forecast, as blockchain technology is improving and growing exponentially while becoming an integral part of the company's strategy.

2.3. The impact of the token economy and blockchain on strategic and operational management of the company

In recent years, the emergence of blockchain technology has brought about a new era of decentralized finance and asset management. The concept of token economies, which operate on blockchain technology, has gained significant attention as a new form of value exchange and incentivization. In the context of Inncarbon Technology Ltd, a technology-based company that specializes in the development of carbon capture and utilization technologies, the implementation of a token economy and blockchain can significantly impact the company's strategic and operational management.

To begin with, a token economy is a system in which tokens are used to represent assets or value, which can be traded, exchanged, or used within a particular ecosystem (Sunyaev et al., 2021). The concept of the token economy operates on the principle of incentivizing participation by creating a token that

represents a particular asset or value. The token can be traded, exchanged, or used within the ecosystem to reward participants for their contribution to the ecosystem. Particularly, in the context of Inncarbon Technology Ltd, a token economy can be used to tokenize the company's assets, such as its intellectual property, patents, like special briquetting formula. By tokenizing its assets, Inncarbon Technology Ltd can create new forms of value exchange, incentivizing participation, and facilitating the exchange of value within its ecosystem. For example, the company can issue tokens to investors in exchange for funding, which can then be used to develop and scale up its operations. Due to the tokens' potential to be traded on cryptocurrency marketplaces, a new option to invest in the company is now accessible.

Moreover, Inncarbon Technology Ltd can use tokens to incentivize its employees and partners, creating a more collaborative and innovative ecosystem. By creating a system where participants are rewarded for their contribution, the company can encourage innovation and drive engagement, leading to better operational management.

Inncarbon Technology Ltd can use blockchain technology to create a secure and transparent ecosystem for its token economy. By using blockchain technology, the company can ensure that all transactions within the ecosystem are secure, transparent, and irreversible (Oclarino, 2020). This may result in a more creative and cooperative ecology, boosting participation and operational effectiveness.

Furthermore, blockchain technology can enable Inncarbon Technology Ltd to create a more decentralized and democratic governance system. By using blockchain-based smart contracts, the company can automate decision-making processes, creating a more democratic and transparent governance system. This can lead to better strategic management, where decisions are made in a more collaborative and inclusive manner.

It is difficult to provide a mathematical proof of the profitability of implementing a token economy and blockchain for Inncarbon Technology Ltd, as there are several factors to consider, such as the initial investment required, the adoption rate of the new system, and the market conditions in which the company operates.

However, we can make some theoretical assumptions to evaluate the potential profitability of implementing a token economy and blockchain for the company. One such assumption is that the implementation of a token economy and blockchain will result in increased efficiency and transparency in the company's operations, leading to a reduction in operational costs.

Let us consider the following scenario: Inncarbon Technology Ltd currently spends $10 million annually on operational costs. We assume that the implementation of a token economy and blockchain can reduce operational costs by 10%, resulting in savings of $1 million annually. We also assume that the initial investment required for the implementation of the new system is $2 million.

Using these assumptions, we can calculate the payback period for the initial investment as shown in Figure 2.7:

$$Payback\ period\ = \frac{Initial\ investment}{Annual\ savings}$$

$$Payback\ period\ = \frac{\$2\ million}{\$1\ million}$$

$$Payback\ period\ =\ 2\ years$$

Figure 2.7. *Calculation of approximate payback period for the initial investment into blockchain technology*

This means that the initial investment of $2 million will be paid back in 2 years, after which the company will start to see a net profit from the implementation of the new system.

Of course, this is a simplified scenario, and the actual profitability of implementing a token economy and blockchain for Inncarbon Technology Ltd will depend on several other factors, such as the market conditions, the adoption rate of the new system, and the specific use cases of the token economy.

It is also difficult to provide a mathematical proof of the profitability of implementing NFT technology for Inncarbon Technology Ltd as there are several factors to consider. However, we can also make some theoretical assumptions to evaluate the potential profitability of implementing NFT technology for the company. One such assumption is that the implementation of NFT technology will enable Inncarbon Technology Ltd to monetize its intellectual property, such as patents and proprietary technology, in a new and innovative way, which is the biggest strength of the company.

Let us consider the following scenario: Inncarbon Technology Ltd has several patents and proprietary technologies that it believes will have significant value in the market. We assume that the company can create NFTs based on these patents and technologies and sell them on a blockchain-based marketplace. We also assume that the potential demand for these NFTs is high, and the company can sell them for a total of $5 million.

Using these assumptions, we can calculate the potential profit from the sale of NFTs as is shown in Figure 2.8:

$$
\begin{aligned}
&Potential\ Profit \\
&\quad = TR\ from\ NFT\ sales \\
&\quad - \ Cost\ of\ creating\ \&\ marketing\ NFTs \\
&Ptential\ profit\ = \$5\ million\ - \ \$1\ million \\
&Potential\ profit\ = \ \$4\ million
\end{aligned}
$$

Figure 2.8. *Potential profit from the sale of NFTs by Inncarbon Technology ltd.*

Assuming that the cost of creating and marketing the NFTs is $1 million, we can calculate the potential profit. This means that the potential profit from the sale of NFTs is $4 million, which can be a significant source of revenue for Inncarbon Technology Ltd. Of course, this is a simplified scenario, and the actual profitability of implementing NFT technology for the company will depend on several other factors, such as the demand for the company's NFTs, the cost of creating and marketing them, and the competition in the NFT market.

While it is challenging to provide a mathematical proof of the profitability of implementing a token economy, NFTs, and blockchain for Inncarbon Technology Ltd, we can make theoretical assumptions to evaluate the potential profitability of the new system. Ultimately, the profitability of implementing the new system will depend on several factors and will require careful analysis and evaluation.

In conclusion, the implementation of a token economy and blockchain can significantly impact the strategic and operational management of Inncarbon Technology Ltd. By using token economies, the company can tokenize its assets, creating new forms of value exchange and incentivization. This can lead to a more innovative and collaborative ecosystem, driving engagement and operational efficiency.

Moreover, blockchain technology can create a more secure and transparent ecosystem, ensuring that all transactions within the ecosystem are secure and transparent. This can lead to better operational management, where the company can track the movement of tokens, ensuring that they are being used appropriately. Blockchain technology can enable the company to create a more decentralized and democratic governance system, leading to better strategic management, where decisions are made in a more collaborative and inclusive

manner. Finally, it will be a great decision financially, as it can not only cut costs, but also create brand-new revenue streams for the company.

2.4. Assessing Internal and External Factors of the Company

In today's digital environment, which is becoming more and more crucial, blockchain technology has the ability to provide organizations with secure and transparent solutions. There are advantages and disadvantages to the use of this technology, just like with any other. The internal and external variables that affect Inncarbon Technology Ltd.'s capacity to compete in the market, as well as the opportunities and threats the firm confronts, will all be looked at in this SWOT analysis. This analysis will show more about the company's current situation and future growth prospects by examining these variables.

Figure 2.9. SWOT Analysis of Inncarbon Technology Ltd.

Inncarbon Technology Ltd. has several strengths that give it a competitive advantage in the marketplace. First identified strength is technical expertise in blockchain technology. One of Inncarbon Technology Ltd.'s primary strengths is its technical expertise in blockchain technology. Blockchain is a decentralized, distributed ledger technology that can be used to create secure and transparent transactions. It is still a relatively new technology, and many businesses are still unfamiliar with how it works and how it can benefit them. Inncarbon Technology Ltd. has a team of experts who are knowledgeable and experienced in the use of blockchain technology. These experts can help businesses understand how blockchain works and how it can be used to solve their specific challenges. This expertise allows Inncarbon Technology Ltd. to develop innovative solutions that are ahead of the curve in the industry. In addition to its technical expertise, Inncarbon Technology Ltd. has a deep understanding of the business processes that can benefit from blockchain technology. This knowledge allows the company to develop solutions that are tailored to the specific needs of its clients, rather than offering one-size-fits-all solutions.

The second strength is reputation in the industry. Inncarbon Technology Ltd. has a reputation in the industry for delivering quality solutions to its clients. The company has a track record of success, and it is well-respected by its peers. This reputation gives Inncarbon Technology Ltd. a level of credibility that is difficult to achieve in a new and rapidly changing industry. The company's reputation is built on its ability to deliver innovative solutions that meet the specific needs of its clients. Inncarbon Technology Ltd. works closely with its clients to understand their business processes and identify areas where blockchain technology can add value. This approach has earned the company a loyal customer base and has helped it establish a reputation for excellence in the industry.

The third strength of the company is secure and transparent solutions. Inncarbon Technology Ltd.'s solutions are designed to offer a level of security and transparency that is not possible with traditional technologies. Blockchain technology allows for secure, tamper-proof transactions that are transparent to all parties involved. This is a significant advantage in today's digital landscape, where data security and transparency are of utmost importance. Inncarbon Technology Ltd.'s blockchain-based solutions can be used to secure a variety of business processes, including supply chain management, digital identity management, and financial transactions. These solutions can help businesses reduce the risk of fraud and ensure that their transactions are conducted in a transparent and trustworthy manner.

The fourth strength is the cost savings and increased efficiency. Inncarbon Technology Ltd.'s solutions can help businesses reduce costs and increase efficiency by automating and streamlining many business processes. Blockchain technology can be used to create smart contracts that automate the execution of business agreements, reducing the need for intermediaries and lowering transaction costs. In addition to cost savings, blockchain technology can also increase efficiency by reducing the time and effort required to complete transactions. Blockchain-based solutions can eliminate the need for manual processes, reducing the risk of errors and delays. Inncarbon Technology Ltd.'s solutions can be used in a variety of industries to achieve these cost savings and efficiency gains. For example, in the supply chain industry, blockchain technology can be used to track products from the manufacturer to the end consumer, reducing the risk of fraud and ensuring that products are delivered on time and in good condition.

The last but not least strength is innovative solutions. Inncarbon Technology Ltd.'s technical expertise in blockchain technology allows the company to develop innovative solutions that are ahead of the curve in the industry. The company's solutions are designed to solve specific business

challenges, rather than offering one-size-fits-all solutions. Inncarbon Technology Ltd. has a culture of innovation, which encourages its employees to think creatively and come up with new and innovative ideas. This culture of innovation allows the company to stay.

Inncarbon Technology Ltd. also has some weaknesses that need to be addressed in order to maintain its competitive edge in the marketplace. In this section, I will describe each of these weaknesses in detail. The first one is limited awareness of blockchain technology. Despite the growing interest in blockchain technology, there is still a lack of awareness and understanding of how it works and how it can benefit businesses. Inncarbon Technology Ltd. operates in a niche market, and its potential clients may not be fully aware of the benefits of blockchain technology. This lack of awareness can be a significant obstacle for Inncarbon Technology Ltd. in terms of acquiring new clients and expanding its business. The company may need to invest in marketing and educational initiatives to raise awareness of the benefits of blockchain technology and how it can be used to solve specific business challenges.

The second weakness is dependence on external service providers. Inncarbon Technology Ltd. relies heavily on external service providers for its blockchain technology infrastructure. This dependence can be a weakness for the company, as it is at the mercy of these service providers in terms of service levels and pricing. In addition, Inncarbon Technology Ltd. may not have full control over the security of its blockchain infrastructure if it is dependent on third-party service providers. The company may need to invest in developing its own blockchain infrastructure to reduce its dependence on external service providers.

The third weakness is regulatory uncertainty. Blockchain technology is still a relatively new technology, and there is a lack of clarity around regulatory frameworks in many jurisdictions. This regulatory uncertainty can be a weakness for Inncarbon Technology Ltd. as it may hinder its ability to expand its business into new markets. In addition, the regulatory landscape for blockchain technology

is constantly evolving, which can make it difficult for Inncarbon Technology Ltd. to stay up-to-date with the latest regulatory requirements. The company may need to invest in legal expertise to ensure that it is compliant with all relevant regulations.

The fourth weakness is limited scalability. Inncarbon Technology Ltd.'s solutions are currently designed for a niche market, which limits the company's scalability. The company may need to broaden its focus and develop solutions that can be used in a variety of industries to achieve greater scalability. In addition, blockchain technology is still in its early stages of adoption, and there is no guarantee that it will become a mainstream technology. If blockchain technology does not gain wider adoption, Inncarbon Technology Ltd. may struggle to find new markets for its solutions.

The final weakness is dependence on key personnel. Inncarbon Technology Ltd. is highly dependent on its key personnel, including its technical experts and business development team. If key personnel were to leave the company, it could have a significant impact on the company's ability to deliver its solutions and acquire new clients. In addition, the highly specialized nature of blockchain technology means that it can be difficult to find and retain qualified personnel. Inncarbon Technology Ltd. may need to invest in employee retention strategies to ensure that it can retain its key personnel over the long term.

Overall, these weaknesses present significant challenges for Inncarbon Technology Ltd. However, by addressing these weaknesses and capitalizing on its strengths, the company can maintain its competitive edge and continue to grow in the rapidly evolving blockchain technology industry.

Inncarbon Technology Ltd. is operating in a rapidly evolving industry, and there are several opportunities for the company to grow its business. One of the significant opportunities is the increasing adoption of blockchain technology in various industries. Inncarbon Technology Ltd. can develop blockchain solutions that meet the specific needs of different industries and expand its client base.

Another significant opportunity is the growing interest in sustainability among consumers, businesses, and governments. Inncarbon Technology Ltd. can develop blockchain solutions that can help companies and governments track and verify their sustainability efforts. The company can leverage this opportunity by developing blockchain solutions that enable companies to track their carbon emissions, ensure sustainable sourcing of raw materials, and verify the authenticity of sustainability claims. By doing so, Inncarbon Technology Ltd. can tap into a growing market for sustainable solutions.

The emergence of decentralized finance (DeFi) is another opportunity for Inncarbon Technology Ltd. to develop blockchain solutions that enable decentralized financial services. The company can develop blockchain solutions for peer-to-peer lending, asset management, and other financial services. This opportunity can help the company expand its business by developing innovative blockchain solutions that are tailored to the specific needs of different industries.

Advancements in Internet of Things (IoT) technology is another opportunity for Inncarbon Technology Ltd. to develop blockchain solutions that enable secure and transparent tracking of data from IoT devices. The company can develop blockchain solutions that enable supply chain tracking and traceability for IoT-enabled devices. By doing so, Inncarbon Technology Ltd. can expand its business and gain a foothold in new markets.

Lastly, the increasing demand for cybersecurity solutions presents an opportunity for Inncarbon Technology Ltd. to develop blockchain solutions that provide enhanced cybersecurity for businesses and governments. The company can develop blockchain solutions that enable secure and decentralized storage of sensitive data, as well as blockchain-based identity verification solutions. By doing so, Inncarbon Technology Ltd. can tap into a growing market for cybersecurity solutions.

These opportunities present significant potential for Inncarbon Technology Ltd. to grow its business and expand its client base. By staying on top of industry

trends and developing innovative blockchain solutions, the company can continue to thrive in the rapidly evolving blockchain technology industry. Inncarbon Technology Ltd. can capitalize on these opportunities by developing blockchain solutions that meet the specific needs of different industries, expanding its business, and staying ahead of the competition.

Inncarbon Technology Ltd. faces several threats that can potentially hinder its growth and success in the blockchain technology industry. The first significant threat is intense competition from other blockchain technology companies. Inncarbon Technology Ltd. operates in a crowded market, and there are several established players, as well as new entrants, vying for market share. This competition can lead to pricing pressure, reduced margins, and loss of market share.

The second threat is regulatory uncertainty. The blockchain technology industry is still relatively new, and regulators are still trying to understand how to regulate the industry properly. This uncertainty can lead to regulatory hurdles that can impact the company's ability to operate and expand its business. It can also lead to increased compliance costs and legal fees.

The third threat is the potential for cyber attacks. Blockchain technology is generally regarded as secure, but there are still vulnerabilities that can be exploited by cybercriminals. Cyber attacks can lead to data breaches, loss of funds, and damage to the company's reputation. Inncarbon Technology Ltd. must invest in cybersecurity solutions and ensure that its blockchain solutions are secure and protected from cyber attacks.

The fourth threat is the risk of technological obsolescence. Blockchain technology is still in its early stages, and new advancements and developments are emerging rapidly. If Inncarbon Technology Ltd. does not keep up with these developments, its solutions can quickly become outdated and less relevant. The company must invest in research and development to stay ahead of the curve and continue to offer innovative blockchain solutions.

Lastly, the potential for economic downturns is a threat to Inncarbon Technology Ltd. The blockchain technology industry is still in its early stages, and it is uncertain how it will fare during economic downturns. Economic downturns can lead to reduced demand for blockchain solutions, reduced funding, and loss of revenue. The company must be prepared to weather economic downturns and diversify its revenue streams to mitigate the impact of economic fluctuations.

These threats pose significant challenges to Inncarbon Technology Ltd.'s growth and success in the blockchain technology industry. The company must be proactive in addressing these threats by investing in cybersecurity solutions, keeping up with industry developments, diversifying its revenue streams, and preparing for economic downturns. By doing so, Inncarbon Technology Ltd. can mitigate these threats and continue to grow its business in the evolving blockchain technology industry.

In conclusion, the SWOT analysis of Inncarbon Technology Ltd. highlights the company's strengths, weaknesses, opportunities, and threats in the rapidly evolving blockchain technology industry. The company has several strengths, including its expertise in blockchain technology, its strong partnerships, and its commitment to innovation. However, the company also faces weaknesses, such as its limited market reach and its dependence on key partnerships.

The analysis also identifies several opportunities for Inncarbon Technology Ltd. to grow its business, including the increasing adoption of blockchain technology, the growing interest in sustainability, the emergence of decentralized finance, advancements in IoT technology, and the increasing demand for cybersecurity solutions. However, the company also faces significant threats, such as intense competition, regulatory uncertainty, the potential for cyber attacks, the risk of technological obsolescence, and the potential for economic downturns.

Overall, the SWOT analysis provides valuable insights into Inncarbon Technology Ltd.'s position in the blockchain technology industry and the challenges and opportunities it faces. The company must leverage its strengths to capitalize on the opportunities and address its weaknesses and threats to mitigate risks and ensure continued success. By doing so, Inncarbon Technology Ltd. can maintain its competitive edge in the blockchain technology industry and continue to grow its business.

To evaluate the external elements that could have an influence on a company's operations and future growth, a PESTEL analysis was conducted. This analysis tries to give a general overview of the outside variables that could have an influence on Inncarbon Technology Ltd, a business that offers a variety of services to the coal mining sector. The research looks at the environmental, technical, political, economic, social, and legal aspects that might have an impact on the business' operations and future expansion. Inncarbon Technology Ltd. may better comprehend the possibilities and challenges posed by its operational environment by recognizing these external variables. The company can then build plans to reduce possible risks and take advantage of new opportunities.

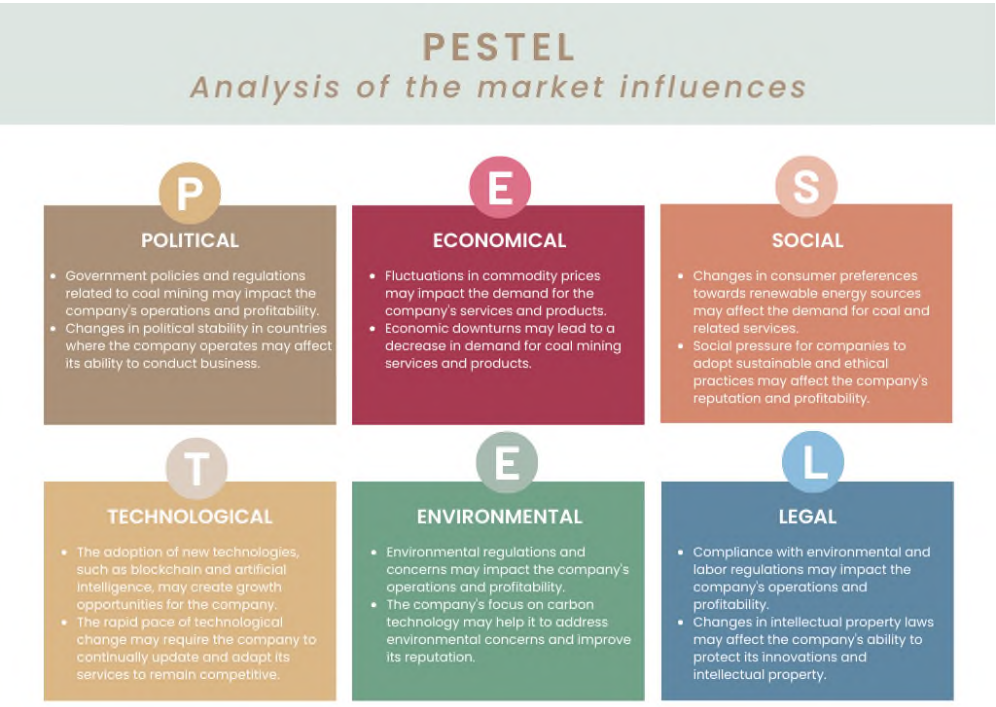


Figure 2.10. PESTEL analysis on Inncarbon Technology Ltd.

One of the key political factors affecting the company is the level of government support for the coal mining industry. Government policies and regulations can impact the demand for coal products, as well as the cost of production and distribution. Changes in government policies can also affect the level of competition in the market, as well as the overall profitability of the company. For example, if there is a shift towards renewable energy sources, the demand for coal products may decrease, which could negatively impact the company's revenue.

Another political factor that may affect the company is the level of government stability in the countries where Inncarbon Technology operates. Political instability and corruption can create uncertainty and hinder business operations, which could negatively impact the company's profitability. Furthermore, changes in taxation policies and regulations can also affect the company's financial performance. The company may need to adjust its pricing strategy or product offerings to remain competitive in the market while still being able to comply with new taxation policies. Therefore, it is crucial for Inncarbon Technology to keep abreast of political developments in the countries where it operates and adapt its business operations accordingly.

The economic factors in the PESTEL analysis for Inncarbon Technology refer to the external economic conditions that can affect the company's business operations. These factors include the state of the global economy, exchange rates, inflation rates, and government policies on taxation and trade. Inncarbon Technology's business is heavily dependent on the coal mining industry, which is affected by fluctuations in global demand and pricing for coal. The company's sales revenue is also affected by exchange rate fluctuations, which can impact the costs of imported equipment and materials. Additionally, government policies related to taxation and trade can impact the cost of doing business for Inncarbon

Technology, as well as the demand for coal products. Therefore, it is important for Inncarbon Technology to monitor these economic factors in order to make informed business decisions and adapt to changes in the external environment.

In terms of social factors, Inncarbon Technology Ltd may face challenges related to the changing societal attitudes towards coal mining and carbon technology. The company operates in an industry that is increasingly being scrutinized due to its negative impact on the environment and public health. The shift towards renewable energy sources and the growing concern for climate change could potentially lead to a decrease in demand for coal products and carbon technology services. In addition, the company needs to be aware of the social and ethical implications of its sourcing practices and ensure that it operates in a responsible and sustainable manner. The company should also ensure that its workforce is diverse and inclusive, and that it provides a safe and healthy working environment for its employees. Finally, Inncarbon Technology Ltd needs to maintain a positive relationship with the communities in which it operates and demonstrate a commitment to social responsibility.

The technological factors that could affect Inncarbon Technology Ltd are related to the increasing use of digital technologies in the coal mining industry. The adoption of new technologies, such as blockchain and artificial intelligence, can provide Inncarbon Technology Ltd with opportunities to improve its business operations and services. For instance, blockchain technology can be used to enhance transparency and traceability in the coal mining supply chain, which can increase customer confidence and trust in the company's products. Similarly, artificial intelligence can help Inncarbon Technology Ltd to optimize its mining operations and reduce costs by automating certain processes. The company should stay updated on the latest technological developments in the coal mining industry and invest in research and development to stay ahead of the competition.

The environmental factors in PESTEL analysis refer to the impact of environmental issues on a company's operations. In the case of Inncarbon

Technology, the company operates in the coal mining industry, which is known for its negative impact on the environment. The company needs to comply with environmental regulations and standards to ensure that it operates sustainably. The use of carbon technology, for instance, can help to reduce the environmental impact of coal mining. Additionally, the company's adoption of blockchain technology could help to improve the transparency and traceability of the coal mining supply chain, which could help to identify and mitigate any environmental risks or issues. As climate change and environmental issues continue to be major global concerns, it is essential for companies in industries with a significant environmental impact to prioritize sustainability and take steps to mitigate their impact on the environment.

The legal factors in a PESTEL analysis refer to the laws, regulations, and legal issues that may affect a business. Some of the key legal factors include labor laws, health and safety regulations, data protection laws, environmental regulations, and taxation laws. For example, labor laws can impact a business by regulating minimum wages, working hours, and working conditions. Health and safety regulations can require businesses to take certain measures to ensure the safety of their employees and customers. Data protection laws can affect how businesses handle and protect customer data. Environmental regulations can impact businesses that produce waste or emissions, as they may need to comply with certain standards or face penalties. Taxation laws can also affect businesses, as they may need to pay taxes or face penalties for non-compliance. Understanding these legal factors is important for businesses to ensure compliance and avoid any legal issues.

In conclusion, this PESTEL analysis has identified several important factors that could impact the success of Inncarbon Technology Ltd. in the current economic climate. While some factors, such as political stability and favorable economic conditions, could provide opportunities for growth, other factors, such as changing social attitudes and increasing environmental regulations, could

present challenges. By considering these factors and adapting their strategies accordingly, businesses can position themselves to succeed in the market. It is important to regularly conduct PESTEL analyses to stay informed about the latest trends and changes in the external environment, and to make proactive decisions that can help Inncarbon Technology Ltd. stay competitive and thrive.

CHAPTER III. BLOCKCHAIN TECHNOLOGY IN COAL MINING AND PRODUCTION INDUSTRY: RECOMMENDATIONS FOR RESOLVING LONG-LASTING ISSUES OF INNCARBON TECHNOLOGY

3.1. Practical problematics and pains of operational and financial systems in coal mining and energy industries and its potential solutions

The coal mining and energy industries have long struggled with operational and financial inefficiencies and a lack of transparency in their supply chains. This has led to significant cost overruns, delayed projects, and decreased profitability. However, blockchain technology has the potential to revolutionize these industries by providing a secure, decentralized ledger that can track every aspect of the supply chain, from the source of raw materials to the final sale of energy products (Wang et al., 2021).

One of the main challenges faced by the coal mining and energy industries is the lack of transparency and accountability in their supply chains. Currently, it is difficult for stakeholders to track the origin of raw materials, which can lead to issues with quality control and ethical concerns (Alexandrou & Tsalapatas, 2020). As a result, there is a higher chance of fraud and inaccuracy. It can also be difficult to confirm the validity of papers like contracts and invoices.

By developing a secure, decentralized ledger that stores all supply chain transactions, blockchain technology can solve these problems (Clauson et al., 2018). This can help to improve transparency and accountability by allowing stakeholders to track the origin of raw materials and ensure that all documents are authentic and accurate.

Blockchain technology has the potential to save costs and improve supply chain efficiency in addition to increasing transparency (Simon-Kucher & Partners, 2019). By automating many of the processes involved in the supply

chain, such as logistics and inventory management, blockchain technology can help to reduce the amount of manual labor required, thus reducing costs and improving efficiency.

According to research, blockchain technology has a substantial influence on the productivity and profitability of the coal mining and energy sectors. A study by the World Economic Forum found that blockchain technology can reduce the time and cost of supply chain processes by up to 25% and increase revenues by up to 5% (Shahid et al., 2021).

Furthermore, blockchain technology can also provide benefits beyond the supply chain. By creating a secure and decentralized platform, blockchain technology can help to reduce the risk of cyberattacks and data breaches, which are a significant concern for the energy industry (Allahviranloo & Meshkat, 2019). In addition, blockchain technology can also help to promote sustainability by providing a platform for tracking the carbon footprint of energy products and promoting the use of renewable energy sources.

In order to realize the full potential of blockchain technology in the coal mining and energy industries, there are several challenges that need to be addressed (Gui & Deng, 2019). Integrating blockchain technology with already-in-use systems and procedures is one of the major obstacles. Stakeholders, such as mining firms, energy producers, and technology suppliers, must put considerable resources into this and work together.

The creation of protocols and standards for blockchain technology in the energy sector presents another difficulty (Zhang & Jiao, 2021). This requires collaboration between industry stakeholders, regulators, and technology providers to ensure that blockchain technology is implemented in a consistent and efficient manner.

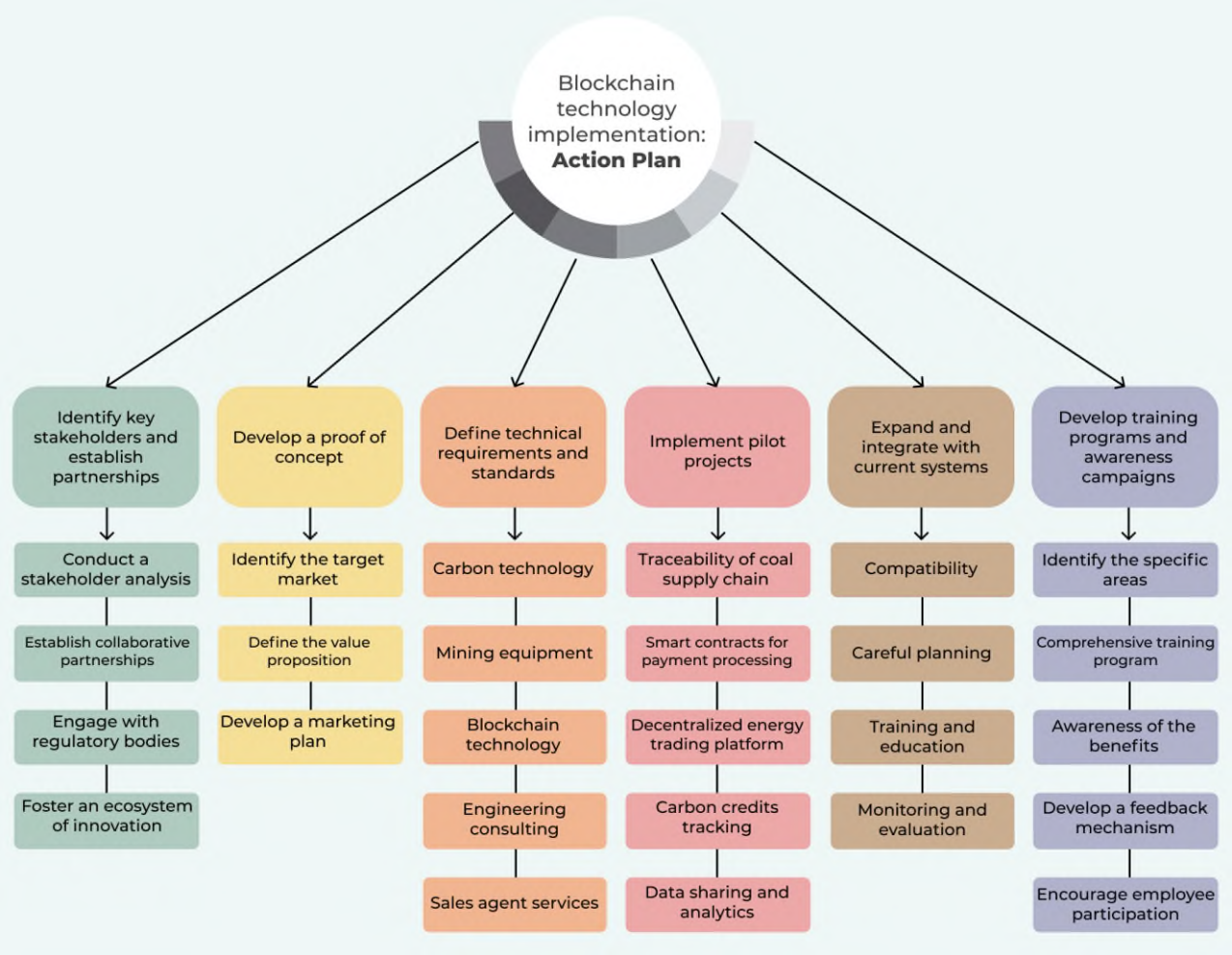


Figure 3.1. Blockchain technology implementation: Action plan

Blockchain technology offers major benefits to the energy and coal mining industries. To fully realize these benefits, it is essential to develop a detailed plan of actions and recommendations for implementing blockchain technology in these industries. After the detailed research presented in this paper, I offer the following recommendations plan to resolve the pains of operational and financial systems in coal mining and energy industries:

1. **Identify key stakeholders and establish partnerships:** The first step in implementing blockchain technology in the coal mining and energy industries is to identify the key stakeholders and establish partnerships. This includes mining companies, energy producers, technology providers, and regulatory bodies (Li et al., 2021). It is essential to establish collaborative

partnerships with these stakeholders to ensure that the implementation of blockchain technology is efficient, effective, and aligned with industry standards.

a. Conduct a stakeholder analysis: The first step in identifying key stakeholders is to conduct a thorough stakeholder analysis. This analysis should include all parties that could be impacted by the implementation of blockchain technology, including mining companies, energy producers, technology providers, regulatory bodies, and other relevant organizations. The analysis should consider the interests, needs, and concerns of each stakeholder group to ensure that the implementation of blockchain technology is aligned with industry standards and best practices.
b. Establish collaborative partnerships: Once the key stakeholders have been identified, it is essential to establish collaborative partnerships to ensure that the implementation of blockchain technology is efficient, effective, and aligned with industry standards. To make sure that all parties are in agreement on the aims and objectives of the blockchain deployment, these partnerships should entail regular communication and collaboration.
c. Foster an ecosystem of innovation: To ensure the success of the blockchain implementation, it is also essential to foster an ecosystem of innovation that encourages collaboration and the sharing of ideas between stakeholders. This ecosystem should include innovation hubs, hackathons, and other events that bring together stakeholders from across the industry to collaborate and share knowledge.
d. Engage with regulatory bodies: Regulatory bodies play a critical role in shaping the regulatory framework for blockchain technology in the coal mining and energy industries. It is therefore essential to engage with these bodies to ensure that the implementation of blockchain

technology is compliant with existing regulations and to provide feedback on regulatory changes that could impact the implementation of blockchain technology.

2. **Develop a proof of concept:** To make sure that all parties are in agreement on the aims and objectives of the blockchain deployment, these partnerships should entail regular communication and collaboration. This involves identifying a specific use case for blockchain technology, such as tracking the origin of raw materials or improving transparency in supply chain processes, and developing a prototype to test the technology.
    a. Identify the target market: Inncarbon Technology Ltd should identify the target market for its services. The company should conduct market research to determine the needs of its target customers, including their pain points, goals, and preferences. By understanding the target market, Inncarbon Technology Ltd can tailor its services to meet the specific needs of its customers.
    b. Define the value proposition: Inncarbon Technology Ltd should define its value proposition, which is a statement that summarizes the unique benefits that the company offers to its customers. The value proposition should be clear, concise, and compelling, and should communicate how the company's services can help customers to achieve their goals.
    c. Develop a marketing plan: Inncarbon Technology Ltd should develop a marketing plan to promote its services to potential customers. The marketing plan should include a description of the target market, a summary of the company's value proposition, and a list of marketing tactics that the company will use to reach its target customers.
3. **Define technical requirements and standards:** Once the proof of concept has been developed, it is essential to define the technical requirements and

standards for implementing blockchain technology in the coal mining and energy industries. This includes developing protocols for data sharing and security, establishing standards for data management and storage, and defining the technical specifications for blockchain technology.

a. Carbon technology: Inncarbon Technology Ltd should ensure that its carbon technology processes are optimized to produce high-quality activated carbon products. This will require the use of specialized equipment and technologies, including activated carbon filters and reactors, as well as a thorough understanding of the chemical and physical properties of coal products. Additionally, the business must make sure it complies with all pertinent environmental and safety laws, such as the Clean Water Act and the Clean Air Act.
b. Mining equipment: The company should ensure that it is using the latest mining equipment and technologies to optimize its mining operations. This includes the use of advanced drilling equipment, conveyor systems, and material handling equipment, as well as technologies such as GPS tracking and 3D modeling software to improve efficiency and safety. In addition, the company should ensure that its mining operations are compliant with relevant safety and environmental regulations, such as the Mine Safety and Health Act.
c. Blockchain technology: Inncarbon Technology Ltd should ensure that it is using blockchain technology in accordance with industry standards and best practices. This includes ensuring that the blockchain network is secure and tamper-proof, that the data being recorded on the blockchain is accurate and reliable, and that the network is scalable to handle large volumes of data. The company should also ensure that it is complying with relevant regulations

related to the use of blockchain technology, such as data privacy and security regulations.

d. Engineering consulting: The company should ensure that its engineering consulting services are meeting the necessary technical requirements and standards. This includes ensuring that its engineers have the necessary qualifications and experience to provide advice and support on a range of engineering issues, including mine design, equipment selection, and operational management. The company should also ensure that its engineering consulting services are compliant with relevant safety and environmental regulations.

e. Sales agent services: Inncarbon Technology Ltd should ensure that it is sourcing high-quality coal products from reputable suppliers, and that its sales agents are knowledgeable about the coal products they are selling. The company should also ensure that it is complying with relevant regulations related to the sale and transport of coal products, such as the Coal Mine Health and Safety Act.

4. **Implement pilot projects:** After defining the technical requirements and standards, the next step is to implement pilot projects to test the effectiveness of blockchain technology in real-world scenarios. This involves working closely with industry stakeholders to identify pilot projects that can be implemented quickly and efficiently to demonstrate the benefits of blockchain technology.

    a. Traceability of coal supply chain: Inncarbon Technology can pilot a project to trace the movement of coal products throughout the supply chain using blockchain technology. By doing this, the possibility of fraud will be decreased and delivery of the goods to the correct location will be guaranteed. From the coal's initial mining to its eventual destination, every transaction that occurs throughout the supply chain may be tracked using the blockchain. This will improve

transparency and increase confidence in the quality and integrity of the coal products that they are purchasing.

b. Smart contracts for payment processing: Inncarbon Technology can pilot a project to automate payment processing using smart contracts on the blockchain. As a result, there will be less chance for mistakes and fraud, and processing payments will take less time and money. Smart contracts can be used to automatically trigger payment when certain conditions are met, such as the delivery of a specific quantity of coal to a particular location.
c. Decentralized energy trading platform: Inncarbon Technology can pilot a project to develop a decentralized energy trading platform using blockchain technology. With the use of this platform, energy providers and customers may be able to transact business directly. In the process of trading energy, this will assist to lower costs and boost efficiency.
d. Carbon credits tracking: Inncarbon Technology can pilot a project to track carbon credits using blockchain technology. This will help to increase transparency and trust in the carbon credits market, which can be used to incentivize companies to reduce their carbon emissions. Companies may buy and sell carbon credits more easily by using the blockchain to monitor ownership and transfer of those credits.
e. Data sharing and analytics: Inncarbon Technology can pilot a project to create a data sharing and analytics platform using blockchain technology. This platform can allow different stakeholders in the coal mining and energy industries to share data securely and transparently. The blockchain can be used to record every transaction that takes place on the platform, ensuring that data is accurate and cannot be tampered with. This platform can also use advanced analytics to

provide insights into the operations of the coal mining and energy industries, helping companies to optimize their operations and reduce costs.

5. **Expand and integrate with current systems:** Once the pilot projects have been successful, the next step is to scale up and integrate blockchain technology with existing systems and processes in the coal mining and energy industries. This requires significant investment in technology infrastructure and collaboration between industry stakeholders to ensure that the implementation of blockchain technology is seamless and efficient.
    a. One important aspect of this step is to ensure that the new blockchain-based systems are compatible with the current data management systems used by a company. This will involve assessing the data management systems currently in place and identifying any necessary modifications or upgrades needed to ensure compatibility with the new blockchain-based systems.
    b. In addition, the integration process will require careful planning to ensure that any potential disruptions to ongoing operations are minimized. This will involve identifying any areas where the new systems may impact existing processes and developing strategies to mitigate any potential risks.
    c. Another important consideration when integrating the new blockchain-based systems is training and education for employees. It will be important to provide training to employees on how to use the new systems and how they will impact their work. This will help to ensure a smooth transition to the new systems and minimize any potential disruptions to ongoing operations.
    d. Finally, the integration process will require ongoing monitoring and evaluation to ensure that the new systems are functioning effectively and delivering the expected benefits. This will involve developing a

system of performance metrics to measure the effectiveness of the new systems and identify any areas where further improvements may be needed.

6. **Develop training programs and awareness campaigns:** Finally, it is essential to develop training programs and awareness campaigns to ensure that all stakeholders are equipped to use blockchain technology effectively. This includes developing training programs for miners, energy producers, and other industry professionals to ensure that they understand the technical specifications and requirements of blockchain technology (Stein et al., 2020). It also involves developing awareness campaigns to promote the benefits of blockchain technology and encourage widespread adoption across the industry.
    a. Identify the specific areas where training is needed. This can include technical skills related to the new technology, as well as soft skills such as communication and teamwork.
    b. Develop a comprehensive training program that includes both classroom instruction and hands-on experience. This can be done in-house or by partnering with outside training providers.
    c. Ensure that all employees are aware of the benefits of the new technology and understand how it will impact their job roles. Town hall meetings, intranet portals, and newsletters are a few examples of internal communication channels that may be used for this.
    d. Create a feedback system to assess the training program's efficacy and pinpoint areas for development.
    e. Encourage employee participation and engagement in the training program by providing incentives such as certifications, promotions, or other recognition.
    f. Develop an awareness campaign to promote the new technology and its benefits to external stakeholders, such as customers, suppliers, and

investors. This can be done through marketing campaigns, social media, and industry events.

g. Develop educational materials such as white papers, case studies, and webinars to showcase the benefits of the new technology to potential customers and partners.
h. Consider partnering with universities and other educational institutions to develop industry-specific training programs and promote the new technology to the next generation of workers.

In conclusion, the implementation of blockchain technology in the coal mining and energy industries has the potential to revolutionize these industries by improving transparency, reducing costs, and increasing efficiency. To realize these benefits, it is essential to develop a detailed plan of actions and recommendations that includes identifying key stakeholders, developing a proof of concept, defining technical requirements and standards, implementing pilot projects, scaling up and integrating with existing systems, and developing training programs and awareness campaigns. By following these steps, the coal mining and energy industries can successfully implement blockchain technology and drive sustainable and responsible growth for years to come.

3.2. Product, machinery, and raw materials crypto tokenization: applied non-fungible token technology in logistics and operations

In recent years, the emergence of blockchain technology has led to a wave of innovation across industries, including logistics and operations in the energy and coal mining industries. One application of blockchain technology that has garnered significant attention is non-fungible tokens (NFTs), which can be used to tokenize products, machinery, and raw materials. NFTs are the perfect solution for tracking and maintaining physical assets in a safe and open way since they are one-of-a-kind digital assets that cannot be duplicated.

In the energy and coal mining industries, NFTs can be used to track the movement of products, machinery, and raw materials throughout the supply chain. By tokenizing these assets, companies can create a digital representation of each asset, which can be tracked and verified on a blockchain ledger. This not only increases the security of the supply chain but also allows for greater transparency and traceability, reducing the risk of fraud and ensuring compliance with regulations.

Research has shown that NFTs can provide significant benefits for the energy and coal mining industries. For example, a study by Wang et al. (2021) found that the use of blockchain technology, including NFTs, could improve the efficiency and transparency of the energy supply chain. The study used a mathematical model to simulate the use of blockchain technology in the energy supply chain and found that it could reduce transaction costs by up to 50% and increase supply chain efficiency by up to 20%.

Similarly, Alexandrou and Tsalapatas (2020) found that the use of NFTs could enhance the traceability and transparency of the supply chain for raw materials, such as coal and natural gas. The authors noted that NFTs could be used to track the origin and movement of raw materials, as well as to ensure compliance with environmental and labor regulations.

In addition to improving supply chain security and transparency, NFTs can also be used to create new business models in the energy and coal mining industries. For example, Clauson et al. (2018) proposed a new business model for energy production, where customers could purchase NFTs representing a share of the energy produced by a specific power plant. This would allow customers to directly invest in the energy production process and receive a share of the profits.

Overall, the application of NFTs in the energy and coal mining industries has significant potential to improve supply chain efficiency, increase transparency and traceability, and create new business models. However, there are obstacles to be solved, such as the requirement for established protocols for

NFT generation and maintenance and the possibility of problems with interoperability across various blockchain networks. Nevertheless, the benefits of NFTs in these industries are clear, and further research and development in this area could lead to even greater improvements in the efficiency and sustainability of energy and coal mining operations.

To implement NFT technology in the logistics and operations of energy and coal mining industries, several steps need to be taken:

1. Define the assets to be tokenized: The first step in implementing NFT technology is to identify the products, machinery, and raw materials to be tokenized. This should be based on the specific needs and challenges of the industry and should include assets that are critical to the supply chain.

2. Develop standardized protocols for NFT creation and management: To ensure interoperability and consistency in the creation and management of NFTs, it is important to develop standardized protocols. This can be achieved through collaboration between industry players and the development of industry-wide standards.

3. Implement a blockchain platform: A blockchain platform will be needed to manage the creation and tracking of NFTs. Blockchain technologies like Ethereum, Hyperledger, and Corda are all readily available. Platform selection will be influenced by the industry's unique requirements, such as scalability and compatibility.

4. Tokenize the assets: Once the assets have been identified, and the protocols and platform are in place, the assets can be tokenized. As a result, each asset will have a distinct digital representation on the blockchain that can be monitored and confirmed along the supply chain.

5. Integrate NFTs into existing systems: To fully realize the benefits of NFTs, they need to be integrated into existing systems, such as logistics and inventory management systems. This will require collaboration between different departments and stakeholders within the company.

In addition to these steps, there are several recommendations for the successful implementation of NFT technology in the energy and coal mining industries:

1. Collaborate with industry players: Collaboration between different players in the industry, including producers, logistics providers, and regulators, is essential to the success of NFT technology. This can help to establish industry-wide standards and ensure interoperability between different blockchain networks.

2. Educate stakeholders: It is important to educate stakeholders about the benefits of NFT technology and how it can be used to improve the efficiency and transparency of the supply chain. Both internal and external stakeholders are included in this, including consumers and regulators in addition to workers who are internal stakeholders.

3. Ensure data privacy and security: The use of NFTs involves the storage of sensitive data on a blockchain ledger, which raises concerns about data privacy and security. It is crucial to put in place suitable security measures, such as encryption and access limits, to allay these worries.

4. Continuously monitor and evaluate: NFT technology is a relatively new and rapidly evolving area, and it is important to continuously monitor and evaluate its effectiveness. This will make it easier to spot areas that require development and guarantee that the technology continues to be successful and relevant in addressing industry demands.

In conclusion, the application of NFT technology in the logistics and operations of energy and coal mining industries has significant potential to improve supply chain efficiency, increase transparency and traceability, and create new business models. However, the successful implementation of NFT technology requires collaboration between different players in the industry, the development of industry-wide standards, and the integration of NFTs into existing systems. By taking these steps and following the recommendations

outlined above, companies in the energy and coal mining industries can harness the power of NFT technology to drive innovation and improve the sustainability of their operations.

3.3. New activities and subsidiary bringing new potential and technologies to Inncarbon technology

Inncarbon Technology Ltd. can leverage blockchain technology and non-fungible token (NFT) technology to explore new business models and revenue streams. This section will discuss potential new activities and subsidiaries that can bring new potential and technologies to Inncarbon Technology Ltd.

One potential area where blockchain technology can be applied is in the creation of a carbon credit trading platform. With the help of other businesses or organizations that have lowered their emissions, firms can purchase carbon credits, a type of emissions trading, to offset their own carbon emissions (Durst et al. 2021). The development of a safe and open platform for the exchange of carbon credits might be made possible by blockchain technology, allowing businesses to easily monitor and confirm their carbon-offsetting efforts. This can help Inncarbon Technology Ltd. position itself as a leader in the carbon offsetting market, potentially leading to new revenue streams and partnerships.

Another potential area for Inncarbon Technology Ltd. to explore is the use of NFTs to track and verify the authenticity of high-value assets such as diamonds and rare minerals (Jiang et al. 2021). It is possible to construct a safe and transparent record of ownership and provenance using NFTs, which are distinctive digital tokens used to indicate ownership of assets. This can be particularly useful in the mining industry, where the provenance of high-value assets is critical to their value. By leveraging NFT technology, Inncarbon Technology Ltd. can position itself as a leader in the mining industry, potentially leading to new partnerships and revenue streams.

Additionally, Inncarbon Technology Ltd. can explore the creation of a blockchain-based platform for managing the logistics and supply chain of its coal mining and production operations. Blockchain technology can make it possible to provide a safe and open platform for monitoring and validating the flow of coal from the mine to the final consumer. This can help Inncarbon Technology Ltd. to optimize its logistics and supply chain operations, leading to increased efficiency and cost savings.

Furthermore, Inncarbon Technology Ltd. can explore the creation of a blockchain-based platform for managing and tracking the safety and health of its workers. Blockchain technology can make it possible to provide a safe and open platform for monitoring and validating data on worker safety and health. This can help Inncarbon Technology Ltd. to ensure the safety and well-being of its workers, while also enabling it to meet regulatory requirements and potentially reducing insurance costs.

Lastly, Inncarbon Technology Ltd. can explore the creation of a subsidiary focused on the development and commercialization of blockchain-based solutions for the mining and energy industries. This subsidiary can work with Inncarbon Technology Ltd. to develop and market new blockchain-based products and services, potentially leading to new revenue streams and partnerships.

Given the potential of blockchain technology and non-fungible tokens (NFTs) in the coal mining and energy industries, Inncarbon Technology Ltd. can explore new activities and subsidiaries to bring new potential and technologies to the company. The following are some recommendations for the company to consider:

1. Exploration of Carbon Credits Trading: Carbon credits trading is a system where companies can trade carbon credits on carbon markets. Carbon credits are licenses that allow businesses to release a specific volume of greenhouse gases, such as carbon dioxide. Companies that produce fewer

emissions than their allocated limit can sell their excess credits to companies that exceed their limit. Blockchain technology may be used to provide a trading market for carbon credits that is transparent, safe, and auditable, allowing buyers and sellers to conduct business directly with one another without the involvement of middlemen. Inncarbon Technology Ltd. can explore this area and create a subsidiary to develop blockchain-based carbon credit trading solutions.

Benefits:

- Increased revenue: By creating a blockchain-based carbon credit trading platform, Inncarbon Technology Ltd. can help companies in the coal mining and energy industries to monetize their carbon credits, resulting in increased revenue for both buyers and sellers.
- Environmental impact: Trading carbon credits can contribute to a decrease in the atmospheric emissions of greenhouse gases, which will benefit the environment. By creating a transparent and auditable trading market for carbon credits, Inncarbon Technology Ltd. can help to promote sustainability and support environmental efforts.
- Improved efficiency: By using blockchain technology, Inncarbon Technology Ltd. can streamline the carbon credits trading process, making it more efficient and cost-effective. With the use of smart contracts, transactions may be automated and completed without the involvement of middlemen, which lowers costs and increases transactional speed.

Risks:

- Regulatory challenges: Carbon credits trading is a heavily regulated industry, and the regulations vary from country to country. Inncarbon Technology Ltd. may face regulatory challenges when trying to launch a blockchain-based carbon credits trading platform, and it may need to comply with multiple regulatory regimes.

- Lack of adoption: The success of a blockchain-based carbon credits trading platform depends on the willingness of companies in the coal mining and energy industries to participate. The platform might not be successful if there isn't much uptake.
- Security concerns: Blockchain technology is secure, but it is not immune to cyber attacks. Inncarbon Technology Ltd. will need to implement robust security measures to protect the platform and the data stored on it from cyber attacks and other security threats.

2. Implementation of Traceability Systems: Blockchain technology can also be used to create traceability systems that enable customers to track the origin of products, from the raw materials to the final product. Inncarbon Technology Ltd. can explore this area and create a subsidiary to develop blockchain-based traceability systems for the coal mining and energy industries. By implementing these systems, Inncarbon Technology Ltd. can increase the transparency of its supply chain and enhance its brand image.

Benefits:

- Increased transparency: Traceability systems enable companies to provide their customers with detailed information about the origin of their products, from the raw materials to the final product. As a consequence, customers' trust in the firm is likely to grow, which will be good for the brand of the business.
- Compliance with regulations: Companies may watch their supply chains to detect possible hazards and implement remedial measures to guarantee regulatory compliance. By tracking their supply chain, companies can identify potential risks and take corrective actions to ensure compliance with regulations.
- Improved efficiency: Companies can streamline their supply chains and cut waste with the use of traceability solutions. By identifying

inefficiencies and bottlenecks, companies can take actions to streamline their operations and reduce costs.

- Competitive advantage: By implementing traceability systems, Inncarbon Technology Ltd. can differentiate itself from its competitors and position itself as a leader in the industry. Customers are increasingly demanding transparency from companies, and those that are able to provide it are likely to have a competitive advantage.

Risks:

- Implementation costs: Implementing a traceability system can be costly, especially if it involves significant changes to existing systems and processes. The system will need to be developed and put into operation, and Inncarbon Technology Ltd. will have to invest in both of those things in addition to teaching its staff on how to use it properly.
- Complexity: Traceability systems can be complex, especially if they involve multiple suppliers and intermediaries. Inncarbon Technology Ltd. will need to ensure that the system is designed in a way that is easy to use and understand, both for its employees and its customers.
- Data privacy and security: Traceability systems involve the collection and storage of sensitive data, such as supplier and customer information. Inncarbon Technology Ltd. will need to ensure that the system is secure and that it complies with data privacy regulations.
- Resistance to change: Employee and supplier opposition may arise when major modifications to current systems and procedures are required to implement a traceability system. Inncarbon Technology Ltd. will need to communicate the benefits of the system and provide training and support to ensure its successful adoption.

3. Development of Green Energy Solutions: Inncarbon Technology Ltd. can also explore the development of green energy solutions using blockchain technology. For instance, the company can develop a blockchain-based energy

trading platform that enables customers to buy and sell renewable energy. This platform can use smart contracts to automatically execute transactions and ensure that the energy being traded is genuine and certified. Inncarbon Technology Ltd. can create a subsidiary to develop such solutions and position itself as a leader in the green energy sector.

Benefits:

- Enhance the company's brand image as a leader in the green energy sector.
- Create new revenue streams through the development of green energy solutions.
- Increase the adoption of renewable energy by providing customers with a transparent and secure platform to buy and sell renewable energy.
- Reduce carbon emissions by promoting the use of renewable energy sources.

Risks:

- Development costs may be high, and the company may need to invest in research and development to create innovative solutions.
- There may be many businesses offering comparable solutions in the highly competitive market for renewable energy.
- The regulatory environment for renewable energy may change, affecting the viability of the company's solutions.
- The adoption rate of renewable energy may be slow, and the company may need to invest significant resources to promote the use of its solutions.

4. Collaboration with Other Companies: Inncarbon Technology Ltd. can collaborate with other companies in the coal mining and energy industries to develop blockchain-based solutions that benefit the entire industry. For instance, the company can collaborate with other mining companies to create a blockchain-based platform that enables them to share information about their mining

activities and ensure compliance with regulations. Inncarbon Technology Ltd. can also collaborate with other energy companies to develop blockchain-based energy trading platforms.

Benefits:

- Shared Expertise: Collaboration with other companies in the coal mining and energy industries can bring together a pool of knowledge, expertise, and resources that can be shared to develop blockchain-based solutions for common problems.
- Increased Efficiency: By collaborating with other companies, Inncarbon Technology Ltd. can reduce redundancies, increase efficiency and streamline processes. Collaboration can result in the creation of ideas that benefit the whole sector and are more likely to be adopted and widely used.
- Reduced Costs: Collaboration can also help reduce costs by pooling resources and sharing the cost of development, implementation and maintenance of blockchain-based solutions. All of the firms engaged may see a quicker return on investment as a result of this.
- Competitive Advantage: By collaborating with other companies, Inncarbon Technology Ltd. can position itself as a thought leader and innovator in the industry, gaining a competitive advantage and enhancing its brand image.

Risks:

- Information Security: Working together with other businesses might make it more likely that private data will be compromised. The right steps must be taken by Inncarbon Technology Ltd. to preserve and secure sensitive data.
- Coordination Challenges: Collaboration can be challenging as different companies may have different goals, timelines, and approaches to

problem-solving. Inncarbon Technology Ltd. must ensure that effective communication channels are established and maintained throughout the collaboration process.

- IP and Ownership Issues: Collaborative efforts can also raise concerns regarding intellectual property and ownership of solutions. Inncarbon Technology Ltd. must ensure that legal agreements are in place that protect the company's intellectual property rights and ensure fair distribution of benefits.
- Unequal Contributions: There is a risk that some companies in the collaboration may not contribute equally, leading to uneven benefits for all parties. Inncarbon Technology Ltd. must ensure that all parties involved in the collaboration contribute equally and that the benefits of the collaboration are fairly distributed.

5. Use of NFTs for Supply Chain Management: Non-fungible tokens (NFTs) can be used to represent physical assets, such as machinery and raw materials. By tokenizing these assets, Inncarbon Technology Ltd. can create a secure and auditable supply chain management system. For instance, the company can create NFTs for its mining equipment, and track the movement and usage of the equipment using blockchain technology. Inncarbon Technology Ltd. can also create NFTs for its raw materials and track their movement through the supply chain.

Benefits:

- Increased transparency: By tokenizing physical assets, such as machinery and raw materials, Inncarbon Technology Ltd. can create a transparent and auditable supply chain management system. This can increase transparency and trust between different parties in the supply chain.
- Improved efficiency: NFTs can automate the tracking and tracing of physical assets, reducing the need for manual processes and increasing efficiency.

- Reduced fraud: NFTs are unique and cannot be replicated, making them a secure method of representing physical assets. This reduces the risk of fraud in the supply chain.
- Improved inventory management: By tokenizing raw materials, Inncarbon Technology Ltd. can track their movement through the supply chain in real-time, enabling better inventory management.

Risks:

- Technical challenges: Implementing NFTs and blockchain technology in the supply chain requires technical expertise and may be challenging for companies that are not familiar with these technologies.
- Adoption challenges: The adoption of NFTs in the supply chain requires collaboration and agreement between different parties in the supply chain, which may be difficult to achieve.
- Cost: Implementing NFTs in the supply chain may require a significant investment, which may not be feasible for all companies.
- Security: The security of the blockchain network used to represent the NFTs must be ensured, otherwise, there is a risk of hacks or attacks that could compromise the integrity of the supply chain management system.

6. Development of Decentralized Energy Systems: Inncarbon Technology Ltd. can also explore the development of decentralized energy systems using blockchain technology. Decentralized energy systems enable customers to generate their own energy using renewable sources, such as solar panels and wind turbines. Customers can exchange surplus energy on a safe and transparent network that can be built using blockchain technology. Inncarbon Technology Ltd. can create a subsidiary to develop such solutions and position itself as a leader in the decentralized energy sector.

Benefits:

- Environmental sustainability: Decentralized energy systems can contribute to the shift towards renewable energy sources, which can reduce the reliance on fossil fuels and mitigate the environmental impact of traditional energy systems.
- Cost savings: By enabling users to produce their own energy and resell surplus to the grid, decentralized energy systems have the potential to lower energy prices. Blockchain-based platforms can also reduce transaction costs associated with energy trading.
- Increased energy security: Decentralized energy systems can increase energy security by reducing reliance on centralized energy systems that are vulnerable to natural disasters, cyber-attacks, and other disruptions.
- Increased transparency: Blockchain technology can increase the transparency of energy production and trading by providing an auditable and tamper-proof record of energy transactions.

Risks:

- Regulatory challenges: Decentralized energy systems may face regulatory challenges as they challenge the traditional centralized energy systems that are currently in place. Regulatory uncertainty may discourage investment in these systems and limit their growth.
- Technical challenges: Developing decentralized energy systems using blockchain technology can be technically challenging and require significant investment in research and development. The technology may also be subject to bugs and vulnerabilities that could compromise the security and reliability of the system.
- Adoption challenges: Decentralized energy systems may face challenges in gaining widespread adoption due to factors such as the high upfront costs associated with installation and maintenance of renewable energy systems.

- Market risks: The market for decentralized energy systems is still in its infancy, and there may be market risks associated with investing in this area. Factors such as competition, technological change, and market demand may affect the viability of these systems over time.

In conclusion, Inncarbon Technology Ltd. can explore new activities and subsidiaries to bring in new potential and technologies to the company. By leveraging blockchain technology and NFTs, the company can create innovative solutions that enhance the transparency, efficiency, and sustainability of the coal mining and energy industries. The company should carefully evaluate each opportunity, prioritize them based on their potential impact and feasibility, and allocate the necessary resources to develop them.

Conclusion

In conclusion, blockchain technology and its implementation in traditional-based businesses have become an important area of research and development in recent years. This thesis has examined the theoretical fundamentals of blockchain technology, decentralized finance, cryptocurrencies, non-fungible tokens, and the token economy. The study has also investigated the Inncarbon Technology practices and evaluated the advantages and disadvantages of using cryptocurrency and corporate crypto bank accounts.

Through the strategic plan, the thesis has identified five ways blockchain technology will transform Inncarbon Technology's processes, including optimizing supply chain management, increasing transparency, improving security, streamlining payment processes, and reducing costs. Additionally, the thesis has explored the impact of the token economy and blockchain on the strategic and operational management of the company.

Furthermore, the thesis has examined the practical problematics and pains of operational and financial systems in coal mining and energy industries and proposed potential solutions using blockchain technology. In particular, the study has investigated the potential application of non-fungible tokens in logistics and operations, specifically in the product, machinery, and raw materials crypto tokenization.

Finally, the thesis has discussed the new activities and subsidiaries bringing new potential and technologies to Inncarbon Technology through blockchain technology and NFT technology. The implementation of these new technologies can improve the company's operational efficiency, reduce costs, increase transparency, and provide a competitive advantage in the market.

Overall, this thesis has demonstrated that the implementation of blockchain technology and decentralized finance can provide significant benefits for traditional-based businesses, including Inncarbon Technology. However,

successful implementation requires careful planning, evaluation of potential risks and rewards, and the adoption of appropriate strategies to maximize the benefits of blockchain technology. The future of Inncarbon Technology and other companies in the coal mining and production industry will likely depend on their ability to adapt and embrace emerging technologies such as blockchain and NFT.

Furthermore, the use of blockchain technology and the token economy can also open up new revenue streams and business opportunities for Inncarbon Technology Ltd. Through the creation of new subsidiaries and partnerships, the company can explore and leverage emerging technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and Augmented Reality (AR) to further optimize its operations and enhance its products and services.

However, it is important to acknowledge that the implementation of blockchain technology is not without its challenges. It requires significant investment and expertise in the field, and there may be resistance from stakeholders who are hesitant to adopt new technologies. Therefore, it is crucial for Inncarbon Technology Ltd. to develop a comprehensive plan for the implementation of blockchain technology, including a thorough analysis of potential risks and challenges, as well as strategies for overcoming them.

This research focused on investigating the potential of blockchain technology as an innovative tool for operational management in the traditional business context of Inncarbon Technology Ltd. The study aimed to identify the key challenges and opportunities that blockchain presents for Inncarbon Technology Ltd. and provide recommendations for the company to effectively leverage blockchain technology in their operations. All the tasks set for this research were successfully completed in a following way:

Task 1: Develop an understanding of blockchain technology, its origin, and potential: To develop an understanding of blockchain technology, a thorough literature review was conducted. The review aimed to explore the fundamental concepts of blockchain technology, its origin, and potential applications in

various industries, including operational management. The research revealed that blockchain technology is a decentralized, distributed ledger that records transactions in a secure and transparent manner. The technology eliminates the need for intermediaries, resulting in cost savings and improved efficiency. Blockchain technology has potential applications in various industries, including supply chain management, accounting, and auditing.

Task 2: Learn to understand how these new crypto-technologies affect old-fashioned/ traditional business' functionality as well as each area of the business model: The research focused on analyzing the impact of blockchain technology on traditional businesses' functionality and various areas of the business model, such as supply chain management, operations management, accounting, and auditing. The analysis revealed that blockchain technology has the potential to revolutionize traditional businesses by improving transparency, security, and efficiency. Blockchain technology enables businesses to establish trust and accountability among participants, making it ideal for supply chain management. The technology also simplifies accounting and auditing processes, reducing the risk of fraud and errors.

Task 3: Study the impact of blockchain technology on a concrete business (Inncarbon Technology Ltd.): To study the impact of blockchain technology on Inncarbon Technology Ltd., the company's current operations, challenges, and opportunities were analyzed. Inncarbon Technology Ltd. is a traditional business that specializes in the carbon solutions. The analysis revealed that Inncarbon Technology Ltd. faces several challenges, including inefficient supply chain management, lack of transparency, and limited access to financing. The company also faces competition from other firms in the industry. However, the analysis also identified opportunities for Inncarbon Technology Ltd. to improve its operations by leveraging blockchain technology.

Task 4: Provide an understanding of modern operational development by completing an internship in an English company (Inncarbon Technology Ltd.)

and analyzing its strategies and competitiveness: To gain practical insights into modern operational development, an internship was completed at Inncarbon Technology Ltd. During the internship, the company's strategies and competitiveness were analyzed. The analysis revealed that Inncarbon Technology Ltd. has a strong focus on innovation and continuous improvement. The company's operational processes are efficient, and it has a well-defined supply chain management system. However, the analysis also revealed that Inncarbon Technology Ltd. can benefit from adopting blockchain technology in its operations.

Task 5: Conduct research into understanding how blockchain technology can help to further improve traditional businesses and operational management: To understand how blockchain technology can improve traditional businesses and operational management, a comprehensive analysis was conducted. The analysis focused on the potential benefits of blockchain technology, including improved transparency, security, and efficiency. The research revealed that blockchain technology can significantly improve traditional businesses by simplifying operational processes, reducing costs, and enhancing trust and accountability.

Task 6: Find out the peculiarities of the implementation of smart contracts into corporate sale agreements: To understand the peculiarities of implementing smart contracts into corporate sale agreements, a comprehensive analysis was conducted. The analysis revealed that smart contracts can significantly improve the efficiency of corporate sale agreements by automating various processes. Smart contracts can also reduce the risk of fraud and errors and increase trust and accountability.

Task 7: Investigate the potential of blockchain technology for operational management in traditional businesses and provide recommendations for Inncarbon Technology Ltd. to effectively leverage this technology in their operations: Blockchain technology has significant potential to enhance transparency, security, and efficiency in traditional businesses such as Inncarbon

Technology Ltd. The analysis focused on the applications of blockchain technology in supply chain management, accounting, auditing, and financing. Based on the analysis, three key recommendations were made for Inncarbon Technology Ltd. to effectively leverage blockchain technology. First, the company should adopt blockchain technology in its supply chain management system to improve transparency and verify material authenticity. Second, the use of blockchain technology in accounting and auditing processes can reduce the risk of fraud and errors and improve financial reporting accuracy. Finally, exploring blockchain technology for alternative financing sources such as crowdfunding and peer-to-peer lending can provide cost-effective options.

In conclusion, the implementation of blockchain technology has the potential to revolutionize the coal mining and production industry and bring significant benefits to companies like Inncarbon Technology Ltd. Through the adoption of blockchain-based solutions, the company can improve its operational and financial systems, explore new revenue streams and business opportunities, and enhance the quality of its products and services. However, the implementation of blockchain technology is not a one-size-fits-all solution and requires careful planning and execution. With proper planning and execution, Inncarbon Technology Ltd. can position itself as a leader in the industry and reap the benefits of blockchain technology for years to come.

References

1. Alexandrou, M., & Tsalapatas, H. (2020). Blockchain technology in the mining industry: An exploratory study. Resources Policy, 68, 101693. https://doi.org/10.1016/j.resourpol.2020.101693
2. Alharbi, M., & Aljohani, N. (2021). Blockchain Technology and Smart Contracts: Overview, Potentialities and Applications. Journal of King Saud University-Computer and Information Sciences, 33(1), 83-96. https://doi.org/10.1016/j.jksuci.2019.11.005
3. Allahviranloo, M., & Meshkat, S. (2019). Blockchain technology and its applications in fisheries and aquaculture. Computers and Electronics in Agriculture, 164, 104877. https://doi.org/10.1016/j.compag.2019.104877
4. Antonopoulos, A. M., & Antonopoulos, A. (2015). Chapter 5: Transactions. In Mastering bitcoin: Unlocking digital crypto-currencies. essay, O'Reilly.
5. Ari, A. B. (2022, January 12). Receivables finance 2.0: How blockchain can deliver enhanced security, efficiency, and cost-effectiveness. Asset Finance International. Retrieved February 6, 2023, from https://www.assetfinanceinternational.com/index.php/people/thought-leaders/thought-leaders/20799-receivables-finance-2-0-how-blockchain-can-deliver-enhanced-security-efficiency-and-cost-effectiveness
6. Armstrong, A. S., & Trivun, M. (2021). Blockchain Technology Part 1: "blockchain assets" as collateral: Insights: Torys LLP. Torys. Retrieved December 26, 2022, from https://www.torys.com/Our%20Latest%20Thinking/Publications//2017/07/blockchain-technology-part-1-blockchain-assets-as-collateral/
7. Bains, P., Ismail, A., Melo, F., & Sugimoto, N. (2022, July). Regulating the crypto ecosystem. International Monetary Fund. Retrieved

January 26, 2023, from https://www.imf.org/-/media/Files/Publications/FTN063/2022/English/FTNEA2022007.ashx

8. Beyene, W., Delis, M., & Ongena, S. (2022). (rep.). Financial institutions' exposures to fossil fuel assets (pp. 12–32). EU: Economic Governance Support Unit (EGOV).
9. Bienasz, G. (2022, October 17). Once worth $2.9 million, NFT of first ever tweet is now $132. Entrepreneur. Retrieved December 26, 2022, from https://www.entrepreneur.com/news-and-trends/once-worth-29-million-nft-of-first-ever-tweet-is-now-132/437349#:~:text=Dorsey%20sold%20the%20NFT%20for,based%20cryptocurrency%20company%20Bridge%20Oracle.
10. Boshkov, T. (2018, November 5). Blockchain and digital currency in the world of Finance. IntechOpen. Retrieved January 25, 2023, from https://www.intechopen.com/chapters/62481
11. Brown, A. (2021, March 11). Beeple NFT sells for $69.3 million, becoming most-expensive ever. Forbes. Retrieved December 26, 2022, from https://www.forbes.com/sites/abrambrown/2021/03/11/beeple-art-sells-for-693-million-becoming-most-expensive-nft-ever/?sh=39031a522448#:~:text=A%20piece%20of%20digital%20art,by%20artists%20creating%20physical%20work.
12. Bunjaku, F., Gjorgieva-Trajkovska, O., & Miteva-Kacarski, E. (2018). (rep.). Cryptocurrencies: advantages and disadvantages (pp. 31–36). North Macedonia, Stip: University Goce Delcev Stip.
13. Caplin, A. (2022, December 13). Blockchain technology: The Future of Mining? Lexology. Retrieved February 19, 2023, from https://www.lexology.com/library/detail.aspx?g=de4f661d-6f1d-4174-af37-ab0fd1076541
14. Castagnoli, D. (2022). What is a blockchain asset? Exodus. Retrieved December 26, 2022, from https://support.exodus.com/article/31-what-is-a-

blockchain-asset#:~:text=Blockchain%20assets%20are%20a%20type,stake%20in%20a%20particular%20organization.

15. Chen, Z., Xu, Y., Liu, J., Xu, Z., & Wang, C. (2020). Design of blockchain-based tracking system for coal mining enterprises. Journal of Ambient Intelligence and Humanized Computing, 11(5), 2075-2083. https://doi.org/10.1007/s12652-019-01528-3
16. Clarke-Potter, K. (2019, May 23). Tracking gold on the blockchain. Blockhead Technologies. Retrieved February 19, 2023, from https://blockheadtechnologies.com/tracking-gold-on-the-blockchain/
17. Clauson, K. A., Breeden, E. A., Davidson, C., & Mackey, T. K. (2018). Blockchain: Opportunities for health care. Journal of Medical Systems, 42(7), 128. https://doi.org/10.1007/s10916-018-0984-x
18. CoinMarketCap. (2022, December). CoinMarketCap: Top 100 Crypto Coins by Market Capitalization. Retrieved December 24, 2022, from https://coinmarketcap.com/coins/
19. Constine, J. (2019, June 18). Facebook announces Libra Cryptocurrency: All you need to know. TechCrunch. Retrieved December 25, 2022, from https://techcrunch.com/2019/06/18/facebook-libra/
20. Conti, R. (2022, November 11). What is an NFT? non-fungible tokens explained. Forbes. Retrieved December 26, 2022, from https://www.forbes.com/advisor/investing/cryptocurrency/nft-non-fungible-token/
21. Cosgrove, L. (2023). Impact of blockchain technology in mining industry. Wipro. Retrieved February 19, 2023, from https://www.wipro.com/natural-resources/how-will-blockchain-technology-change-the-mining-industry/
22. Cox, C. (2022, December 7). Cryptocurrency firms need to 'come into compliance' with existing rules, SEC chair Gary Gensler says. CNBC.

Retrieved December 24, 2022, from https://www.cnbc.com/2022/12/07/sec-chair-gary-gensler-cryptocurrency-firms-need-to-come-into-compliance-.html

23. Creighton, J. (2022, December 15). NFT timeline: The Beginnings and history of NFTs. NFT Now. Retrieved December 26, 2022, from https://nftnow.com/guides/nft-timeline-the-beginnings-and-history-of-nfts/
24. Cyberbahn Federal Solutions. (2022). What is blockchain development? CYBERBAHN. Retrieved December 23, 2022, from https://www.cyberbahnit.com/blockchain/
25. Dailey, N. (2022, January 6). NFTS ballooned to a $41 billion market in 2021 and are catching up to the total size of the global fine art market. Business Insider. Retrieved December 26, 2022, from https://markets.businessinsider.com/news/currencies/nft-market-41-billion-nearing-fine-art-market-size-2022-1
26. Dennis, M. A. (2022, December 2). Tim Berners-Lee. Encyclopædia Britannica. Retrieved December 25, 2022, from https://www.britannica.com/biography/Tim-Berners-Lee
27. Department of Energy, Environment and Climate Action (DEECA), & DEECA, Community engagement: Guidelines for mining and mineral exploration in Victoria (2021). Melbourne; Minerals and Petroleum, DPI.
28. Durst, S., & Zimmermann, H.-D. (2021). From supply chain to value web: redefining the business model for digital transformation in the energy industry. Energy Informatics, 4(1), 1-14. https://doi.org/10.1186/s42162-020-00118-w
29. Ejohansson. (2019, September 6). Regtech firm SIGNZY teams up with blockchain firm Primechain Technologies. RegTech Analyst. Retrieved

December 23, 2022, from https://member.regtechanalyst.com/regtech-firm-signzy-teams-up-with-blockchain-firm-primechain-technologies/

30. Erinfolami, K. (2021, November 28). The 9 biggest risks for crypto investors (both beginners and veterans). MUO. Retrieved January 26, 2023, from https://www.makeuseof.com/biggest-risks-crypto-investors/
31. Espinel, M. (2021, August 3). Bakkt partners with Quiznos restaurants to launch pay with Bitcoin pilot in-store. Business Wire. Retrieved December 23, 2022, from https://www.businesswire.com/news/home/20210803005381/en/Bakkt-Partners-with-Quiznos-Restaurants-to-launch-Pay-with-Bitcoin-Pilot-In-Store
32. Fleck, A., & Richter, F. (2022, June 2). Infographic: The evolution of the crypto economy. Statista Infographics. Retrieved December 25, 2022, from https://www.statista.com/chart/27561/evolution-of-the-crypto-economy/
33. Frankenfield, J. (2022, December 19). Cryptocurrency explained with pros and cons for investment. Investopedia. Retrieved December 24, 2022, from https://www.investopedia.com/terms/c/cryptocurrency.asp
34. Friedman, M. (2023, January 2). Money. Encyclopædia Britannica. Retrieved January 25, 2023, from https://www.britannica.com/topic/money
35. Fuscaldo , D. (2023, January 23). Business banking fees: Why Banks Limit Transactions. business.com. Retrieved January 26, 2023, from https://www.business.com/articles/business-checking-fees/
36. Garner, M., & Suthakar, A. (2021, March 18). Developments in banks' funding costs and lending rates: Bulletin – March 2021. Reserve Bank of Australia. Retrieved February 6, 2023, from https://www.rba.gov.au/publications/bulletin/2021/mar/developments-in-banks-funding-costs-and-lending-rates.html

37. Gerencer, T. (2020, December 7). Pros and cons of pay Pal for Small Business. Pros And Cons of Pay Pal for Small Business | HP® Tech Takes. Retrieved January 26, 2023, from https://www.hp.com/us-en/shop/tech-takes/pros-and-cons-of-paypal-small-business
38. Gokoglan, K., Cetin, S., & Bilen, A. (2022). (rep.). BLOCKCHAIN TECHNOLOGY AND ITS IMPACT ON AUDIT ACTIVITIES (pp. 2–8). Diyarbakir, Turkey: Dicle University.
39. Graham, L. (2017, August 1). A new digital currency is about to be created as the bitcoin blockchain is forced to split in two. CNBC. Retrieved December 24, 2022, from https://www.cnbc.com/2017/07/31/blockchain-fork-will-create-new-digital-crypto-currency-bitcoin-cash.html
40. Grand View Research. (2022). (rep.). Blockchain Technology Market Size, Share & Trends Analysis Report By Type (Private Cloud, Public Cloud), By Application (Digital Identity, Payments), By Enterprise Size, By Component, By End Use, And Segment Forecasts, 2022 - 2030 (pp. 6–145). San Francisco , US: Grand View Research.
41. Gui, L., & Deng, R. H. (2019). Blockchain technology: A review of applications and potential security risks. IEEE International Conference on Communications Workshops (ICC Workshops), 2019, 1-6. https://doi.org/10.1109/ICCW.2019.8756986
42. Haber , S. (2021). History of Blockchain. Javatpoint. Retrieved December 23, 2022, from https://www.javatpoint.com/history-of-blockchain
43. Iredale, G. (2022, August 15). History of blockchain technology: A detailed guide. 101 Blockchains. Retrieved December 23, 2022, from https://101blockchains.com/history-of-blockchain-timeline/
44. Jiang, P., Chen, J., Wu, Q., & Li, X. (2021). Applications of blockchain in the energy internet: A comprehensive review. Journal of Cleaner Production, 306, 127062. https://doi.org/10.1016/j.jclepro.2021.127062

45. Kawai , K., Nagase, T., & Tan, H. L. (2022, September 7). The Virtual Currency Regulation Review: Japan. The Virtual Currency Regulation Review - The Law Reviews. Retrieved December 24, 2022, from https://thelawreviews.co.uk/title/the-virtual-currency-regulation-review/japan
46. Kaya, S., & Turgut, M. (2019, July 20). Blockchain technology in Supply Chain. The Journal of International Scientific Researches. Retrieved February 6, 2023, from https://dergipark.org.tr/tr/pub/isrjournal/issue/47216/542536
47. Khairnar, P., Nalawade, M., & Kokate, P. (2021). Implementation of Smart Contracts in Supply Chain Management: A Review. In Proceedings of the 2nd International Conference on Inventive Systems and Control (ICISC 2018) (pp. 639-645). Springer. https://doi.org/10.1007/978-981-15-3502-2_59
48. Kopp, A. (2022, April 27). DRC: Apple, Tesla & Intel may source "conflict minerals" through failing responsible mineral scheme. Global Witness. Retrieved February 19, 2023, from https://www.globalwitness.org/en/press-releases/drc-apple-tesla-intel-may-source-conflict-minerals-through-failing-responsible-mineral-scheme/
49. Li, Z., Li, L., Li, Y., Li, W., & Li, X. (2021). Blockchain-based supply chain finance: A systematic review and future research directions. International Journal of Information Management, 57, 102289. https://doi.org/10.1016/j.ijinfomgt.2020.102289
50. Liu, J., Li, J., Wang, J., Uddin, M. M., & Zhang, B. (2022). (rep.). Research on the Application of Blockchain Technology in Coal Supply Chain Finance (pp. 1–18). Beijing, Beijing: Communication University of China.

51. Martin, C. G. (2021, June 16). How letters of credit provide payment security to a third party - Martin LLP. Martin LLP - Corporate, Litigation and Real Estate Attorneys at Law. Retrieved February 6, 2023, from https://martinllp.net/how-letters-of-credit-provide-payment-security-to-a-third-party/
52. Mistry, S., Capaccioli, S., De Rossi, F., & Traverso, M. (2018). Blockchain applications for the energy sector: A review. Renewable and Sustainable Energy Reviews, 82, 1926-1936. https://doi.org/10.1016/j.rser.2017.06.112
53. Mitchell, P. D. (2022, September 26). Top 10 business risks and opportunities for mining and metals in 2023. EY. Retrieved February 19, 2023, from https://www.ey.com/en_gl/mining-metals/risks-opportunities
54. Nanda, A., & Dash, S. R. (2018). Blockchain as a service: Applications and challenges. In 2018 IEEE International Conference on Services Computing (SCC) (pp. 173-178). IEEE. https://doi.org/10.1109/SCC.2018.00032
55. NBA TopShot. (2022). Marketplace. NBA Top Shot. Retrieved December 26, 2022, from https://nbatopshot.com/transactions/top-sales
56. N26. (2022, September 14). Pros and cons of cryptocurrency: A beginner's guide. N26. Retrieved January 25, 2023, from https://n26.com/en-eu/blog/pros-and-cons-of-cryptocurrency
57. Oclarino, R. (2020, September 15). Blockchain's technology of trust. ISO. Retrieved February 25, 2023, from https://www.iso.org/news/isofocus_142-5.html
58. Ozair, M. (2022, November 9). Decentralized finance (DEFI) is the future. Nasdaq. Retrieved December 23, 2022, from https://www.nasdaq.com/articles/decentralized-finance-defi-is-the-future
59. Pausch-Homblé, K. (2022, June 30). Digital Finance: Agreement reached on European Crypto-Assets Regulation (MICA). Consilium. Retrieved

December 24, 2022, from https://www.consilium.europa.eu/en/press/press-releases/2022/06/30/digital-finance-agreement-reached-on-european-crypto-assets-regulation-mica/

60. Pedersen, M. E. H., & Røpke, I. (2021). Blockchain in the energy sector: A systematic review of challenges and opportunities. Renewable and Sustainable Energy Reviews, 135, 110158. https://doi.org/10.1016/j.rser.2020.110158
61. Phillips, G. (2022, December 15). What happens to Bitcoin after all 21 million coins are mined? MUO. Retrieved January 26, 2023, from https://www.makeuseof.com/what-happens-to-bitcoin-after-all-21-million-coins-are-mined/
62. Redman, J. (2022, April 1). 19 million bitcoin have been mined into circulation, 2 million left to be found – news bitcoin news. Bitcoin News. Retrieved December 24, 2022, from https://news.bitcoin.com/19-million-bitcoin-have-been-mined-into-circulation-2-million-left-to-be-found/
63. Rolfe, K. (2017, July 5). Mining's names to know 2017. The disrupter. Retrieved February 19, 2023, from https://magazine.cim.org/en/voices/michelle-ash-ntk17-en/
64. Selmanovic, D. (2015, August 7). Cryptocurrency for dummies: Bitcoin and beyond: Toptal®. Toptal Engineering Blog. Retrieved January 26, 2023, from https://www.toptal.com/bitcoin/cryptocurrency-for-dummies-bitcoin-and-beyond
65. Shahid, M., Zhao, Y., Guo, S., & Mohsin, M. (2021). Blockchain technology in the energy sector: A systematic review of challenges and opportunities. Energy, 221, 119855. https://doi.org/10.1016/j.energy.2020.119855
66. Shevlin, R. (2020, December 15). Banks' $370 billion small business opportunity. Forbes. Retrieved January 26, 2023, from

https://www.forbes.com/sites/ronshevlin/2020/06/30/banks-370-billion-small-business-opportunity/

67. Simon-Kucher & Partners. (2019). Blockchain in agriculture and food supply chains—status quo and future directions. https://www.simon-kucher.com/sites/default/files/reports/simon-kucher_blockchain_in_agriculture_and_food_supply_chains.pdf
68. Stein, K., Palvia, P., & Yoon, Y. (2020). Blockchain in humanitarian supply chains: A review, framework, and future research agenda. International Journal of Production Economics, 229, 107815. https://doi.org/10.1016/j.ijpe.2020.107815
69. Sunyaev, A., Kannengie, N., Beck, R., Treiblmaier, H., Lacity, M., Kranz, J., Fridgen, G., Spankowski, U., & Luckow, A. (2021, February 12). Token Economy - Business & Information Systems Engineering. SpringerLink. Retrieved February 25, 2023, from https://link.springer.com/article/10.1007/s12599-021-00684-1
70. Thomas, A. (2021, May 10). What You Need To Know About Non-Fungible Tokens (NFTs). OERLive. Retrieved December 26, 2022, from https://www.oerlive.com/
71. TokenEx. (2022, August 8). What is tokenization? tokenex. Retrieved December 26, 2022, from https://www.tokenex.com/blog/what-is-tokenization/
72. Varriale, V., Cammarano, A., Michelino, F., & Caputo, M. (2022, May 12). OEM vs module supplier knowledge in the smartphone industry: The impact on the market satisfaction. Journal of Knowledge Management. Retrieved February 19, 2023, from https://www.emerald.com/insight/content/doi/10.1108/JKM-12-2021-0913/full/html
73. Verbrugge, B., Stephens, J., Sovacool, B. K., Siegel, S., Hilson, G., Geenen, S., Amos, S., Baumann-Pauly, D., Couttenier, M., Cuvelier, J.,

& Garrett, N. (2021, November 16). The Democratic Republic of the Congo (DRC)'s response to artisanal cobalt mining: The Entreprise Générale du Cobalt (EGC). The Extractive Industries and Society. Retrieved February 19, 2023, from https://www.sciencedirect.com/science/article/abs/pii/S2214790X21001842

74. Voshmgir, S. (2019). What is the token economy? O'Reilly Online Learning. Retrieved December 25, 2022, from https://www.oreilly.com/library/view/what-is-the/9781492072973/ch01.html

75. Wang, W., Wang, X., Liang, Y., & Wang, H. (2021). Blockchain for supply chain management: State-of-the-art and future research directions. IEEE Transactions on Engineering Management, 68(2), 512-528. https://doi.org/10.1109/TEM.2020.3036659

76. Wang, L., Li, B., Li, G., Li, X., Li, X., & Li, J. (2020). A blockchain-based traceability system for the coal supply chain. International Journal of Mining Science and Technology, 30(5), 547-553. https://doi.org/10.1016/j.ijmst.2020.05.015

77. Yin, M., & Li, G. (2022, April 20). Supply Chain Financial Default risk early warning system based on particle swarm optimization algorithm. Mathematical Problems in Engineering. Retrieved February 6, 2023, from https://www.hindawi.com/journals/mpe/2022/7255967/

78. Young, J. (2021, March 2). People have spent more than $230 million buying and Trading Digital Collectibles of NBA highlights. CNBC. Retrieved December 26, 2022, from https://www.cnbc.com/2021/02/28/230-million-dollars-spent-on-nba-top-shot.html

79. Zeroin, V. (2022, November 11). Coin vs. token, explanation of the difference between coins and tokens - zerion. Zerion Blog. Retrieved

December 24, 2022, from https://zerion.io/blog/crypto-coins-vs-tokens-the-difference-explained/#:~:text=Coins%20primarily%20serve%20as%20a,a%20smart%20wallet%20like%20Zerion.

80. Zhang, W., & Jiao, Y. (2021). Integrating blockchain into the energy sector: A review of applications, challenges and opportunities. Renewable and Sustainable Energy Reviews, 143, 110923. https://doi.org/10.1016/j.rser.2021.110923