

LOCUS CHAIN

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WHITEPAPER

LOCUS CHAIN FOUNDATION

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CHAPTER 1

OVERVIEW OF LOCUS CHAIN



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OVERVIEW OF LOCUS CHAIN

1.1 Executive Summary

Locus Chain is a state of the art blockchain protocol that can maintain stable transaction time even if the number of nodes and transactions increase using Account Wise Transaction Chain (AWTC). Through the use of AWTC, Locus Chain is able to provide high transaction speed for every user in the eco-system and the network.

Scalability is essential for any blockchain protocol. Locus Chain applies the latest technology of unique Dynamic State Sharding to the transaction ledger block to resolve the problems associated with ever-growing data size.

The Locus Chain Main Net uses a very fair and competitive consensus model, VRF-PBFT + PoS+DPoS, that is revolutionary as it ensures proper compensation based on the relevant contribution to the Locus Chain Network.

Using the most advanced technology of Locus Chain, Smart Contracts can be executed even in harshest network environments that other blockchain protocols will not be able to. Furthermore, Locus Chain is resistant to quantum computing attacks, a huge threat to existing cryptography system.

1.2 Abstract

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The hype and craze in cryptocurrency have given us a sneak peak of the large scale decentralized blockchain revolution with mass adoption in the future. Currently, most of the services and protocols control and retain majority of the profits under the pretext of user security and asset safety. This results in large amount of resources being spent by government bodies and organizations.

Cryptocurrency and the notion of decentralization have become very well endorsed in today's landscape, and Token Generation Event (TGE) is one of the most popular fundraising tools as it allows for decentralization of the funds raised. Decentralization might finally be in the sight of people again due to strong influence of cryptocurrency popularity.

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Revisiting the past, the centralized operating models tend to incur the operating cost of the company and provides a safe haven for those in power. However, through the use of cryptocurrency coupled with decentralized operating model, these issues can be mitigated.

At the moment, the utmost goal of cryptocurrency projects will be to gain mass adoption by replacing fiat or the ideal payment solutions to go to. This is overly idealistic as there is insufficient technological infrastructure in place to support such an adoption and transition. Nonetheless, this does not impede with the booming of the cryptocurrency and blockchain industry. In time to come, it will not be surprising to use cryptocurrency in our daily lives.

Throughout the course of history, a currency holds a specific value to a specific group of people and it can be used to exchange for something of equivalent or higher in value. What this translates to for the various decentralized cryptocurrency platforms is that it has to achieve a common value and liquidity. This competitive yet intriguing characteristic of digital currency will result in a showdown between the top tier cryptocurrencies as they compete to be the most widely adopted cryptocurrency. This have extensive requirements on the technical system that the cryptocurrency is running on and thus Locus Chain have taken extensive consideration when designing their protocol.

1.3 Introduction

Locus Chain strives to be the digital currency with state-of-the-art technology that will be at the heart of all the smart cities and massive economies through strategic partnerships and key collaboration. The approach of Locus Chain is not to compete with centralized government agencies and powerhouse from traditional industry but instead form lasting strategic partnerships to develop Locus Chain together to achieve mass adoption and wide spread acceptance. Eventually, Locus Chain will be a stable coin being used extensively.

Locus Chain pride itself at the solid technological footing it has to maintain a high amount of Transaction Per Second (TPS) even when the number of transaction increase exponentially. With a plan for Locus Chain to be implemented in Smart Cities, Locus Chain is being developed with extremely high technical standards to meet the needs of a Smart City in areas such as Machine to Machine (M2M) authentication system. Locus Chain have incorporated advance algorithm and consensus in their system design to prepare for such high-level technical requirements.

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1.4 Locus Chain Philosophy

Decentralization was first introduced by Satoshi Nakamoto in 2008 along with Bitcoin. Decentralization is a very well received concept as it allows the transparency and integrity of the transaction that happen to be isolated from external factors such as politics or financial gains. However, many blockchain protocol today did not address the issue of decentralization and focus on developing a business idea that will sell well to investors instead. Otherwise, they are overly centric on the TPS of their product and neglect other important aspects. However, for Locus Chain, decentralization along with superior TPS and functionality will both be achieved.

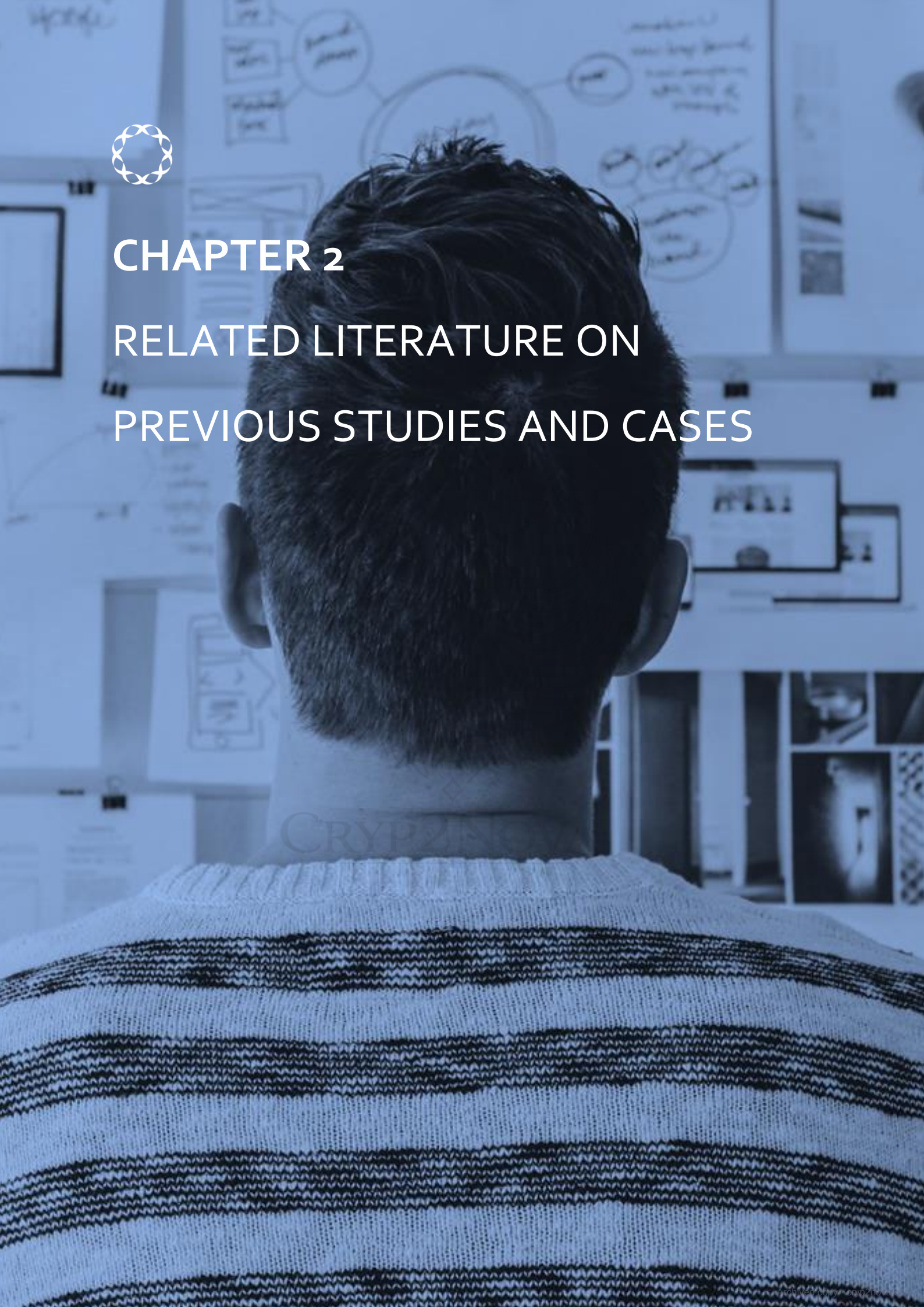
There are obstacles such as low TPS, poor security, high transaction fees and poor structure design impeding cryptocurrencies from becoming mainstream payment methodology. Locus Chain have accurately identified such obstacles and already have found the solution to tackle these issues to realize their goals of being the mass adopted blockchain protocol in transaction and authentication that can be used in such energy and IoT.

The previous few digital revolutions have alleviated the social divide and inequality in society today. With blockchain, Locus Chain can reduce inequality and promote sustainable growth. Above and beyond pure business profit, Locus Chain aspire to be the blockchain protocol for all business and all global citizens.

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CHAPTER 2

RELATED LITERATURE ON PREVIOUS STUDIES AND CASES

RELATED LITERATURE ON PREVIOUS STUDIES AND CASES

2.1 BITCOIN

Many people are still amazed by Bitcoin's [1] innovative concept even though its technology is relatively outdated at the moment. Bitcoin has some disadvantages to be used in our everyday lives, but Bitcoin has obviously led us to a new era.

	Bitcoin	Locus Chain
Decentralization	✓	✓
Traceability	✓	✓
High Transaction Speed	✗	✓
Scalability	✗	✓
Low Fee	✗	✓
Power Efficient	✗	✓
Stable Prices	✗	✓

Figure 2.1.a Comparison between Bitcoin's Blockchain and Locus Chain

The following are the advantages of Bitcoin:

- **Decentralization** – Operates without a central server.
  No need to emphasize this advantage. This is the core of every cryptocurrencies and the related business. Bitcoin achieves decentralization in the true sense which completely rules out centralized facilities.

- **Transparency** – Transaction records are transparent and cannot be manipulated.
  It is similar to the role of balancing the pendulum of decentralization. With these two elements, we can get inspirations for a fair, efficient society. It is about true efficiency beyond mere prevention of corruption or distortion.

The above mentioned two advantages of Bitcoin will be clearly reflected on the philosophy of

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Locus Chain development works.

However, we consider that the following disadvantages that must be overcome:

- **Slow transaction speed**

  Due to the designed capacity of block throughput, it takes a long time for the transactions to be confirmed.

- **High fees**

  A high fee is incurred for fast processing since there is a limit to the volume and unit time of transaction addition.

- **Power-inefficient**

  The PoW calculation required for each block consumes considerable amount of electric energy.

- **Not scalable**

  The more nodes there are, the longer the waiting time. In addition, there will be frequent collisions; thus, increasing the amount of power consumption.

- **Unstable value**

  Since it is difficult to use in the real-world financial case, it is evaluated as a simple asset, and we are not sure about its future values.

2.2 IOTA

The ledger saving data structure is switched from the blockchain to DAG to remove the limitation on the speed of add-on transaction. As a result, the transaction speed is greatly improved among many scalability issues. Authentication is mandatory whenever any node adds a transaction. Therefore, no fee is gained when there is no mining.

2.3 NANO

Nano uses account-wise transaction chain in the name of Block Lattice, which is a kind of DAG. It has reduced the frequency of collisions at the transaction and also removes the speed limit. There

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is neither mining nor fee, which means less incentive on consensus nodes at the collisions. Compared to other blockchains, the structure of blocks is relatively less complex, so there is a unique attack vector such as precomputed POW attacks. A light node exists, but the ledger state sharding of full nodes is not mentioned.

2.4 ZILLIQA

Zilliqa has adopted the "Network Sharding" and it can enhance the performance of entire system as the number of nodes is increased. State sharding has yet to be introduced.

- **Radix**

  Radix has adopted "State Sharding, and an algorithm to explore the transfer order of two randomly selected transactions even when the partial order of each transaction is defined. Once the number of shards is set, it cannot be changed. It will be disclosed in the second half of 2018.

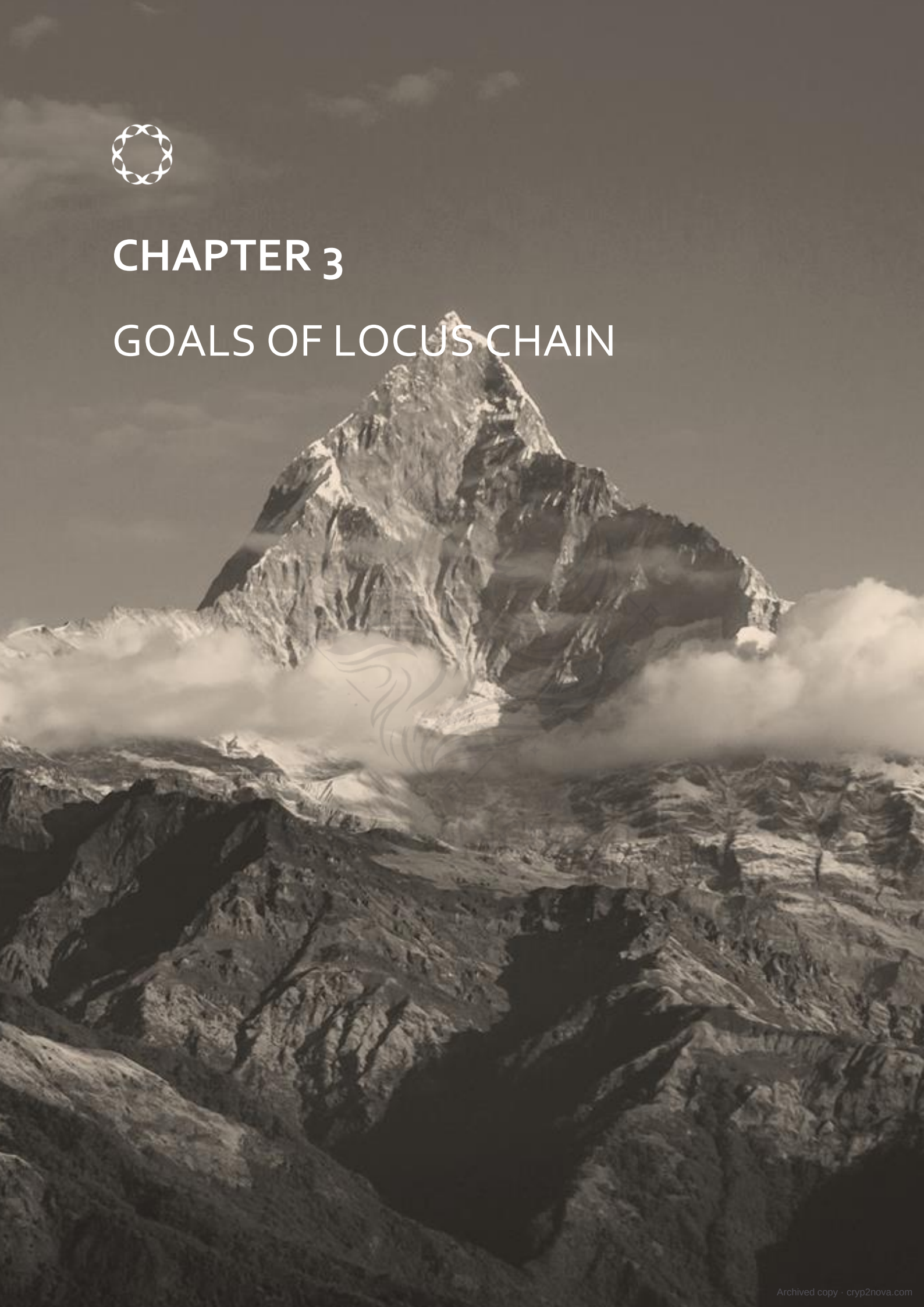
- **Algorand**

  Each time you select a block, you will choose a node to add a block to and a committee node to verify based on VRF (Verifiable Random Function), and then process a consensus based on PBFT. In each PBFT phase, a different node is selected, so it is very hard to attack it. Consensus voting depends on the stakes.

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CHAPTER 3

GOALS OF LOCUS CHAIN

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GOALS OF LOCUS CHAIN

As discussed in the overview, to make sure that Locus Chain is used as a payment method in a wide range of fields from energy, communications to smart city, or at least allow it to have high asset values, we will develop Locus Chain to fulfill the following goals:

3.1 Sufficiently Fast Transaction Speed

Fast and reliable transaction is the primary requisite to enable Locus Chain to be used in financial transactions. Our goal is to achieve a high transaction speed. Other blockchain technologies may also aim to have a high transaction speed, but the most critical issue is how one can maintain a stable high transaction time despite of the increasingly huge number of nodes or transactions. Locus Chain will incorporate Account-Wise Transaction Chain (AWTC) architecture to accomplish this.

3.2 Technology to Improve Transaction Reliability

The Smart Contract technology which is implemented in many next-generation blockchain technologies will also be supported by Locus Chain with the promise of a fast, reliable transaction environment.

3.3 Efficient Data Structure and Consensus Algorithm

Locus Chain uses AWTC, a type of DAG to provide high transaction speed for every user and the entire Locus Chain network. The consensus algorithm will be based on a new consensus algorithm model that ensures proper compensation depending on the contribution to the network without using the traditional Proof-of-Work (PoW). Our design will incorporate a stake-based Proof-of-Stake together with the Delegated Proof-of-Stake (PoS+DPoS) scheme, combined with Verifiable Random Function based Practical Byzantine Fault Tolerance (VRF-PBFT) algorithm in order to achieve two main goal of decentralization and fast transaction. The core design and algorithmic choice of Locus Chain not only improves the speed and capacity but will also enable the reliability of whole network to far future without concentration of power. We are also designing our system to be sustainable. Some blockchain systems with decreasing transaction processing compensations (mining returns) may not be sustainable if the compensations are critically dropped in the future. For that reason, many different blockchain companies are announcing plans to change their compensation method. Locus Chain has very clear vision and goal of future

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proof, from the very beginning of our R&D.

3.4 Blockchain Technology with Scalability and Flexibility

To offer better scalability with high transaction speed, *Dynamic State Sharding* technology will be applied to Locus Chain. Dividing blocks into smaller manageable sub-blocks ("*Shards*") will resolve the problem of ever-growing data size. Moreover, we are organizing multiple application development teams to provide various types of programming interfaces and hardware applications as early as possible.

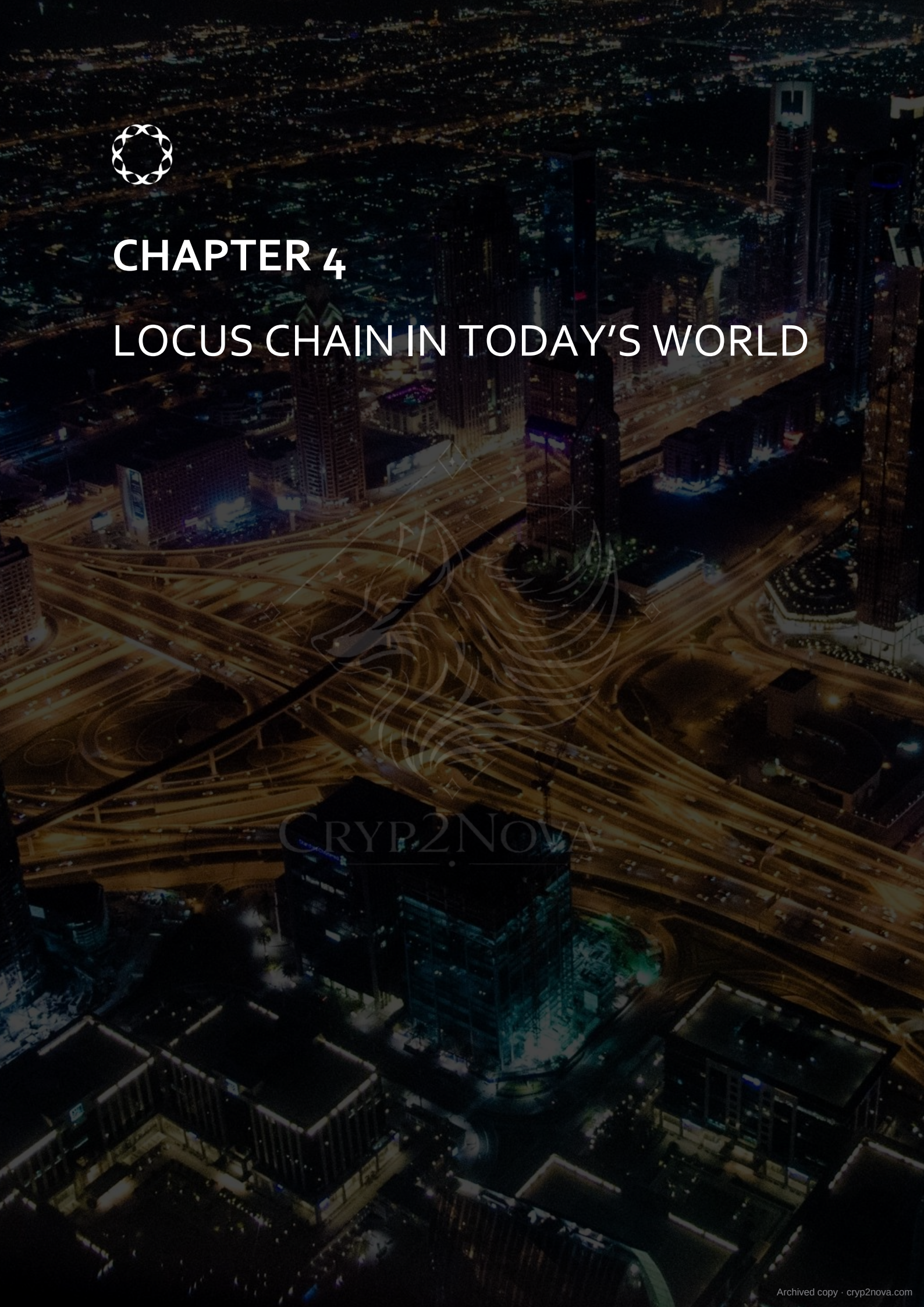
3.5 Secure Technology

The Locus Chain team expects that the attacks utilizing the quantum computing power can be a threat to the existing security systems and cryptography system. Therefore, having the resistance or tolerance against the abusing in the quantum computing environment is the one of the important development tasks to the Locus Chain team. We will collaborate with top-notch university labs that specialize for the relevant fields (security and cryptography). Even after the Locus Chain's main net launches, we will continue to apply research results in this field to ensure the highest level of security.

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CHAPTER 4

LOCUS CHAIN IN TODAY'S WORLD

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4.1 Democratic Republic of the Congo

Locus Chain Foundation has entered into a strategic alliance agreement to implement the "Locus Chain" as the national resource development projects, distribution systems and financial systems of the Democratic Republic of the Congo.



Figure 4.1.a Locus Chain Foundation signing a strategic alliance agreement with Theore Mugalu, Chief Secretary of the Presidential Administration of the Democratic Republic of the Congo (center)

The Democratic Republic of the Congo is Africa's third largest country with a population of 84 million. It has the largest arable area and rich in minerals such as cobalt (40% of world production), diamonds (20% of world production). Mineral resources produced in the Democratic Republic of the Congo are likely to increasingly used worldwide.

The main contents of the agreement are applying the blockchain platform Locus Chain to the national resource development project and distribution system of the Democratic Republic of the Congo and using it as a settlement currency. In addition, to develop and apply the online banking

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system of the banking and securities firms based on the Locus Chain. In particular, with the introduction of blockchain technology in the field of resource industry, expected to develop into a stable industry that does not depend on exchange rate and at lower cost compared to existing ones. It will also be expanding to the resources and finance sector as well.

When Locus Chain is introduced into the resource production and distribution industries, it is possible to directly deal with resources and energy, and all transaction records making market transactions more reliable and fairer than ever. Applying the blockchain technology to the financial industry will increase the reliability and credibility of financial transactions by reducing the cost of fund management and streamlining procedures in asset management, registration, settlement, trading, and identification.

4.2 Tunisia Economic City

Locus Chain aims to apply their blockchain platform to the entire city construction projects to be used as a base technology and settlement currency for various industries such as finance, communication, medical, shopping, automatic vehicle. Locus Chain is aiming to digitalize businesses and the public sector by realizing a mega economic and urban development project on the eastern coast of Tunisia.

Jointly owned by Tunisia and Saudi Arabia, the Tunisia Economic City (TEC) is a large-scale project in the eastern peninsula of Tunisia. It covers a total area of 90 sq km at a cost of US$50bn during the initial decade. TEC, which is a cluster of 14 large themed zones, is expected to serve as an international business and technology hub connecting Europe, Africa and Asia. It will also act as Africa's gateway to Europe and complement the economic growth of GCC countries.

The blockchain platform will be used as a transaction and authentication method for various industries and will provide an ideal management and service system. The agreement will enhance the TEC's future-readiness through technological precision and innovation, and benefit, in a broad perspective, all similar projects in the MENA region. This purpose will be served through the LCF's Middle East headquarters in Dubai Silicon Oasis.

4.3 Eco City in Uganda

Locus Chain Foundation has entered into a strategic alliance agreement with OMENE holdings LLC, an energy company in Africa, operated by Nigeria's Franklin E. Omene. Through these efforts,

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Locus Chain will work on the Lake Victoria Eco City construction project in Uganda with the goal of completing the new city development project as a smart city that highly digitalized businesses and the public sector. The project is Africa's largest new town development project, which is built on an area of 900 acres in the Entebbe area of Africa. It is one of the world's leading residential and auxiliary facilities such as state-of-the-art residential and tourism facilities.

4.4 Rwanda Health Care City Project

Locus Chain Foundation has entered into a strategic alliance agreement with ONCOMED solutions, a medical services company based in Dubai. The strategic alliance agreement between Locus Chain Foundation and Oncomed is designed to provide in-vivo diagnostic capabilities close to international standards within 10 years of Rwanda's poor health care services.

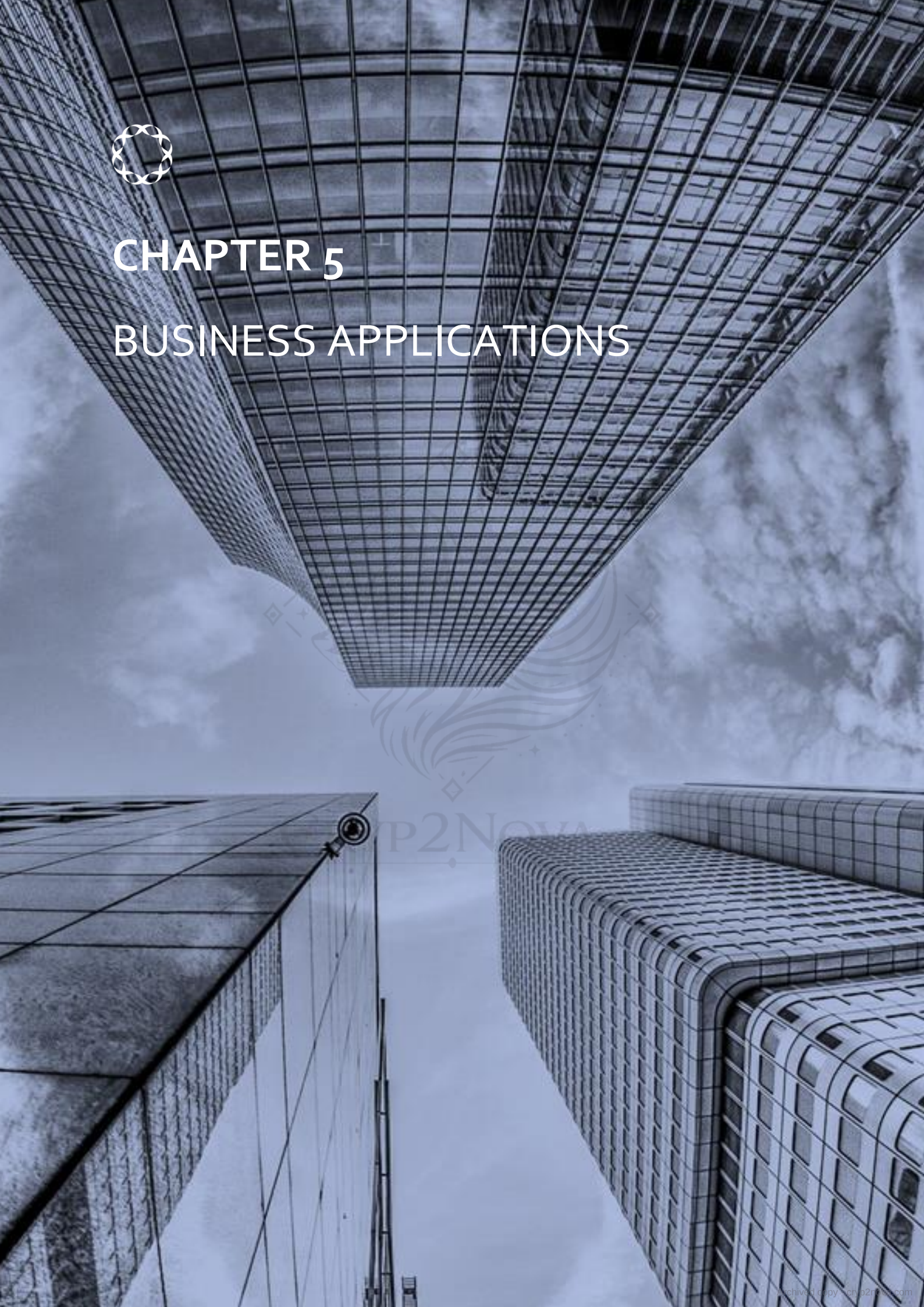


Figure 4.4.a Locus Chain Foundation signing a strategic alliance agreement with CEO Mohamed El Gabry from Oncomed Solutions

When blockchains are applied to healthcare services, medical data that was difficult to standardize due to reliability and cost can be standardized at low cost. In addition, since all medical records of patients can be checked at all hospitals, reliability of various imaging and test data is increased, and medical records and charts are transparently managed. Comprehensive health management of patients will be much easier.

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CHAPTER 5

BUSINESS APPLICATIONS

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BUSINESS APPLICATIONS

5.1 Business Vision

Recently there are many teams among blockchain related developers who trying to focus the optimization for the certain usage specialized in the target industry and naturally various alt-coins are newly emerging. These alt coins are being developed as several different blockchain platforms-based dAPP (Decentralized Application). Since a single company cannot control the entire industry, these approaches are surely the most realistic ways of increasing the scale of the entire blockchain business. When the smartphone's revolution has started, various industries have created many different types of applications for the OS of smartphone (Google's Android and Apple's iOS) and we could get the benefit from those applications. Now, we believe that new experiences from the Smart phone's applications had very positive impacts on the entire human society.

Still, one should pay attention to the fact that the development of blockchain platform differs from the development of business in the past, since a separate payment and authentication structure will eventually be required for each goal, therefore connecting them becomes the most critical issue. As a result, no matter which OS you use, if there is a need to generate a transaction between business areas using different types of blockchains, there has to be a kind of relay system that operates reliably. Connecting such blockchains with totally different structures may raise concerns in terms of technology and business since they can increase costs or security vulnerability. To reduce the risks in relaying other systems, we take the direction to develop the integrated(universal) blockchain platform, which has the homogeneous but advanced structure.

As discussed earlier, Locus Chain uses the same basic structure of supporting various dAPPs (Decentralized Applications) in one platform token; note, however, it will be an integrated blockchain that enables the most of transactions and authentications under one blockchain technology.

5.2 Business Structure

It is very difficult task to create the organic protocol, which can interact with the various different protocols developed for different fields, since each protocol or digital coin will exist or act in its own independent system. It is not easily realizable matter both in terms of technology and

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business and this attempt can easily cause the security vulnerability as well

Therefore, Locus Chain team's primary goal is to develop the most flexible Platform blockchain, which can be integrated as one unit. We are setting the technical features of Locus Chain for these goals and carrying out R&D to implement them.

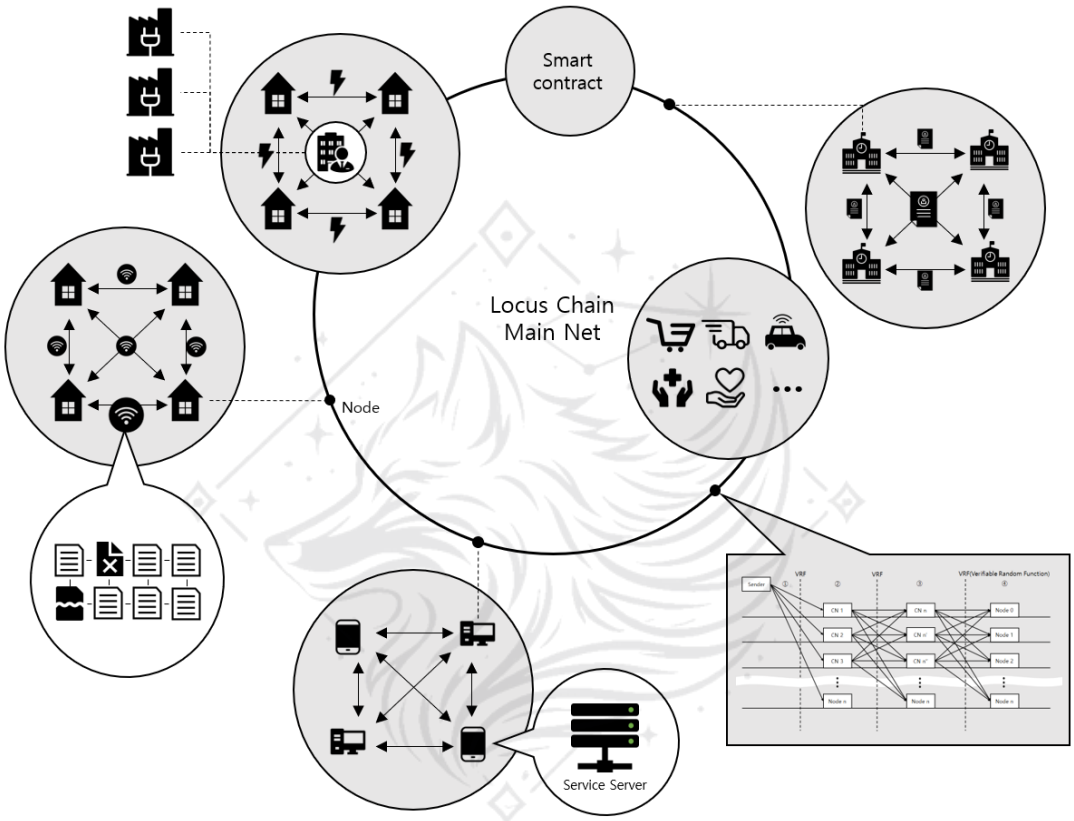


Figure 5.2.a Overview of the Full Business Structure

When Locus Chain becomes a successfully commercialized technology, the Locus tokens would then be used as a transaction currency in the market beyond simply serving the transactions. At present, we are connected to various companies or organizations providing various energy and communication services or construction of smart cities for the near future; we are cooperating with many partners from the early stage of their project development for Locus Chain to be utilized as fundamental technology.

Therefore, when each smart city of our partners is constructed, Locus Chain will be used as a cryptocurrency for each smart city, supporting almost every type of transaction such as B2B, B2C,

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C2C, or M2M. Various on/offline network transactions using Locus Chain within a city will expand to various industry fields, and every transaction will be connected by a single currency in the Locus Chain ecology. The Locus Chain technology will be used as a method for authenticating and recording every service; as a result, transparent, accurate service will be achieved, significantly improving the overall level of trust in the city.

We will first apply Locus Chain to an individual smart city or an industry field, and then verify it in the test net so that we can eventually make a connection between individual smart cities or industry fields to implement the smart world. As the common usability of Locus Chain, it enables use as a unit of transaction for various industry fields; thus giving us reason to believe that the future value of Locus Chain is very massive.

The Smart City Project is the very good example that can shows the vision and business goal of Locus Chain, since it demands, requires various types of highly advanced technologies for many areas and also the reformation of the transactions. As we have seen and heard from various news media, Smart City is the space for providing very high-level digital service in all areas such as administration, transportation, residence, shopping, entertainment, and legal affairs. If you try to implement them all in a centralized structure, then it is highly likely to incur high costs, induce technical dependence, and give rise to numerous security problems. Once the construction of the smart city starts, one can easily meet the conflict between cost and efficiency, because certain process or transaction shall be handled at the low cost to have the usability, despite being highly related to safety and privacy. As remote technology becomes common, such problems will emerge more often.

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5.3 Business Applications

Starting with the energy and communication sectors, Locus Chain will be used as a transaction and authentication tool for various fields such as medical, shopping, IoT, and public sectors. Here, we will give examples of several industry fields and application methods thereof.

5.3.1 Internet of Things (IoT)

Internet of Things (IoT) is an industrial area where many companies have been carrying out R&D since smart devices were introduced to the market. IoT is the technology that connects to the Internet by using various sensors and communication functions within various things. Objects are connected with each other through wireless communication; in the course of data exchanges,

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each object can analyze and learn the information on its own and pass it on to users or allow users to adjust them remotely. IoT application areas range from electronics used frequently in our daily lives to mobile devices, various wearable PCs, automobiles, and building systems. Since we expect the future scale of the industry to be massive, many global companies are participating in it.

In particular, with communication technology and smart device technology continuing to evolve rapidly, the development of the IoT industry seems very promising; since every IoT device is vulnerable to external hacking, however, perfect security technology is required. Especially in the fields of automobile, heating devices, and locking devices where safety is an important issue as a person's life or property can be severely affected, we believe that IoT requires blockchain-based technologies. In the blockchain market, special blockchain technology for IoT has emerged, and it has already been proven to be more suitable for application to the IoT industry than the existing blockchain technologies.

Based on the information disclosed so far, we believe that other competing blockchain technology developers have resolved the issue of speed to a certain degree but have failed to address the security issue when the number of nodes drops below a certain limit in the unit network at a specific time when network communication is reduced or in a region with poor network conditions.

Most of the IoT devices are composed of small hardware modules, and they tend to have small memory. In this case, the blockchain can cause a fatal problem compared to the centralized system, and the problem of consistently increasing block size as mentioned earlier can emerge earlier than we expect. If the block size is increased given the insufficient memory, the problem must be fixed immediately before normal operation can be guaranteed. We are fully aware that the problem is a very urgent one that needs to be fixed.

As we briefly mentioned while explaining the game and online service areas, the problem can be fixed by our unique blockchain technology methods. In conclusion, the technology that can realize high transaction speed and security and small-sized blocks are the prerequisites for use as fundamental basis for the IoT industry. Once the Locus Chain network is completed, the problem will be removed completely, so we can use it properly as commercial service.

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5.3.2 Resource and Energy

The existing centralized transaction of resource and energy involves a process wherein a specific customer purchases the product – be it traditional minerals, oil, or latest wind power generation -- from the producer and makes an individual transaction. In this type of transaction, since a specific organization solely owns the individual transaction information, it is called a capital-intensive structure wherein they can control the cost for transaction with each producer and the company or country owning the sole rights is supposed to gain more profits. Eventually, the transaction method centralized for several agents leads to the end user's relatively greater disadvantages. With the introduction of Locus Chain, however, every person or organization can supply resource and energy. In addition, since a direct transaction can be realized while all the transaction records are disclosed, the transaction itself becomes highly reliable and fair according to the market principle.

Apart from the existing problem with transaction information or rights centralized on certain persons, there is the issue of efficiency. If there is a slight problem within the producer or the production process -- for example, if the mid-manager is corrupt, or an outdated production facility causes measurement errors -- then it becomes difficult to find the cause in the entire system quickly; there will also be a variance in the production costs.

If we introduce Locus Chain to this series of processes, however, then we will be able to set up a direct transaction between the producer and the customer and manage all the processes including distribution and purchase transparently and in real time and clarify the history tracking process. Eventually, we will be able to reduce the production and distribution costs significantly.

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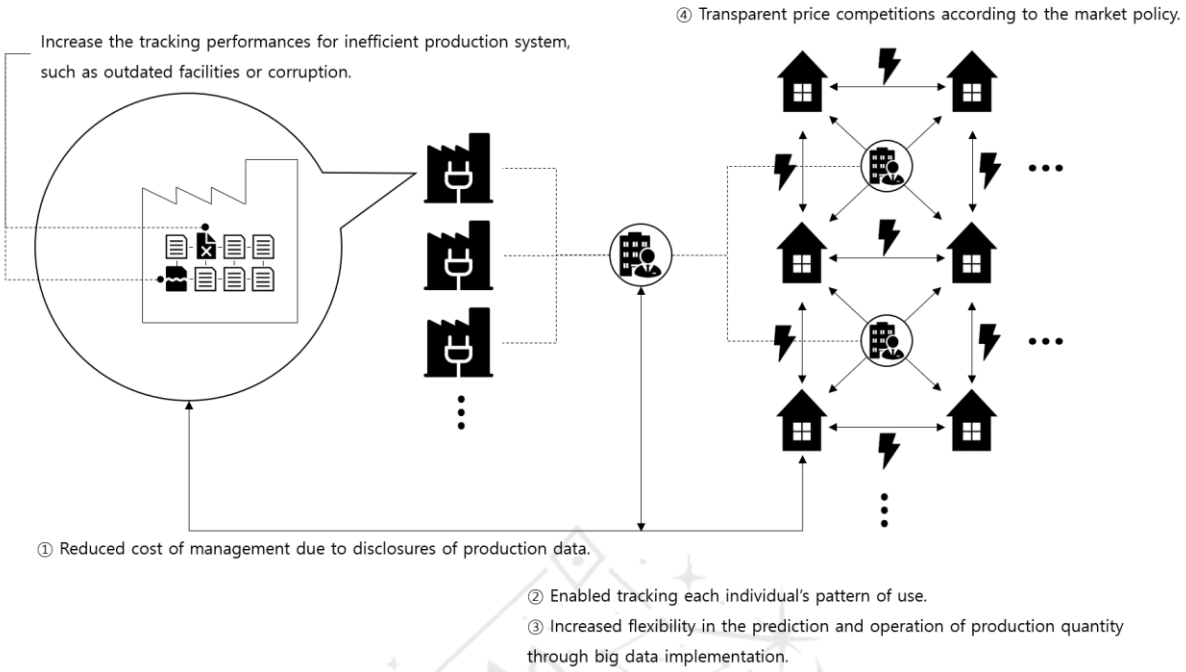


Figure 5.3.2.a Resource and Energy Application

In other words, with the help of the technological excellence of the Locus Chain-based system, we can support (i) the authentication of the energy production & distribution, (ii) verification of the transactions between end users, (iii) unmanned transaction/process by implementing the M2M (machine to machine) communications for all of the deals of energy and resources-- all of which were not possible with the existing blockchain technologies. For this reason, many politicians and companies in countries or regions producing lots of energy and resource are participating as advisers for Locus Chain.

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5.3.3 COMMUNICATION

The current communication sector shares similar characteristics with the energy sector as previously described. The service provider that implemented the communication network is the sole owner of the individual transaction information, and they tend to demand very high prices consistently from a large number of specific customers who use the network in order to pay off the initial costs for implementing the network. According to the market principle, we cannot say that this is wrong since a specific service provider solely owns the information about the repair, maintenance, and control of the network, however, this can give rise to various unfairness issues. As such, customers cannot get fair transaction on communication service due to the non-transparent market policy. This is the most urgent problem that needs to be fixed.

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Since the blockchain technology is applied to the communication sector, it is now possible to disclose the history of more precise, detailed network use; thus, the efficiency of network use will improve, and fair trade will then be realized between the network owner and the consumers. The network operator can configure the entire network efficiently and provide a transparent price policy to gain the trust of customers, who in turn will be able to pay a fair price for their service use. Moreover, regardless of the size and time period, resale becomes very easy to achieve. Thus, many of new customer-friendly services driven by VNO (Virtual Network Operator) and MVNO(Mobile Virtual Network Operator), who will cooperate with the licensed network operator for using the small sized network including Wi-Fi network, could be more actively developed.

This vision of the future will ensure that various types of MVNOs (Mobile Virtual Network Operator) or VNOs (Virtual Network Operator) -- which have been not easily allowed in many countries – will have the proper positions in the market based on the detailed, diversified service model. Instead of luring consumers with big-budgeted marketing to protect their own profits, Network Operator will make efforts and allocate more budget to improve the fundamental quality-assurance of network service; eventually, they will be able to gain profits and customer trust at the same time. Moreover, consumers will be free from the burden of paying additional fees for the initial network implementation and be able to pay fair fees based on network use.

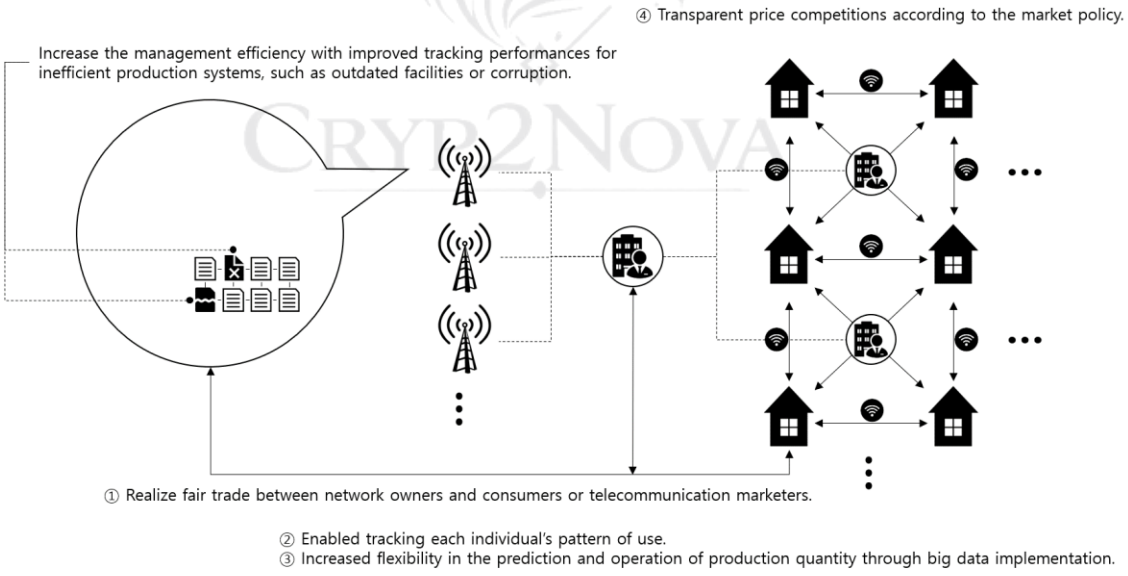


Figure 5.3.3.a Communication Application

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Therefore, Locus Chain plans to sign the strategic partnerships with various service providers (network operators) in the Middle East and Africa to support the more efficient, transparent network. Through the verification of efficiency, we can achieve the one big vision of the smart city with communication infra followed by the smart world with ultra-connections.

5.3.4 MEDICAL

If Locus Chain is combined with the healthcare service, medical data whose standardization used to be difficult due to reliability and cost issues can now be standardized into the medical data blockchain cloud, etc. at low cost; As a result, small hospitals lacking digital systems due to the high cost can easily check all the history of patient's medical records and can more easily obtain the past medical data sent from other clinics. Since the full history of the patient's medical record can be viewed, the examination's accuracy and reliability can be much more improved; thus, medical records and charts can be managed transparently. Consequently, the medical charge billed to public/private Health Insurance or medical accident disputes cannot be manipulated; the hospitals and medical staff's preference and abilities are disclosed more clearly, and the entire medical industry is expected to be advanced further. In the future, we expect the level of AI machine examination, remote examination, or customized examination to improve further.

The application team at Locus Chain will develop a closed/open blockchain cloud system in the future to support the safe, easy management of medical records at low cost.

5.3.5 PUBLIC

In the above described three industries, profit of public and private sectors are mixed or combined. Therefore, the role and responsibility in those sectors are usually decided upon the policy of each government. In industrial areas where public and private profits are mixed, if all the rights are assigned to the private sector, then it is likely for a specific company to have monopoly over the information. To avoid such side effects, usually most of the government tends to control such business as government project, which is operated and funded by government budget. In case of a government-funded project, however, there are limits in many aspects such as human resource management in the operating entity, facility repair and maintenance; In many cases, it is hardly achieved the cost-effective operation from the government driven projects and it can be very sensitive weakness since the government budget is based on the tax income from the taxpayers.

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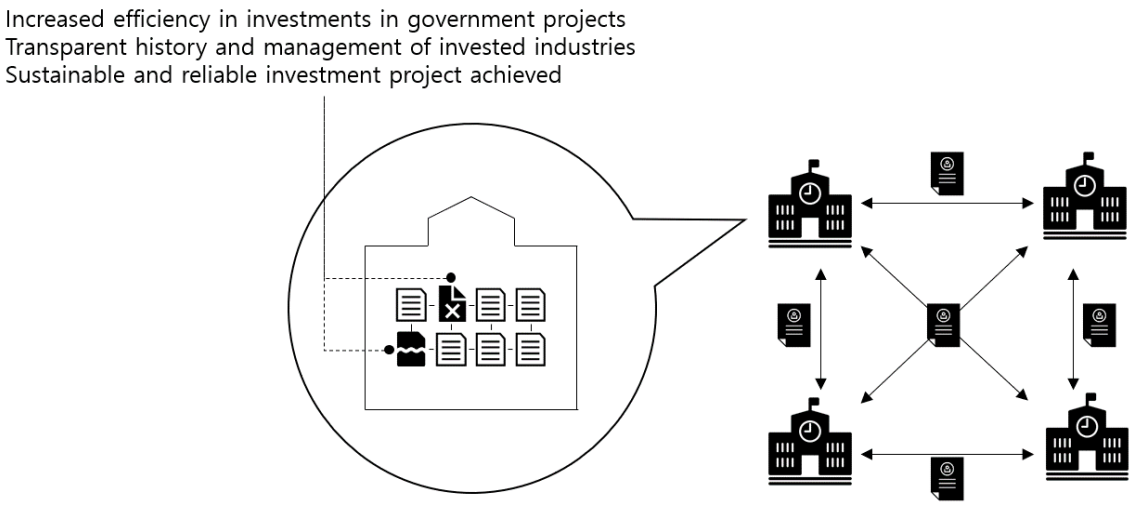


Figure 5.3.5.a Public Application

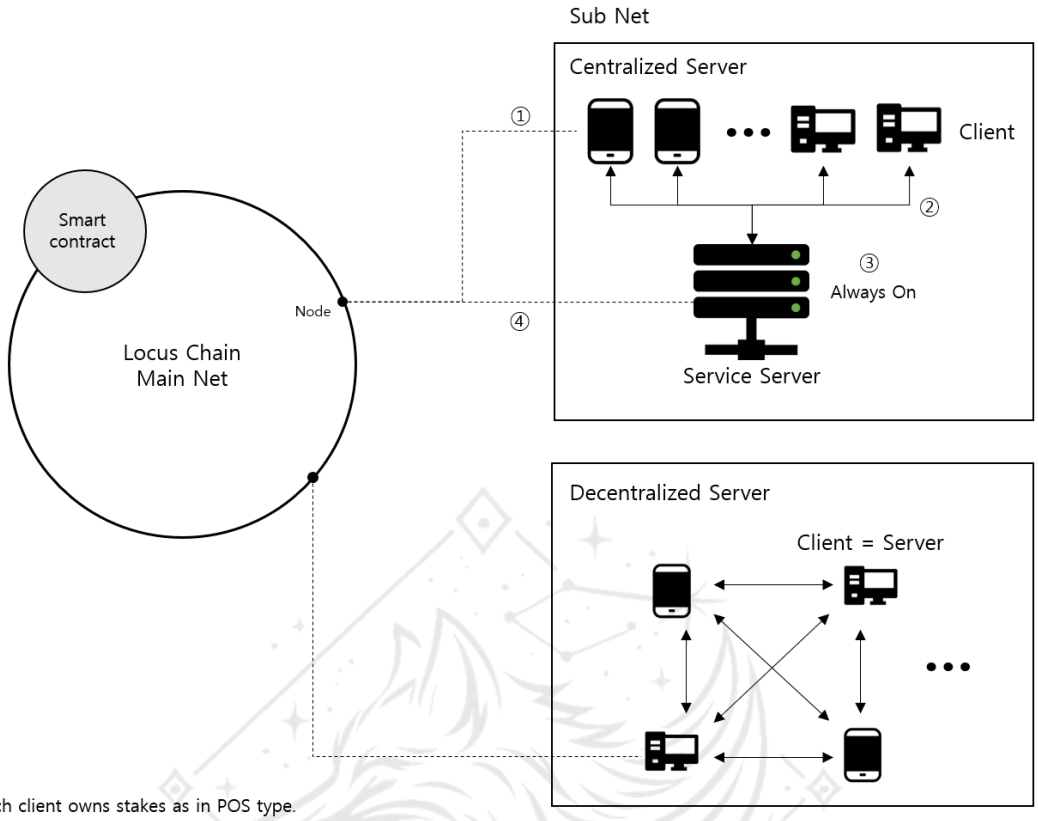
If the Locus Chain-based blockchain technology is applied to public investment, however, then the characteristics of blockchain -- wherein all the transaction ledgers are disclosed -- will enable realizing transparent transactions. Moreover, since it is possible to track the progress and actual transaction costs from the past when the government is selecting a company, the overall investment efficiency will increase further. Consequently, we can make sure that the efficiency of tax money spending is improved, and the proper amount of budget is spent only on a necessary area. It can also wield positive impacts on the national economy, and the citizens of the country can receive benefits indirectly or directly as well.

5.3.6 GAME AND ONLINE SERVICE AREAS

With the blockchain technology becoming the center of attention for the market, the entire game industry began to show interest in contents development. In fact, at present, various crypto games are being developed. For example, the Ethereum DApp-based crypto game called crypto kitty is a digital cat collection game based on the Ethereum platform. From the perspective of game contents, it is about simply buying and breeding cats and selling them back to the market. It is very similar to the Tamagotchi game that appeared in the market about 20 years ago. There is nothing new in terms of content; with the cryptocurrency gaining popularity in 2017, however, it became the center of attention in the market because a transaction made in the game is connected to the Ethereum network.

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① Each client owns stakes as in POS type.
- However, the contribution to the Locus Chain Network is recognizable, only when the client is turned on.
② If you take a specific action within the service, there will be a transaction with the service server and the Locus Chain network.
③ Since the server is on at all times, it always takes POS activities; hence the contribution of service server to the Locus Chain network becomes very high.
- Each client can delegate the stakes to the service server as DPoS.
④ Depending on the contribution, the service server and the clients can receive incentives. The service server with the highest contribution will receive the largest amount of incentives and can pay the service improvement costs with incentives.

※ If there is no central server, then a P2P-type network is configured, and a client plays the role of a server. In this structure, each client's access time is proportional to the amount of incentives, so it is suitable for games and services that require long hours of access time.

Figure 5.3.6.a Game and Online Service Application

A game user who buys, breeds, or sells a cat will be connected to the Ethereum network, and gets to consume or acquire Ethereum just like when making a transaction through the cryptocurrency market. A user's action simply involves the use of contents in the game; in reality, however, there will be a transaction occurring in the Ethereum network, so gas is consumed as processing fees.

It is possible to configure a similar service in online game or general service application; on the Locus Chain network, however, we will adopt further improved compensation methods. For

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example, when a user uses contents or service within the game, the Locus Chain network is maintained, or it contributes to transactions consensus, we will differentiate the level of compensation depending on the level of contribution. We will explain it later in the chapters on technology; instead of doing heavy workloads, we will apply a new concept of network contribution wherein all you have to do is to place a node online. Since all a user needs to do to contribute to the networks is to continue using the Locus Chain-based service, the compensation method will be somewhat similar to receiving points or cashbacks as frequently used in the current market. Compared to the existing service wherein a user does high-cost mining to acquire tokens, it is much better in terms of accessibility and node distribution.

5.3.7 CHARITY WORKS AND EDUCATION AREAS

What businesses make a man most human? We are sure everyone believes education and charity works are some of them. From the eyes of reasoning rather than from eyes with sympathy or compassion, we all believe that charity work can bring about huge profits for mankind. Mankind has developed as much as the inherent unfairness has disappeared, so there is no need to prove that education and charity works can bring the best benefits to mankind.

The biggest problem with charity work is that we do not trust the efficiency or transparency of expenditures. For such reason, a relatively less amount of funds is collected, the organizations are forced to use very stimulating video clips or new ways to raise funds, and the viewers watch them with frowns on their faces. If charity organizations can gain their trust through efficient and transparent fund execution, then more funds will be collected, and the range of beneficiaries will be widened. The Locus Chain Foundation is engaged in serious discussion on the matter with several charity work organizations. If the entire process of fund raising up to execution is disclosed completely, everyone will be more willing to do charity work.

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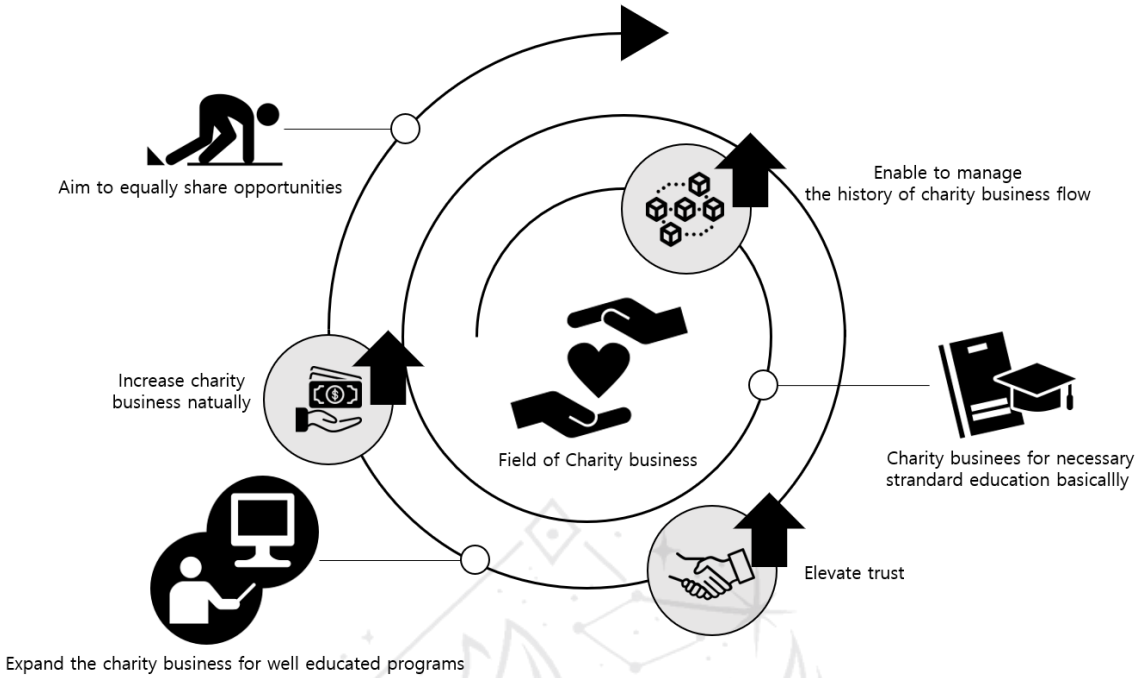
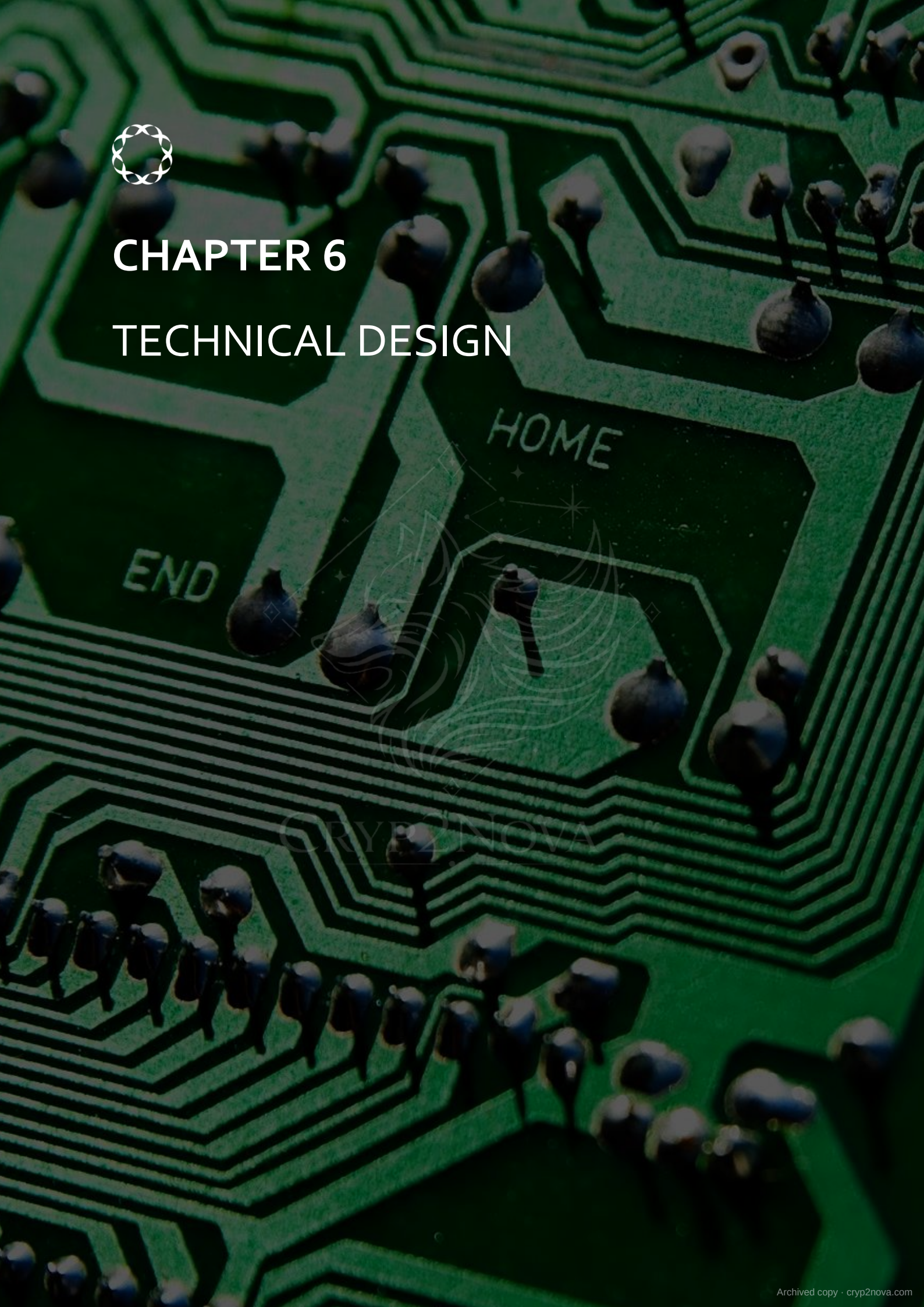


Figure 5.3.7.a Charity Works and Education

True charity works must be accompanied by cooperation for basic training. We will aggressively participate in the process through cooperation with several charity work organizations. In addition, we will provide software technology training beyond basic training. In regions with inherent technological subordination to the western world and Asia with highly advanced technologies, governments have a hard time developing the industry very quickly as they can only select a few excellent students who will get to study abroad. Politicians from such areas and the Locus Chain Foundation are discussing possibilities for direct and indirect cooperation such as construction of a technology center.

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CHAPTER 6

TECHNICAL DESIGN

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6.1 Approaches of Locus Chain

The main focus of Locus Chain is *scalability*. To achieve this goal, we are pursuing *Dynamic State Sharding*. We expect that the usage of blockchain will be increased, as much as the transaction speed getting faster, but the problem is that the size of the ledger will also escalate much larger. In our opinion, there is no point in discussing practicality if this problem is not resolved. To resolve this complex problem, we decided to adopt the AWTC ledger data structure and the stake based VRF-PBFT consensus algorithm. We consider that this approach can implement more flexible Block-ledger's Sharding and can support smart contracts much better. We are currently developing a practical test bed based on this structure.

6.1.1 AWTC (Account-Wise Transaction Chain a.k.a. Nano block lattice)

AWTC (Account-Wise Transaction Chain) is a type of DAG, that has a separate Blockchain Ledger per account and it stands out since the performance of whole system can be improved without the slow-down of transaction speed, even if the number of nodes is increased.

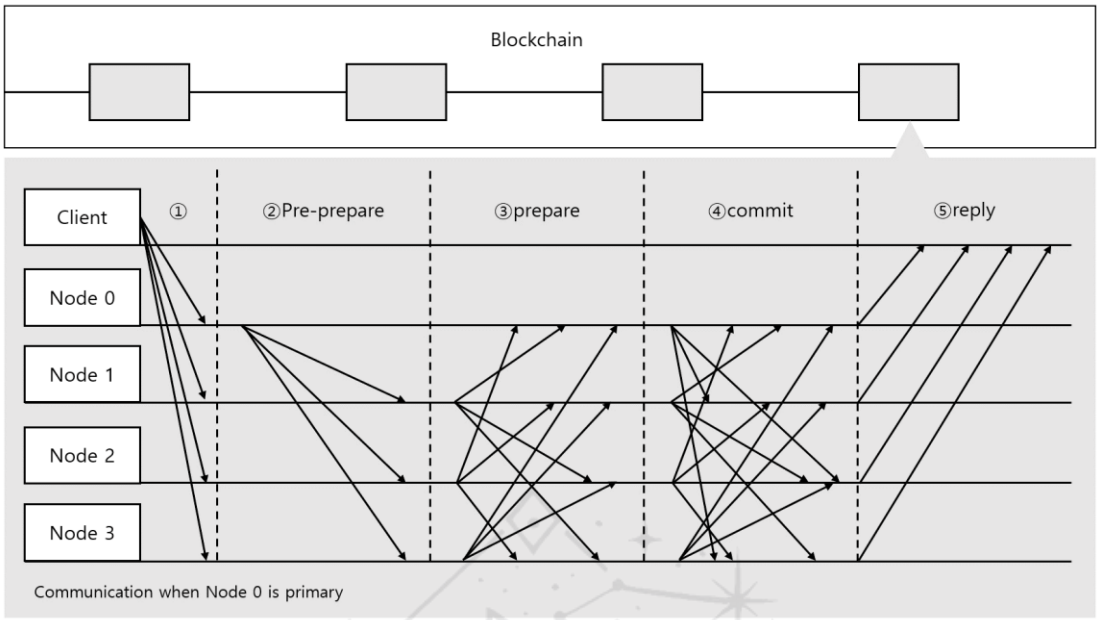
It is easy to apply Dynamic State Sharding as well. It is a ledger structure adopted under the name *"Block Lattice"* in "*Nano"* for the first time. But Locus Chain doesn't follow the exactly same Per-account blockchain with Nano, since Locus Chain uses a different consensus algorithm.

6.1.2 VRF – PBFT Consensus

Locus Chain adopts a definitive consensus method without branching the ledger data in order to ease transaction processing under sharding. When adding a transaction, each node selects the committee independently based on VRF (Verifiable Random Function) and stakes in order to reach the Verifiable Random Function based Practical Byzantine Fault Tolerance consensus.

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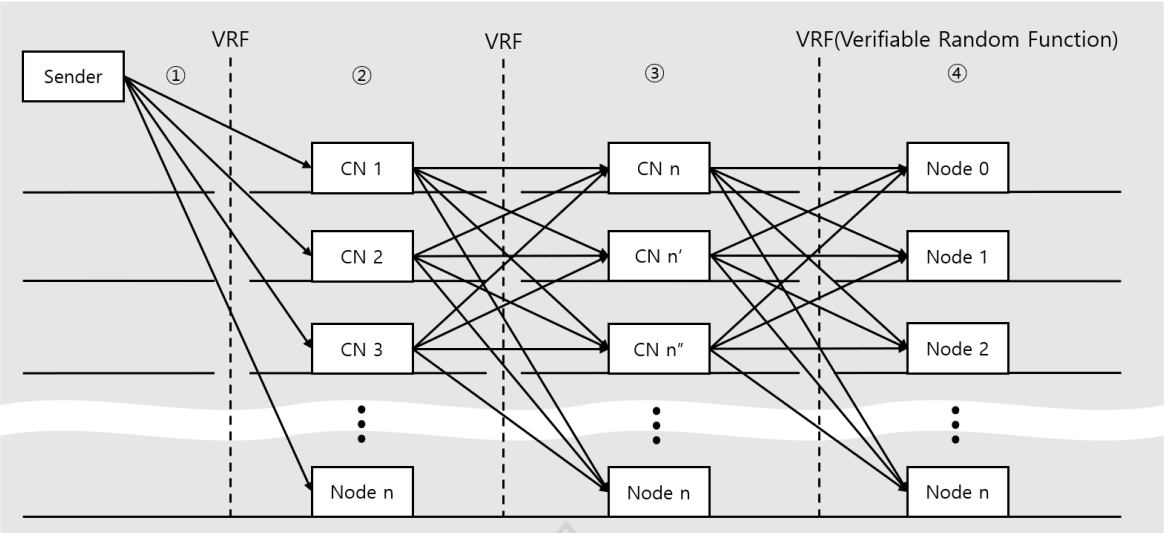
① Client broadcasts a request to every node.
② Node0 becomes the primary node (leader) and sends commands to other nodes one by one.
③ Upon receiving the command in ②, each node replies to every node including the primary (Node0) node.
④ When receiving a number of commands in ③, which is greater than the limit (2f), each node transmits the received signals to every node including the primary (Node0) node.
⑤ When receiving a number of commands sent in ④, which is greater than the limit (2f), each node executes the commands and registers the block to return a reply.

Figure 6.1.2.a PBFT Structure

It is possible to cover the target from the attempt of attack, since a different committee is selected per every stage of PBFT. The combination of VRF and PBFT has been adopted from *Algorand* [7]. Locus Chain takes the direction to create a simplified and speed up version, which is suitable for the per-account ledger structure.

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① Sender broadcasts a request to every node. (Committee sign incl.)
② n random nodes that receive requests are selected as VRF and classified as committee nodes ((CN).
③ CN broadcasts a request to every node again.
④ Finally, step ② is repeated to confirm Tx.

Figure 6.1.2.b VRF-PBFT Structure

Since a committee's signature is added to the block, the following next transaction can be executed only after the authentication of the transaction per account is completed. Namely, it is possible to prevent a type of attack, that tries to freeze the network system by sending the thousands of pre-generated blocks (which is valid at one node).

But it is not realistic to assume that every node can be connected to the network all the time, therefore we will adopt the delegation as in the DPoS to be prepared. In this method, additional committees are selected from the delegated node only in case a number of to-be-selected committee nodes are off the network and there are not enough committee nodes online. As a result, even if there are off nodes, it is possible to maintain the definite consensus of PBFT and also to avoid the centralization.

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6.1.3 DYNAMIC STATE SHARDING

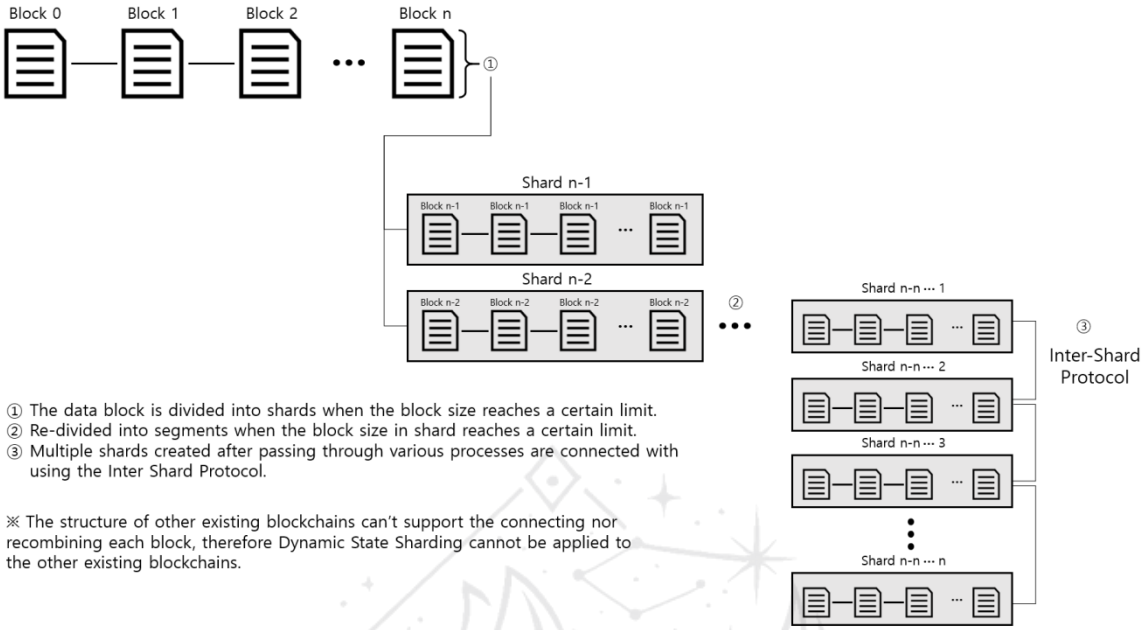


Figure 6.1.3.a Dynamic State Sharding

When the nodes are increased, and it becomes difficult to save the ledger in one node, dynamic state sharding is performed to lower the upper limit of ledger size per node. Unlike static sharding, there is no instability issue when there are not enough nodes in a shard. Locus Chain's committee is consisted upon VRF without communication, therefore it is possible to have no problem on the authentication of transaction during the adjustment of shard.

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6.1.4 GAS USE

Even in the VRT-PBFT consensus algorithm, where the verification by multiple nodes for each transaction are required, to facilitate smooth transactions, we introduce the concept of gas – a sub currency which is earned when verifying a transaction and spent when creating a transaction -- to support the smooth operation of the Locus Chain network. If one wants to send out a transaction without gas, then he either has to wait to verify another transaction to earn gas or spend a small fee in place of gas. The goal is to maintain a balance between the frequency of generating a transaction and the frequency of verifying a transaction as in IOTA [4]. When the smart contract is introduced in the future, it can also be used to execute the smart contract as in Ethereum [3].

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6.1.5 GRADUAL ISSUANCE AND INCENTIVES

A certain proportion of the total issuable token will be gradually mined. When there are small number of active nodes, especially in the early years, Locus Chain would periodically be mined the incentives of encouraging transactions and maintaining network stability. The minable number of tokens can be decided upon the frequency, that each node has participated to verify transactions. Since a node must be connected to the network at the time to be selected as a committee member to verify transactions, the more stakes there are and the longer it is connected to the network, the more tokens being mined. The number of additional tokens mined decreases gradually depending on the remaining number of tokens. After a certain time period, they will all be issued; after that, issuance will only be done to refill the spent amount as fee.

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CHAPTER 7

TOKENOMICS DESIGN

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TOKENOMICS DESIGN

7.1 TOKENS

The token type before the main net will be an Ethereum-based ERC20 token with smart contract issued by Locus Chain Foundation based in Singapore. However, given that the tokens on the public Ethereum network cannot be used on the Locus Chain directly, we will be making use of hashed time-locked contracts to allow 1-to-1 atomic swaps of Locus tokens from the Ethereum main-net to the Locus Chain. Multiple examples of such cross-chain atomic swaps already exist, such as Republic Protocol, or COMIT. For simplicity, we will not attempt to integrate these protocols, and will only support 1-to-1 atomic swaps of Locus tokens from the public Ethereum main-net to Locus Chain.

7.2 TOKEN ECONOMY

The primary design of the token distribution and economic incentives were centralized around three concepts that act as foundational pillars that underpin the rest of the ecosystem value mechanisms:

- Value stability and security
- Incentive compatibility proportional to contributions to the ecosystem
- Decentralization of value aggregation and ownership

In order to fulfill these three criteria, Locus Chain's consensus mechanism will use a form of Proof-of-Stake, which allows the Delegated Proof-of-Stake as well, or otherwise termed as "PoS+DPoS".

Within Locus Chain's system, anyone can become a "Full User" who is able to participate in the validation of transactions to earn coins as their incentive, which is a form of mining. Full Users can become the validators by downloading the ledger and meeting the criteria that they have not delegated their stakes, followed by maintaining their connection and staking in long enough. This model is suited to nodes running background on desktop PCs normally connected to the internet.

When the node delegates its stake, the node is then classified as a "light user". Light users do not mine coins but have the capabilities to transact without keeping the ledger, this model is thus suited for nodes running on hardware with lesser processing power like smart phones. This choice gives freedom to anyone to be a validator to mine Locus as long as they have accumulated a lot of stakes and have long internet access time, regardless of their hardware specifications and hash

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power.

The PoS+DPoS of Locus Chain mitigates against asymmetric mining circumstances, as the barriers to mining Locus tokens are low, and anyone can do mining easily. The system ultimately only allows programmatic rules that can prevent from delegating errors or byzantine faults (malicious hacking attempts). Apart from these rules, any other artificial interventions aren't allowed in the system, and this reinforces high levels of decentralization. Such a mechanism is better than traditional DPoS as it prices in the positive externalities of contributions to the ecosystem and network, which is currently undervalued.

Aside from the usual benefits of DPOS such as faster processing speeds and not needing to waste unnecessary energy on hashing, our incentive mechanism is also very effective for kickstarting stable and constant growth of the platform, which is a key factor that is a barrier for many new blockchain platform entrants. This is a gap that we have seen in other consensus mechanisms, which do not sufficiently factor in the high risks associated with early contributors, whereas our PoS+DPoS mechanism scales rewards based on the such associated contributions. By rewarding early contributors fairly for the risks associated with building on top of our new platform, we send a strong message that shows that we value platform creators and enablers that help to generate platform growth.

7.3 Token Allocation

A total of 7 billion Locus Tokens has been pre-mined to be issued, with the entire supply of tokens to be allocated for private sales without any public participation. Should there be any remaining tokens that have yet to be sold before being listed, they would be sold as a form of block deal through over the counter transactions.

All of the foundation supplies are owned by the Locus Chain foundation and are specifically allocated only to causes with business benefits. The supply of tokens for advisors and partnership entities are mostly kept in lock-up for a period of 6 to 24 months.

Apart from the 7 billion Locus tokens, there are no more additional issuing except through mining after the launch of the main-net. Locus token would be fully atomic swapped to locus coins at the launch of the main-net.

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Entity	Token Quantity	Percentage	Remarks
Foundation Reserves	1,200,000,000	17%	Locus chain foundation has and holds these which can be used for great strategic benefits and contributions.
Founders & Team	600,000,000	9%	Lock Up period of 2 years
Advisors & Partnerships	1,200,000,000	17%	Lock Up period of 6~24 months
Contributors	4,000,000,000	57%	
Total	7,000,000,000	100%	

Figure 7.3.a Token Distribution Quantities

Additional mining of Locus tokens would only start after the launch of the main-net, with the maximum number of tokens to be mined capped at 5 billion Locus tokens. Based on estimates and tests run on the current mechanics, the 5 billion additional Locus tokens are to be completely mined up over an approximate period of several decades. However, the estimated period is variable depending on the overall usage of Locus Chain. This would then fulfill the total token supply of 12 billion Locus Tokens.

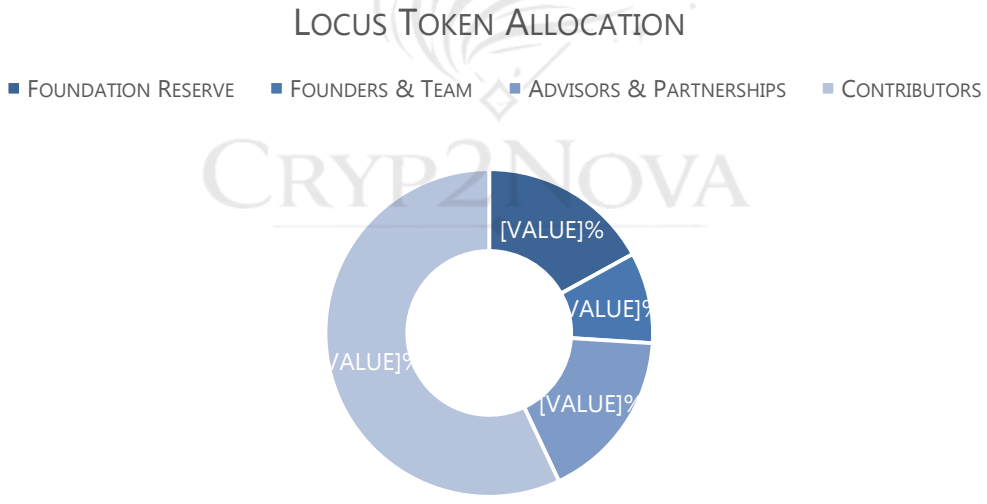


Figure 7.3.b Locus Token Allocation

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7.4 Utilization of Funds Raised

The funds raised through the sale of Locus tokens would be used for the major operations of building up and developing the project. Technical development of the blockchain is core to the success of the project and utilizes 50% of the funds raised. Subsequently, 20% would be used to build strategic partnerships with entities that support the Locus chain ecosystem. 15% of funds raised would be used for marketing purposes to develop the public adoption of Locus chain. 10% of funds raised would be used to support the daily operational overheads of the project, and the last 5% of funds raised would be kept in reserve.

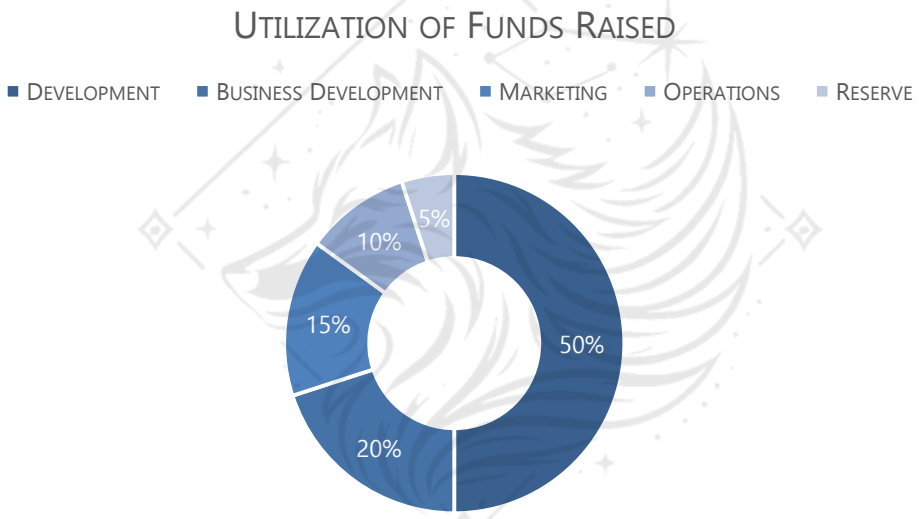
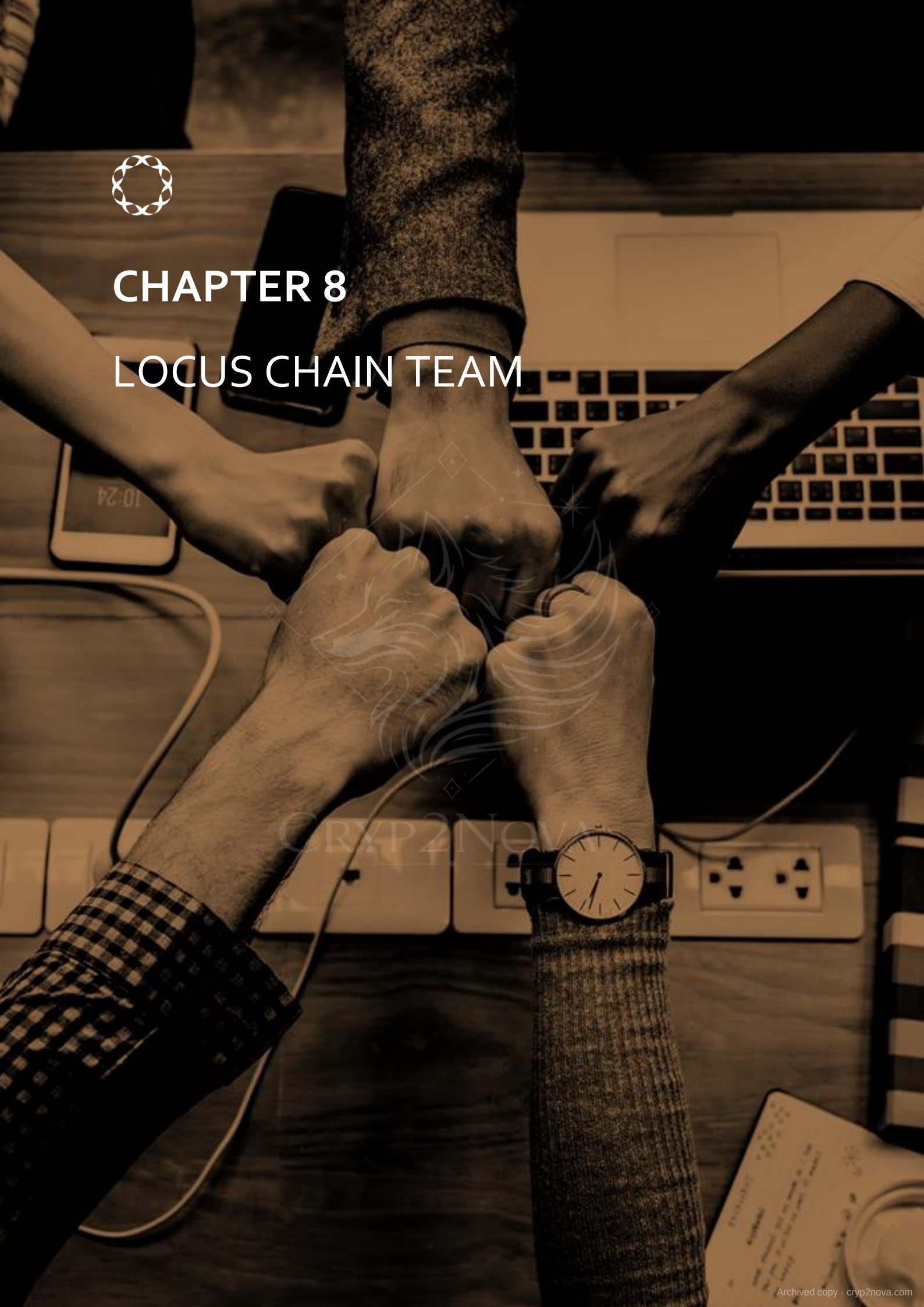


Figure 7.4.c Utilization of Funds Raised Distribution

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CHAPTER 8

LOCUS CHAIN TEAM

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LOCUS CHAIN TEAM

Locus Chain's core team members are engineers from various countries, including Korea and Japan. All the engineers onboard are veterans with more than 20 years of field and academic experiences.

It is remarkable to have a lot of gaming engine developers onboard in the team. Game engines are very sophisticated systems for high-speed parallel data processing and real-time network processing, which are comprehensive collection of complex technologies to enable real-time processing of billions of events per second, for several thousand users playing the game. The developers of game engines are at the frontiers who explore extremely technical problems with splendid balance of efficiency and expressiveness. Our team members include key developers of game titles that have sold millions of copies. The combined competence of industrial experts working towards the common goal makes Locus Chain viable to be the world's best high-speed cryptocurrency system. There are also other expert members in the core development team of Locus Chain, including network system experts, cryptography experts, and commercial internet service experts to complement the development involved for Locus Chain.

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8.1 Locus Chain Core Team



SANGYOON LEE

Founder & CEO

Since 1987, he has worked as game programmer; as a game creator, he has released many hits such as Kingdom Under Fire and N3. He led the development of the Blueside engine, which is regarded as the world's best-performing game engine. He is also an entrepreneur who has served as a representative in the past, such as Phantagram and Bigpot Games.



SEJUNG KIM

Co-Founder & Business Head

She worked for 8 years in Korea's first-generation game developer Phantagram and served as vice president for overseas business. She was responsible for overseas branches and overseas business development, game licensing, and publishing. She is also the founder of Blueside.



JAKE JOO

Technical Director & Architect

He has been working in the game industry for 20+ years, mostly in leading technology R&D roles. He always challenges himself to come up with new technology, and he is known for the exceptional quality of his work in various fields including game engine, networking, AI, optimization, and security. He agreed to leave the game industry temporarily and join Locus Chain as lead technical director to make the best possible technology one more time in this quickly advancing field.



GILHO LEE

Technical Lead



CHARLIE

Core Developer & Architect



PIERCE KANG

Core Developer

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TAK OGURA

Technical Director



NAKAJIMA

Technical PM



MYUNGWOO HAN

Core Developer



KYOUNGPYO HONG

Developer



OSEONG KWON

Developer



YEONHO KIM

Developer



SOOHAN CHO

CMO



JACKEY

CSO



CHIHWAN CHOI

CCO



GEUNSOO LEE

Lead Project Manager



JINHYUN JUNG

Public Relations Manager



JIMAN JUNG

Project Manager

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HM LIM

Marketing



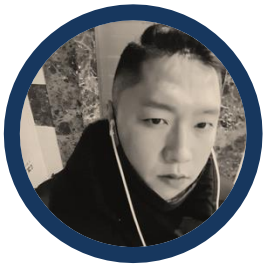
JIHYE KWON

Designer



SOONMI LEE

Global Marketing



GUNDO PARK

Lead Business Developer



CHANGWOO PARK

Manager



DONGHUN MIN

Manager

8.2 Middle East and Europe Division Partners



KHALFAN SAEED AL MAZROUEI

Undersecretary for the Private Department of HRH Sheikh Zayed bin Sultan al Nahyan, the Founder and President of UAE and Ruler of Abu Dhabi

The founder of Emirates Consulting group LLC ("ECG")



MR. FAWAZ ALADWANI

Original Group International, Bahrain market

Property development in Bahrain

Project management of real estate in Kuwait



MR. WALID BIN HASSAN ALSAYGH

Established a group of companies under one umbrella to bring customer satisfaction Kingdom wide and across the GCC, Middle East and the west with a portfolio in excess of One Billion Saudi Riyals.

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MR. NIZAR AZAR

SIMA International, a grade A contracting company which participated in large scale, highly specialized projects by being considered as a prime contractor for the UN Forces in Lebanon.
SIMA Baghdad, an integrated, full services contracting and construction company, serving local government and private companies especially in Oil & Gas sector.

8.3 Consultancy Partners



TOUKABRI RIADH

President & Founder of TUNISIA ECONOMIC CITY (T.E.C) Project
Special Advisor & Business Manager of H. R, H. Prince Mansour B. Mugrin B. Abdulaziz. Holding. Holding Jeddah K.S.A.



MOHAMMAD BACAI

Partner in SASAL General Trading in Dubai
Advisor of AH Group KOREA

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8.4 Advisors



YONGSU LEE

Founder & CEO of Icoda



DAEJOON JOO

Director of Information Division at Presidential Security Service of Korea (Former)

Director of IT Affairs at Presidential Security Service of Korea (Former)

Vice Chancellor of KAIST (Former)

Chairman of CTS International (Current)



YOUNGBAE MOON

CEO of Digital Finance Research Institute



KUN-SHAN LU

Founder and Chairman of LEADTEK (the first VGA company)

The President of Chinese Taipei Football Association (2009-2013)

The Highest Award "Pan Shi award" of Small and Medium Enterprises in Taipei.



JAMES HUANG

President of LeadHope Inc.

Digital Switch Engineer at AT&T Bell Lab USA

Senior Business Director at Taiwan Fixed Network



PRINCE E. FRANKLIN E. OMENE

Chief Executive Officer of Omene Holdings

Director for Finance & Project Development for IBello Foundation Nigeria

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MR. THANVEER UMMER

Managing Director MARIA GROUP INTERNATIONAL



AHMED H. AL GHAREEB

General Manager of Humaid Bin Rashid Al Nuaimi Foundation for Human Development

Member of the Board of Trustees of Rashid Bin Humaid Cultural and Sciences Award



ROHAN

Managing Director Connexionz Dubai

Founder & Chef Innovations Officer

CITI Telecommunications International



USMAN ZAFA

Accomplished UAE based Business Management and Technology Executive

Several Executive level position in major BlueChip and Fortune 500 Technology Corporations advising organizations on acquiring new ventures and all aspects of global expansion



AVINASH HALLOOMAN

Executive Director of Prime Consultants LLC

Director for Business Development of OAG

Associate Director of WGL

Landscaping Site Officer of Esp Landscapers Ltd-ENL Group

Landscape Contract Manager of Tap Turfs (Mitus) Ltd



HAKAN BALCI

Found & CEO of Burgschild Holding UG, in Germany based company

Shareholder of UAE based company, INVESTHA INTERNATIONAL

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SALLY EAVES

Number 21st Globally – 100 most influential blockchain expert

Official Member – Forbes Technology Council

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CHAPTER 9

ROADMAP

Q1 2018
LOCUS CHAIN FOUNDATION ESTABLISHED

Q2 2018
MARKETING AND PARTNERSHIP ANNOUNCEMENTS

Q3 2018
LOCUS CHAIN PLATFORM ALPHA COMPLETE
ROADMAP UPDATE

Q4 2018
LOCUS CHAIN PLATFORM BETA COMPLETE
PAYMENT SYSTEM BETA COMPLETE

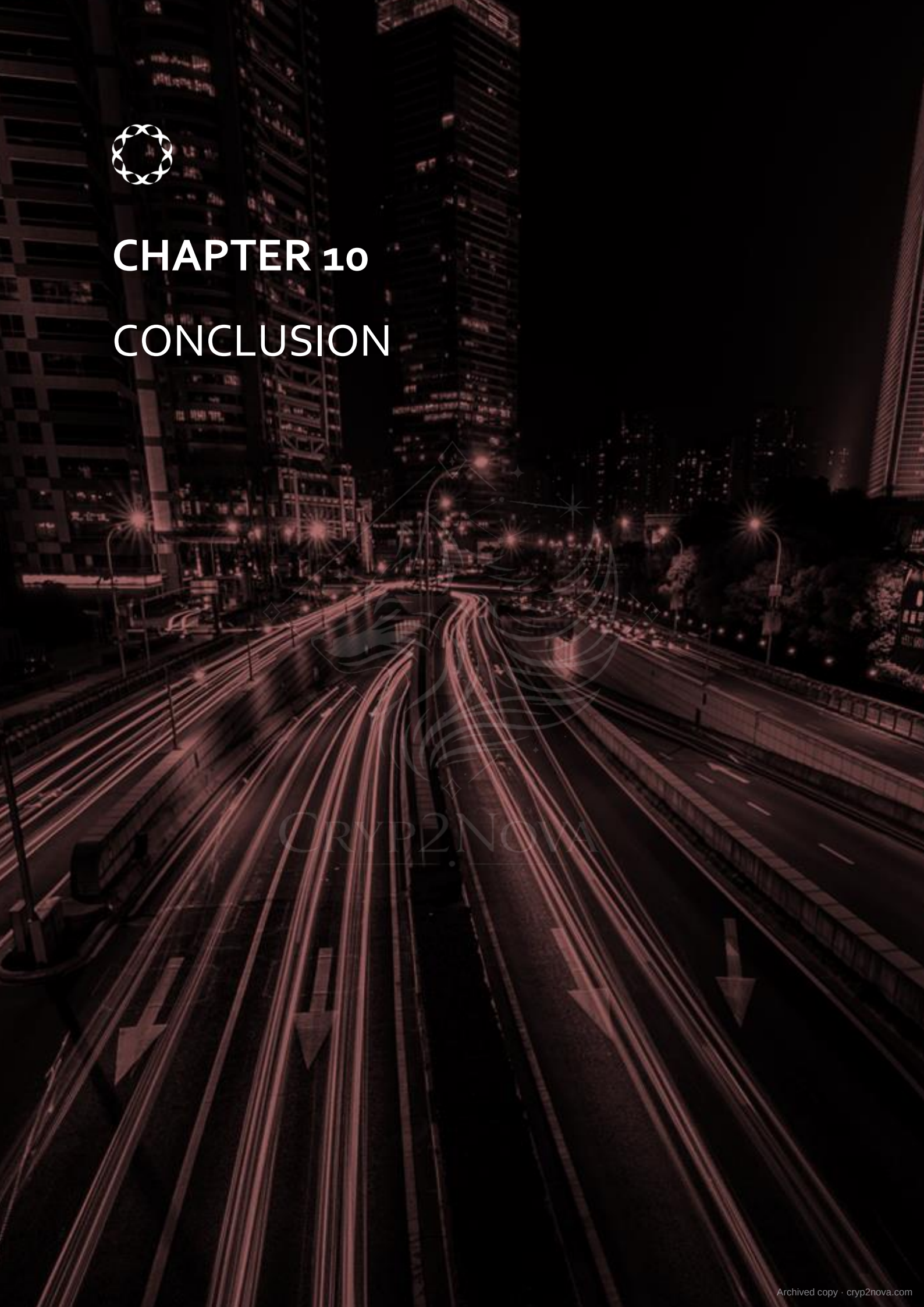
Q1 2019
MAIN NET RELEASE
SOURCE CODE OPEN

Q2 2019
DEVELOPMENT OF LOCUS CHAIN APPLICATIONS
PAYMENT SYSTEMS IMPLEMENTED

Q3 2019
BUSINESS DEVELOPMENT
PARTNERSHIP APPLICATION

Q4 2019
NEW LOCUS CHAIN BASED PROJECT LAUNCH
AIRDROP

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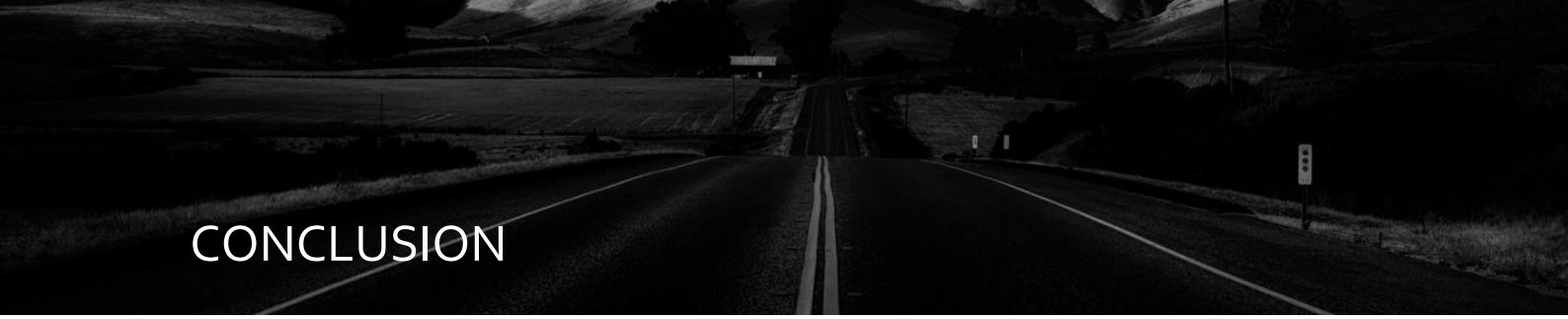


CHAPTER 10

CONCLUSION

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CONCLUSION

In conclusion, Locus Chain is truly convicted to the revolution brought by blockchain and cryptocurrencies. In order to create a blockchain system that everyone can benefit from and use, Locus Chain aspire build a protocol that will have mass adoption and wide spread usage.

Locus Chain is a fourth generation blockchain protocol that will meet the needs of various businesses and corporations from the IoT, natural resources, energy, communications, medical, gaming, public services, charity and education. With an advanced consensus mechanism of VRF-PBFT + , coupled with AWTC and Dynamic State Sharding, Locus Chain is able to achieve high transaction speed, low fees, power efficient, stable value while being Decentralize, Transparent and Scalable.

Locus Chain aspires to be the core protocol used in a wide range of projects, from large scale building of smart city technology infrastructures, right down to the individual applications interfacing with consumers within the smart city. The versatility of Locus Chain allows developers to build all kinds of applications to support all kinds of functions that are interconnected within the ecosystem. This is definitely achievable with our strong technical development team, reputable international advisers, a wide array of strategic partners and our community's strong support. With strategic partnerships such as the development of the smart city for Democratic Republic of the Congo already in place, Locus Chain can go to market rapidly after their systems are up. This reflects the overwhelming edge Locus Chain have over other teams that have overlook the business development aspect of their project.

With an experienced technical and business team, advance technological system designs, strong key advisers and strategic partnerships, Locus Chain will be the blockchain protocol of choice among all the countries and top tier traditional companies.

We warmly welcome you to be part of the Locus Chain revolution today to build a scalable, flexible integration block-chain platform!

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CHAPTER 11

RISKS



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RISKS

You acknowledge that there are the following risks associated with investing in Locus Chain, and you also agree to the representations and warrants made below:

1. You agree and acknowledge that Locus Tokens do not constitute securities in your operating jurisdictions
2. You agree and acknowledge that this Whitepaper does not constitute a prospectus or offer document of any sort and is not intended to constitute an offer of securities in any jurisdiction or a solicitation for investment in securities and you are not bound to enter into any contract or binding legal commitment.
3. You agree and acknowledge the risks of participating in the token generation event for Locus Chain, which include, but are not limited to, the following:
    a. Changes in legal environment leading to a change in the token strategy for Locus Chain
    b. Potential competitors that establish alternative networks that could utilize the same or similar code as Locus Chain which could negatively impact the value of Locus Chain
    c. Failure to develop a working product due to a variety of reasons such as unforeseen technical difficulties or shortage of funds or fluctuations in prices of digital assets, etc.
    d. Security weaknesses exploited by malicious groups or organizations in order to interfere with Locus Chain's development and operations including, but not limited, malware attacks, denial-of-service attacks, consensus-based attacks, Sybil attacks, and spoofing. Furthermore, there is a risk that weaknesses could be introduced either by a third-party or a developer that could affect the core protocol of Locus Chain.
    e. Other risks that result from the holding of and participation in Locus Chain, that cannot be anticipated at this time.

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CHAPTER 12

APPENDIX



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APPENDIX

12.1 TERMINOLOGY

1. **Transaction (Tx)**

   Unit of trade information.

2. **DLT (Distributed Ledger Technology)**

   Distributed ledger technology (namely DLT) is a digital system for recording the transaction of assets (Ledger data) in which the transactions and their details are recorded in multiple places at the same time. Thus, it blocks the manipulation of the ledger data. It is based on the Cryptology algorithm.

3. **Cryptocurrency**

   Cryptocurrency is a digital currency and also digital asset system which is based on the technology of Cryptology and DLT. Cryptocurrencies use decentralized control as opposed to centralized electronic money and central banking system. The decentralized control of each cryptocurrency works through a blockchain.

4. **Blockchain**

   Blockchain is a public transaction database, functioning as a distributed ledger. It is also a kind of DLT. Ledger data structure is formed as the chain of blocks. In many cases, the term is used to represent the entire DLT.

5. **DAG (Directed Acyclic Graph)**

   DAG is a directed graph data structure that uses a topological ordering. Unlike the Bitcoin's blockchain, the ledger structure of DAG is not consisted of the blocks in series. It has the acyclic graph structure.

6. **Nakamoto Consensus**

   It is the consensus protocol that has been used firstly in Bitcoin. When any attackers or malicious nodes are found in the network, it regards the longest node (longest history of proof of work) as the honest node and eventually decentralized network come to a consensus on the ordering blocks. While come to a consensus, temporary branching of ledger can occur, so it would be difficult to confirm which block shall be included in the ledger.

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7. **PoW (Proof-of-Work)**

   It is a mathematical proof of that time-consuming works has been done. In the DLT context, it refers to the Nakamoto consensus algorithm that uses PoW in many cases. In this sense, it is a counterpart of PoS and PBFT.

8. **PoS (Proof-of-Stake)**

   It is a proof of owning stakes. In the DLT context, it often refers to consensus algorithms utilizing proof of stake of each node.

9. **PBFT (Practical Byzantine Fault Tolerance)**

   It is a consensus algorithm that all of participating nodes can agree the consensus successfully at the asynchronous distributed system, in which disloyal Byzantine (it doesn't follow the pre-assigned action) also can exist. Unlike the Nakamoto Consensus, the agreed block will be applied after the consensus are made and confirmed. It can be worked in case that only dozens of nodes are participating.

10. **VRF (Verifiable Random Function)**

    VRF is verifiable random function whose result values can be verified outside.

11. **Sharding**

    Technically, sharding is a synonym for horizontal partitioning. In practice, the term is often used to refer to any database partitioning that is meant to make a very large database more manageable. Sharding is a technology to divide and process the activity in single shard from the activities in multiple shards.

12. **Network Sharding**

    Technology to reduce the network overhead by separating networks into shards.

13. **State Sharding**

    In the DLT context, it refers to the technology for separating ledger data into shards and distributing them across multiple nodes.

14. **Dynamic State Sharding**

    Technology for dynamically adjusting the number of ledger shards. Adopted by Locus Chain.

15. **Gas**

    In the cryptocurrency context, it refers to a supportive digital currency, created or consumed for system operation, but not accepted as the main currency. Used in Ethereum or NEO, planned to be used by Locus Chain.

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LOCUS CHAIN

THE MOST SCALABLE AND FLEXIBLE INTEGRATION BLOCKCHAIN PLATFORM

DEVELOPER

BLOOM Technology

PARTNERS

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icoda · SM Wave · CELLSERVE · IntaBuild

SIL · ICPS · SQUIRE PATTON BOGGS · D'ledgers CONSULTANTS

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