香港區塊鏈產業協會
Hong Kong Blockchain Industry Association

TSF 工商機構支援基金
Trade and Industrial Organisation Support Fund

# BLOCKCHAIN TECHNOLOGY

# Content

# Introduction

Generally, blockchain is a list of records called blocks that store data publicly and in chronological order. The information is encrypted using cryptography to ensure that the privacy of the user is not compromised and data cannot be altered. It can be imagined that blockchain is a distributed database shared among the nodes of a computer network.

Blockchain carries lots of features, benefices in different area compared to traditional database.

Blockchain also invented various transformation, such as cryptocurrency, non-fungible token (NFT) and smart contracts, which are widely used in recent years.

There are **2 main natures** indicating the irreplaceable position of nowadays blockchain.

- Distributed Ledgers

A distributed ledger is a collection of digital data that is shared, synchronized, and replicated by every user of the blockchain.

- Hash Encryption

Blockchain uses cryptography to ensure that all the data in the blocks is kept secure from unauthorized access and is not altered.

# Advantages

Distributed ledger and hash encryption bring various advantages compared to traditional technology.

- Greater transparency

With distributed ledger, users can go for a complete decentralized network where there is no need for a centralized authority, improving the system's transparency. Authorized users can access the data anywhere and anytime.

- Increased efficiency and speed

Since decentralization eliminates third parties between users, the speed of transaction can be accelerated. Blockchain solves the time-consuming process and automates them to maximize efficiency.

# Advantages

- Reduce cost and error

Decentralization nature of blockchain avoids the maintenance fee of databases and services fee of third parties. It greatly reduces the cost of large enterprises. Besides, it eradicates the human-based error with the help of automation.

- Enhanced security

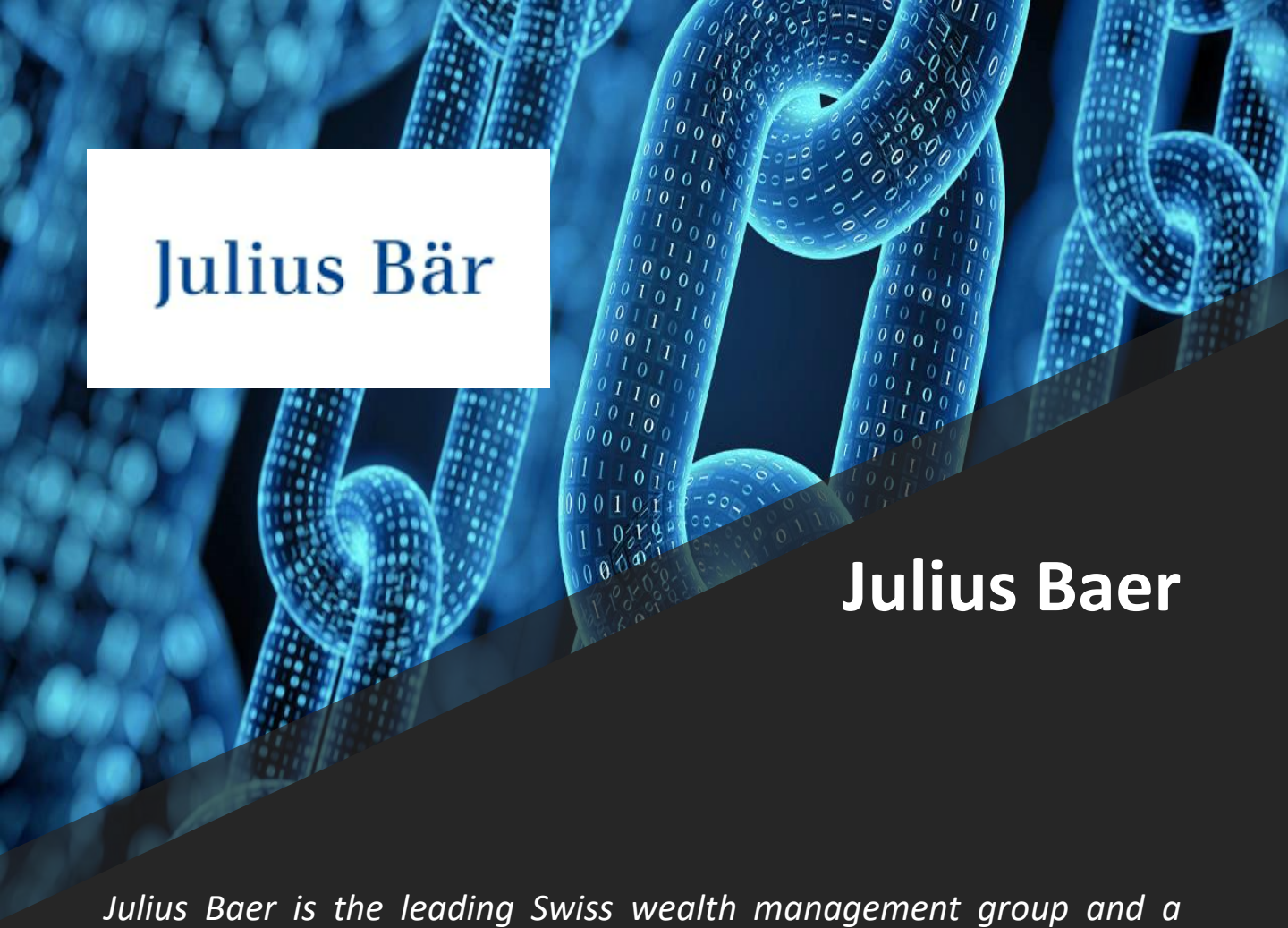
As blockchain gets rid of the need for a central authority, no one can just simply change characteristics of the network for their benefit. Hash encryption ensures another layer of security for the system.

It seems that blockchain contains a lot competitive advantages compared to traditional technology.

The following will talk about blockchain application among different industries.


Case Study

# Banking Industry




# Julius Baer

*Julius Baer is the leading Swiss wealth management group and a premium brand in this global sector, with a focus on servicing and advising sophisticated private clients.*

JB Bank provides an easy login service based on the Open Keychain technology of blockchain for the New Smart Banking App, which is the new version of mobile banking. Customers can simply login by installing the Blockchain Certificate in the JB Bank banking App, and then entering the password for the certificate. The service is limited to just easy logins, and thus customers cannot use blockchain-based authentication in purchasing financial products and services. It is known that JB Bank plans to apply blockchain-based authentication service to all online financial services.

In this case, Smart Easy Login service applied to mobile banking App of JB Bank is limited to increasing convenience of the mobile App banking service with the Open Keychain technology of blockchain.

# KB Financial Group

*KB Financial Group is Korea's leading financial services provider offering broad range of financial products and services since 2008.*

In 2016, KB Financial Group developed an overseas remittance service using blockchain technology. It has completed the beta-test for the overseas remittance service and the technological verifications between KB Kookmin Bank Headquarters in Korea and overseas branches. Blockchain-based overseas remittance service is using blockchain network as the remittance information network, instead of SWIFT network (overseas remittance network that goes through the intermediary bank), which is currently being used.

Since blockchain uses distributed transaction ledger to process overseas remittance, which prevents from forgery and falsification, it was expected that the foundation for handling overseas remittance service was safe. However, blockchain did not play any role in the process of providing test service in connection with other financial institutions. As a result, officially blockchain-based overseas remittance service is not being provided.


From December 2016, KB Kookmin Card started to provide blockchain-based authentication service in the App credit card “K-motion”. Customers can enter the information of the valid credit card into the K-motion App credit card and set a six-digit password, which allow the customers using various services with the same password. Unlike the Public Key Certificate currently being used, customers do not have to re-issue Public Key Certificates every year. Furthermore, customers can alter their passwords through the App conveniently.

In 2015, KB Kookmin Card provided a service to transition Pointree into Bitcoin. Pointree was the point accumulation system of the KB Kookmin Card. If the accumulated points reached 1,000 points or more, customers could convert them for Bitcoin on a one-point scale, up to 300,000 points annually, at the market value of the Bitcoin trading platform Coinplug through the KB Kookmin Card website or mobile application.


Using the blockchain technology, it has established a “non-face-to-face real name verification evidence material storage system”, which could confirm whether non-face-to-face real name verification evidence materials are forged or falsified. If a bank account is opened through the mobile, the confirmation of ID card and transfer details must be proved online, for the non-face-to-face real name verification. During this process, malicious attackers cannot forge the data of the evidence materials, and forgery and falsification of data can be verified without the need for the original data. Therefore, efficient proof of data is possible.

In this case, it is very difficult to innovate the international remittance service field, such as SWIFT, by utilizing the characteristics of the dispersion technology of the blockchain by a specific financial institution alone. To innovate international remittance services such as SWIFT, it is necessary to innovate at the level of ecosystem perspective.


# NongHyup

*Nonghyup is an agricultural bank headquartered in South Korea. The bank was established in 2012 as detached from and is now owned by the National Agricultural Cooperative Federation.*

NH Bank has entered into partnership agreement with KORBIT, a Bitcoin Trading Center, to take measures to incorporate blockchain technology into authentication, remittance and more. The blockchain-based fingerprint authentication service has been provided by NH Bank since 2016. This service registers fingerprints in the smartphones and allows customers to make transactions on an internet banking account without a separate self-identification process. If customers follow the guide to scan their fingerprints on their smartphones, they can make all the transactions, including checking the account, transfers and registering for a financial product, without needing to go through a separate self-identification process.


# Shinhan Bank

*Shinhan Bank is a bank headquartered in South Korea. Historically it was the first bank in Korea, established under the name Hanseong Bank in 1897.*

In 2015, Shinhan Bank has been trying to enter into collaboration with Streami, a startup specializing in blockchain, to develop blockchain-based foreign currency remittance system. It has made an equity investment of KRW 500m to Streami, a blockchain technology startup, and is jointly developing foreign currency remittance system using blockchain technology as of now. It provides “Digital Kiosk”, which is an automated teller service storing data in blockchain format. Kiosk, using palm vein recognition, stores the information in a blockchain format, and each of them is equipped with security system, to match the information in the server. Thus, even if you complete the authentication information, it cannot be reused. Furthermore, it has registered to become the member of the global blockchain consortium “R3CEV”.


Shinhan Bank has developed Digital Kiosk, which is a blockchain-based data storage service, and NH Bank has developed and is providing blockchain-based fingerprint authentication service that could be used on smartphones. These are just simply making business process automatic to reduce cost and enhance efficiency, rather than innovating the business model.

In the literature study, it is argued that the blockchain can innovate the business model at financial institutions. Through case studies, it is concluded that the blockchain enables the financial institution's process automation and cost reduction rather than innovation at the business model level. It was because business model innovation reflecting the distributed characteristic of blockchain introduced by the domestic financial institutions, cannot be found.


# KEB Hana Bank

*Hana Financial Group is poised to become one of the world's leading financial groups with the Korean financial industry's most extensive overseas network. It started as Korea Investment & Finance since 1971, followed by its conversion to a commercial bank in 1991 and financial holding company in 2005.*

KEB Hana Bank has been participating in R3CEV, which is a global blockchain consortium, from 2016 until now, and is verifying blockchain technology by implementing payment-, settlement- and authentication-related projects. KEB Hana Bank is using blockchain as follows: using Smart Contract, which is a digital automatic contract of blockchain, KEB Hana Bank made non-deliverable in Korean currency process into an automatic process, and through blockchain-based customer authentication, customer authentication process (CDD/EDD) is automated to prevent money laundering. Through this automation process, it is expected that cost will be reduced and efficiency will be enhanced.


Cross-Border
Payment

# Ripple

*Ripple is the only enterprise blockchain company today with products in commercial use by hundreds of customers across 55+ countries.*

RippleNet is a global payments network by using advanced blockchain technology. It is widely applicable between the financial institutions all around the world. There are two selling points on RippleNet, which also indicates the advantages of blockchain.

Through applying blockchain technology, RippleNet becomes a decentralized infrastructure, which means it will not pass through any third-party during the process of payments. On the other hand, it highly reduces the processing time and every cross-boarder payments can be completed within ten seconds. It provides a better performance than the traditional overseas remittent.


# Ripple

Moreover, millions of dollars are spent each year reconciling ledgers between banks formerly. Under the application of blockchain, distributed transaction ledger is being used in RippleNet and hence the outlay of banks could be greatly reduced. In addition, distributed transaction ledger protect clients from forgery and falsification, so that the transaction will be more secure than traditional method.

In this case, blockchain play an important role in developing RippleNet. The advantages of blockchain technology are fully illustrated on the network. It can be said that the success of RippleNet mainly depends on the blockchain technology which offer a better payments experience to the customers.


# VISA

*Visa Inc. is an American multinational financial services corporation headquartered in United States. It facilitates electronic funds transfers throughout the world, most commonly through Visa-branded credit cards, debit cards and prepaid cards.*

Another example of blockchain-based global payments network is Visa B2B connect. Visa B2B connect is developed by Visa Inc. and Chain Inc.(a blockchain-based technology company). Approximate to RippleNet, Visa B2B connect provides global payments services to institutions in different countries. Under the applications of blockchain technology, it streamlines the payments services and reduces the costs for customers.


Insurance
Industry

# American Association of Insurance Services

*AAIS has served the Property & Casualty insurance industry as the only national nonprofit advisory organization governed by its member companies since 1963. AAIS serves as an intermediary between regulators and insurance carriers, filing forms and rates and serving as a statistical reporting bureau.*

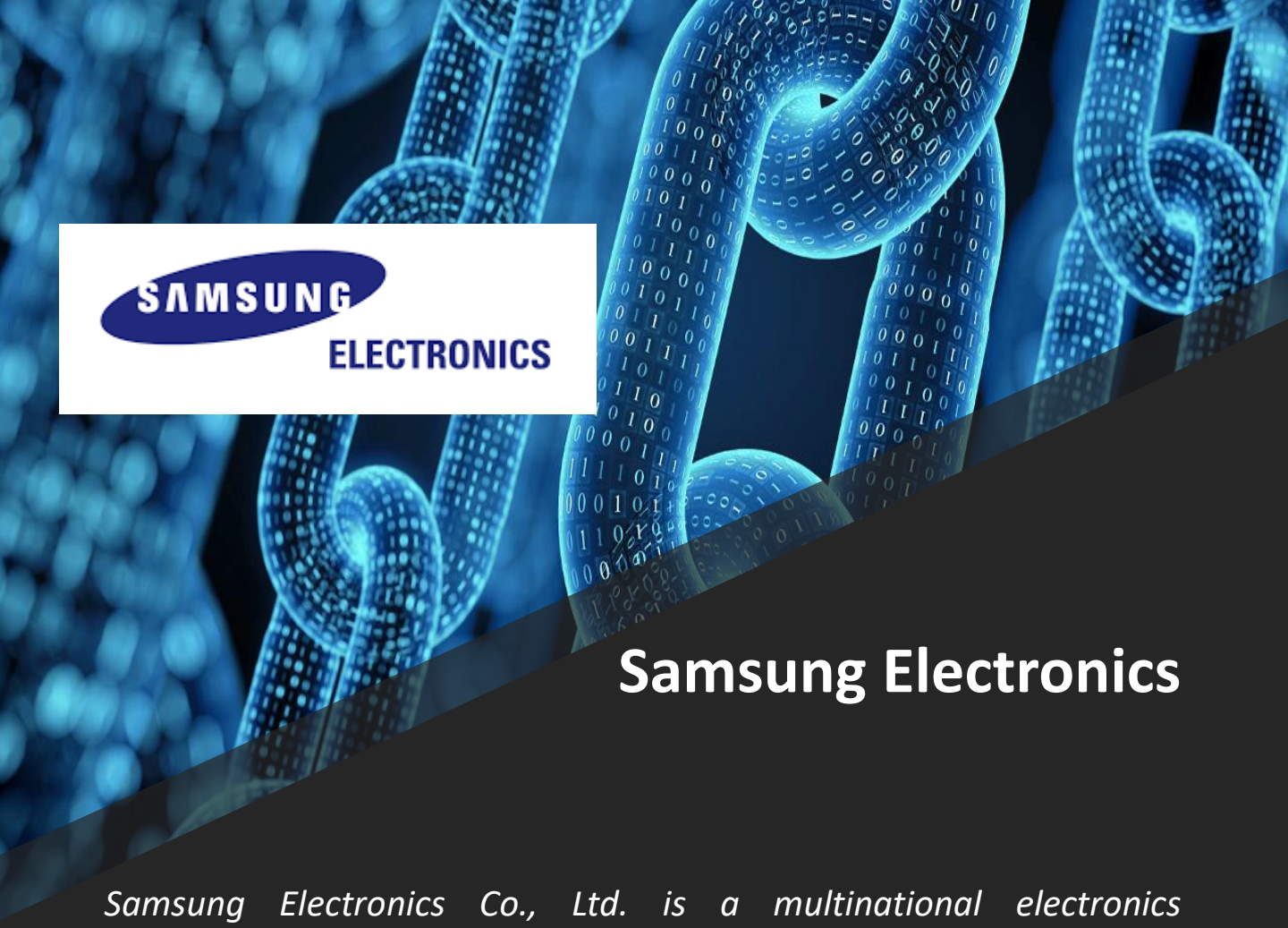
OpenIDL is an open source, distributed ledger platform developed by AAIS and IBM. By using blockchain technology, openIDL infuses efficiency, transparency and security into regulatory reporting. The automate underwriting and claims settlement function increase the speed and cost efficiency of insurers. Besides, it reduces fraud and abuse by improving the traceability and transparency. Regulators can gain targeted insights into exposures to assure the authenticity of the report.


# Marsh

*Marsh is a global professional services firm, headquartered in New York City with operations in insurance broking and risk management.*

As the insurer that helps create millions of insurance guarantees each year, Marsh saw an opportunity to streamline and improve the process by using IBM blockchain technology. The IBM Services team helped Marsh integrate Salesforce.com with the IBM blockchain platform as the starting point in the certificate process to create an immutable proof-of-insurance record accessible by all permissioned network members to increase efficiency and boost trust among all parties to the transactions.

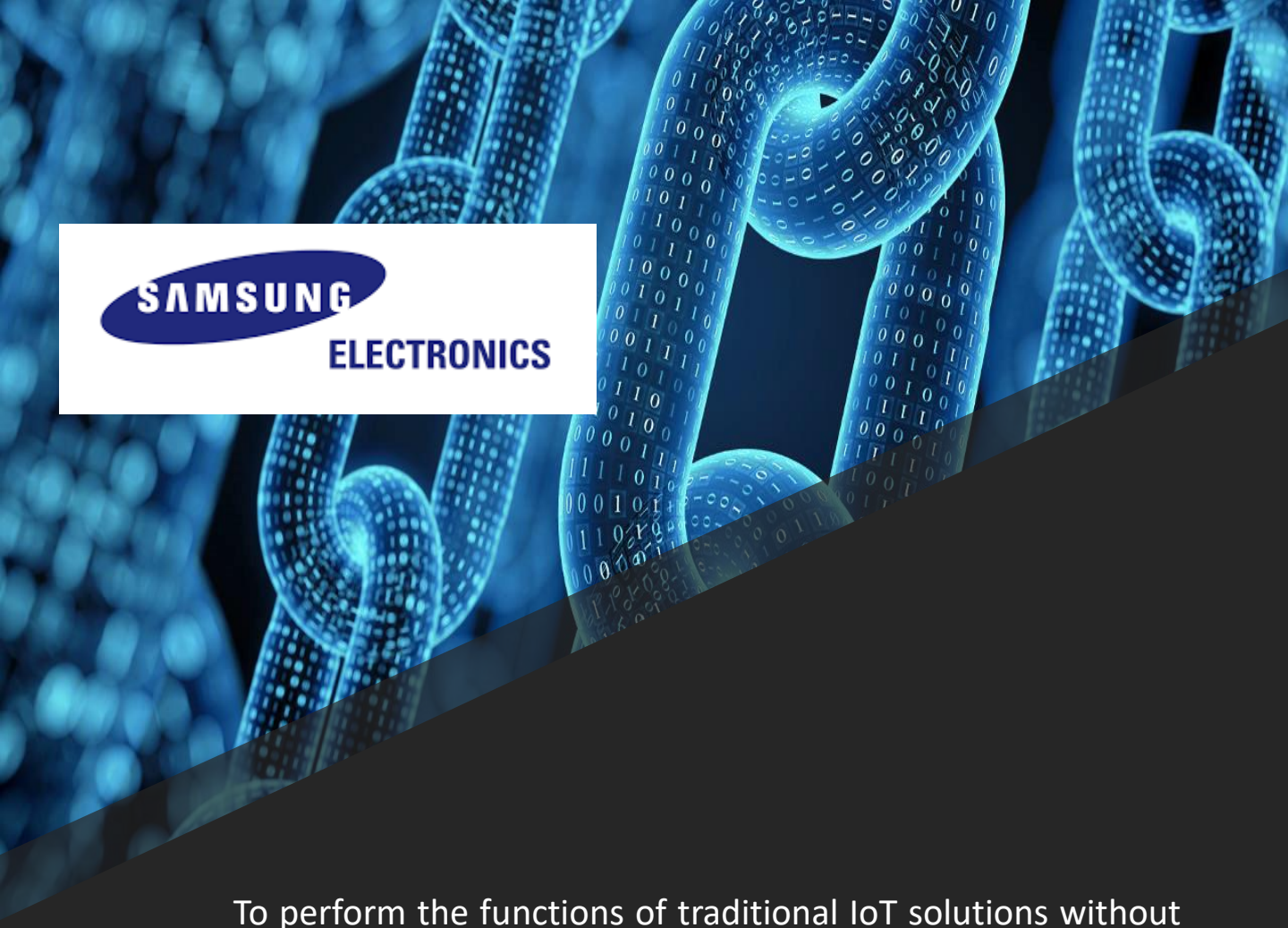

Internet of
Things (IoT)




# Samsung Electronics

*Samsung Electronics Co., Ltd. is a multinational electronics corporation headquartered in South Korea. Samsung Electronics has assembly plants and sales networks in 74 countries, and it is the world's largest manufacturer of consumer electronics by revenue.*

In 2015, Samsung Electronics jointly developed with IBM the Autonomous Decentralized Peer-to-Peer Telemetry(ADEPT) proof-of-concept(PoC). The primary objective of the ADEPT PoC was to establish a foundation on which to demonstrate several capabilities that are fundamental to building a decentralized Internet of Things(IoT). As the IoT scales exponentially, decentralized networks have the potential to reduce infrastructure and maintenance costs to manufacturers. Decentralization also promises increased robustness by removing single points of failure that could exist in traditional centralized networks. By shifting the power in the network from the center to the edges, devices gain greater autonomy and can become points of transaction and economic value creation for owners and users.




To perform the functions of traditional IoT solutions without a centralized broker, ADEPT support three foundational functions : peer-to-peer messaging, distributed file sharing and autonomous device coordination. The ADEPT PoC implemented these functions using three open source protocols: Telehash for messaging, BitTorrent for file sharing and Ethereum, a blockchain protocol for autonomous device coordination functions such as device registration, authentication, proximity-based and consensus-based rules of engagement, contracts and checklists.


In this case, ADEPT validates the feasibility of both implementing the foundational functions of a decentralized IoT and enabling device autonomy in IoT transactions and marketplaces. For example, ADEPT tracks the state of safety for critical machines and their maintenance. Third-party repair partners can monitor the blockchain for preventive maintenance and record their works back on the blockchain. Moreover, in the use of distributed ledgers of blockchain technology, decentralized IoT reduces the cost of data transfer between large quantity of devices and enhances the efficiency compared with centralized IoT.

# DocuSign

*DocuSign, Inc. is a company headquartered in United States, that allows organizations to manage electronic agreements. As part of the DocuSign Agreement Cloud, DocuSign offers eSignature, a way to sign electronically on different devices. DocuSign has over 1 million customers and hundreds of millions of users in more than 180 countries.*

In 2015, DocuSign collaborated with Visa on one of the first public prototypes of a blockchain-based smart contract. The DocuSign proof-of-concept app, embedded into the dashboard of a connected car prototype developed by Visa for car-based commerce, simplifies the process of leasing or buying a car by automating all the steps into a seamless, completely secure electronic environment. The technology enables the car to be a smart asset among the IoT with the ability to manage services like auto insurance, lease payments and even tolls and parking. The proof-of-concept was developed using the blockchain and brings DocuSign's Digital Transaction Management (DTM) platform, eSignature solution and APIs together with the Visa Token Service for secure payment processing.

# Logistics Industry


# Chronicled

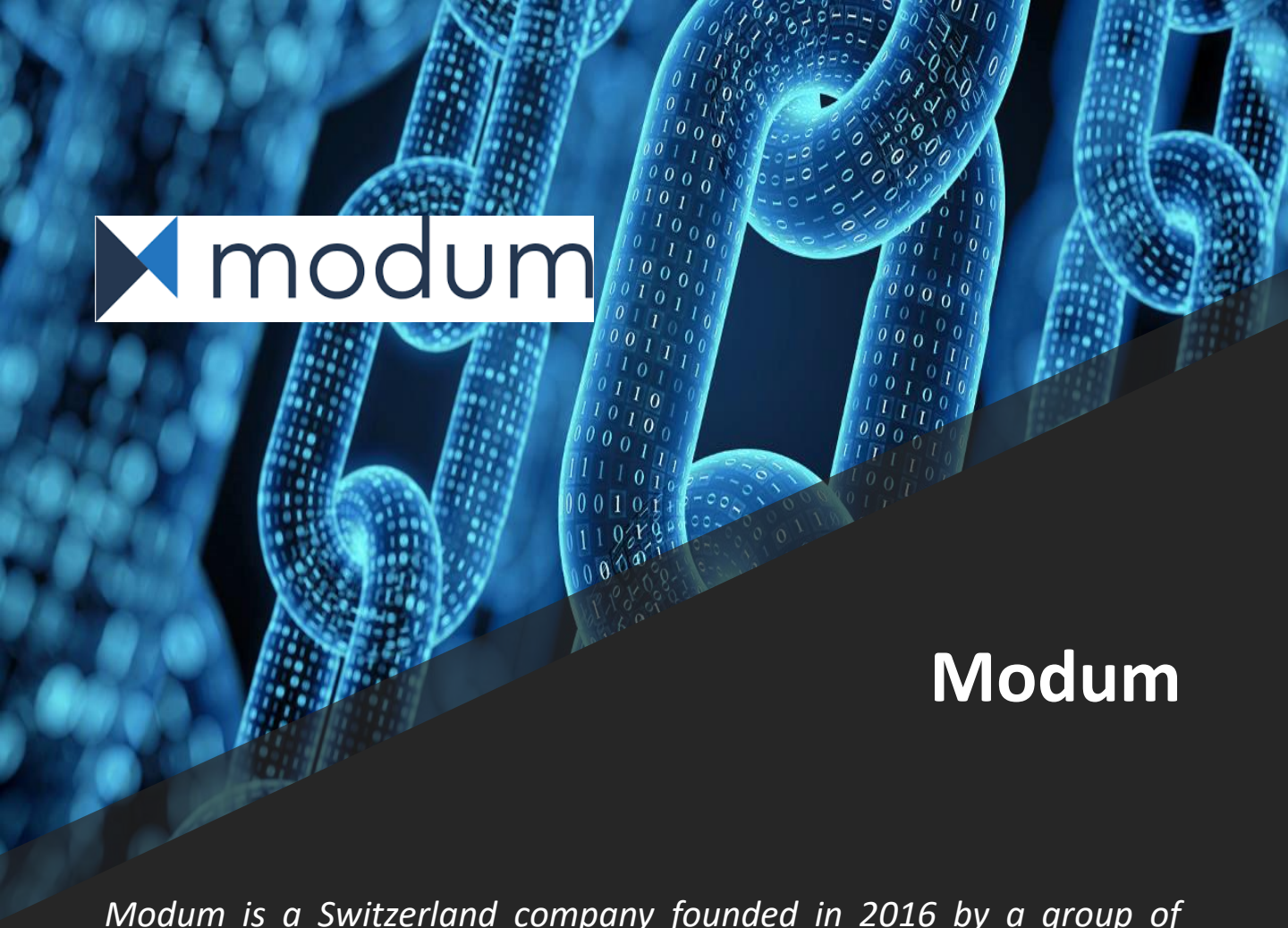
*Chronicled is a company in California, the U.S. that offers supply chain solutions for blockchain and other technologies. The company was founded in 2014 and produces technologies for blockchains, zero knowledge proofs, supply chain solutions, and planning systems.*

Chronicled combines blockchain with AI and IoT devices to automate traceability and instantaneously approve financial transactions in the shipping industry. It gives logistics companies better insights into environmental conditions and transfer-of-custody processes. Besides, it automates the payment procedure whenever the cargos arrived and received, which speed up the process of transactions. As a result, businesses can securely and efficiently transport their products all over the world.


# ShipChain

*Founded in 2017, ShipChain is a blockchain technology platform designed for transport and logistics.*

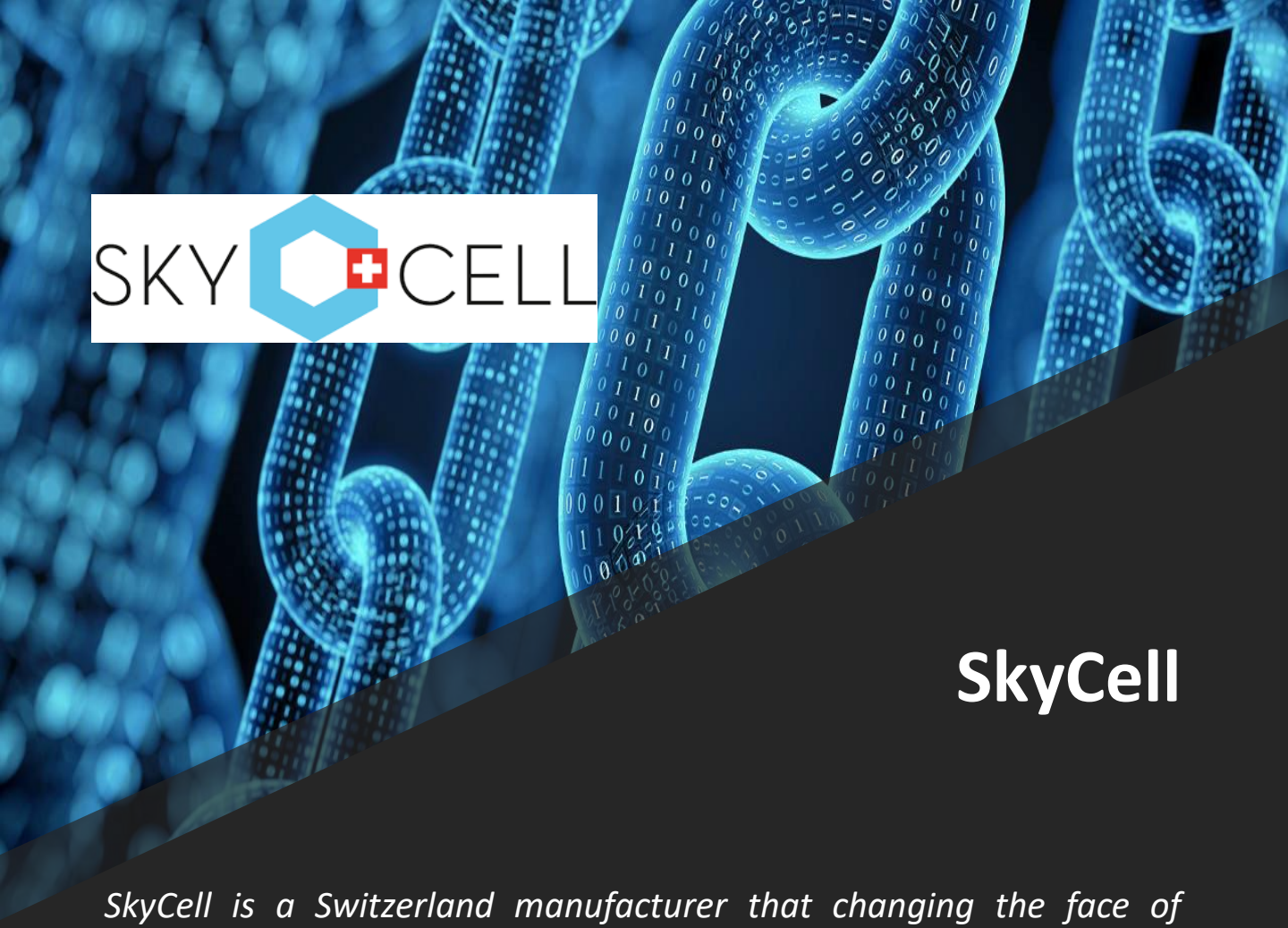
ShipChain built a blockchain-based logistics platform to support the shipping process from end to end. The platform allows all parties on the chain to receive updated information on a container's locations, as well as estimated arrival times, via encrypted public ledgers. Besides, ShipChain releases a cryptocurrency called SHIP token which facilitates the use of its logistics platform.



# Modum

*Modum is a Switzerland company founded in 2016 by a group of entrepreneurs and experts in process innovation, digitalization and pharma logistics with the goal to digitalize supply chains of sensitive goods with the help of modern technology.*

Pharma-focused Modum offers blockchain-enabled products that manage the production and shipment of medicines. The company's temperature monitors, route tracking and smart contracts all work to ensure that medicines arrive safely and on time.




# SkyCell

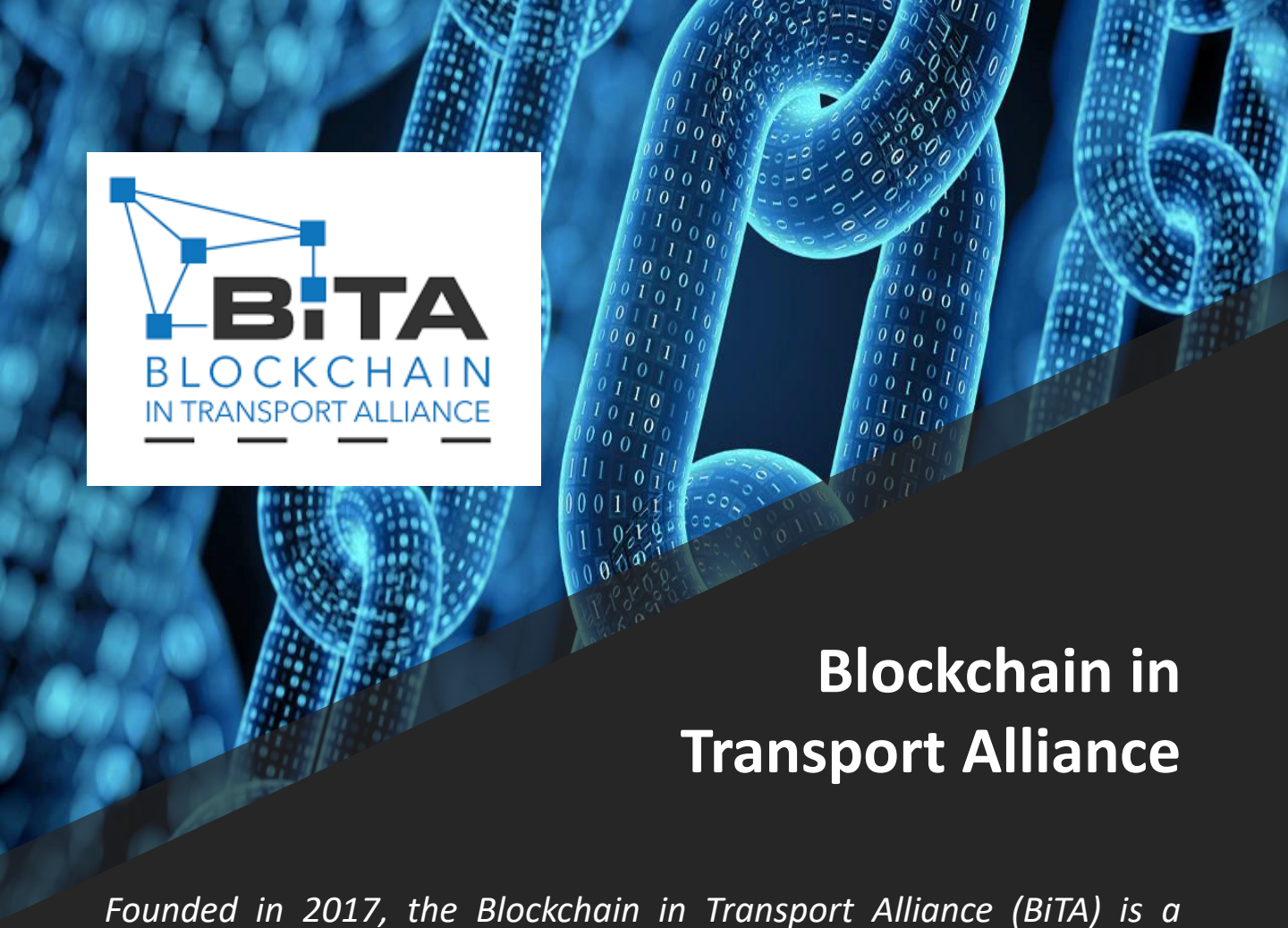
*SkyCell is a Switzerland manufacturer that changing the face of global pharmaceutical supply chains through a combination of hybrid containers, tracking software and risk management service.*

SkyCell's shipping containers are designed specifically for the pharmaceutical industry, made of recycled materials and contain temperature barriers to protect the most sensitive medicines. Users are allowed to track the location of the containers to predict the arrival time through the blockchain-based software and hence make a more precise decision.

# FoodGuardians

*The sister company of SkyCell, FoodGuardians is a Switzerland manufacturer of food containers.*

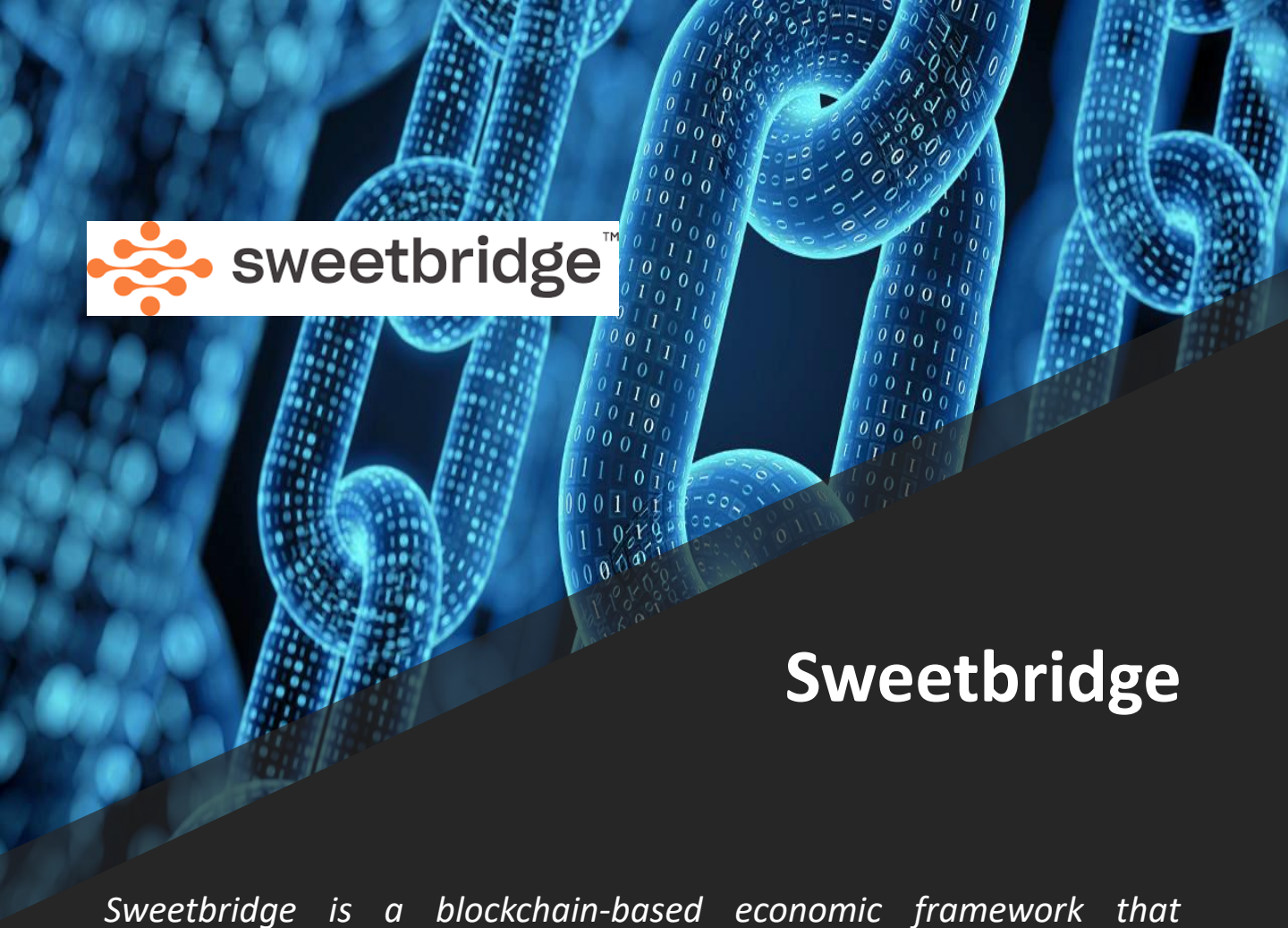
FoodGuardians helps protect foods and keep them fresher longer. Paired with the company's temperature barriers and patented insulation, the blockchain-based software helps food supply chain managers efficiently track and trace the life cycle of their most sensitive foods. It maintains the food quality during the transportation period.




# Blockchain in Transport Alliance

*Founded in 2017, the Blockchain in Transport Alliance (BiTA) is a standards and advocacy organization to help educate, advocate, and establish standards for blockchain applications in the transportation industry.*

BiTA was created as a forum for the logistics industry to discuss and develop plans for implementing ledger technology in shipping. The alliance is currently working on common standards and practices for the industry while attempting to educate professionals on the benefits of blockchain. Logistics behemoths like UPS, FedEx, Uber Freight, Union Pacific Railroad and project44 are the examples of BiTA's member companies.



# Sweetbridge

*Sweetbridge is a blockchain-based economic framework that transforms supply chain and logistics collaboration through a fast, fair and flexible value exchange that unleashes working capital for the benefit of all participants.*

Sweetbridge focuses on liquidity and flexibility in the supply chain. The company uses blockchain to help free up billions of dollars that are currently in limbo over payment disputes. With real-time auditing ledgers, smart contracts and Sweetbridge's own cryptocurrency, Sweetcoin, payment disputes can be settled in seconds rather than days or weeks.

# Provenance

*Provenance offers software for businesses that can gather and present data-supported information about products and their supply chains.*

Provenance uses blockchain to increase transparency in the retail industry. In order to give consumers a better idea of its business practices, Provenance retailers can document the origination of their products and showcase their supply chains on a ledger. Provenance's goal in using blockchain is to hold retailers accountable while helping members make higher-quality, more trustable products.


# WaltonChain

*Founded in 2016, on the fifth anniversary of Walton's death (the inventor of RFID technology) , WaltonChain is a project and platform of a business ecosystem with complete data exchange and absolute information transparency based on the blockchain, IoT (Internet of things) and the application of radio-frequency identification (RFID) released from China .*

WaltonChain is a platform that seeks to combine RFID and blockchain technology to manage supply chains. It is enabling the next generation of Value Internet of Things (VIoT). Still in its early stages, the company plans to combine blockchain-based RFID chips with IoT devices to boost safety and efficiency. They're also investigating the integration of ledger technology with supply chains for smart cities and agricultural IoT devices. The use of WaltonChain in supply chain management promotes transparency, integrity, traceability, and monitoring of commodities in circulation. It allows users to manage, trade, trace, and pay for products using the Walton cryptocurrency while having full access to information of those products through their RFID chips.

# Koopman Logistics

*Koopman Logistics was founded in 1923, Netherlands. It offer a range of solutions such as preparing vehicles for delivery, short or long-term storage, preparing ex-lease or rental cars for sale, transporting large volumes of vehicles into 1 car hauler or direct delivery to the end customer.*

Koopman Logistics is an automotive transportation company that uses blockchain to ship cars all over the world. By employing the ledger technology, it reduces paper supply, quickens the payment process and makes the shipping process more secure. In April 2018, Koopman became the world's first automotive logistics company to deliver a vehicle via a completely paperless blockchain process.


# Guardtime

*Guardtime is a software security company. It was founded in 2007 in Estonia and is headquartered in Amsterdam. The company developed a digital signature system based on blockchain technology.*

Guardtime is the first and only platform for ensuring real-time integrity for data and systems at scale. Guardtime's blockchain for maritime logistics aims to correct industry issues stemming from inefficiency as well as lack of trust and transparency. The company's ledger uses smart encrypted contracts and decentralized shipping tracking to quickly verify data in a way that protects it from cyber attacks and manipulation.


# CargoLedger

*CargoLedger is a digital transformation of the supply chain founded in 2017, Netherlands. It applies blockchain to the process of logistics.*

CargoLedger builds blockchain-based software for the logistics industry. Primarily focused on reducing physical and time waste, the company has plans to implement personalized blockchain technologies into all aspects of the logistics process. Smart contracts replaces paper agreements and transformed logistics into digital format. Proof-of-delivery and real-time track-and-trace can be done easily via the software.

# Slync

*Slync is transforming the logistics industry with solutions built to eliminate wasted time, effort, and data. It works closely with the clients to bridge the gaps that exist between human-driven processes and technology, leveraging deep industry expertise and a powerful cloud platform that integrates with and extends the value of core planning and execution systems.*

The Logistics Orchestration® platform produced by Slync combines blockchain and AI to give retailers, manufacturers and suppliers real-time insights into all of their local and global shipments. The platform allows shippers to automate monotonous workflows, predict bottlenecks or challenges in a logistics process and even get a real-time overview shipment activity.


# Blockfreight

*Founded in 2017, Blockfreight was established to build the blockchain of global freight to the shipping and logistics industry. The Blockfreight beta software was developed in 2018 and Blockfreight now works with leading industry partners to pilot the network and prepare for the launch of an industry association.*

Blockfreight develops blockchain-based technologies that eliminate wasteful payments throughout the traditional shipping process. The Blockfreight software platform currently runs on the Bitcoin blockchain to facilitate easier payments and safer transactions between parties in a supply chain. It is supporting over 360,000,000 containers on network launches in late 2020.


# MuleChain

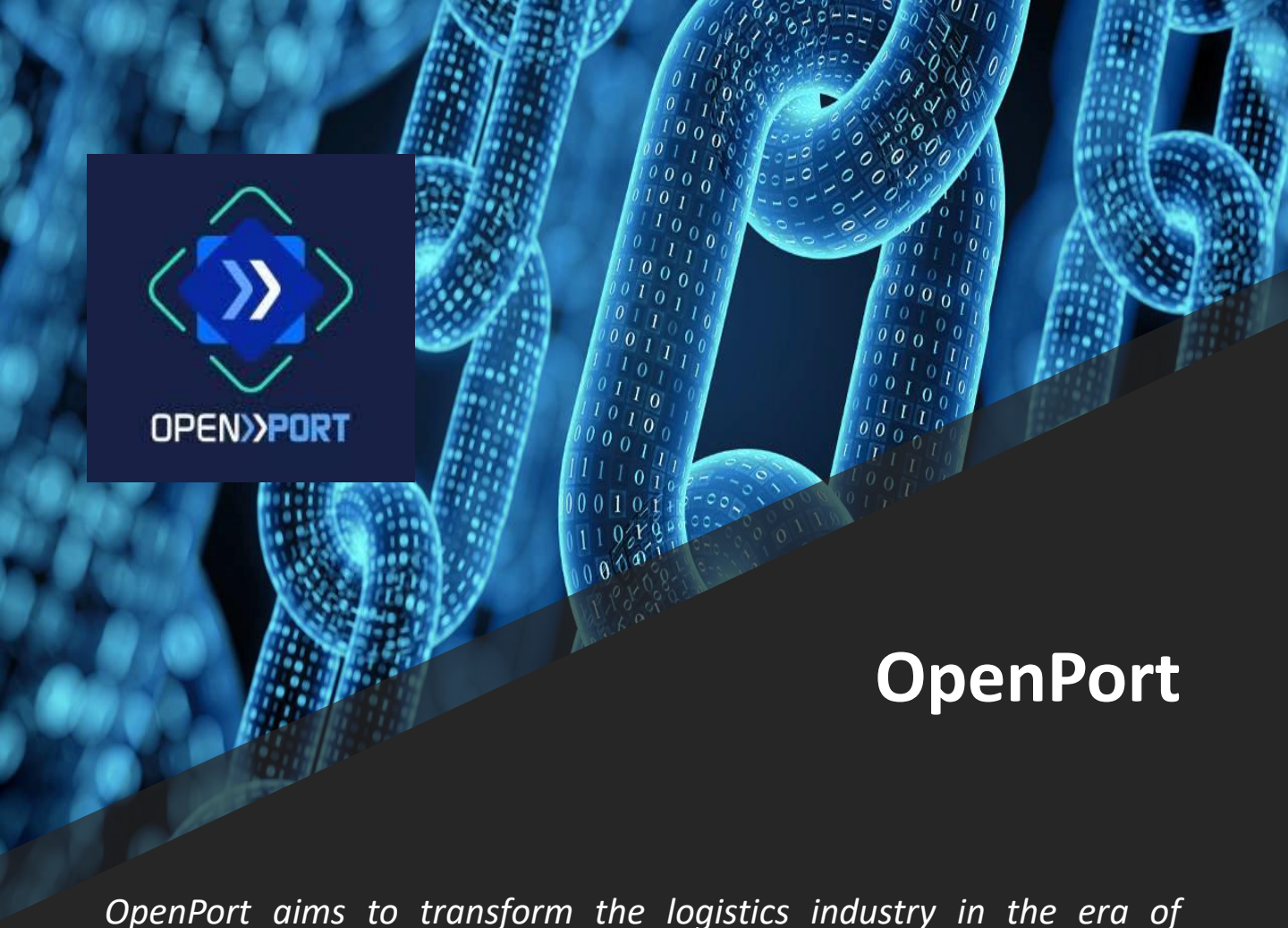
*MuleChain is a decentralized peer-to-peer personal delivery network which enables the transport of products and valuable items to their destinations with as close to zero risk as possible. MuleChain's peer-to-peer delivery networks can help millions within the new sharing economy, especially by enabling the creation of postal services where there are none.*

Using blockchain-based smart contracts, shippers enters into agreements with "mules" who are headed to the same destination. Once the parties hash out a price, mules personally deliver the shippers' items. All involved put up MCX tokens as collateral. Once shipping is complete, mules receive the tokens as payment.

# dexFreight

*dexFreight is a logistics enterprise that aims to build the universal decentralized, open-source network that enables collaboration and facilitates the coordinated movement of goods while bringing liquidity to the supply chain.*

The dexFreight platform features an industry-first, blockchain-backed P2P marketplace for shipping and hauling. It includes everything from encrypted identity management to smart contracts and tokenized payments, all of which help to reduce friction and increase transparency in the P2P supply chain market.




# OpenPort

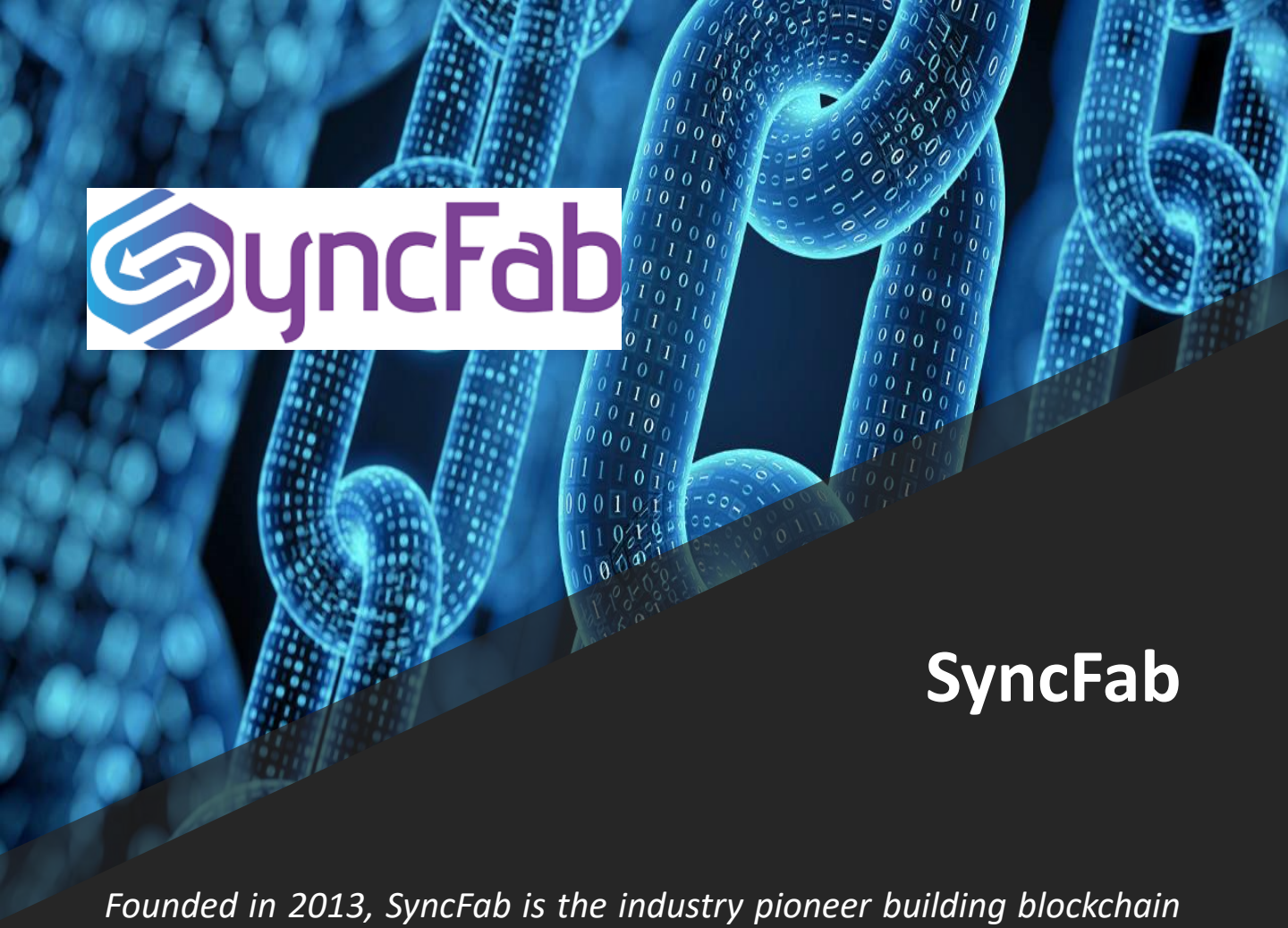
*OpenPort aims to transform the logistics industry in the era of emerging markets consumption, becoming a leading force shaping the supply chains of the future by leveraging blockchain technology for improved visibility, reliability, security, trust and cash flow in road transport.*

OpenPort's blockchain is designed to modernize cash flow issues that often arise in the traditional logistics process. The company's digital ePOD (electronic proof-of-delivery) provides indisputable evidence of cash flow as well as a digital contract that enforces payments to all parties involved in the shipping process. Moreover, OpenPort's smart contract platform enables our real-world transport management technology to record shipment events in real-time.

# Skuchain

*Skuchain is a currency agnostic blockchain for global trade, which aims to streamline the payment of logistics and builds a liquid supply chain.*

Skuchain creates a variety of ledger technologies for the logistics industry. The company's Popcodes (Proof-of-Provenance codes) provide track-and-trace technology for valuable items in a shipment. The Zero Knowledge Collaboration tool gives companies permissioned access to data and details about other supply chain parties in order to increase the overall level of trust.



# SyncFab

*Founded in 2013, SyncFab is the industry pioneer building blockchain technology for digital transformation of the space, aerospace & defense, automotive and medical manufacturing industries since 2017.*

SyncFab focuses on the manufacturing supply chain. Its platform lets users access real-time product manufacturing quotes, lock into detail-oriented deals with factories and shippers via smart contracts and even track the product creation process. The company's services have been used by Amazon, NASA's Jet Propulsion Lab and Google, among many others.

# Energy Industry


# Energy Blockchain Labs

*Based in Beijing, China, Energy Blockchain Labs provides blockchain financial services to businesses aiming to improve their energy saving and sustainability agenda. The company positions itself as the global leader in digitalized green assets and is working to improve the efficiency of the carbon emissions reduction market.*

Working with IBM, Energy Blockchain Labs is creating a carbon asset development platform based on IBM blockchain technology. The platform will allow enterprises to generate carbon assets consistently and efficiently. The solution uses the carbon emission reduction quota standard to encourage enterprises and individuals to decrease carbon emissions and use low carbon emission technology.

# Acciona Energia

*Founded in 1997, Acciona Energia is a Spanish multinational conglomerate dedicated to the development and management of infrastructure and renewable energy.*

Acciona Energia became the first utility to use blockchain technology to certify the origin of its energy to consumers. Acciona's "GreenChain" application, based on blockchain technology, enables clients to check the source of the electricity consumed. The company used a platform and software developed by the Energy Web Foundation (EWF). Customers can check the specific renewable plant that is generating the electricity, as well as past consumption statistics and other relevant data, such as CO2 avoidance or the social initiatives that Acciona is carrying out around the project that supplies them.


# WePower

*Founded in 2017, WePower is a green energy trading platform that connects energy buyers (households and investors) directly with the green energy producers.*

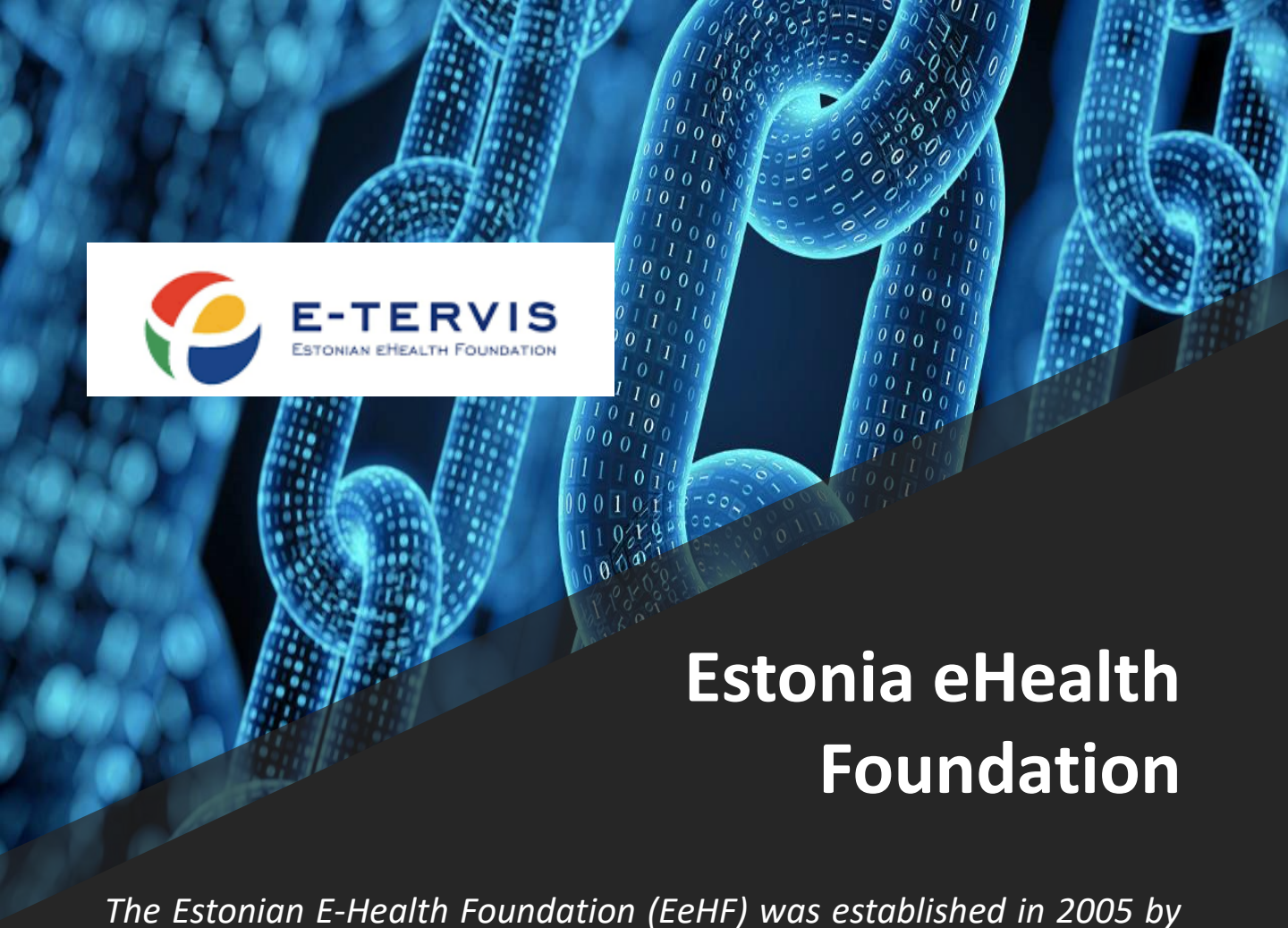
WePower builds a platform by using blockchains and smart contracts. Renewable energy produced is tokenized and subsequently traded through the platform either to purchase electricity or exchanged for fiat currencies or cryptocurrencies. Backed by green energy, its token model is designed to meet regulatory requirements, and is linked to the energy donation pool. Users have the option to use energy or immediately trade it in the wholesale market. Furthermore, it enables green energy producers to increase their capital by issuing tradable energy tokens.


# Efforce

*Efforce is a platform for trading energy efficiency products worldwide. Contributors can participate in energy efficiency projects by acquiring tokenized future savings. Companies benefit from energy efficiency improvements at no cost and the resulting savings are written in real time on blockchain.*

By applying blockchain technology, Efforce solves the three main problems of the energy efficiency market: the difficulty of putting Investors and Savers in contact, the size of the investments required and the types of financial return. Through Efforce, energy saving financed by the investor is tokenized and used or sold to energy-intensive consumers. Since it guarantees the integrity and uniqueness of the energy saving data obtained. The data transmitted will be validated and certified by the blockchain, hence a smart contract redistributes the real-time resulting savings to token holders.

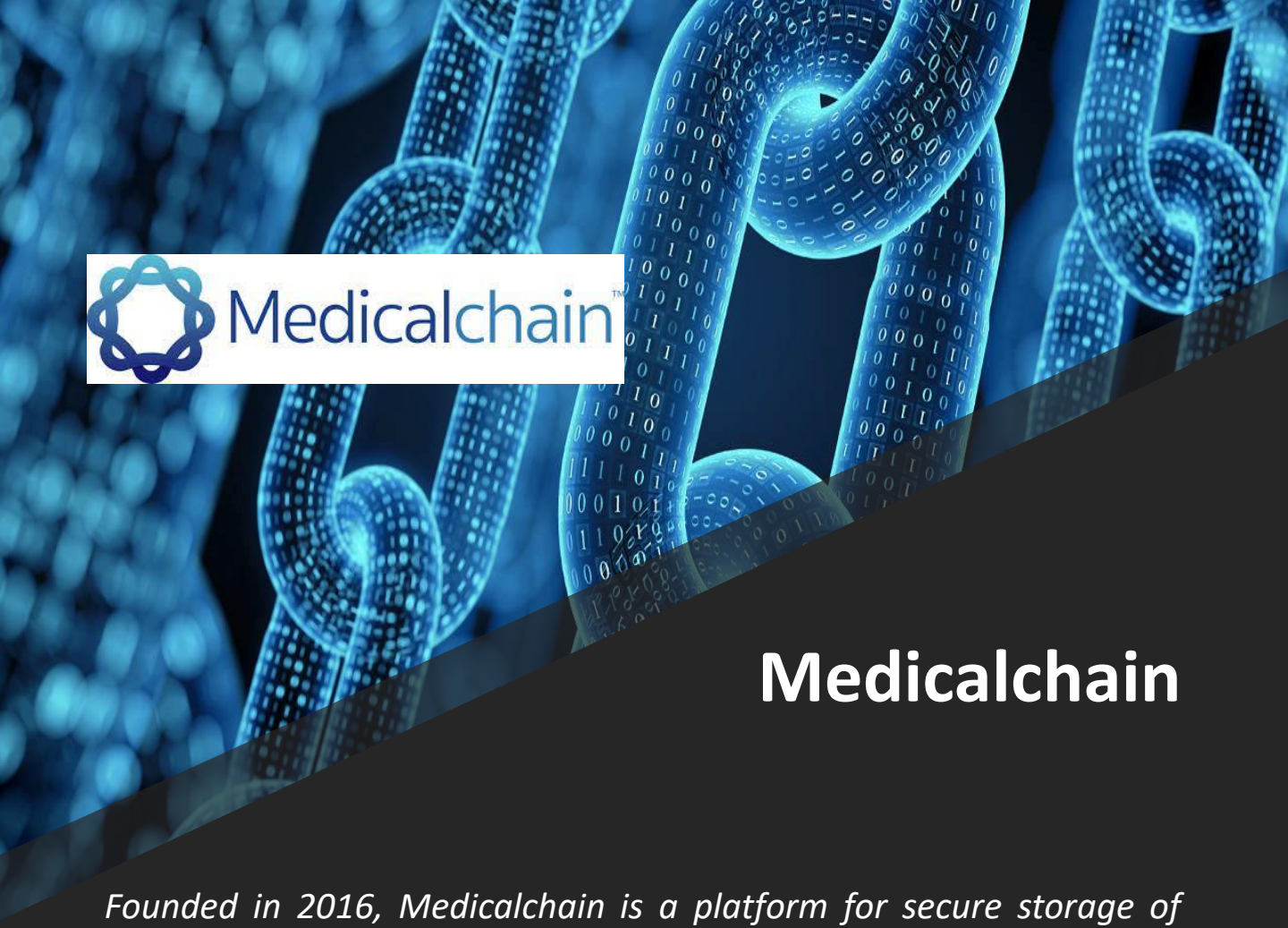
# Healthcare Industry




# Estonia eHealth Foundation

*The Estonian E-Health Foundation (EeHF) was established in 2005 by the Ministry of Social Affairs of Estonia and leading Estonian healthcare service providers with the objective to initiate and implement e-health activities in Estonia as well as to develop and manage the Estonian nation-wide Electronic Health Record System.*

In 2016, EeHF collaborated with Guardtime to manage the electronic healthcare system of Estonian. Estonian eHealth Foundation uses Oracle technology to process and store the patient records. By using the keyless signature infrastructure(KSI) blockchain of Guardtime, the auditability, transparency and security of electronic health care system has been enhanced. Due to the decentralized feature of blockchain, it can protect the records from being manipulated, deleted or stolen by hackers, and the records being accessed are traceable.




# Medicalchain

*Founded in 2016, Medicalchain is a platform for secure storage of medical records of patients in the blockchain and the use in online consultations with doctors.*

Medicalchain is an electronic health record platform powered by a dual blockchain, smart contracts and their own cryptocurrency, "MedTokens". The up-to-date electronic health records (EHR) of patients are created and stored in a decentralized network. Therefore, third-parties are allowed to access the data under the permission of patients. Besides, patients can revoke access by setting up a time limited gateway to guarantee data security. As a result, the platform enhances the conveniency and efficiency on the EHR application. For example, pharmaceutical and research companies can access the EHR directly under the patient's approval. It is more time and cost effective without approaching third-parties (hospitals or clinics). Similarly, insurance enterprise may receive the client’s EHR directly and accelerate the process of regulatory reporting.


In addition, Medicalchain offers another function by releasing their own cryptocurrency - MedTokens. In the use of MedTokens, patients are able to receive online consultation from teledoctors and specialists. The EHR of patient can be accessed and hence reduced the risk of medical errors and misdiagnosis.

In this case, blockchain supports Medicalchain by its decentralized technology, resulting in the improvement of transparency and security of EHR. Besides, the development of MedTokens by blockchain applied on the telemedicine platform which facilitates the conveniency and accuracy of diagnosis.

# ProCredEx

*The Professional Credentials Exchange (ProCredEx) is a United States based digital marketplace for verified professional credentials. Using distributed ledger technology, advanced data science, and machine learning technologies, organizations use ProCredEx to streamline the process of offering and consuming practitioner credentials within a secure, trusted community.*

Similar to tracking the provenance of a medical good, blockchain technology can be used to track the experience of medical professionals, where trusted medical institutions and healthcare organizations can log the credentials of their staff, in turn helping to streamline the hiring process for healthcare organizations.

ProCredEx has developed such a medical credential verification system using the R3 Corda blockchain protocol. By ProCredEx, verified credentials can be uploaded and shared on the marketplace. Medical institutions, insurers, and healthcare providers can view the credentials and make further decisions such as employment or cooperation.


# Entertainment Industry


# Opus

*Opus is an open-source decentralized music sharing platform with demo based on Ethereum and InterPlanetary File System (IPFS).*

By basing the Opus Player, the Ethereum blockchain and storing all the tracks on IPFS, there is no central server and so the storage costs are drastically reduced. This allows for more of the revenue to go directly to the artists, in a more secure and transparent way. Artists are willing to join and support Opus as it can assure the copyright fee of artists will be paid directly from the users.


# Steem

*Steem is a social blockchain that grows communities and makes immediate revenue streams possible for users by rewarding them for sharing content. It's currently the only blockchain that can power real applications via social apps like Steemit.*

Nowadays, social medias like Instagram occupy part of our daily life. However, users seldom make profit from their social media contents. Unlike usual social media platforms, Steemit returns the value to the users who contribute the most. Users become platform stakeholders and earn cryptocurrency "STEEM" for their contribution.

Furthermore, DTube is another blockchain-based application developed by Steem. It is a decentralized video platform which also allows users to make revenue by uploading and sharing videos.


# UgChain

*UgChain is a China-based blockchain ecosystem established in 2015. It consists of a series of decentralized applications by decentralized account system (DAS) based on blockchain technology.*

UgChain teamed up with 360, Hoolai and other China domestic famous game operators to design a gaming ecosystem solution with the application scenarios including game distribution channel, game account trading, game payment, virtual commodity purchase, E-gaming, league holding, crowdfunding, community and other areas.

By using the double-blockchain technology, ugChain built a Block-as-a-Service (BaaS) platform which can be combined with artificial intelligence and big data more effectively to provide strong support for resource-heavy blockchain apps and accelerate the development of blockchain applications. As a result, developers reduce costs and promote *the effective integration and sharing of resources.*


Besides, ugChain developed a blockchain-based virtual asset management platform for the users. With the blockchain applied to video games, it prevents game accounts or licenses being stole, as well as databases being attacked by hackers. Moreover, it also prohibits score cheating from players.

In this case, ugChain provides a stable gaming ecosystem to both players and developers. Players can manage their virtual assets more efficiently and securely to prevent loss from hacking or cheating. On the other hand, ugChain provides a better ecosystem for developer’s communication and innovation.

# Education Industry


# Sony Global Education

*Sony Global Education is a Japanese company headquartered in Tokyo, Japan. It aims to create a new educational infrastructure that goes beyond educational content or services, and becomes the foundation of human resources development so that everyone can compete and learn from one another.*

Cooperate with IBM, Sony Global Education developed a blockchain platform that enabled multiple institutions to add all the individual academic achievements and other information on a ledger to maintain records on the students who have transferred from one institution to another. By applying blockchain on the platform, records are kept transparently to the institutions and securely to avoid any fraud or false passing of student funds.

# APPII

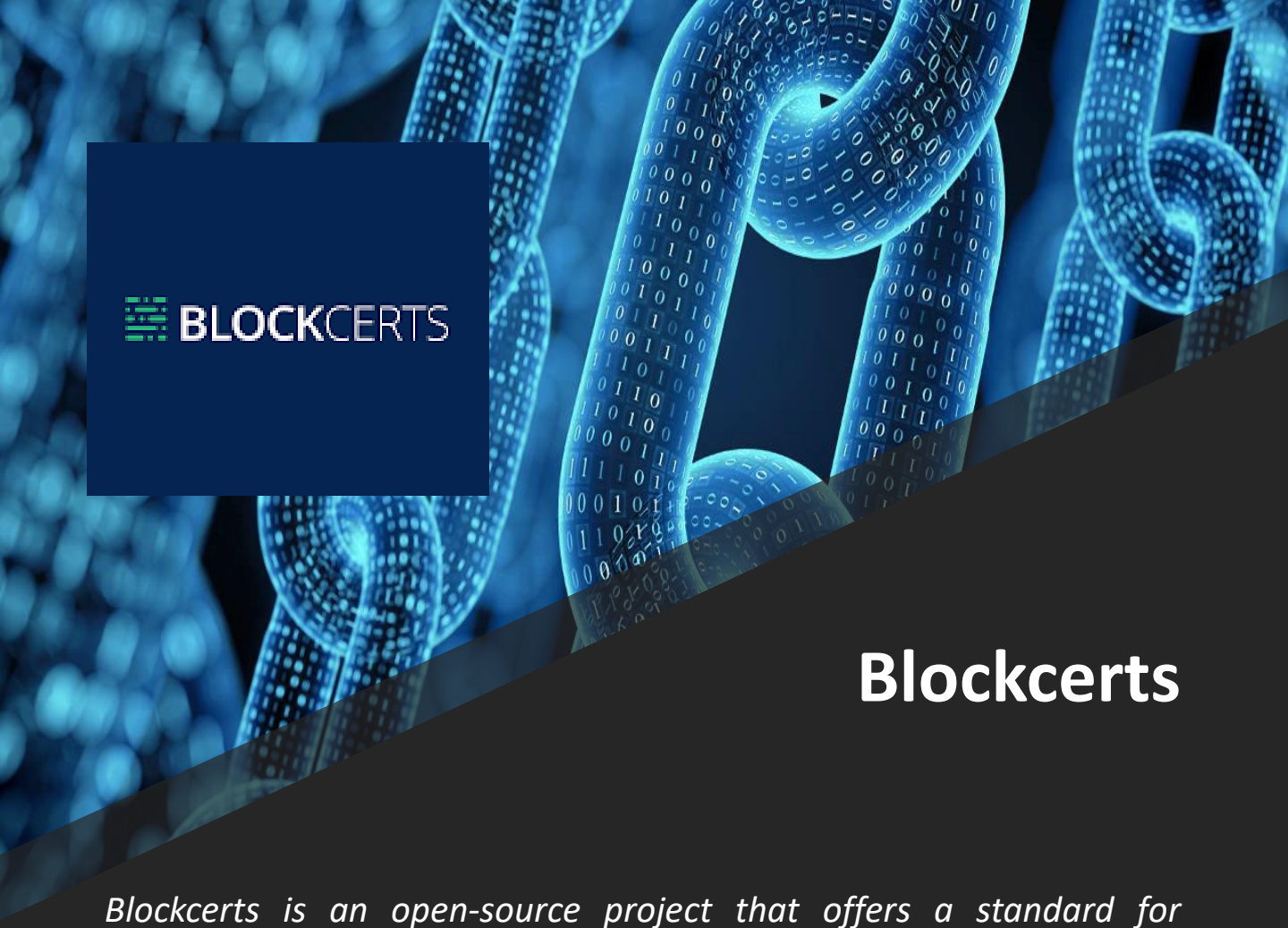
*APPII is a UK based, world-leading technology and verification software company that develops simple, trusted, and secure biometric applications and solutions suitable for use across a breadth of industries.*

APPII combines blockchain, machine learning and smart contracts together in a software. They use their solutions to verify the academic credentials of students. After inputs of data, APPII uses a blockchain to check the background of the user and locks the information. APPII has collaborated with Open University to organize an accreditation platform for handling academic records.

# ODEM

*ODEM is a Switzerland-based education company that has a decentralized marketplace for educational products and services .*

ODEM developed a blockchain-based platform to connect educators, students and professionals to the available courses and resources. It was established to help students in getting access to the knowledge databases and educational programs. Besides, OBEM token was developed specifically for the transaction within the platform. Students can use ODEM token to pay for the courses that they wish to learn. The ODEM ledger keeps a record of the courses completed by the students and the certificates they have received.




# Blockcerts

*Blockcerts is an open-source project that offers a standard for initializing, issuing and verifying blockchain-based certificates.*

By applying blockchain, Blockcerts reviews the integrity of the documents and finds out if there is any false information. The records are then registered on a blockchain, which is cryptographically signed, tamper-proof and shareable. The Blockcerts platform also enables developers to build Dapps that are capable of validating certificates for academic credentials, professional certifications, and civic records. Users can gain access to the Blockcerts verification platform by downloading the Blockcerts mobile application.


# Disciplina

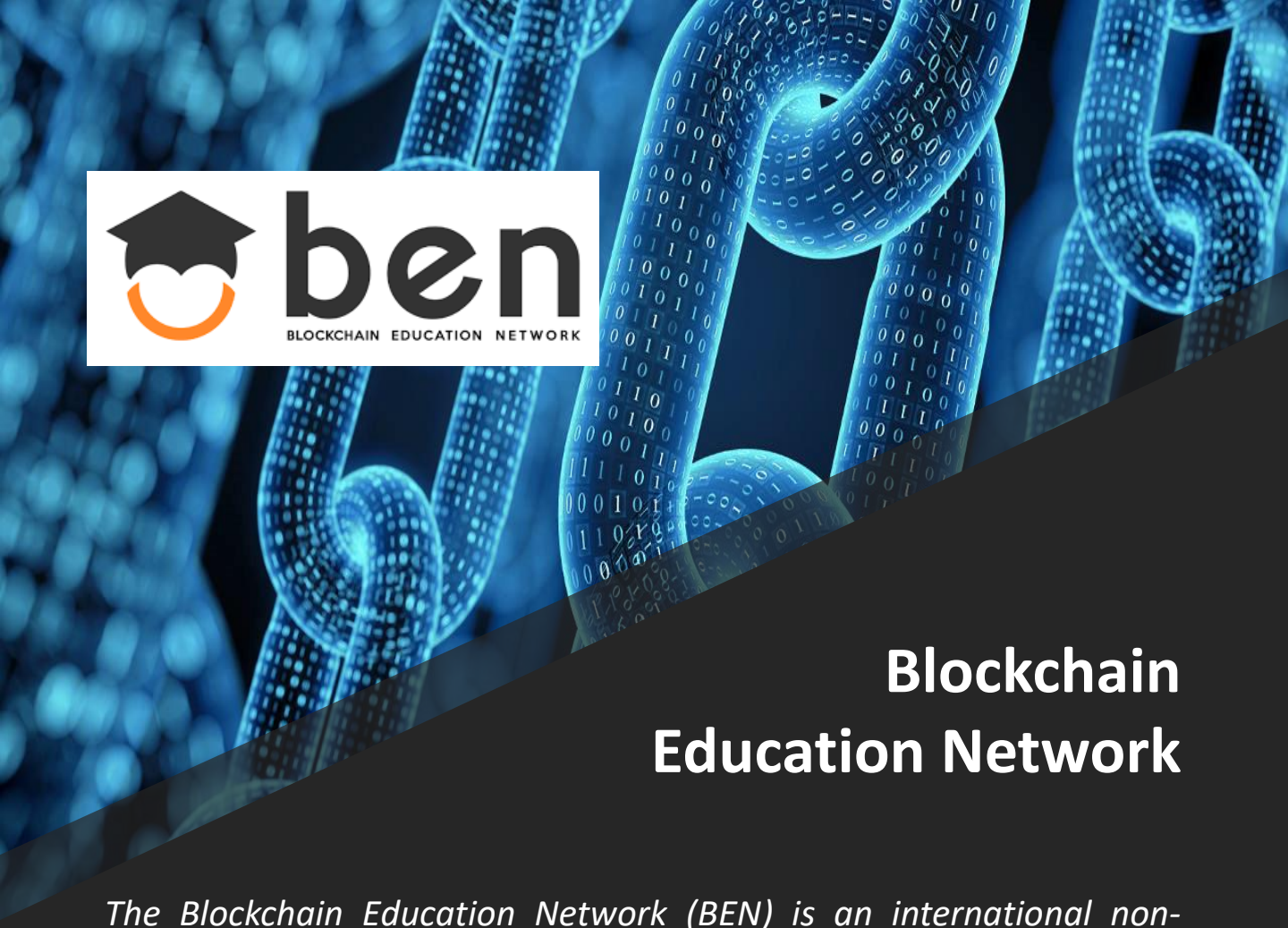
*Disciplina is a multifunctional blockchain for projects in the educational and recruiting spheres. It provides the transparency of work and creates conditions of maintaining confidentiality and reliability of information added by system participants.*

Disciplina provides a blockchain-based platform to maintain a unified register of academic achievements and qualifications for universities. The decentralized algorithm system automatically assigns a score to students based on their achievements and qualifications. Universities can determine individualized learning plans based on the score and learning experiences.


# Gilgamesh Platform

*Gilgamesh is a knowledge-sharing social platform powered by Ethereum smart contracts and blockchain technology.*

Using the Gilgamesh platform, users can gain and transfer knowledge in a protected environment that encourages widespread learning and education, and incentivizes users to become more thoughtful and information-centric. Productive interactions and engagements on the Gilgamesh platform earn users GIL Tokens, on the Ethereum blockchain through smart contracts. GIL Tokens can be spent on in-app services and goods such as academic eBook.




# Blockchain Education Network

*The Blockchain Education Network (BEN) is an international non-profit organization dedicated to forming a robust network of student organizations for blockchain education, innovation, and development.*

BEN is a platform for students, alumni, professors, teachers, professionals, and community leaders all over the world who are focused on initiatives related to blockchain and cryptocurrency. BEN provides borderless blockchain education by online courses and apply blockchain during the courses. For example, students build and launch various prototypes of blockchain among the lessons.

# Charitable Organization


# World Food Program

*The World Food Program (WFP) is the food-assistance branch of the United Nations. It mainly focuses on the hunger problem around the world and provides varies support to those areas.*

WFP is increasingly delivering assistance in the form of cash transfers, and has been trialing blockchain as a means of making these transfers more efficient, transparent and secure. WFP built and implemented a more robust blockchain system in refugee camps in Jordan. As of October 2018, more than 100,000 people residing in camps redeem their cash-for-food assistance through the blockchain-based system “Building Blocks”. Building Blocks now becomes the world’s largest implementation of blockchain technology for humanitarian assistance, that assists over 1 million people in Bangladesh and Jordan to securely access and receive multiple forms of assistance from different organizations via one access point.

# Alice

*Alice is a social funding and impact management platform built on the Ethereum blockchain. It incentivizes social organizations to run projects transparently.*

Alice is a social funding platform that uses results-based financing to incentivize charities by only paying them when specific goals are achieved. By applying blockchain, data can be shared between charities and donors, which enhances the transparency of donations. Besides, sharing impact data on the platform is expected to significantly reduce due diligence and reporting costs, and help social organizations collaborate more effectively.

# BitGive

*BitGive is the first Bitcoin and blockchain technology non-profit organization that solicits Bitcoin donations for use in charitable causes.*

BitGive has been accepting bitcoin for crowdfunding charitable projects since 2013. Donors can donate bitcoin directly to BitGive or to specific projects on their donation platform, GiveTrack. GiveTrack provides transparency and accountability to donors by sharing financial information and direct project results in real-time. As blockchain allows rapid transaction process, it saves the costs in fees and transaction times. Besides, the real-time data will be uploaded to blockchain and transparent to the donors. Therefore, the donations are traceable and prevent misuse of the funds. As a result, high level of transparency enhances donors' trust and encourages them to donate more.

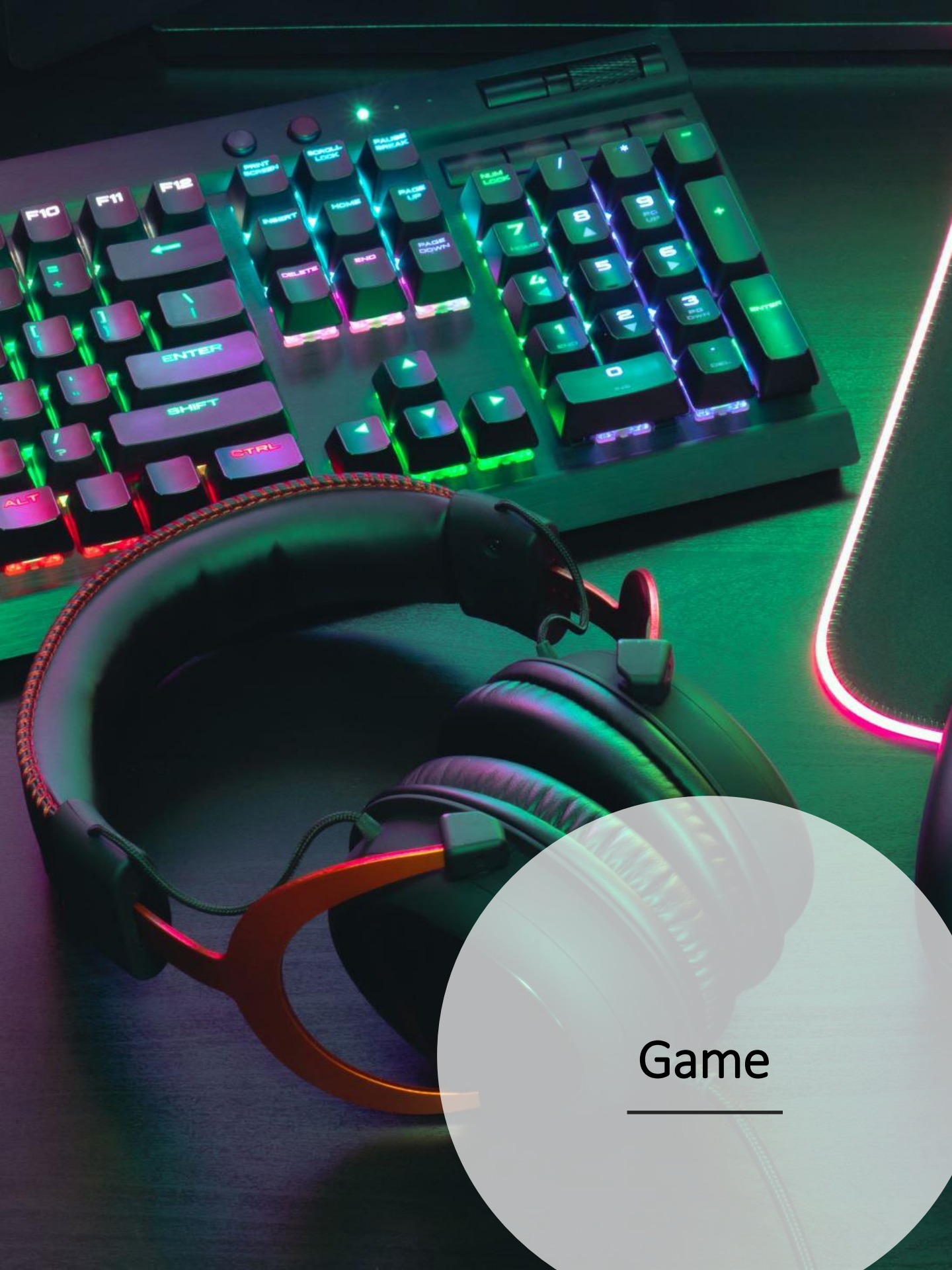
# AidChain

*AidChain is an Ethereum-based donation platform for charities. It enables charities to accept cryptocurrencies and allows donors to track their donations. They aim to establish a transparent ecosystem of charities, donors, and service providers.*

AidChain is a giving platform that charities can use to promote projects, collect and manage donations. AidChain is developing multiple blockchain-based solutions to make donations trackable and efficient in the charity space. By embedding the AidPay widget on the charities' websites, it allows organizations to easily accept and manage most popular cryptocurrencies. It also allows donors to track the donations on AidChain. Furthermore, AidChain developed AidCoin and used in the platform.


# Non-Fungible Token (NFT)


*NFT is a unique and non-interchangeable unit of data stored on a blockchain, a form of digital ledger. It can be associated with reproducible digital files such as photos, videos, and audio. NFTs use a digital ledger to provide a public certificate of authenticity or proof of ownership, but do not restrict the sharing or copying of the underlying digital files. Nowadays NFTs have became a trend and business.*




# Game


# Axie Infinity

*A blockchain-based video game launched in 2018 by Vietnamese studio Sky Mavis. It is a trading and battling online game that allows players to collect, breed, raise, battle and trade creatures known as "Axies".*

Axie Infinity is a blockchain game applying NFT and allowing players "play-to-earn". The Axies of the game are digitalized as NFT and can be trade on the marketplace by Ethereum-based cryptocurrency Axie Infinity Shards (AXS). In the beginning, players need to purchase at least three Axies to start playing the game. Axies can be used for battle, breed and trade. Player can buy the in-game items and raise the abilities of Axies by using Smooth Love Potion (SLP), which is a cryptocurrency gained by winning battles of the game. When the Axies raised to certain levels and became more powerful, breed function will be activated for the Axies to reproduce offspring. Therefore, players aim to breed more powerful Axies and sell them on the marketplace. As a result, the players can gain AXS for buying new Axies or exchanging AXS into real money.

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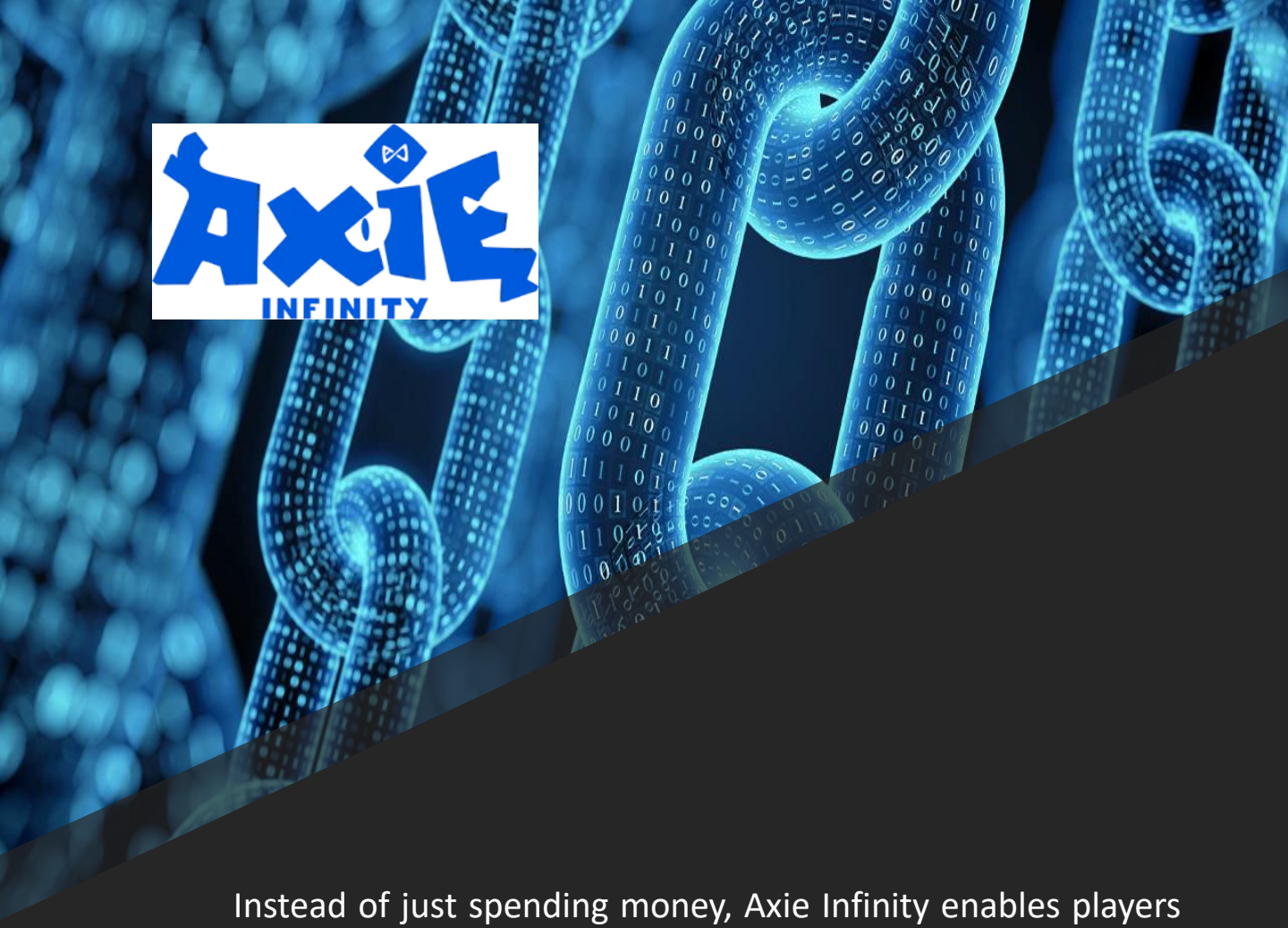


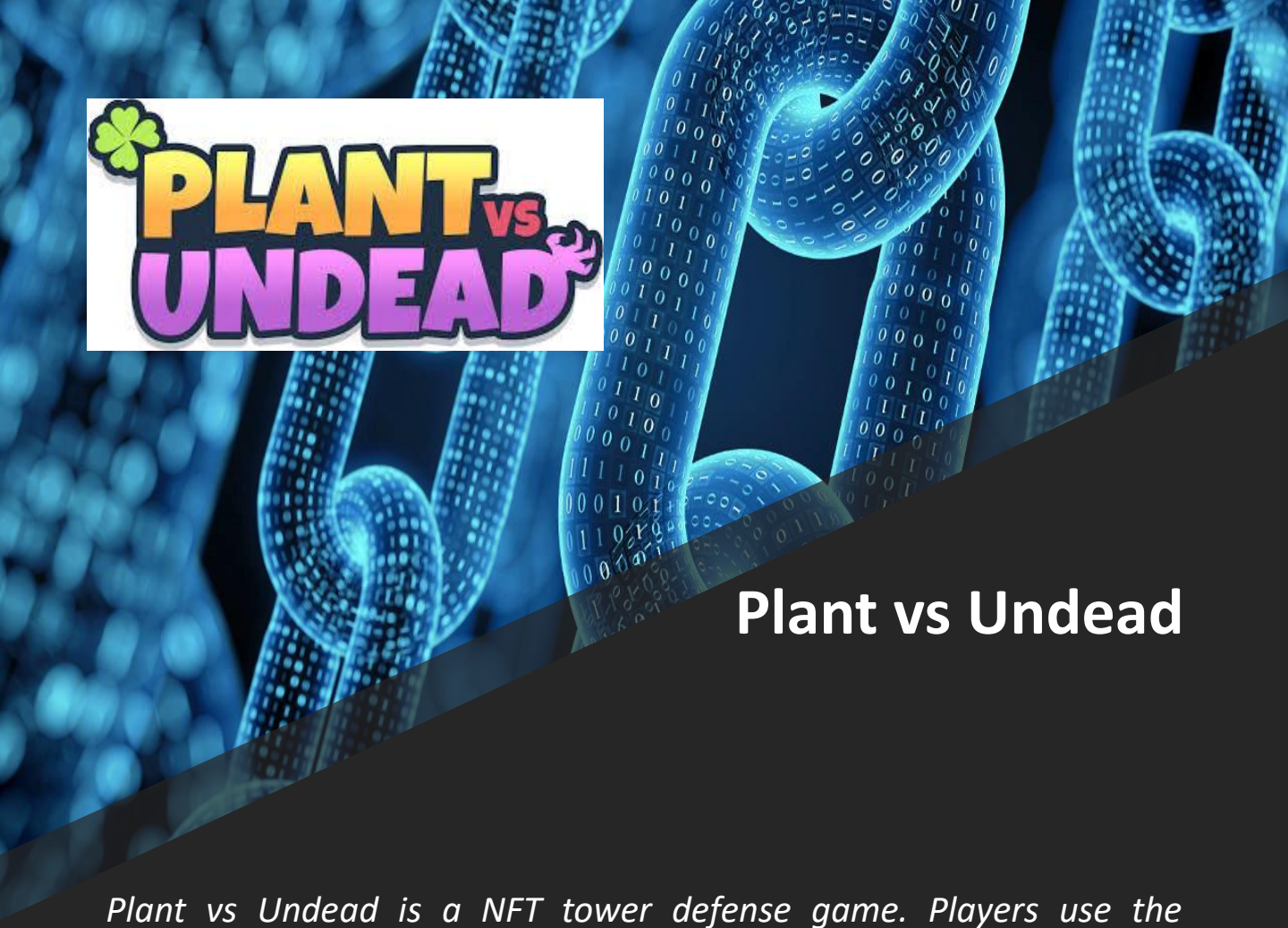

Instead of just spending money, Axie Infinity enables players play-to-earn and gain income. It altered the environment of game industry and became popular around the world.

According to *Rest of World* in August of 2021, 1.8 million users logged in the platform and 40% of them are from Philippines. As the income level of Filipino maintain low, Axie Infinity becomes an economy opportunity to earn more income. Furthermore, in some areas of Philippines, the game token SLP are even used to pay for the rent. It improves the living standard of the players and gives a monetary reason for them to keep playing the game.


# CryptoBlades

*CryptoBlades is a play-to-earn NFT RPG game on the Binance Smart Chain platform. The game revolves around the acquisition of legendary Blades and powerful Heroes to wield them. Players may participate in combat using their assets to earn SKILL tokens.*

Owning a Binance Smart Chain compatible wallet such as MetaMask is the basic requirement for playing CryptoBlades. Binance Coin (BNB) will be the only currency used for purchasing SKILL tokens in the game. SKILL tokens are essential for crafting powerful character and weapon NFTs, which can be earned by either purchasing from the wallet or defeating enemies in the game. The NFTs can be then traded on the marketplace to earn BNB.




# Plant vs Undead

*Plant vs Undead is a NFT tower defense game. Players use the cryptocurrency (PVU) developed by the game company to purchase the NFT (plant) and defeat the enemies.*

In Plant vs Undead, plants will be the weapon to fight against the enemies. The plants are being sold on the game marketplace in NFT format. To begin playing, a new player must register a cryptocurrency wallet and buy the plant NFT. PVU will be the only token used within the game. Apart from buying PVU on the cryptocurrency wallet, players can also earn PVU through the game missions and battles. Players can then exchange PVU into US dollar and complete the play-to-earn ecosystem.


# Splinterlands

*Splinterlands is a collectible digital trading card game built on blockchain technology. It contains hundreds of unique cards with different stats and abilities for player to collect and battle in the game.*

In Splinterlands, each card is a NFT owned by player. Full transparency of the blockchain's distributed ledger enables gamers to see how many of each different card exist in the entire game. Every card is individually owned, which means that even the creators of the game cannot take them away from any player, and all players are free to buy, sell, or trade them just like physical trading cards. Players are allowed to trade the cards on the peer-to-peer market for earning the main official in-game cryptocurrency (DEC). Besides, players are also able to make a profit by renting cards to other players.

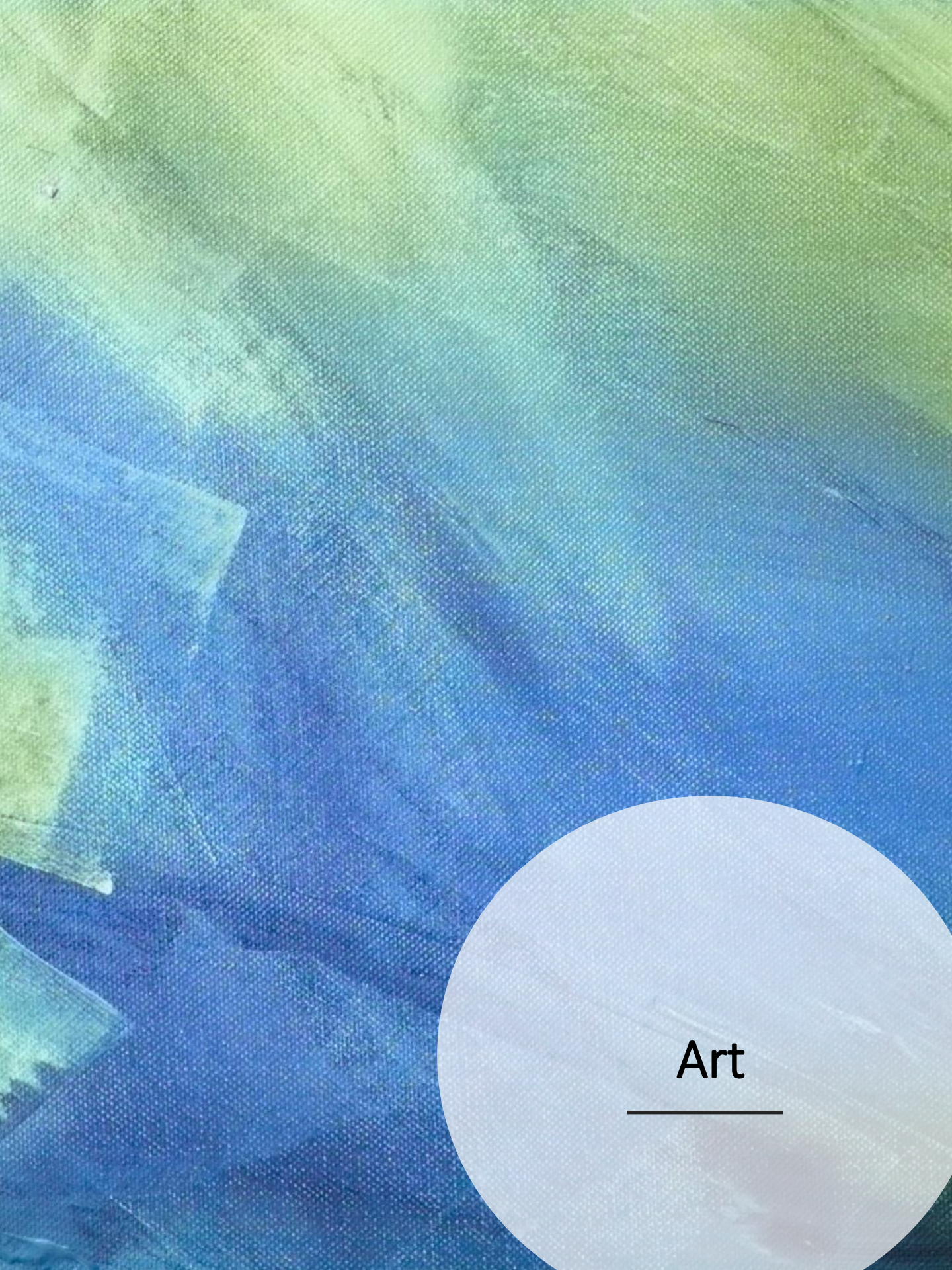

# The Sandbox

*The Sandbox was developed by the game studio Pixowl and Animoca with the purpose of providing users with a gaming platform that allowed to create pixel art similar to Minecraft. It is a decentralized gaming platform built on the Ethereum blockchain and proffers players access to its virtual world.*

The Sandbox consists of three components, Voxel Editor, Marketplace and Game Maker, that together provide a comprehensive experience for user-generated content (USG). The combined products allow users to secure copyright ownership for the content created through blockchain and a smart contract. There are totally 166,464 parcels of LAND inside The Sandbox. Player can use the cryptocurrency “SAND” to buy the ownership of LAND. A combination of multiple consequent lands become ESTATE, allowing players to build up their dream worlds.

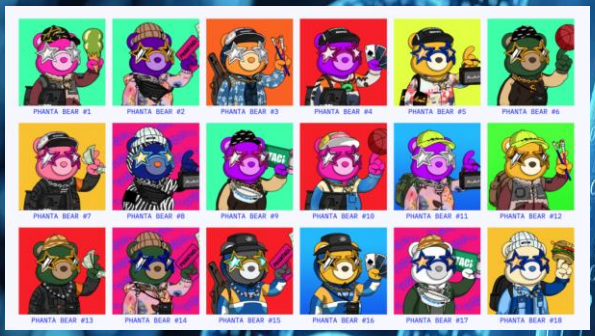

In addition, The Sandbox is just like a simplified Metaverse. Players can open their own LAND for visit to earn SAND as the entrance fee. On the other hand, the owners of ESTATE can even organize an activity or competition to attract players, receiving considerable amount of SAND as entrance fee or participation fee.

In November 2021, the Sandbox team announced that Sandbox Metaverse Alpha is set to launch on November 29 after four years of development. The Sandbox will open up part of its metaverse to players for the first time via a multi-week play-to-earn (P2E) Alpha event. The event will start on November 29 and will run until December 20, 2021. A select group of 5,000 users will have the chance to earn up to 1,000 SAND and three exclusive NFTs via time spent across 18 experiences developed by the Sandbox team. The three exclusive NFTs will only be available during the event. They will depict a medieval-style gate, a blue-and-black dragon, and a longsword, all of which are usable in The Sandbox metaverse.


Art

# Everydays: The First 5000 Days

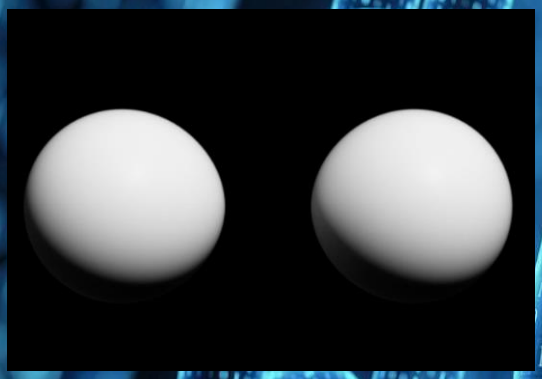
*Everydays: The First 5000 Days* is a digital work of art created by Mike Winkelmann, known professionally as Beeple. The work is a collage of 5000 digital images created by Winkelmann for his *Everydays* series. Its associated NFT was sold for $69.3 million US dollar at Christie's auction in 2021, making it second on the list of most expensive non-fungible tokens and among the most expensive works by a living artist.




# PHANTACi x Ezek.io

Found by famous singer Jay Chou, PHANTACi crossover Ezek.io released a brand new NFT called Phanta Bear. Every Phanta Bear is a unique NFT, dressing in different style and background. Besides, Phanta Bear also represent a virtual concert ticket, allowing owners to join a metaverse virtual concert in the future.

On the first date of 2022, ten thousand Phanata bear officially on sale and sold out in a flash. It brought over ten million US dollar income to the companies.



# The Merge

Designed by Pak, known as a designer, technologist, programmer and digital creator, the Merge is a changeable artwork that presents in a sphere form. Different from other NFTs, the Merge used a specific cryptocurrency “MASS” for transaction. The Merge will change its presentation according to the quantity of “MASS” the owner possessed. The more the “MASS” owned, the more the Merge combined in the collection, expanding in size and presenting unique animation according to the amount of “MASS”.

The Merge first sale on Nifty Gateway in December 2021, which is an NFTs transaction platform,  attracted over 28 thousand buyers and brought over 91 million US dollar income. The mechanism allows for “MASS” available on the secondary market to consolidate. This pioneering approach highlights the social nature of art collecting and market scarcity, while utilizing NFT technology in an innovative way.

# Bored Ape Yacht Club

The Bored Ape Yacht Club is a collection of 10,000 algorithmically generated unique avatars. Different background, outfit and ape combined together to generate every unique NFTs, ensuring that none of the 10,000 NFTs repeated.

Created by Yuga Labs, ownership of a Bored Ape represents more than just possession of a collectible and bragging rights. The Ape token doubles as membership to a virtual club full of like-minded Apes.

It has become one of the popular NFT icon and even famous NBA superstar Stephen Curry spent 180,000 US dollar to buy one of them.


# Adidas

Collaborated with Bored Ape Yacht Club, Gmoney and Punks Comic, Adidas released a brand new NFT “Into the Metaverse”. The owner of the NFTs can receive a set of Indigo sportswear, a hoodie and a cap from the collaborated brands in 2022. Besides, owners are able to “wear” the products in the blockchain game *The Sandbox* to build up a unique character.

“In to Metaverse” first sale on 17th December 2021, total 29,620 NFTs were sold and brought over 22 million US dollars income.

# CryptoPunks

Randomly generated using an algorithm, Larva Labs created and gave away 10,000 CryptoPunk NFTs in 2017 to any interested party with an Ethereum (ETH) wallet. CryptoPunks was then took off on the secondary market, skyrocketing in value. The cheapest of the 10,000 CryptoPunks is currently worth over 100,000 US dollar , and totally over 1 billion US dollar has traded hands over the NFT series.


# NBA Top Shot

NBA is always the most famous sport league in United States, attracting massive audiences to enjoy the competitions. NBA Top Shot is an officially licensed digital collectibles, recording the memorable moment as NFTs. The NFTs display in video format, showing the data of the matches and players, and classify in common, rare and legendary categories. Buyer can go to the marketplace in official website, purchasing the memorable moment of favorite NBA stars.

# Oleksandra Oliynykova

Can you imagine human body can be NFT? Croatian tennis player Oleksandra Oliynykova auctioned off a small section of her arm as an NFT. Bought on OpenSea for over $5,000, the NFT entitles the owner to tattoo whatever they would like on the small section of her arm. Oliynykova claims this NFT will appreciate dramatically in value as her tennis career progresses. The buyer now owns a small space that could one day be on display on public vision, such as Wimbledon, The Australian Open, or the Olympics.

# Blockchain in Hong Kong & Greater Bay Area

# Blockchain in Hong Kong & Greater Bay Area

Chairman of the People's Republic of China ***Xi Jinping*** emphasized that the integrated application of blockchain technology played an important role in new technological innovation and industry change, which means that the development of blockchain technology has become a national strategy.

In the development plan of the Guangdong-Hong Kong-Macao Greater Bay Area, blockchain technology, as an important breakthrough in the independent innovation of core technologies, is the driving force for the economic development and scientific and technological progress of the Greater Bay Area.

# Blockchain in Hong Kong & Greater Bay Area

Blockchain application scenarios in the Greater Bay Area have covered all aspects of the industry application layers, including government administration, standard construction, education and scientific research, industry level, intellectual property rights, industry supervision, real estate developer lottery room selection application and so on.

As the core engine of regional development, Hong Kong, Macao, Guangzhou and Shenzhen concentrate on their scientific and technological innovation ability, complement each other’s advantages, promote industrial upgrading by point and area, and promote the development of surrounding areas with technology.

# Blockchain in Hong Kong & Greater Bay Area

To facilitate and prompt the development of blockchain industry in Greater Bay Area, in 2019, Guangzhou announced that there were 1 billion RMB funding in total to support the operation and development of blockchain enterprises in Greater Bay Area, encouraging investments and attracting talents from Guangzhou, Shenzhen, Hong Kong and Macao.

# Blockchain in Hong Kong & Greater Bay Area

Apart from enterprises, associations and organizations related to blockchain are also being supported.

To encourage communication between blockchain organizations in three cities, 50% of expenditure will be subsidized for every joint organization events, no matter the events were hosted in Guangzhou, Macao or Hong Kong.

Besides, institutions and colleges are offered 1million RMB per year for establishing blockchain courses in Greater Bay Area in order to promote blockchain technology and foster talents.

# Blockchain in Hong Kong & Greater Bay Area

Blockchain will also play a key role in developing Hong Kong's digital economy, helping solidify its position in the Greater Bay Area as a financial hub.

As a global financial hub, Hong Kong could use blockchain to lower barriers to entry and give it a foothold in emerging decentralized finance sector, commonly referred to as DeFi.

DeFi is a blockchain-based form of finance largely owned and maintained by users, opening up financial services to anyone with an internet connection. It becomes more global and open alternative to the current centralized financial system.

# Belt and Road Initiative

## Role & Responsibility of blockchain

# Belt and Road Initiative

The Belt and Road Initiative (BRI) is today's new Silk Road,  a trans-continental passage that links China with southeast Asia, south Asia, Central Asia, Russia and Europe by land – and a 21st century Maritime Silk Road, a sea route connecting China's coastal regions with southeast and south Asia, the South Pacific, the Middle East and Eastern Africa, all the way to Europe.

# Role & Responsibility of blockchain

***Cross-Border Payment***

There are currently multiple significant challenges to cross-border financial transactions.

First, multiple intermediaries such as agents, settlement banks and correspondent banks are involved in traditional cross-border payment process. This current system is inefficient as payments not only take days to process but also involve high transaction fees.

Second, the multiple differing government regulations and compliance frameworks between countries also slow down the efficiency of these transactions.

Lastly, other challenges arising from the traditional cross-border payment system include the lack of a basic payment infrastructure, differing messaging standards, and currency conversion costs and volatility.

# Role & Responsibility of blockchain

***Cross-Border Payment***

As blockchain involves the use of a distributed public ledger that combines peer-to-peer technology with public-key cryptography. Cryptocurrency is based on blockchain technology where no centralized intermediary is needed and transactions can be verified through blocks of information peer to peer.

A well developed blockchain payment system removes the need for an intermediary, increases the speed of financial transactions and reduces the cost of compliance.

Besides, it increases the security but also the transparency at the same time. Blockchain technology uses cutting-edge encryption methods combined with multifactor authentication, ensuring the security of transactions. Cryptography protects these transactions from being forged.

# Role & Responsibility of blockchain

***Cross-Border Payment***

Due to the immutability of blockchain, every blockchain transaction is permanently logged on the ledger and cannot be altered. Blockchain also records all transactions from the very start, leaving an auditable trail of transactions. Any attempts to alter transaction details can be easily detected as multiple immutable copies are available throughout the blockchain.

At the same time, users can keep track of the status of the payments on the network around the clock. This feature greatly increases the transparency of the process through real-time monitoring by all the participants in the network. Besides, the transactions will be recorded permanently on blockchain and traceable at any time.

# Role & Responsibility of blockchain

***Logistic and Supply Chain***

Logistic and supply chain will be one of the challenges in BRI. As BRI involved countries in Asia, Russia and Europe, the cargo logistics take considerable time.

It is hard to shorten the transportation time, but what if the logistics procedures being simplified?

As mentioned before, applying blockchain to logistics sharply reduces the time of delivering. When logistics companies transform complicated documentations into digital smart contracts, processes such as payment, transfer of ownership, settlement of tariffs and cargo check can be done automatically. It reduces the chance of human error. Besides, it replaces the role of intermediaries and enables peer-to-peer models.

# Role & Responsibility of blockchain

***Logistic and Supply Chain***

Moreover, blockchain offers an automated network where records are shared, which highly increase the transparency of transactions. Organizations involved in the transaction can access the validated data.

In this case, if the custom departments of BRI countries participate in the blockchain system, it will reduce the time for handling approval documents and facilitated the logistics monitoring.

Last but not least, blockchain ensures the accuracy of data and provides proof-of-origin along with assurance of compliance and safety standard throughout the supply chain.

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