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~		4Q MARKET R	EPORT
		TOOLS TO HELP YOU PL YOUR BLOCKCHAIN P	ANNING&RESERCH ROJECT&BUSINESS 2021

4Q 2021, Market Report

In 2021, global blockchain technology has made another leap forward. Through the rapidly growing blockchain market such as DeFi and NFT, many people have experienced blockchain firsthand, and workers in various industries are undergoing changes. In particular, since the outbreak of Covid-19, the contactless digital society is rapidly changing, and at the center of digital transformation, blockchain-based authentication is becoming more common, and we are meeting more and more 'Life Blockchain'.

The essence of blockchain technology is trust that another name of innovation. Global companies are rushing to adopt blockchain to solve problems such as forgery and falsification of products and data that have been impossible to solve, and this is expected to affect the entire global industry. This can lead to effects such as improvement of profit structure through unnecessary cost reduction across manufacturing-distribution-sales, simplification of business processes and shortening of processing time through digital transformation.

2021 4Q 'M' Market Report illuminates various examples of global companies for this purpose and intends to deliver insights from blockchain specialists on the future 'Life Blockchain'.



	Crowth of global blockchain across industries in 2021
2021 Market Status	Crowth of global blockchain across industries in 2021
	1) In 2021, the global blockchain market is expected to reach \$4.9 billion, a growth of 68% compared to the previous year.
	2) Spending on blockchain solutions was \$6.6 billion, a 46% increase over the previous year.
	3) The DeFi market recorded growth of over 400% from January to October 2021.
	4) NFTs will record explosive growth in 2021 as demand drives supply.
Industry Adoption	Introduced/used blockchain for various purposes:
madstry Adoption	such as insurance Manufacturing, Supply Chain, Healthcare, Clothing
	- Problems that can be solved by introducing blockchain
	1) Anti-counterfeiting/fraud prevention: The amount of damage to the manufacturing sector due to counterfeiting is approximately \$3.7 trillion annually.
	2) Saving cost: 10% of the world's food and beverages are fraudulent products, costing approximately \$3~400 billion.
	3) Reduce customer damage: More than 320,000 patients die annually due to incorrect medical information.
	4) Efficiency of work: Due to the outdated trade process, it takes 7-10 days to issue a letter of credit.
	Decides and D ^o D to solve social and economic problems are continuing through the introduction
Insight	of blockchain in various industrial fields around the world, and direct/indirect effects such as trust recovery, cost reduction, and efficiency increase are being demonstrated.
	This will bring the global blockchain closer one step to the 'Life Blockchain' in 2022 and it changes in a wide range of areas

Blockchain in 2021 with continued growth across all areas

- The global blockchain market is expected to grow to \$4.9 billion in 2021.
- The blockchain market in the energy sector is expected to grow significantly over the next five years and become the second largest in the overall market.
- The retail market is growing rapidly with digital currency's market entering.

(USD Bn)

				MARKET	2019	2020	2021	2026	CAGR
				Blockchain Market	1.76	2.96	4.98	67.40	68.4%
			\$67.40Bn	Blockchain in Energy Market	0.70	1.24	2.21	40.32	78.3%
				Blockchain in Retail Market	0.16	0.31	0.61	17.72	96.4%
				FinTech Blockchain Market	0.65	1.14	2.01	33.90	75.9%
				Aviation Blockchain Market	0.42	0.51	0.63	1.70	22.1%
				Blockchain as a Service (BaaS) Market	0.39	0.63	1.02	11.52	62.2%
				Blockchain Government Market	0.30	0.54	1.00	21.72	84.5%
			Crypto Asset Management Market	0.30	0.37	0.45	1.20	21.5%	
				Automotive Blockchain Market	0.27	0.35	0.46	1.79	31.2%
				Blockchain Devices Market	0.25	0.35	0.48	2.46	38.5%
				Blockchain IoT Market	0.18	0.26	0.38	2.40	45.1%
				Blockchain Al Market	0.18	0.23	0.29	0.88	25.3%
		Blockchain Identity Management Market	0.17	0.31	0.57	12.11	84.5%		
				Blockchain Supply Chain Market	0.16	0.25	0.38	3.27	53.2%
				Blockchain In Insurance Market	0.11	0.21	0.38	8.81	84.9%
				Blockchain in Telecom Market	0.09	0.17	0.31	6.23	84.4%
¢1 76 Dm	\$2.96 Bn	\$ 4.98 Bn		Blockchain in Media, Advertising, and Entertainment Market	0.09	0.16	0.30	5.94	81.1%
э і.76 вп				Blockchain Technology in Healthcare Market	0.09	0.15	0.26	4.28	72.8%
2010	2020	2021	2026	Blockchain in Agriculture and Food Supply Chain Market	0.09	0.13	0.19	1.40	48.1%
2019	2020	ZUZI	2026	Cryptocurrency Market	1.36	1.46	1.56	2.20	7.1%

<Global Blockchain Market size>

<BLOCKCHAIN - HIGH GROWTH MARKETS, KNOWLEDGESTORE, 2021>

Expansion of Global Blockchain Solutions Spending

- Amount of spending on global blockchain services and solutions will reach \$6.6 billion in 2021, a 46% increase over the previous year.
- By 2022, the world will expand spending in the blockchain sector to \$11.6 billion.
- 60% of spending in 2021 is concentrated on blockchain finance (\$3.96 billion), followed by manufacturing (\$1.16 billion) and logistics (\$9.6 billion).

\$6.6 Billion

2021 Clobal Spending on Development Services and Solutions



\$11.65 Billion

Projected Biggest Regional Spenders on Blockchain Solutions by 2022



Finance

of which 60% was spent in Blockchain Solution Field



Big Growth of DeFi

- Growing over 400% (\$111.754B) in about 10 months from \$25.975B on Jan 1, 2021.
- As of December 2021, DeFi's TVL was \$189B, an increase of 767% from the previous year.
- Among the global TOP 100 DeFi services, Digital Asset lending, Digital Asset Decentralized Dxchanges, and Digital Asset Management services occupy the same market share.



Item / Category Digital Asset Lending		Digital Asset Decentralized Exchange	Digital Asset Management	Digital Asset Management	Digital Asset Management
Service Overview Creating liquidity through Service Overview specific collateral (Ethereum, etc.)		Platform operation for decentralized exchanging of various digital assets	Digital asset management and operation	Digital asset-based payment service	Development and sales of various derivatives based on digital assets
TVL (Total Value Locked)	\$46.07B	\$31.46B	\$16.49B	\$2.94B	\$2.91B
Occupation rate 27%		22%	28%	5%	18%
Leading Service	MakerDAO	Curve Finance	Convex Finance	Flexa	dYdX
Service Contents	- Ethereum collateral based - Digital asset lending service	- Decentralized digital assets exchange service	 Interest income provision service through digital asset deposit 	- Digital asset-based payment, payment, and storage service	- Margin trading - Spot trading -Indefinite contract transaction - Lendings and Borrowings

< TOP 100 in DeFi Services, DeFi Pulse (2021.12.12.)>

Hottest ever, NFT Market

- The growth indicators of the NFT market until the third quarter of 2021, were absolutely explosive.
- In the first half of 2021, \$2.5 billion worth of transactions occurred, and the volume of transactions in the third quarter grew to \$10 billion, which is much higher than the total transaction volume in the first half.
- The growth of the NFT market shows that 'demand leads supply', with the number of buyers growing faster (+38% QoQ) than the number of sellers (+25% QoQ).



Rising Star 'Digital Asset Custody market'

- The surge in the value of cryptocurrency in the first half of 2021 leads to an increase in the adoption/holding of digital assets in global, and the custody market for digital assets is emerging.
- More than 70% of institutional investors worldwide plan to adopt digital assets in 2021. (2021 Institutional Investor Digital Assets, Fidelity Digital Assets)
- The proportion of digital assets planning in the wealth management portfolio will increase to 80% in 2021, and custody services for global digital assets have been continuously launched.



3 Industry Adoption Status - Manufacturing

for 'Anti-Fraud, Reduce Cost & Environment'

One of the biggest problems in the global manufacturing sector is the loss of counterfeit products from manufacturers. In the case of U.S. manufacturing, which accounts for about 12% of the global economy, the amount of damages caused by counterfeit goods amounted to \$3.7 trillion each year, and many global companies have been seeking solutions. Blockchain technology is being applied as a solution to solve this problem in various fields, and it is being introduced to solve various problems in the manufacturing industry in addition to counterfeit detection.

Pain Point

- Difficulty in forecasting demand
- Poor inventory management
- low efficiency
- Difficulty in increasing ROI
- Outdated legacy networking system



Losses from counterfeit products for electronics and technology companies account for 4-7% of annual sales. Numbers in Pain Points



Average cost to recall a single product (Forbes)



Annual loss in manufacturing sector due to counterfeit products (US)

Adoption Point

- Product tracking and improved tracking
- Intellectual property protection and monetization
- Simplify quality inspection
- Maintenance Activation

60~80%

Fraudulent sales can be reduced by 6~80% by applying blockchain.

Numbers in Adoption Points

3.85%

Cost recovery effect by reducing fraudulent transactions

2~5%

Financial benefits from blockchainbased product certification are between 2% and 5% of corporate sales

3 Blockchain in Manufacturing

Leading Case #1

"Global Mobility Company & Initiative"

In 2019, in the global automobile manufacturing sector, the effectiveness/feasibility review for vehicle data tracking and humanitarian problem solving of raw material production was mainly. In 2021, the automobile manufacturing industry will pass the 'technical verification of blockchain' stage and begin to be adopted as a supply chain management means such as the practical application of blockchain for 'development of eco-friendly/next-generation transportation' and 'verification of the authenticity of vehicle parts'.

Blockchain is now entering a more advanced 'commercialization' stage, and social functions such as air pollution reduction have begun to be important. In addition, projects to secure mutual trust such as vehicle identification, history management, and data integrity of manufactured parts continue, We are continuously proving the potential of blockchain commercialization.

2021	Ford		MOBI	
Company (Initiative)	Ford	Volkswagen Group Innovation (Energy Web)	Mobility Open Blockchain Initiative (General Motors, BMW, Ford, AWS, Accenture, Bosch, Car IQ, Honda, IBM)	Hyundai Mobis
Adoption Point	Ethical Sourcing to Reduce Air Pollution	Environmentally friendly modes of transportation	Data sharing of autonomous vehicles for the launch of next-generation transportation (self-driving car data)	Prevention of losses due to counterfeit vehicle parts, improvement of after-sales parts supply efficiency
How to	Equipped with blockchain-based Ford Transit Custom PHEV (hybrid electric vehicle)	Development and testing of open source software for seamless integration of electric vehicles and power markets	Blockchain-based vehicle identification standard VID II: Vehicle registration and maintenance, traceability link, Cross- border vehicle data, maintenance log, etc.	Building 'MAPS(Most Advanced Parts System)': Integrated information system based on blockchain/IoT
Result	London Pilot: Drive 180,000 km by pollution-free power Cologne/Valencia: Drive 105,600 km By pollution-free power PHEV Refrigerated Van: Achieved 82% of mileage	Development of digital common reference frame in progress (2021.03)	Expansion of participation in global automobile manufacturing and technology companies Accenture, AWS, AutoData Group, Bosch, Car IQ, DENSO, DMX, Hitachi America, Ltd., Honda, IBM, Kar Auction Services, Luxoft, Quantstamp, Ownum, USAA	Check the authenticity of 3 million parts of 300 vehicle models - 200+ countries / 100,000 people including 16,000 dealers

3 Blockchain in Manufacturing

Leading Case #2

"Establishing Trust in Aerospace Maintenance, Honeywell"

Honeywell

Honeywell International, Inc. is a software industry company that provides industry-specific solutions for aerospace and automotive products and services. As a leading company for aerospace industry, Honeywell is good at building controls (including heating, ventilation and air conditioning systems), electronic switches and motors, alarms, industrial automation systems, microelectronics, medical devices, military and commercial avionics, and space systems. And this company focused on the development of innovative products and developed the Hyperledger Fabric-based GoDirect Trade[™] platform to build a secure B2B market for aircraft parts trading. This innovative system generated \$1 million in sales within 10 weeks of introduction.

Building Background of GoDirect Trade	 The world's largest passenger plane, the Airbus A380, has about 4 million parts. Only 2.5% trades(about \$4 billion) of the aerospace components industry do in online. For certification by other agencies such as the US Federal Aviation Administration, information such as use, repair, and ownership must be documented. This makes it difficult to track/manage parts and transaction details. 			
		WHO WE ARE		
About GoDirect Trade Offers	- Part life cycle - Service period - Repair history - Own/Owned records	eCommerce & Digitization solutions alution market Subagements & & Subagements		
Build Results	- Achieved \$4 million in sales in less than one year	7-10 DAVS TO SHIP. SPRING Condition New Capit In at Sign Lar To Year Michael		
	- Influx of over 50 global suppliers with stores	Produce Details PLEASE ALLOW 7-50 DAX'S TO SHIP. WARRANT WINFO NOT YET MAIL ALL E		
	- Reduced trading time: from days to minutes	more Location Proteint, Arizona, USA		
	- Shorten aircraft dismantling process: from up to 10 weeks to about 5 weeks			

3 Industry Adoption Status - Supply Chain

for "Trust Building & Cost efficiency"

In the logistics field, which is the core of supply chain processes and transportation management, blockchain is being adopted to reduce inefficient costs, create profits, and secure trust between transaction parties.

- The global cargo and logistics market is expected to grow to \$19.36 trillion by 2024. (Envision Intelligence Agency)
- The amount of damage caused by bad practices, theft, cyberattacks, theft, and misdelivery amounts to \$50 billion annually.
- Counterfeit goods account for 3.3% of global trade, it costs about \$600 billion in damage to the U.S. economy.

Pain Point

- Reduced Logistics Efficiency
- Information opacity and asymmetry
- Recovery and payment of funds
- The complexity of the transaction process
- Delivery inefficiency, poor quality



Growth forecast of counterfeit and counterfeit market (~2022, OECD) Numbers in Pain Points



The scale of costs incurred by the distribution of counterfeit drugs



More than 10% of food and beverages on the market are fraudulent products, resulting in an economic cost of about \$3~40 billion worldwide.

Adoption Point

- Improved Logistics Traceability
- Distributed technology (DLT) application, trust secured
- Reduce transaction complexity
- Process automation, error improvement
- Improved shipping stability

4_{Hours}

Reducing the time required for the issuance of letters of credit in the trade process from 7 to 10 days to 4 hours by blockchain adoption Numbers in Adoption Points



The counterfeit sneaker market is worth about \$600 billion, accounting for about 40% of the global counterfeit fashion market.

55.3%

Logistics service providers who started spending on blockchain to prevent counterfeiting are 55.3% in worldwide. (Research and Market, 2021)

Global Projects for "Supply Chain innovation"

Blockchain in the supply chain has confirmed the feasibility and proof-of-concept of the technology in various fields, from improving product traceability, reducing transaction costs, to inventory management, and solving existing problems that other technologies have not been able to solve. Moreover, various projects around the world are underway to innovate in the field of supply chain.

Sector	Leading Companies and Projects		
Sea shipping and container shipping	Tradelens Project (Maersk, CMA CGM, IBM, ports)		
Sea transport and port operations	Smart port program (Port of Anterwep and T-mining)		
Detail/Food	Walmart & IBM		
	Carrefour / Auchan / Casino		
	Freight and Logistics Consortium (Accenture, APL- Shipping liner, Kuehne + Nagel, AB InBev- Beverage Manufacturer)		
Freight Transportation and Logistics	Blockchain in Transport Alliance		
	UPS -blockchain		
Pharmaceutical Industry	MediLedger Project (Industry consortium including IBM Blockchain, T-Mining, Block Verify, Chronicled, FarmaTrust, iSolve, Modum, OriginTrail, Provenance)		
	Advanced Tracking and Traceability Project : (SAP, Merck, AmerisourceBergen, GSK, AMGEN, Boehringer Ingelheim, McKesson, Novo Nordisk)		

<Global Blockchain projects in Supply chain, 2020>

Breakthrough food supply ecosystem innovation, Walmart

Walmart 🔀

Walmart, which has 10,566 stores and clubs in 24 countries around the world, has built a successful food tracking system by introducing blockchain technology to logistics and supply chain management since 2016 based on Hyperledger Fabric. This company achieve breakthrough results by reducing the time required to verify food sources 'from 7days to just 2.2 seconds'. The system is capable of tracking more than 25 product origins from 5 global grocery suppliers and is gradually expanding the scope of blockchain applications.

Process of development

October	August	September	September	October
2016	2017	2018	2020	2021
Announcements two PoC (food tracking blockchain)	After successful PoC, launch IBM Food Trust by collaborating with IBM & Unilever.	Track more than 25 products with a system (powered by Hyperledger Fabric) "Requires registration of	Since the introduction of the blockchain solution DL Freight (Walmart Canada), a 97% reduction in disputes from 350,000 cases per year.	Do a Pilot test to purchase BTC at kiosks in some stores in the US. Ai, IoT, Blockchain integrated development in progress for
		blockchain-based system for all fresh products in 2019"		supply chain improvement

Leading Case #3

Blockchain-based logistics technology standard, BiTA



BiTA (Blockchain In Transport Alliance) is a blockchain logistics and transport alliance that develops blockchain technology standards for the logistics and transport industry and leads innovation in global logistics business. In 2017, UPS, FedEx, Uber Freight, Union Pacific Railroad and project44. It was launched with the participation of global companies and is the largest blockchain logistics alliance in the world as of 2021. BiTA has adopted the IEEE ISTO (Industry Standards and Technology Organization) to provide stable services to the alliance, and is developing "open source and royalty-free standards" that allow interoperability among supply chain participants.

First official standard approval in 2019

- BiTA Standard 120-2019 Location Component Specification

X Achieved results in a much faster period (6 months) compared to the general data standard generation period (2 years)



Innovation in Global Supplier Onboarding, CHAINYARD

$CH\Lambda INY\Lambda RD$

Chainyard is a global blockchain consulting and development company based in the United States, supporting businesses and governments around the world with blockchain projects and implementations. Chainyard has built the 'Trust Your Supplier network' to modernize the end-to-end process of managing supplier information using a blockchain network built with Hyperledger Fabric by IBM.

Background of Trust Your Supplier Network Establishment -

- The time required for the Global 100 companies to select a new supplier is typically 45 to 60 days.
- Selection of a new supplier requires a large amount of information such as customer recommendation letters, insurance evidence, and bank balance. And the friction and delays between buyers and sellers occur frequently.
- With IBM's legacy system, the time required for vendor selection was 30 days.

Trust Your Supplier Network Features

- 'Trust Your Supplier' creates a unique "Digital Passport" for each Supplier ID and shares it with authorized buyers on the network.
- The network, built in collaboration with IBM, includes more than 24* Fortune 500 companies, and Trust Your Supplier supplies hundreds of thousands of supplier data.
- TYS(Trust Your Supplier) member

Anheuser-Busch InBev, GlaxoSmithKline, Lenovo, Nokia, Schneider Electric, Vodafone, Cisco, JetBlue, Lenovo 및 UPS, JP Morgan, American Express

Network Construction Performance

- The onboarding cycle through Trust Your Supplier is reduced from
- 60 days to 3 days.
- Supplier information verification and maintenance costs are reduced to 50% of the previous condition.



3 Industry Adoption Status - Health Care

for Efficient Health Credentials & Trust

Blockchain technology in the global healthcare market in 2021 is estimated to be worth \$12.45 billion and is expected to reach \$55.83 billion by 2022 at a CAGR of 35%. As the technology in the medical field is advanced, the patient data acquired by hospitals and medical institutions is being refined and segmented, and the introduction of global blockchain in the area of data storage and management is accelerating.

In addition, blockchain technology, which is being used as a solution to solve the problem of counterfeit drugs distributed around the world, is applied as an effective means of preventing the spread of infectious diseases due to the prolonged COVID-19 and personal health credentials, and gradually expanding the scope I'm going.



3 Blockchain in Health Care

Global projects to prevent the spread of COVID-19

As the global human/economic damage increases due to COVID-19 in 2021, the world is seeking new solutions in the form of a consortium between the medical field and blockchain technology companies. Various countries and companies are developing blockchain-based solutions to prevent the spread of infectious diseases and provide effective personal health credentials, and through this, we expect to secure the trust of vaccine programs and improve the vaccination rate.

Top blockchain developments towards Covid-19 in 2021

		мау	Jun	July
Moderna & IBM collaboration for vaccine traceability	Estonia VaccineGuard: blockchain-based	South Korea blockchain-based vaccine certificates		Tech Mahindra and Statwig blockchain vaccine
% IBM Blockchain - Digital Health Pass solution	vaccine certificates X Guardtime Estonia	% Blockchain Labs - Infrablockchain		traceability solutions X Tech Mahindra and Statwig used their own
New York Excelsior Pass, a identity credentials app				technologies
	Moderna & IBM collaboration for vaccine traceability ※ IBM Blockchain - Digital Health Pass solution New York Excelsior Pass, a identity credentials app	Moderna & IBM collaboration for vaccine traceability % IBM Blockchain - Digital Health Pass solution New York Excelsior Pass, a identity credentials app	Moderna & IBM collaboration for vaccine traceabilityEstoniaSouth Korea blockchain-based vaccine certificates x Guardtime EstoniaMew York Excelsior Pass, a identity credentials appImage: Constant of the second secon	Moderna & IBM collaboration for vaccine traceabilityEstoniaSouth KoreaWaccineGuard: blockchain-based vaccine certificates waccine certificates Waccine certificates Waccine EstoniaBlockchain-based vaccine certificates Waccine certificates

※ IBM Blockchain -DigitalHealth Pass solution.

3 Blockchain in Health Care

Leading Case #2

World's first Blockchain_based digital republic, Estonia



Called the world's first "digital republic," Estonia has digitized 99% of its public services. This country provides the world's most comprehensive online government service, has achieved innovation in various fields such as voting, tax payment, and health care, and has the highest level of trust in the world of government. In 2016, we introduced the world's first blockchain technology to preserve patient health records and launched the HER system, which registers all patient data from birth to death.

<u>% KSI(Keyless Signature Infrastructure)</u> Blockchain

In Estonia, the KSI blockchain designed by Guardtime(since 2007) was applied to the government network to complete digitalization in various fields such as identification, security, health care, and education.

1st in Global Digital health index

Rank	Country	Index
1	Estonia (EST)	81.92
2	Canada (CAN)	74.73
3	Denmark (DNK)	72.47
4	Israel (ISR)	72.45
5	Spain (ESP)	71.36
6	NHS* England (GBR)	69.98
7	Sweden (SWE)	68.26
8	Portugal (PRT)	67.19
9	Netherlands (NLD)	66.05
10	Austria (AUT)	59.81

1st in the EU on Digital public services

4 Digital public	Est	EU	
services	rank	score	score
DESI 2021	1	91.8	68.1





<DESI 2021>

Estonian Blockchain Adoption Results



More than 30 billion health records of 1.3 million people are kept.
99% of medical service information processed on the blockchain is digital.

- 95% of all medical claims and health information are recorded in a distributed ledger-based system.

- No.1 in the digital public service sector among EU countries.
- The world's first COIVD-19 vaccination certificate adopted. (April 2021)

<Bertelsmann Foundation>

3 Blockchain in Health Care

Leading Case #3

To address supply chain disruptions : Joint initiative of Moderna and IBM



Moderna and IBM formed a joint initiative in March 2021 to increase trust in vaccine programs, vaccination rates, and to track vaccine distribution in real time. This partnership aims to develop vaccine management solutions that provide end-to-end traceability to address supply chain disruptions caused by a pandemic. Moreover, this partnership is looking for ways to achieve the goal of enhancing the sharing of secure information among government agencies, healthcare providers, life sciences organizations and individuals.

Digital Health Pass (IBM Blockchain)

A mobile service developed with IBM's blockchain technology for traveler's COVID-19 effective health credential in October 2020



- This pass provide health information such as COVID-19 test results, inoculation records and body temperature measurement results.

- In April 2021, it will be applied to Amadeus, a global airline reservation system, to support travelers' simple credentials.
- It is being adopted as a method to efficiently improve check-in times for flights that take up to 6 hours or longer by checking various types of COVID-19 certificates.

3 Industry Adoption Status - Fashion

for Anti-counterfeiting and customer trust

The problem of counterfeit products in the fashion sector has been a major headache for global fashion brands as high-priced brands sold at a premium can be particularly vulnerable to counterfeiting. Accordingly, an Italian global fashion brand with a large number of high-priced brands is carrying out a project to minimize brand damage caused by counterfeit products through the application of blockchain technology.

- Counterfeit goods from high-end brands account for 60-70% of all counterfeit goods sold annually, accounting for about a quarter of the \$1.2 trillion global luxury goods trade.

- Global luxury brands are losing about \$30 billion in sales due to online counterfeiting. (Global Brand Counterfeiting Report)
- The known damage from counterfeit goods in the jewelry and watch sector is over €1.9 billion per year. (Global Brand Counterfeiting Report)

Pain Point

- Order increase/inventory decrease (Covid-19)
- Production/delivery delay (Covid-19)
- Complex distribution structure
- Increased online circulation of counterfeit products
- Difficulty in distinguishing online counterfeit products

22%

Footwear brands such as Nike, Adidas, Louboutin and UGG, account for 22% of counterfeit goods in the global fashion sector. Numbers in Pain Points

52%

52% of consumers lost brand trust due to online counterfeiting.

20%

20% of fashion products advertised on social media platforms are fake.

Adoption Point

- Provide supply chain transparency
- Prevention of product counterfeiting
- Reduction of operating costs
- Efficiency improvement

67%

Percentage of global consumers who consider the use of sustainable raw materials for clothing as an important purchasing factor Numbers in Adoption Points



The cost of returning duplicate (counterfeit) clothing at online retail stores which can be solved through the introduction of blockchain. €25_{billion}

Transparency and trust can be secured in the used luxury market (€ 25 billion) that is continuously growing by 12% annually with the introduction of blockchain.

3 Blockchain in Fashion

Leading Case #1

For luxury product line and customer protection : Aura Blockchain Consortium



Aura Blockchain is the world's first global luxury blockchain consortium (Louis Vuitton, Bvlgari, Prada, Cartier) engineered by ConsenSys and Microsoft to secure luxury product lines, with the goal of verifying the authenticity of products purchased by customers. do.

Background of Aura Blockchain

- 62% of luxury customers are first introduced to the brand through second-hand luxury goods. (BCG, Vestiaire Collective)
- The size of the global used luxury market in 2021 is about €36 billion. (BCG)
- 44% of luxury customers plan to resell their bags to the second-hand market. (BCG)
- LVMH employs at least 60 attorneys to combat counterfeiting and costs \$17 million per year in legal action for counterfeiting.

Goals of Aura Blockchain

- Identification of counterfeit products and customer protection
- Tracking luxury goods sold on used platforms
- Product-owner records management

Features of Aura Blockchain

The Arianee platform, which authenticates branded products via open source protocols, applies counterfeit identification processes to determine authenticity and protect customer rights.

This process has been applied to more than 60 brands. For instance it applied to the perfume lines of Louis Vuitton and Christian Dior.

Benefit

Customer

- Proof of authenticity and ownership of goods
- Access product history information
- Strengthening customer relationships through greater transparency
- Access to new services offered by the brand

Brand

- Ensuring that brands make and handle products according to the standards they have set.
- Building client trust (without intermediaries)
- Market protection from counterfeiting, second-hand market control

Cost Reduction

- Cost reduction effect caused by counterfeit goods distribution

Blockchain_based environmental and social credentials : TextileGenesis

TextileGenesis[™] is a tracking platform for the pioneering supply chain in the fashion and textile industry based on blockchain technology. This platform trace and guarantee sustainable textile's authenticity and source. The TextileGenesis[™] platform creates strong business incentives for textile suppliers to proactively share supply chain traceability data and evaluate the environmental and social credentials of the entire supply chain. This platform result in a total apparel sales of over \$100 billion, and Collaborates and conducts textile-to-retail traceability programs with the top 10 leading brands they serve.

TextileGenesis Platform

Blockchain-enabled platform that ensures full traceability of branded textiles



TextileGenesis Platform applied project

Lenzing E-Branding fabric

The apparel industry has a significant impact on the environment and accounts for 4-10% of global greenhouse gas emissions.

Austrian global textile producer Lenzing Group is solving this problem with TextileGenesis™ platform.

Goal

- Reduce carbon emissions by 50% (by 2030)

- Achieve carbon neutrality goals (by 2050)

Viscose Traceability Pilot

About 6 million tonnes of viscose is used in garment production annually, and this demand is growing. The problem that 30% of viscose is procured from endangered forests is a global problem.

To solve the problem of sustainability, BESTSELLER and Kering jointly started a project, which applies TextileGenesis™'s blockchain technology to track the textile supply chains of 8 global countries.

Result (2021. 6.22 completed) Successful cataloging and tracking of 4 styles /23,000 products

: Viscose and general fiber blend from 25 suppliers in Austria, Germany, Italy, Turkey, India, Bangladesh and China

3 Industry Adoption Status - Insurance

Insurance for Fraud prevention and cost reduction

Insurance that has existed for centuries has now grown into trillions of dollars, but with little to no innovation in the customer experience. Thousands of contracts are still traded in paper documents, and purchases are still made through intermediaries. It is lost or arbitrarily changed through a complex contract stage, and a lot of data from contracting parties flows into insurance companies, and management risks are increasing. In order to solve various insurance problems including this, the insurance industry around the world is trying to apply blockchain technology.

Pain Point

- Exposure to insurance fraud
- complex process
- Difficulty in accessing medical information
- Increase in insurance company risk
- Simplification of claim procedures



Total annual cost of insurance fraud in the United States exceeds \$40 billion. Numbers in Pain Points



Property and Accident (P&C) insurance will reach \$1.6 trillion in 2020, accounting for 30% of the total insurance market.



Insurance claims errors due to lack of data cost hospitals \$262 billion annually

Adoption Point

- Security enhancement with DLT technology
- Smart contract claim processing
- Encryption of patient medical information
- Simplify the reinsurance process
- Automated insurance claim process

300%

Automated data collection and analysis system with blockchain technology can build a billing process that is 3 times faster and 5 times cheaper. Numbers in Adoption Points



Reduced annual operating costs of more than \$200 billion through smart contracts (BCG) \$10billion

By facilitating information sharing between insurers through the introduction of blockchain, annual costs of reinsurers can be reduced by up to \$10 billion.

3 Blockchain in Insurance

Effective solution to avoid double-dipping : IntellectEU's ClaimShare

CLAIMSHARE

Belgium-based company 'IntellectEU' developed the 'ClaimShare' solution in March 2021 using the R3 Corda blockchain. This is a solution to prevent 'double-dipping', in which a single claimant is fraudulently receiving payments for the same event. It aims to improve cost.



ClaimShare Solution Goals & Expectations

- Actively respond to premium increases of \$4~700 due to the total annual cost of non-health insurance fraud (\$40 billion, FPI estimate)
- Reduce total fraud costs by up to 10% per insurance line
- Insurance companies can filter customers who commit double-dipping through reports on the Claimshare platform

Technology and Business Partners



Reinsurance management platform to protect insurers : B3i Services AG



B3i is an insurance industry consortium comprising 21 global insurance industry investors and more than 40 insurance companies. Founded in 2018 as an independent company, B3i Services AG, developing partnerships with companies and industry-leading initiatives around the world to build broadly supported platforms and protocols to address critical insurance industry needs.

Recent Issues

2019	2010.09	2021.01	2021.09	Main features of the B3i platform
B3i Cat XoL v1.0 released (R3 Corda, July)	Strategic partnership with msg (Sep) Partnership with TCS (Nov)	Eurapco Unity released *Eurapco Unity - solutions for risk transfer for marine	Started development of reinsurance contract management solution	 Minimization of manual process: Automatic input conversion so that the contracting party does not need to enter information redundantly Sharing commonalities about current contract status
- Automate the renewa process of insurance treaties (simplification)	insurers networks (Achmea, La Mobilière, Reale Group and B3i)	for six European countries	Expected Effects & Status
- Allow only the contracting party to access contract information	,		- France, Germany, Spain, Switzerland, United Kingdom and Nordic countries	- 30% reduction in management costs for insurers and reinsurers - 30 *reinsurance contracts concluded, including treaties with 9 insurance companies 4 major securities companies, and 8 reinsurers (2020)
(contract conditions, signature, etc.)			(Sweden and Finland)	 * Reinsurance - Insurance or Stop Loss Insurance for Insurers. The practice of transferring a portion of a risk portfolio to another party by some form of agreement by an insurer to reduce the likelihood of an insurer paying large obligations arising

from an insurance claim - By protecting insurers against cumulative individual commitments, they increase their ability to withstand financial burdens in the event of unusual and significant events, providing greater security to the insurers' equity and solvency.

Global 21 shareholders

Achmea, Aegon, Africa Re, Ageas, Allianz, AXA, China Pacific Insurance, Deutsche Rück, Generali, Hannover Re, IRB Brasil Re, Liberty Mutual, Mapfre Re, Munich Re, SBI Group, SCOR, Swiss Re, Tokio Marine, VIG Re, and Zurich Insurance Group.

Q4 2021 Blockchain

Closer to Daily Life

Digital Asset

In 2021, the world was able to take a step closer to everyday blockchain as direct and indirect experiences of digital assets surge through the growth of DeFi and NFT markets. Based on the accumulated experience, the foundation for the emergence of more diverse types of digital asset-derivatives in 2022 has been laid, and the adoption of global CBDCs, which is accelerating globally, is expected to begin to lay the institutional framework.

digital assets recognized based on the institutional framework will be able to expand their trading area as a means of exchange with the real economy through stable coins and CBDCs, and the market will present solutions to accommodate them in various forms.

Industry Blockchain

By 2021, we were able to see cases of verifying the effectiveness of blockchain technology and introducing experiments in various industries. Blockchain is clearly making changes in the global industry to restore trust between Maker and Consumer, such as verifying the authenticity of products, improving supply chain tracking, and strengthening efficiency across industries such as manufacturing, logistics, and medical care.

Industry Blockchain, led by global companies and startups in various fields such as IBM, Ford, and Walmart, is expected to continue to innovate and evolve in 2022 to trigger a wide range of changes.

Blockchain in Daily-Life

The global pandemic caused by COVID-19 is accelerating the adoption of Life Blockchain. Through uncomfortable experiences due to the inefficiency of health certificates, the world is demanding ways to solve them, and blockchain technology presents the best solution for this. Travelers around the world are already proving their health status through blockchain-based services, and this trend is expected to continue in 2022.

In addition, various changes are expected in individual consumption. The supply chain, one of the key areas of blockchain introduction, will provide an opportunity for consumers to purchase more transparent information such as food, manufacturing, fashion, and healthcare, further improving the demand-supply relationship.