

Resolution No. 2 for Approval
at the 16th Meeting of the 4th
Industrial Revolution Committee

Wednesday, June 24, 2020

Toward a Hyperconnected, Contactless, and Trustworthy Society

Strategy for the Diffusion of Blockchain Technology

June 2020



Jointly by relevant ministries

Table of Contents

I. Background	1
II. Significance of Blockchain	2
III. Current Status and Issues	4
IV. Strategic Initiatives and Objectives	9
V. Key Initiatives	11
1. Comprehensive Implementation of Blockchain in Seven Key Areas	
.....	11
2. Activation of Decentralized Identity (DID) Services as	
Infrastructure for the Contactless Economy	20
3. Establishing an Integrated Support System for Blockchain	
Enterprises	25
4. Development of Next-Generation Core Blockchain Technologies	29
5. Fostering a Blockchain Innovation Ecosystem	33

I . Background

- In response to the **heightened social distancing measures** induced by **COVID-19**, there has been a significant momentum towards the **digital transformation and contactless** (contact-free) trends across the economic and social spheres.
 - It is imperative to lay a groundwork of **trust among economic actors** to navigate and prosper in a **new normal society** characterized by **hyperconnectivity* and contactless interactions**.
 - * Rapid digitalization and contactless interactions boost online connectivity.
 - **Blockchain**, by endowing data - central to all economic activities - with qualities of transparency and immutability, significantly contributes to the **realization of a trust-based society**.
- In June 2018, we **announced the “Blockchain Technology Development Strategy,”** under which efforts have been made to foster the formation of an initial market, secure technological competitiveness, and establish the foundation for the activation of the industry.
 - In addition, by incorporating the recommendations of the Financial Action Task Force (FATF), we have **amended the Act on Reporting and Using Specified Financial Transaction Information*** to legislate the definition of virtual assets in line with international standards.
 - * Imposition of obligations for virtual asset businesses to report and comply with anti-money laundering measures (amendment on March 24, 2020, with enforcement from March 25, 2021).
- As blockchain technology garners renewed attention and global competition for leadership in this field intensifies, we currently find ourselves **at a critical juncture toward becoming a blockchain-advanced nation**.
 - The **initial fervor surrounding virtual assets, which had previously overheated the market, has subsided, and with the transition to a contactless economy**, the market is now focusing on the potential inherent in blockchain technology itself.
 - **Major economies**, including China, Germany, and Australia, have **announced their respective national blockchain strategies, linking them to their industrial competitiveness**, while making national efforts to secure global leadership.

☞ Capitalizing on the COVID-19 crisis as an opportunity, national capabilities must be consolidated to enable the country to **become a leader in blockchain**, which is the foundation of **the hyperconnected and contactless era**.

II. Significance of Blockchain

- Blockchain is a technology that enables the network participants to collectively record, verify, and store the transfer of information and value, thereby ensuring trust **without the need for intermediaries**.
- This is characterized by its technological attributes of **transparency** - where any participant can view transaction details - and **immutability**, making it difficult to modify or delete once a block is connected.
 - This **guarantees a direct and proactive trust relationship** among participants and serve as the infrastructure necessary for **implementing contactless services**.
- Starting with the first-generation distributed ledger sharing technology, blockchain has evolved into the second generation, utilizing smart contracts to be applied across various fields, and is now progressing towards the third generation* aimed at overcoming limitations.
 - * The third generation seeks to resolve technical challenges to expand blockchain's versatility, including scalability, security, and interoperability.
- Blockchain incentivizes participants to actively engage in transactions or services, and when applied to existing industries, it is expected to enhance efficiency and drive structural transformations.
- **Without the need for a complete overhaul of existing systems**, blockchain can achieve cost efficiency **by enabling data sharing and system integration among stakeholders**.
- **Transparent history management*** reduces monitoring costs and **alleviates information asymmetry** between sellers and buyers, thereby invigorating market transactions.
 - * By sharing product histories equally between sellers and buyers, peer-to-peer (P2P) transactions can be facilitated.
- Contributing to **productivity enhancement and value creation across various industries** such as energy and finance, blockchain technology also holds the potential to decentralize the monopolistic positions of existing large platforms.
- Furthermore, by improving the transparency of public services*, blockchain **enhances public trust in the government**.
 - * Examples include preventing election process manipulation and managing the overlap or omission of social welfare benefits.



Public Sector: Establishing trust in public services and implementing digital governance

- Enhancing the transparency of welfare payments and addressing the information asymmetry between the government and the public.
 - (UK) Govcoin is pursuing the development of a public welfare system by integrating blockchain technology into the labor and pension systems.
 - (US) The state convention of the Utah Republican Party utilized the blockchain-based biometric voting application Voatz.
- ☞ **Transparent public services contribute to the establishment of social trust and the protection of citizens' information sovereignty.**



Energy Sector: Promoting P2P electricity trading and efficient energy demand management

- Energy producers, without the need for intermediaries like power exchanges, can directly sell surplus energy to individuals, thereby enhancing the efficiency of energy supply and demand.
 - Power Ledger facilitates the direct trading of electricity generated from solar panels.
 - The De Ceuvel community in the Netherlands has established a local electricity trading system.
- ☞ **The routine small-scale trading of electricity between households is expected to increase the demand for renewable energy.**



Finance Sector: Improving the efficiency of financial systems and achieving inclusive finance

- By moving away from centralized structures, blockchain enhances efficiency by reducing transaction fees and increasing processing speed.
 - R3 CEV has developed an international remittance system that reduces fees by 90% and enables the tracking of suspicious financial transactions.
 - It also provides financially excluded individuals with access to financial services.
- ☞ **The innovation within traditional financial institutions, alongside the realization of inclusive finance, underscores the social value of blockchain.**



Healthcare Sector: Managing medical data with a patient-centered approach

- Patients have control over the scope and use of their personal health records (PHR).
 - A domestic company, M, is advancing the development of a blockchain-based, patient-centric mobile healthcare document platform.
 - IBM Watson Health, in collaboration with the U.S. FDA, is developing a platform for sharing patient data for medical research purposes.
- ☞ **By resolving information asymmetry between patients and healthcare providers, a patient-centered healthcare system can be realized.**

III. Current Status and Issues

1. Global Trends

- As the global blockchain market is **anticipated to expand rapidly**^{*}, **major nations** are striving to secure global leadership **by leveraging their industrial and societal capabilities**.

* Market size forecast (IDC, '19): (2018) USD 2.1 billion → (2022) USD 12.4 billion (CAGR of 80%)

- **Germany** (September 2019), **Australia** (February 2020), **and others have announced national visions and strategies** focused on introducing and fostering blockchain technology **within industries where they already have competitive advantages**.

* (Germany) Energy, finance, logistics, automotive, etc. (Australia) Agricultural supply chains related to exports, such as wine.

- China, leveraging the advantages of its centralized system, has commenced the commercialization of **its government-led Blockchain Service Network** (BSN) (April 2020).

- **As the global economy shifts towards non-face-to-face interactions, the implementation**^{*} of blockchain is becoming increasingly tangible worldwide, with international organizations leading efforts to establish global **recommendations and guidelines**^{**}.

* The WHO is advancing the MiPasa project (launched in March 2020), a global integrated data hub for COVID-19, which is driving the expansion of the DID (Decentralized Identity) services industry as a new technology for non-face-to-face identity verification.

** The OECD is expected to finalize its blockchain recommendations (scheduled for October 2020), while the WEF released blockchain utilization guidelines in April 2020.

- Unlike other emerging industries, the blockchain sector is **still in its infancy**, with no single country holding a monopolistic dominance. However, **signs of monopolization** are emerging, particularly among global corporations.

- **Global ICT giants** like Amazon and Microsoft are **launching blockchain services**^{*} by leveraging the monopolistic power of their existing platforms.

* Amazon and Microsoft have each launched blockchain services based on their respective cloud platforms, AWS and Azure.

- Similar to the cloud market, there is a concern that global corporations may dominate the blockchain market.

☞ Amid fierce competition worldwide to secure blockchain leadership, it is crucial at **this early stage** to make **national efforts to lead the global corporate ecosystem**.

Reference 2

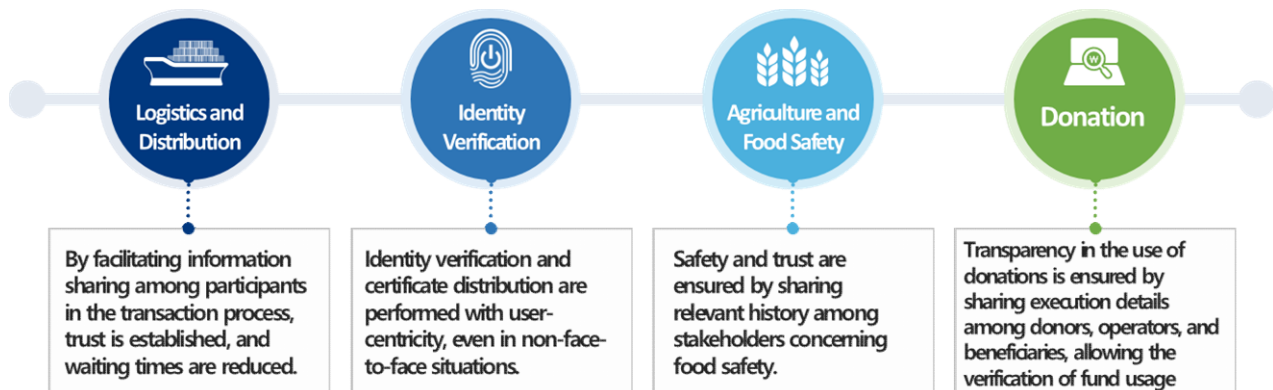
Policy Trends in Major Countries

Countries	Policy Trends
 <p data-bbox="240 568 344 595">Germany</p>	<ul style="list-style-type: none"> <li data-bbox="424 378 1402 439">o The Ministry of Finance and the Ministry of Economic Affairs and Energy jointly announced the “Blockchain Strategy” (September 2019). <li data-bbox="424 479 1402 645">※ Key pilot project areas include: ① Digital identity management, ② Digital economy, ③ Energy supply, ④ Supply and value chains, ⑤ Logistics industry, ⑥ Consumer protection, ⑦ Higher education certification, ⑧ Public health, ⑨ Customs evaluation, ⑩ Vehicle maintenance.
 <p data-bbox="240 804 344 831">Australia</p>	<ul style="list-style-type: none"> <li data-bbox="424 669 1402 730">o The Australian government introduced the “National Blockchain Roadmap” (February 2020), outlining a national blockchain implementation policy. <li data-bbox="424 770 1402 846">※ Specific application areas include: ① Agricultural supply chains related to exports, ② Trusted credentialing, ③ Building competition in the financial sector.
 <p data-bbox="272 1122 312 1149">EU</p>	<ul style="list-style-type: none"> <li data-bbox="424 864 1402 925">o Seven member states (France, Italy, Greece, Spain, etc.) adopted a joint declaration to actively implement blockchain technology (December 2018). <li data-bbox="424 965 1402 1108">※ ① Education (credential verification, student management), ② Logistics and distribution, ③ Land registry management (electronic documents), ④ Healthcare (medical record management), with an emphasis on enhancing e-government services and reducing administrative burdens. <li data-bbox="424 1149 1402 1178">o The International Association for Trusted Blockchain Applications (INATBA) was launched. <li data-bbox="424 1218 1402 1279">※ This involved startups, SMEs, regulators, and standards-setting bodies to promote blockchain adoption (April 2019).
 <p data-bbox="256 1547 328 1574">China</p>	<ul style="list-style-type: none"> <li data-bbox="424 1294 1402 1355">o Chinese President Xi Jinping emphasized key areas for “Blockchain+” during a Central Committee Politburo meeting (October 2019). <li data-bbox="424 1395 1402 1518">※ Focus areas include: ① Education and employment (credential verification, human resource management), ② Healthcare and elderly care (medical record management, data sovereignty), ③ Food safety (supply chain management). <li data-bbox="424 1552 1402 1612">o The government-led central Blockchain Service Network (BSN) commenced commercialization (April 2020). <li data-bbox="424 1653 1402 1682">※ Plans to deploy nodes in 200 cities across China by the end of 2020.
 <p data-bbox="256 1895 328 1921">India</p>	<ul style="list-style-type: none"> <li data-bbox="424 1709 1402 1769">o The Indian government think tank, NITI Aayog, published the national blockchain policy report titled “Blockchain: The India Strategy” (February 2020). <li data-bbox="424 1803 1402 1975">※ The report outlines potential application cases, including: ① Land records, ② Pharmaceutical supply chains, ③ Trusted educational credentials, ④ Healthcare immunization management infrastructure, ⑤ Fund management, ⑥ Insurance (health, automotive, etc.), ⑦ Automotive battery management, ⑧ Organic produce management.

2. Policy Achievements and Current Status

□ In June 2018, the Korean government announced the “**Blockchain Technology Development Strategy**” with the vision of becoming a “nation that innovates and grows through blockchain” [Reference 3].

- The strategy aims to **enhance public service efficiency and expand private investment**, with 34 pilot projects across seven sectors (including used car transactions, livestock tracking, and real estate) launched since 2018.



- The government has also **established a blockchain technology roadmap**, promoted **technological development**, secured a basis for **service reliability assessments**, and **strengthened workforce training and domestic/international standardization efforts**.

□ Although the formation of an initial market and industry base has been **successful**, **limitations remain**.

- **(Pilot Projects)** The projects launched to date have helped establish the early blockchain market but **have been limited to partial system applications, restricting broader adoption across business operations**.

- There is a **lack of focused projects** that demonstrate tangible benefits in everyday life, and there has been insufficient discovery of systematic services*.

* The projects are predominantly single-year initiatives with limited association with other projects.

- **(Research and Development)** Compared to the leading technological nation (the United States), **technology gap* remains significant**.

* (2017) 76.4% of the U.S. level, with a 2.4-year gap → (2018) 80.8% of the U.S. level, with a 2.3-year gap.

- **(Infrastructure Formation)** Although the industry **has expanded quantitatively**, **awareness of blockchain technology adoption** remains low (NIPA Blockchain Industry Survey, 2019).

- The number of **domestic blockchain companies increased by approximately 1.3 times, and the proportion of companies generating revenue rose by 27.7 percentage points***, but **only a few companies** are actively using or **considering adopting blockchain technology****.

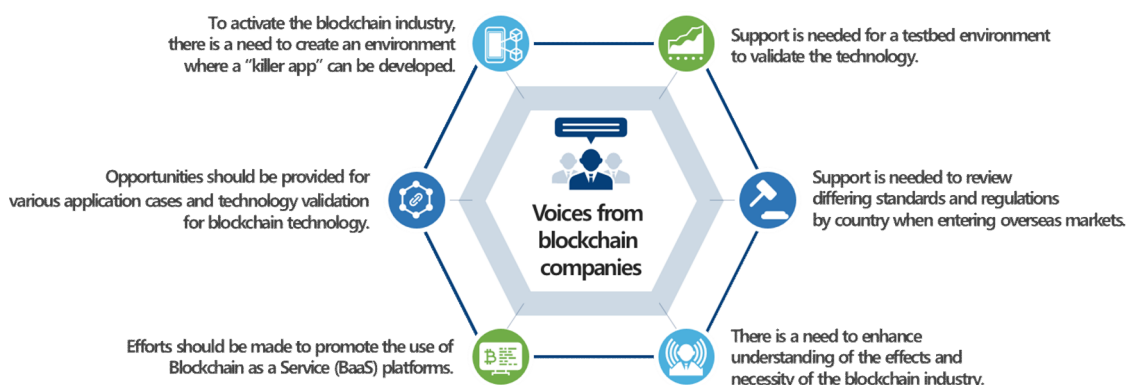
* (Number of blockchain suppliers) 209 companies in 2018 → 265 companies in 2019 (30% increase)

(Percentage of companies generating revenue) 40% in 2018 → 67.7% in 2019 (27.7 percentage points increase)

** Out of 2,099 surveyed companies that are not blockchain suppliers, 2,065 responded that they have no plans to adopt blockchain technology.

- Blockchain companies have reported difficulties in commercialization due to issues such as **regulatory challenges** (63.7%), **lack of trust among users** (19.5%), and **insufficient network capabilities** (14.3%)*.

* Survey on the Adoption and Future Prospects of Blockchain (KDI, January 2020)



□ **Compared to major foreign countries (U.S., China), the domestic investment environment is shrinking.**

○ **While China's share of investments is expanding***, our investment cases **tend to focus only on a few verified business models.**

* As of 2019, the U.S. accounted for 31% of global blockchain investments, and China accounted for 22% (in 2017, the U.S. accounted for 41%, and China for 10%).

◇ Thanks to ongoing policy efforts, the industry **has expanded in scope**, but a **lack of profitable models** and a **shrinking investment environment** make it difficult to achieve **global competitiveness**.

☞ It is necessary to **analyze domestic and international conditions** and **implement concrete action plans for a renewed push forward**.

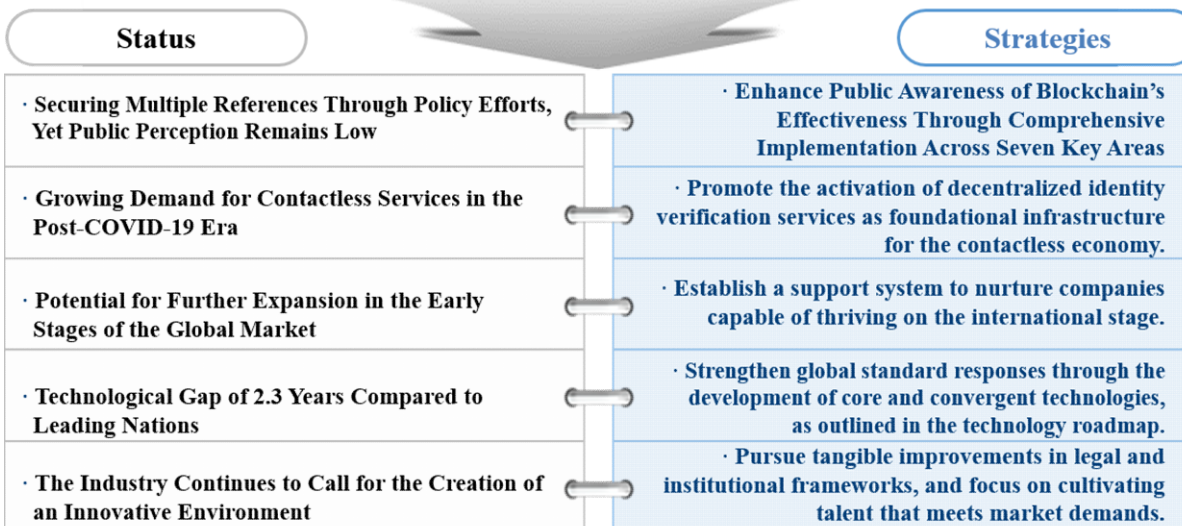
Reference 3

Blockchain Technology Development Strategy (June 2018)

Field	Main Initiatives
<p data-bbox="272 517 296 544">①</p> <p data-bbox="209 555 363 674">Formation of early blockchain market</p>	<p data-bbox="405 387 1374 450">“Domestic projects have only reached the level of confirming technical feasibility and have not yet led to market expansion.”</p> <ul style="list-style-type: none"> <li data-bbox="405 488 1374 551">▶ (Public Sector-Led Projects) Expand pilot projects based on public sector demand to improve public service efficiency and discover best practices. <li data-bbox="405 589 1374 651">▶ (National Projects) Implement private sector-led national blockchain projects to allow citizens to directly experience the benefits of blockchain technology. <li data-bbox="405 689 1374 797">▶ (Linking with Innovation-Led Growth) Prioritize the application of blockchain technology in the eight leading innovation growth projects, such as smart cities and smart factories, to support private sector-led innovation.
<p data-bbox="272 1003 296 1030">②</p> <p data-bbox="193 1041 379 1160">Secure competitiveness in blockchain technology</p>	<p data-bbox="405 819 1374 882">“Compared to the world’s leading technology nation (United States), it reaches 76.4% of their level, with a technology gap of 2.4 years.”</p> <ul style="list-style-type: none"> <li data-bbox="405 920 1374 1028">▶ (Securing Core Technologies) Develop and annually update a blockchain technology development roadmap, and pursue R&D with the goal of achieving 90% of the technology level of the world’s leading nation. <li data-bbox="405 1066 1374 1189">▶ (Technology Support Center) Establish and operate an evaluation system that allows for the objective verification of the reliability and performance of blockchain core technology platforms and services, enabling comparative analysis across different blockchain technologies. <li data-bbox="405 1227 1374 1335">▶ (Standardization Roadmap Advancement) Elevate the blockchain standardization roadmap, and integrate it with the R&D roadmap to leverage it as a mid- to long-term strategy.
<p data-bbox="272 1505 296 1532">③</p> <p data-bbox="193 1543 379 1693">Establishing a Foundation for Blockchain Industry Activation</p>	<p data-bbox="405 1335 1374 1397">“With just 30 or so specialized companies in the nation and insufficient personnel, it’s urgent to establish a supportive ecosystem.”</p> <ul style="list-style-type: none"> <li data-bbox="405 1435 1374 1574">▶ (Core Talent Development) Operate a “Blockchain Playground”[*] to secure practical blockchain talent and expand the designation of research centers to nurture master’s and doctoral-level researchers. * A free space for learning, experiencing, and debating blockchain technology. <li data-bbox="405 1612 1374 1675">▶ (Fostering Specialized Companies) Support blockchain startups, assist in the commercialization of ideas, and provide innovation support for SMEs. <li data-bbox="405 1713 1374 1843">▶ (Legal/Institutional and Awareness Enhancement) Operate a “Blockchain Regulation Improvement Task Force” to address regulations and institutional challenges, and institutionalize a Blockchain Promotion Week that hosts concentrated events to raise awareness.

IV. Strategic Initiatives and Objectives

1. Promotion strategy



2. Vision and Goals

Vision

Realizing a Hyperconnected, Trust-Based Society in a Contactless Era

Strategic Goals

Disseminate blockchain success stories that resonate with the public

Expand an Innovative Business Ecosystem with Global Competitiveness

Overcome Existing Limitations and Promote the Spread of Next-Generation Blockchain Technologies

Key Strategies and Focus

Implement all 7 sectors

- ① Online voting
- ② Donations
- ③ Social Welfare
- ④ Renewable Energy
- ⑤ Finance
- ⑥ Real Estate Transactions
- ⑦ Postal Services

Activate decentralized identification service

- ① Integrated Public Platform Across Multiple Ministries
- ② Interconnectivity Among Authentication Methods
- ③ Discovery of Innovative Contactless Services
- ④ Establishment of Governance

Establish an Integrated Support System for Companies

- ① Activate Blockchain-as-a-Service (BaaS)
- ② Support the Discovery of New Service Models
- ③ Build a Technology Innovation Support Center
- ④ Support Expansion into New Southern Countries

Develop Next-Generation Core Technologies

- ① Redefine the Technology Roadmap
- ② Develop Fundamental and Convergent Technologies
- ③ Strengthen Responses to Global Standards

Create an Innovation Ecosystem

- ① Improve Legal and Institutional Frameworks
- ② Link Innovative Pilot Projects to the Busan Special Zone
- ③ Cultivate Specialized Talent
- ④ Raise Public Awareness

V. Key Initiatives

1

Comprehensive Implementation of Blockchain in Seven Key Areas

- **(Current Status) Countries around the world are announcing blockchain visions and strategies, selecting focus areas** to maximize the effects of adoption, and providing support at the national level.
 - ※ Australia: Agricultural supply chain (wine, etc.), credential verification, finance, education (February 2020)
 - China: Healthcare, food safety, education/employment credential verification (October 2019)
 - Germany: Digital identity management, energy supply, vehicle management, healthcare (September 2019)
 - EU (7 member states): Education (credential verification, student management), healthcare, land registration, logistics/distribution (December 2018)
- **(Strategy) Selection and intensive support for seven key areas** where blockchain's impact is significant.
 - Blockchain will be introduced mainly in areas that can **enhance trust, facilitate the contactless economy, and improve efficiency.**

Hyperconnected, Trust-Based Society in a Contactless Era



◇ Implementation of an Online Voting System

□ Current Status and Issues

- **Online voting continues to be used more frequently*** due to its convenience and efficiency, necessitating enhanced technology to ensure system reliability and guarantee secret voting.

* Expanding to party primaries, university president elections, etc.

- Particularly, the **COVID-19 pandemic** has increased the need for online voting, which allows for **non-face-to-face** voting without visiting polling stations*.

* The 2020 general election saw the lowest overseas voting turnout (23.8%) in history due to COVID-19.

- ☞ **To secure public trust in the voting process and the election results, it is necessary to apply blockchain technology, which offers strong security features such as tamper-proof protection.**

※ Applied in countries such as the USA, Switzerland, Spain, Australia, Denmark, Japan, Estonia, and confirmed its effectiveness through a blockchain pilot project by the Ministry of Science and ICT in 2018.

□ Main Content

- Build a **blockchain-based online voting system (2021–2022) that allows stakeholders, such as political parties and public institutions, to directly access and verify voting and counting results.**
 - Enhance reliability by **applying blockchain technology to the existing online voting system (2021).**
 - **Conduct pilot operations** targeting political parties and public institutions **to stabilize the system (2022).**
- In the future, **expand the adoption of zero-knowledge proof*** for easy voter verification and anonymity guarantees **through blockchain-based decentralized identity verification.**

* A technology that allows the prover to demonstrate the truth of information without providing data to the verifier, enabling voter verification without exposing personal information.

□ Expected Effects

- Increased sharing among participants of the online voting history, **enhancing transparency and reliability in the voting process and results.**

◇ Enhancing the Transparency of Donation Management Platforms

□ Current Status and Issues

- With rising income, **interest in donations and the scale of donations in Korea are increasing***, but **participation rates in donations are declining**** due to distrust in collection and usage.

* Change in donation scale: KRW 12.6 trillion (2014) → KRW 12.9 trillion (2016) → KRW 13.9 trillion (2018)

** Change in donation participation rate: 34.6% (2013) → 29.9% (2015) → 26.7% (2017) → 25.6% (2019)

- **Misuse and improper execution of donations by some organizations** have caused social issues.

☞ By leveraging the transparency and immutability of blockchain, the donation management process can be **transparently disclosed among participants, thereby ensuring trust**.

□ Main Content

- **Enhance the functions of the service*** established through pilot projects, recording the entire process from fundraising to beneficiary delivery **on the blockchain, with donors verifying through mobile devices** (2021).

* Service to create fundraising campaigns and deliver donations to organizations was built and operated as a pilot project in 2019 (as of May 2020, 3,000 members, over KRW 100 million accumulated donations, 30 organizations active).

- Implement **functions using smart contracts for the collection*** and **distribution** of donations** to ensure that donations are used appropriately.

* Automatic payment and suspension functions based on conditions such as period and target amount.

** Automatic execution of payment according to usage period and conditions (monthly) to beneficiaries.

- Add functions to **monitor the use of donations by beneficiaries without infringing on privacy** (2022).

□ Expected Effects

- **Secure trust in donations and spread donation culture by transparently disclosing the collection and usage history of donations.**

◇ Establishing a System to Prevent Overlapping Welfare Payments

□ Current Status and Issues

- With the increase in welfare benefits, **improper payments (overlapping payments) are also continuously occurring**, raising public concern.

* Welfare benefit recovery decision amount: KRW 21.4 billion (2016) → KRW 21.8 billion (2017) → KRW 24.9 billion (2018)

- Welfare project beneficiary history information operated by central and local governments is managed separately, leading to delays in processing time or verification errors.

☞ By utilizing blockchain, **information related to benefits, such as application history and eligibility verification**, can be **transparently shared among institutions** to manage issues like duplicate

□ Main Content

- Verify the effectiveness of operations **by involving the Ministry of Health and Welfare, Ministry of Employment and Labor, Seoul City, and Busan City in welfare projects, such as asset formation support projects*** (2020).

* A project where the government supports a certain amount in proportion to the recipient's savings.

- Share information with central ministries and manage the prevention of overlapping payments in asset formation support projects, even for local governments not participating in the blockchain network nodes.

- Based on this year's experience, **select projects from over 160 types of welfare projects that require overlapping management and expand the scope** (2021–2023).

<Example of expansion areas>

- Overlapping management of medical expense support projects (7 projects),
- Overlapping management of support projects for disability assistance devices (8 projects).

□ Expected Effects

- **Prevent omissions and overlapping payments** through **transparent information sharing** between related agencies, and **shorten processing time** by simplifying required documents.

◇ Expansion of the Renewable Energy Certificate (REC) Trading Service

□ Current Status and Issues

- Following the establishment of the “3020 Implementation Plan” (December 2017) to increase the share of renewable energy generation to 20% by 2030, **the trading volume of Renewable Energy Certificates (REC) has surged** *.

* Power generators with over 500 MW capacity (22 entities) are required to supply at least 7% of their power generation from renewable sources by 2020, and renewable energy businesses generate revenue by selling RECs to these power generators (over 10,000 new contracts annually).

- Different systems used by related entities (power generators, renewable energy developers, Energy Agency, power exchange) lead to increased certification and management costs.

☞ Through blockchain technology, **data tampering is prevented** in transactions involving multiple stakeholders, and **inefficiencies are eliminated through rapid and transparent information sharing**.

※ The 2019 pilot project (Southern Power) verified the efficiency of the fixed REC contract process, and in 2020, Southern Power is expanding the system across all REC contracts with its own budget.

□ Main Content

- Expand the system built through the 2019 pilot project with Southern Power, and further enhanced in 2020, to establish a blockchain-based comprehensive REC management system **among the Energy Agency, Power Exchange, power generators (6 entities), and renewable energy developers** (2021).

- Integrate **REC contracts, result reporting**, payment information, and transaction history management through smart contracts.

- **Expand the service to cover all renewable energy obligation entities**, establishing a comprehensive management system for REC trading (2022).

□ Expected Effects

- **Implement a one-stop service for the entire process** of REC trading, **from bidding, contracting, to settlement**, leveraging smart contracts and other technologies in a non-face-to-face environment.

◇ Introduction of Digital Currency Linked to Regulatory-Free Zones

□ Current Status and Issues

- The COVID-19 pandemic **has highlighted the limitations of traditional payment methods** such as cash and credit cards. As the economy shifts toward non-face-to-face transactions, **the demand for cash is expected to decline.**
- **Major countries** are researching and considering the issuance of **Central Bank Digital Currency (CBDC)**, but due to technical and legal challenges, **full-scale implementation will take a considerable amount of time** *.

* Currently, the Bank of Korea plans to conduct a CBDC pilot test next year (announced in April 2020), but the use of blockchain technology has not yet been decided.

- ☞ In the era of a contactless economy, there is a need for digital currency transaction services that leverage blockchain technology to **ensure tamper-proof and transparent management of transactions.**

□ Major Initiatives

- **Proactively introduce a blockchain-based regional digital currency** through the regulatory-free zone demonstration exemption and use it as the basis for non-face-to-face transactions.
- After **ensuring stability, such as compliance with anti-money laundering measures and prevention of fraud and overlapping payments** (~August 2020), proceed with the real service* for non-face-to-face transactions (~August 2021).

* Payment of policy subsidies, payments to merchants in the Busan region, etc.

- **Expand** the currently limited* **digital voucher platform** in Busan to neighboring regions (Ulsan, Gyeongnam, etc.) (2022).

* Under the current Electronic Financial Transactions Act, the transfer of a named prepaid electronic payment method requires passing through the central system of the issuer, but Busan is allowed exceptions through regulatory exemptions.

□ Expected Effects

- Contribute to **the activation of the contactless economy and enhance the transparency and reliability of regional currency usage.**

◇ Activation of Smart Contract-Based Real Estate Transaction Services

□ Current Status and Issues

- In real estate transactions, **public records required for property verification are issued on paper** and submitted to various institutions (local governments, banks, registry offices, etc.), **leading to social costs**.
- The management of real estate public records (land and forest ledgers, comprehensive real estate certificate, building ledgers, registration details, etc.) is handled by different entities, and the information linkage and update system are complex, limiting the provision of real-time information.
- **Off-line processing of tasks during real estate transactions** (property verification → contract → reporting → loan → registration → public record changes) **causes time and economic inefficiencies**.
- ☞ Apply blockchain technology (smart contracts, etc.) to **prevent forgery and tampering** of various real estate information, enable **real-time sharing, and automate transaction processes**.

□ Main Content

- **Build a system for real-time linkage and sharing of blockchain-based real estate public records with participating institutions and related systems*** to minimize the distribution of paper records (2022).
* Contracts (Real Estate Electronic Contract System), loans (Financial Settlement Service, banks), public records (Comprehensive Real Estate Study, Building Permit System), etc.
- Establish a sharing system that **extends the blockchain-based real estate public records and transaction information to the private sector**, preventing false listings and supporting the **development of service models** (2023).
- Expand the sharing system for real estate public records and transaction information to **the courts (registration administrative system)** to provide a **one-stop real estate transaction service** from contracts to public record adjustments (2024).
- Develop technology to verify real estate information, improving the existing transaction process.

□ Expected Effects

- Simplify administrative procedures related to real estate transactions, such as registration and public record changes, due to electronic real estate transactions, **enhancing efficiency in real estate-related work and improving public convenience**.

◇ Establishment of an Integrated Customer Management System for Postal Services

□ Current Status and Issues

- With the advancement of ICT technology and the emergence of alternative services, the postal service is facing difficulties, necessitating a shift to customer-centered services to discover new services and improve financial performance.
- The existing postal services, such as **mail, savings, and insurance, have a fragmented customer management system for each service**, causing inconvenience for customers.
 - The mail service makes **it difficult for individuals to manage their mail reception and sending history**, as well as **to link financial services**, such as bill payment and management.
 - Savings and insurance services **manage customer information (product subscriptions, savings assets, insurance certificates, etc.) separately for each service**, preventing integrated use and asset management by customers.
- ✉ Blockchain-based decentralized identity verification technology **enables the integration and linking** of multiple services with **a single ID**, while also **ensuring scalability with private sector services**.

□ Main Content

- **Establish a decentralized identity verification platform** that allows customers to access all postal services with a single ID, creating an integrated customer management system for postal services (2021).
- Provide electronic wallets that individuals can use and manage, **supporting new concept postal-financial convergence services** (e.g., simultaneous receipt and payment of electronic bills) (2022).
- **Provide** the postal decentralized identity verification platform **as an open API to private companies, promoting private services** such as delivery, distribution, and online shopping (2023).

□ Expected Effects

- Integration of individual services such as mail, banking, and insurance with a single ID (address, personal) **enhances convenience and efficiency, streamlining usage and improving overall effectiveness**.

◇ Discovery of Additional Blockchain Expansion Projects

□ Background

- Through the blockchain pilot projects* carried out so far, the applicability in various fields has been reviewed, and projects that can be expanded into full-scale projects are being discovered and promoted.

* 34 projects (28 public sector-led, 6 private sector-led) targeting 7 fields are being promoted.

- The advantages of transparency, prevention of forgery, and tampering through data sharing among multiple participants have been confirmed, and the application is possible without a complete system overhaul.

- ☞ **Conducting investigations into potential areas** for blockchain application to **continuously develop fields** where blockchain technology **can be highly effective**.

* Areas involving numerous stakeholders, where transparency concerns highlight the need for information sharing.

□ Main Content

- Conduct **research and surveys on business processes** in the private and public sectors to **identify new projects** that can be applied with blockchain technology and that will have a tangible impact on the public.

<Example of Application>

- **(Medical narcotics)** Medical narcotics are managed by individual systems at hospitals and pharmacies, but the lack of information sharing between medical institutions can lead to issues such as duplicate prescriptions.
- **(Intellectual property rights)** Transparent management of distribution and history of intellectual property rights such as music and artworks, increasing revenue for creators and enabling real-time revenue sharing.
- **(Platform workers)** Manage and issue employment contracts using blockchain to improve working conditions (such as social insurance enrollment) for platform workers by issuing and managing employment contracts on blockchain.

- **Use a blockchain adoption checklist to measure the effectiveness of the system's introduction.**
- **Collect project ideas** by conducting a survey on the demand for blockchain technology adoption **from related organizations** (government ministries, public institutions, etc.) and **the private sector** (academia and industry).
- For projects where feasibility has been confirmed through pilot projects, **conduct a feasibility study through an ISP** to promote full-scale projects. * (Examples) Management of electric vehicle batteries, Apostille management, etc.

- **Implementation Plan:** Identify and Promote New Expansion Projects and Conduct ISP (2021).

□ Current Status and Issues

- **(Contactless Economy)** With the onset of the post-COVID-19 era, contactless economic activities such as telemedicine, online shopping, and remote education are expected to accelerate in daily life.
 - ※ The “Expansion of Contactless Services” is included as one of the 10 key tasks of the Korean New Deal.
- **(Personal Data and MyData)** In response to data protection regulations such as the EU GDPR and growing demand for personalized services in the financial and fintech sectors, there is an increasing need for individuals to manage and control their own data.
- **(Digital Government Innovation)** A unified public DID response system is needed to create a safe public service ecosystem and facilitate public-private collaboration.
 - ※ The Ministry of the Interior and Safety is promoting DID logins for the mobile civil servant ID card and the Military Manpower Administration’s simplified authentication service.
- ☞ DID must be cultivated as a **key technology for the contactless economy**, providing identity verification in a contactless environment and allowing individuals to manage their personal information directly.

□ Strategic Plan

- **Establish a support system for the integrated operation of public DID services and public platforms.**
- Create an ecosystem that allows seamless use of services without differentiation between DID platform authentication methods by providing standardization guidelines and **interoperability**.
- Select fields for DID adoption, such as public and contactless services, and promote projects that enable individuals to manage and control their data, **focusing on public experience**.
- **Establish a DID governance system** in which the public and private sectors participate to formulate common requirements for the expansion of public and private DID services.

◇ The Significance and Policy Principles of Decentralized Identity (DID)

- **(Significance of DID^{*})** DID is a digital identity verification system that **allows users to choose only the information needed for proof** and provide it to the verifying institution, **thereby strengthening personal data protection.**

^{*} Decentralized Identifier

- **As the contactless economy is expected to accelerate post-COVID-19, the spread^{*} of online identity verification technology, such as DID services,** is likely to be in full swing.

^{*} There is fierce competition to lead the DID service ecosystem, driven by alliances of blockchain specialists and major ICT companies.

- Following the amendment of the Electronic Signature Act, **there is a growing trend** of adopting Decentralized Identifiers (DID) as an alternative means of identity verification **in public services^{*}.**

^{*} The Military Manpower Administration (simplified authentication civil service) and the Ministry of the Interior and Safety (mobile ID card) are each expected to provide DID services.

- ☞ **Concerns have been raised about the potential decline in user convenience for public services due to the inability to interconnect and verify between separate DID platforms operated by different ministries.**

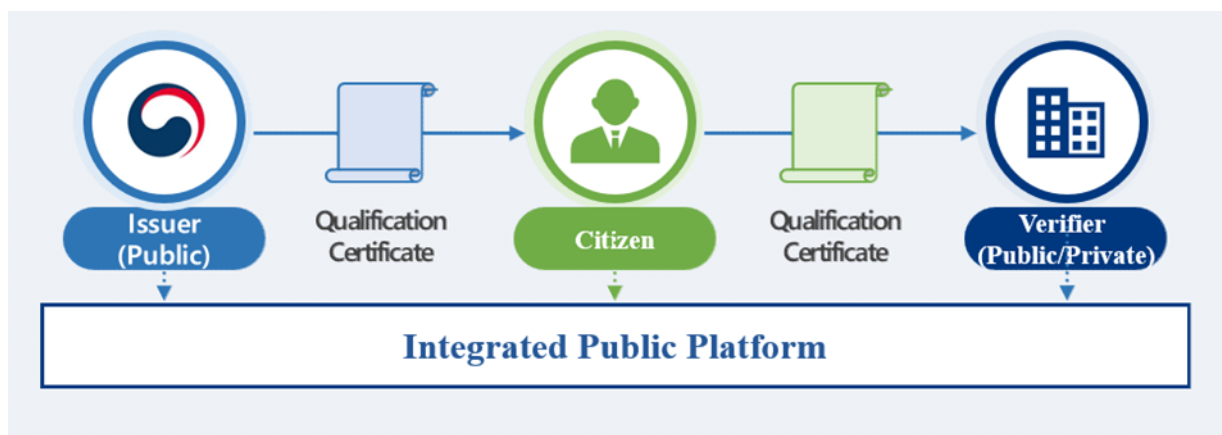
- **(Policy Principles)** Establish principles for the activation of decentralized identity (DID) **technology**, which is foundational to the activation of the contactless economy, and promote consistent policies accordingly.

< DID Policy Principles >

- ① **Support citizens in accessing DID services across different government departments without inconvenience** when using public certification services.
- ② **Maximize the use of the private sector ecosystem to continuously maintain the innovation** of DID services.
- ③ Encourage **the creation of cutting-edge decentralized identity (DID) services** for citizens by **fostering the development of services in the private sector.**

◇ Establishment of an Integrated Public Platform Across Ministries

- **(Public Platform)** To prevent **the inconvenience of citizens needing to install multiple apps** when using public sector DID **services**, establish an integrated public platform and support system (2021).
 - A support system for a **government-wide integrated public platform** will be established to **allow the government to issue** identity and qualification certificates and **for the private sector to verify these certificates**.
 - ※ Ministries such as the Ministry of Science and ICT, the Ministry of the Interior and Safety, and relevant agencies, as well as private companies, will participate in the DID demand.
 - The public platform will be **promoted to ensure its interoperability with private DID platforms**.



◇ Support for DID Interoperability and Linkage with Other Authentication Methods

- 1 **(DID Interoperability)** To enable users to easily use **different DID services**, research and develop a **DID Universal Resolver** * and promote its application (from 2021).
 - * A service that facilitates identity verification regardless of the DID service used.
- 2 **(Standards and Guidelines)** Establish requirements and promote standardization to **resolve interoperability issues** between DID platforms.
 - To ensure interoperability between DIDs, provide guidelines on the standard specifications, technology, and security requirements * that stakeholders must adhere to (2021).
 - * Present minimum compliance requirements, such as methods for identity verification and interoperability, to ensure cross-certification and connection when developing and using DID in all industries.

- ③ **(Integration with Other Authentication Methods)** Develop and operate a cross-linking system that allows **the integration of existing authentication methods** (PKI, FIDO, etc.) with DID (~2025).



◇ Discovery and Application of Innovative Services to Address the Future Contactless Society

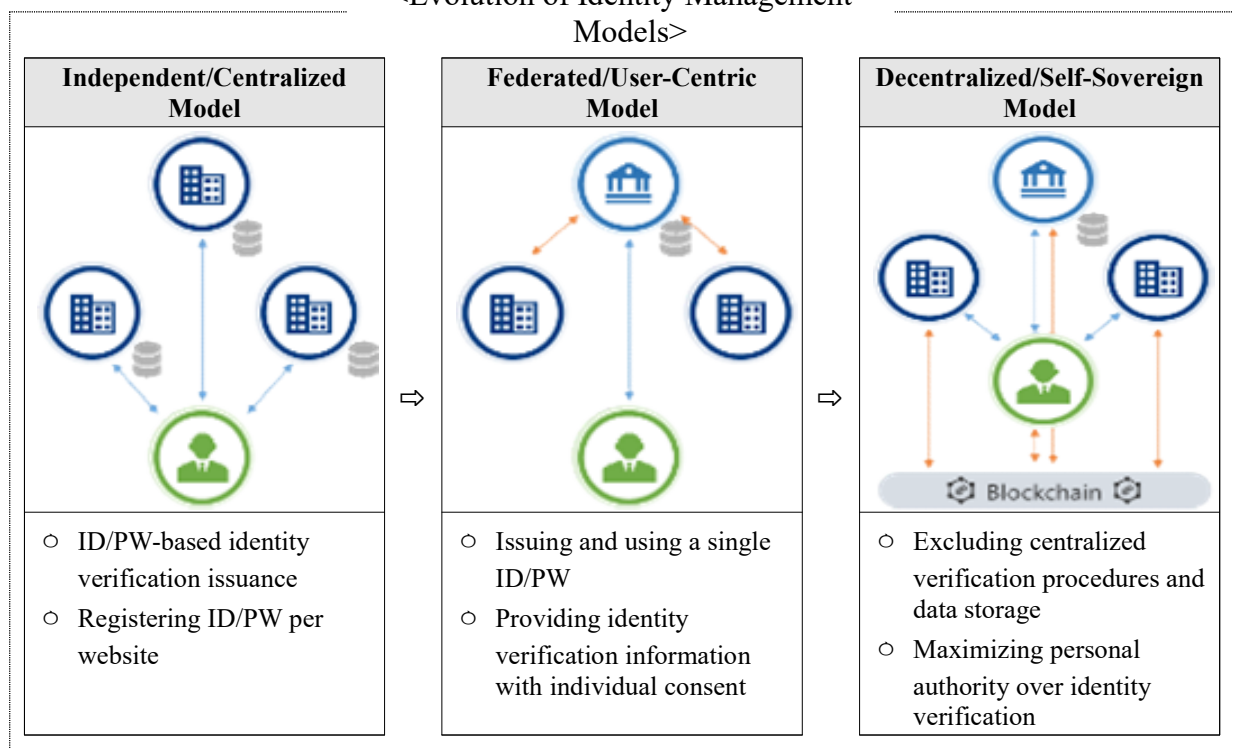
- **(Promotion of New Projects)** Beyond human identity verification, promote pilot projects to **discover innovative DID services such as electronic contracts and IoT control** (2021~).
- **(Medical Information)** Patients will manage their medical information using DID and selectively provide related information to hospitals, thereby promoting the activation of precision medicine and remote medical consultations.
 - **(Electronic Contracts)** Apply DID for identity verification between parties to contracts, activating a trustworthy electronic contract ecosystem in a contactless environment.
 - **(IoT Control)** Create a trustworthy IoT environment by using DID-based authentication and relationship verification between humans and objects or between objects.

◇ Establishing Governance for the Activation of the DID Ecosystem

- **(Governance Establishment)** To activate the public and private DID ecosystem, a **public-private joint DID council*** involving related ministries, expert institutions, and companies will be formed and operated (second half of 2020).
- * Led by the Ministry of Science and ICT, with participation from the Ministry of the Interior and Safety, the Military Manpower Administration, DID-using institutions, KISA, ETRI, TTA, and private DID alliances.
- Discuss policy measures and service linkage strategies to ensure interoperability and promote services between public and private platforms.

- **(Concept)** A digital identity verification system that allows users to manage and control their identity information online, much like managing identity verification in real life.
 - With the frequent **monopolization of personal data** by global corporations and the increasing frequency of **personal data breaches**, the concept of self-sovereign identity (SSI) has emerged.
 - Users can **realize and enhance their personal data sovereignty** by selectively providing **only the information** * relevant to the verification purpose to the verifying institution.
 - * For example, only gender information when only gender is needed, or only email addresses when only email is needed.

<Evolution of Identity Management Models>



- **(Operating Principles)** When an individual requests identity verification (e.g., graduation information) from an issuing institution (e.g., a school), the **issuing institution sends the requested identity verification to the individual**.
 - **The individual stores the identity verification in a mobile digital wallet and sends it to the verifying institution** (e.g., a company) for verification.
 - * In blockchain, personal or issuing authority **public key information** (DID documents) is stored. → Verification authorities **restore documents** encrypted with the personal or issuing authority's private key **using the public key to confirm their authenticity**.

□ Current Status and Issues

- There is a **lack of revenue models*** for blockchain services, and **insufficient awareness among demand companies** is limiting the activation of the blockchain industry and the growth of enterprises.

* There is a lack of infrastructure that allows the easy implementation of various blockchain services and the identification and verification of potential technical and social issues in advance.

- Although attempts are being made for overseas expansion of domestic blockchain companies, particularly in **Southeast Asian countries**, there are challenges in localization due to unclear laws and regulations.

<Overseas Expansion Attempts in Southeast Asian Countries>

- Domestic Company C is participating in the UN Refugee Agency's "Refugee ID Project" (R-project) in Malaysia, which establishes an identity verification system to allow stateless refugees access to basic services such as finance, education, and healthcare.
- In Indonesia, a partnership between a local company and the domestic company L Corp has launched a stablecoin linked to the local currency, Rupiah, targeting citizens without bank accounts.

□ Strategic Plan

- To facilitate the easy implementation of ideas using blockchain technology, **support the use of Blockchain as a Service (BaaS)***, and establish a "**Technology Innovation Support Center**" to verify the developed services.

* BaaS is a cloud-based service that conveniently supports the development, management, and usage of blockchain applications and software.

- Provide systematic support that includes **demand discovery → consulting → technology verification to discover and create demand for various blockchain services.**
- **Operate an overseas expansion support system** composed of experts on **Southeast Asian countries** and establish a local network to **achieve tangible outcomes in entering these markets.**

※ The Presidential Committee on New Southern Policy announced 16 strategies focused on infrastructure development, business expansion, new industries, and smart cooperation with Southeast Asian countries in November 2018.

◇ Support for the Activation of Blockchain as a Service (BaaS)

< Significance of Blockchain as a Service (BaaS) >

□ **(Concept)** BaaS is a blockchain cloud service that **provides** the necessary functions **over the internet, making the development and deployment of blockchain applications quick and easy.**

※ BaaS is emerging as a core platform in the blockchain industry, with the global BaaS market expected to grow at an annual rate of 39.5%, reaching USD 24.9 billion by 2027 (Fortune Business Insights, 2020).

○ BaaS enables companies to provide **stable** blockchain services while **minimizing initial development costs**, and **it facilitates the expansion of services and entry into overseas markets.**

□ **(Domestic and International Trends)** Since 2015, **global cloud companies*** like Amazon and IBM have launched BaaS, and **China has commercialized national-level services (BSN)** as of April 2020.

○ In Korea, **ICT conglomerates and startups** are entering** the BaaS market.

* Microsoft, Oracle, Salesforce, Alibaba, Baidu, Huawei, etc.

** KT, Lambda256 are providing services, and large IT service companies are considering market participation.

< Comprehensive Support for BaaS Activation >

① **(Support for BaaS Utilization)** **Support the development of BaaS-based services** to facilitate the easy development and commercialization of blockchain services through BaaS.

○ **Provide private BaaS services** to support small and startup companies with the **environment*** necessary for **the initial development and verification** of blockchain services (from 2021, 20 companies).

* Computing resources (node servers, network traffic, storage space) necessary for service development, etc.

○ **Support the commercialization of developed services on the BaaS platform** to enable stable service provision (from 2021, 2 companies).

○ Promote the rapid distribution and dissemination of developed services **by linking with innovative procurement*** and **operating an “Integrated BaaS Digital Service Market”** (from 2021).

* A system that enables rapid entry into the public market by allowing sole-source contracts for innovative services.

② **(Specialized BaaS Support) Promote a BaaS platform support project** (2021~) to secure a lead in the increasingly competitive domestic and international BaaS platform market.

- Support the development of **specialized** services and applications* by domestic BaaS companies, similar to IBM's food distribution tracking service (Food Trust)

* Areas where domestic companies have strengths, such as electronic payments, logistics and distribution, content, education, welfare, DID, etc.

◇ **Support for the Discovery of Blockchain Service Models Linked to Market Demand**

① **(Demand Discovery) Support demand-driven blockchain technology and perception change education** for demand companies, and networking with supply companies to discover new blockchain industries (2021~).

- **Promote the adoption and utilization of blockchain technology** in existing industries by providing **concrete examples and application methods tailored to regional specialized industries** (in 5 regions).

② **(Consulting) Provide technical consulting for existing blockchain supply companies and strategic consulting for demand companies to create business value through blockchain** (2020~).

- Support **customized consulting for companies in a step-by-step manner**, enabling them to introduce and utilize blockchain from a business perspective.

③ **(Business/Technical Verification) Expand support for business and technical verification, including prototype development**, to secure various application cases

※ (2020) 9 cases → (2021) 20 cases → (2022) 30 cases.

- In addition to the existing support method focused on blockchain technology suppliers, **also adopt a demand-driven approach** to increase the feasibility of commercialization.

◇ **Establishment of a Technology Innovation Support Center to Improve Blockchain Service Performance**

① **(Testbed) Establish a large-scale experimental environment** capable of testing **multiple servers** (over 100) to identify and address potential issues* before commercialization (2021).

* Issues related to decentralization, processing speed, major concerns of permissionless blockchains, and interoperability between platforms.

- ② **(Technical and Security Verification)** Enhance security by **checking for vulnerabilities** in blockchain platforms and **services, conducting penetration tests, and providing technical support through expert consultations** (2021).
 - Operate a “Blockchain Information Sharing Portal” (tentative name) to manage security vulnerabilities and provide technical and security support.
- ③ **(Collaboration Support)** To support the growth of new and promising blockchain startup companies, provide **office space** and enhance **networking and collaboration opportunities between academia, industry, and research institutions** (2021).
 - Facilitate exchanges such as internships and technology meetups between universities and startup companies.

◇ **Support for Blockchain Companies Entering Southeast Asian Markets**

- ① **(Strategic Projects)** Promote the “Blockchain Support Project for New Southern Countries” as an ODA initiative to assist in the **digital infrastructure of Southeast Asian countries**, including customs, identity verification, and healthcare, using domestic technology.
 - * Select target countries and projects (2020) → Sign MOUs (2021) → Implement main projects (2022).
- ② **(Service Discovery)** Promote support projects to secure early access to the **informatization markets in Southeast Asian countries and discover new blockchain services overseas** (from 2021).
 - Support the development and verification of new blockchain services in the new Southern markets, **enabling companies to build and validate technology and business models.**
- ③ **(Integrated Support)** Advance the “Chain-In Consortium Incubating” initiative to address **regulatory uncertainties, support technology localization, and facilitate business development** in Southeast Asian countries.
 - Provide organic support for market entry, including industry, legal, and patent consulting, as well as local cooperation, by connecting with industry and legal experts and global accelerators (2021~, 10 cases).
- ④ **(Localization Support)** Provide continuous support for localization efforts, such as market and legal information, marketing, and manpower, in coordination with local offices in Hanoi, Ho Chi Minh City, India, and Singapore (2021~).

□ Current Status and Issues

- Globally, there is intense competition to secure technological leadership through **the development of blockchain technology and the application of various services.**
 - Korea is **advancing its blockchain technology development*** in line with its Blockchain Technology Roadmap (2018), **which incorporates** the latest technological trends.
 - * The focus is on promoting mid- to long-term R&D (2-3 years) for convergence technologies and application platforms related to core areas such as consensus technology, expansion technologies like data integration, and service technologies including industry convergence.
 - Despite investments in blockchain R&D since 2018 **to narrow the technology gap with advanced countries and reduce dependence on foreign technology, the gap remains significant.**
 - * In 2018, Korea's blockchain technology level was only 80.8% of that of the leading country, the United States.
- Leading global blockchain platforms are drawing in skilled individuals by encouraging voluntary involvement in **open-source research and development**, and
 - Enhancing their market dominance through proactive activities that **consider global standards.**

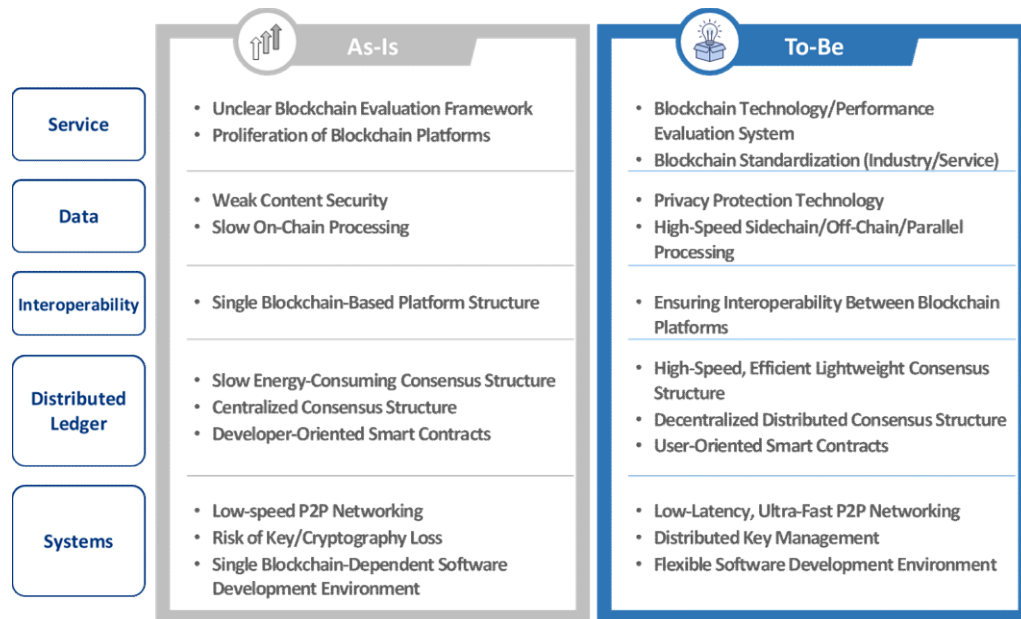
□ Strategic Plan

- Strengthen the blockchain technology ecosystem **by securing next-generation fundamental technologies and industrial convergence technologies**, considering Korea's current blockchain technology level and development direction.
 - Reflect changes in the blockchain industry environment and strengthen the technology ecosystem **by improving the technology classification system and redefining the mid- to long-term technology roadmap.**
 - Promote a two-track development strategy to secure **next-generation core fundamental technologies** and maximize their application through **industrial convergence technologies.**
- **Boost the connection between technology development and standardization, and actively respond to international standardization efforts.**

◇ Promotion of Blockchain Fundamental and Convergence Technology Development

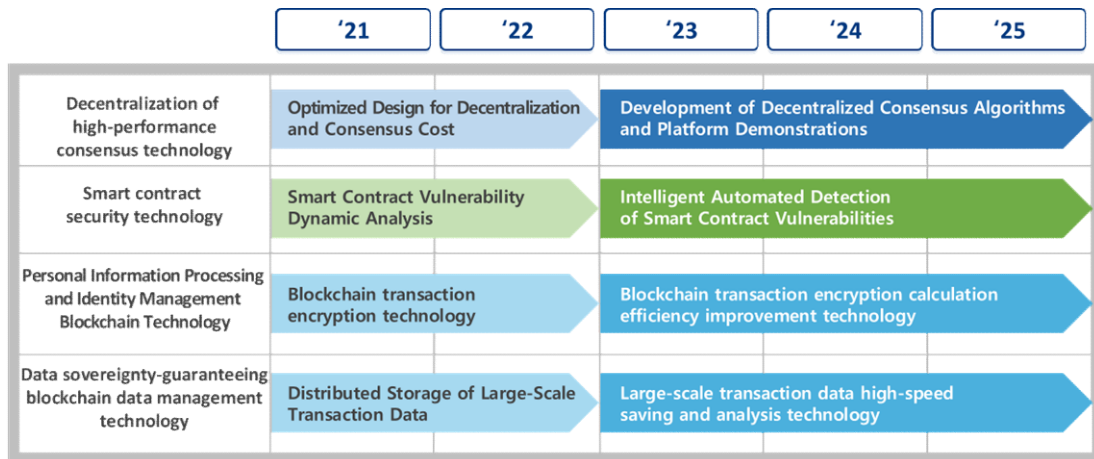
- 1 (Reestablishment of Technology Roadmap) Analyze current blockchain **technology trends and future prospects** to establish a strategy for securing core technologies in the mid- to long-term (~2020).
- Secure foundational technologies such as blockchain data transmission optimization, stability, multi-data integration processing, privacy protection, and scalability enhancement.

< Prospects for Blockchain Technology Development >



- **Refine** the existing blockchain **technology classification** by reflecting recent domestic and international technology trends
 - * Efficient consensus algorithms, low-latency high-speed P2P networks, smart contract speed improvements, and data interoperability between heterogeneous blockchains.
- 2 (Core Blockchain Technology) **Advance the development of key technologies** in challenging areas such as improving transaction processing speed and managing large-scale data **to overcome the limitations of existing blockchain systems.**
 - Development of **fully decentralized, high-performance, and highly efficient consensus algorithms** for application across various industries (~2025).
 - Development of **technologies to automatically detect vulnerabilities in smart contracts*** (~2025).
 - * Technology that automatically executes contract terms when specific conditions are met.
 - Development of **user identity management and privacy protection technologies for blockchain users** (~2025).
 - Development of **technologies for the distributed storage and high-speed analysis of large-scale data** (~2025).

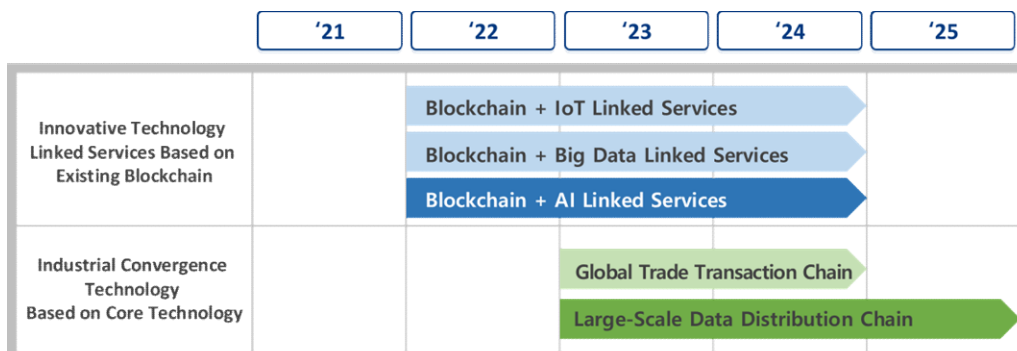
< Development Direction for Core Blockchain Technologies >



③ **(Industrial Convergence Technology)** Integrate blockchain with leading technologies of the Fourth Industrial Revolution and apply them to other industries to accelerate paradigm shifts in existing sectors.

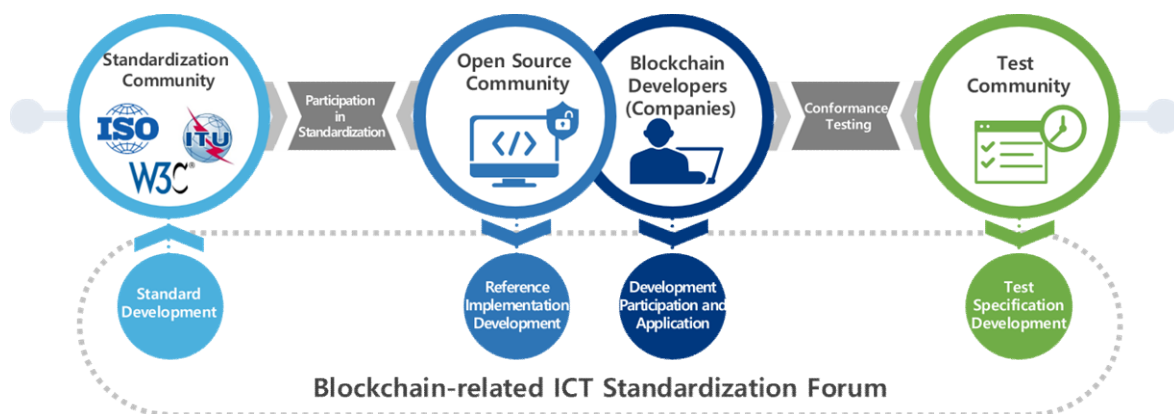
- Develop convergence technologies linking blockchain with IoT, AI, Big Data, and other leading technologies (~2024).
 - **(Blockchain + IoT)** Develop BoT (Blockchain IoT) technology to support autonomous data exchange, processing, and transactions among IoT nodes.
 - **(Blockchain + AI)** Develop data management technology to provide AI with trusted data, ensuring data provenance, integrity, and reliability.
 - **(Blockchain + Big Data)** Innovate trust-based data trading technology that supports large-scale ledger data processing and ensures data sovereignty.
- Secure industrial convergence technologies that apply blockchain core technologies to other industries.
 - **(Large-Scale Data Distribution Chain)** Develop technology to support large-scale data transactions through distributed storage of massive data (~2024).
 - **(Global Trade Transaction Chain)** Develop technology for tracking, managing, and sharing data throughout the distribution process from origin to sale, transcending regional boundaries (~2025).

< Industrial Convergence Technology Development Direction >



◇ Strengthening Global Blockchain Standardization Efforts

- 1 **(International Standardization Response)** Establish a focal point for effectively responding to international standardization in the blockchain service sector and **support conformance verification** (2021~).
 - Establish a **standardization forum** for areas such as **decentralized identity verification**, which is moving toward commercialization.
 - Provide **standard compliance verification** to ensure that blockchain-related products (software) and services are implemented according to the specifications outlined in standards.
- 2 **(Technology-Standard Linkage)** Strengthen the linkage between the technology roadmap and the standardization strategy map (2021~).
 - * Present a standardization strategy to preemptively secure international standards by establishing the targets, organizations, and directions for standardization.
 - Identify key standards that are required beforehand or need to be developed simultaneously with the **core technologies** on the technology roadmap and prioritize them **on the standardization strategy map**.
- 3 **(Open Source Management)** Provide **verification support** for the safe use of open source (2021~).
 - **Analyze and provide security measures for known vulnerabilities** in overseas open-source platforms (e.g., Bitcoin, Ethereum) and continuously identify and disclose new vulnerabilities.
 - Support **functional and license verification** for the open-source outputs of domestic companies.



- 4 **(Global Cooperation)** Monitor global trends in blockchain technology and virtual assets, and **strengthen collaboration with relevant institutions** (2020~).
 - Identify trends in regulations, standards, and policies at home and abroad, including **virtual assets**, and seek **cooperation with major international organizations**.

◇ Improvement of Blockchain Legal Frameworks and Guidelines

□ Current Status and Issues

- Since 2018, a regulatory improvement research group **has been working on reviewing and researching improvement measures for seven laws***, including the **Personal Information Protection Act**.

* Personal Information Protection Act, Electronic Signature Act, Real Name Financial Transactions Act, Electronic Commerce Act, etc.

- The effort fell short of producing specific legal improvement proposals, resulting in **limitations in translating these efforts into regulatory reforms**, and companies **continue to express concerns*** about difficulties caused by legal and regulatory barriers.

* In the emerging software technology sectors, 9.5% of companies reported difficulties in business operations due to legal regulations, which is significantly higher than the average of 2.1% (2018 Software Industry Survey).

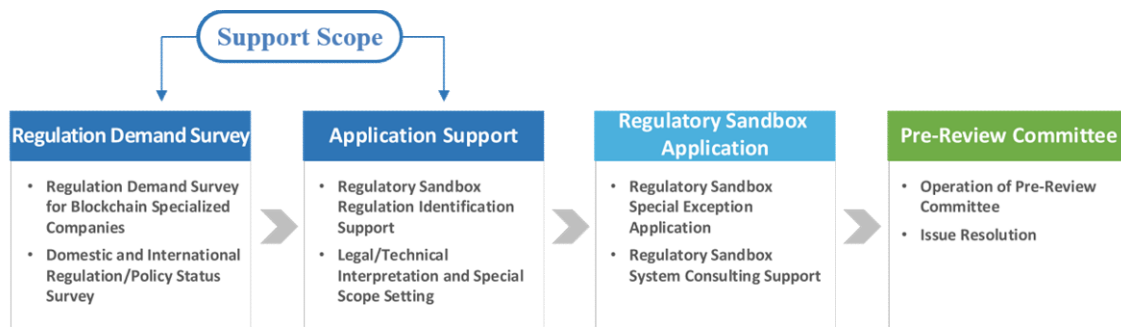
- Given that blockchain is still in the early stages of technological development, there is a need for **guidelines to minimize the trial and error** of companies or institutions considering the adoption of the technology.

□ Strategic Plan

- **Formulate specific legislative amendments** with the participation of relevant ministries, and promote substantial regulatory improvements while **connecting with the regulatory sandbox to stimulate new blockchain industries**.
- Develop and distribute a guidebook to **help** companies and institutions considering the adoption of blockchain **understand the technology and facilitate business development**.

- ① **(Legal Framework Improvement)** Draw up specific improvement measures based on the **blockchain regulatory improvement research results** that have been pursued since 2018 (2020~).

- **(Legal Interpretation) Collaborate with the relevant ministries** to remove uncertainties by **providing clear guidelines** where possible through proactive interpretation.
 - **(Personal Information Protection Act)** Collaborate with relevant ministries to **recognize the deletion of personal data stored on external blockchain servers** as data destruction ([Article 21](#)).
 - **(Real Name Financial Transactions Act)** Collaborate with relevant ministries to allow for the reuse of **real-name verification information obtained through initial non-face-to-face verification** for a certain period when using decentralized identity (DID) for digital real-name verification ([Article 3, Paragraph 1, Non-Face-to-Face Real-Name Verification Guidelines](#)).
- (Legislative Amendment) For matters requiring legislative changes, operate a regulatory improvement research group composed of technical and legal experts from academia and industry, and work with relevant ministries to **propose specific legislative amendments**.
 - **(Personal Information Protection Act)** Collaborate on amending the law to provide reasonable **personal data protection**, including the method for processing personal data by “those incorporated into the blockchain node” after consent is given ([Article 17](#)).
 - **(Electronic Documents Act)** As the designation system for “Certified Electronic Document Intermediaries” required for information transmission is converted to a certification system, pursue revisions to restrictions on the blockchain operating environment ([regulations on personnel, technical capability, facilities, and equipment for certified electronic document intermediaries](#)) ([Article 31-18](#)).
 - **(Electronic Signature Act)** Ensure that the detailed criteria for the “Electronic Signature Certification Business System” introduced by the 2020 legislative amendment (e.g., operating standards for electronic signature certification) **do not conflict with blockchain technology** ([Article 7](#))
- Review conflicts with existing laws and regulations in **areas of common regulation and new industry promotion**, and **continuously respond** to regulatory improvement by proposing specific legislative amendments.
- ② **(Links to Regulatory Sandbox)** Even before legal amendments, support **projects with high impact and urgency by utilizing the “Regulatory Sandbox System”** (2021~, 5 cases).
 - Assist blockchain companies, **which may lack expertise in laws and regulations, in accurately analyzing regulations and preparing alternatives to secure the momentum for launching new blockchain businesses**.
 - **Support the preparatory process** for promoting the regulatory sandbox, including **domestic and international regulation and system status surveys, legal and technical interpretation, regulation identification**, and special scope setting.



③ **(Guidelines)** Develop and distribute guidelines to minimize trial and error and facilitate business development for companies and institutions seeking to adopt blockchain.

- **(Business Guidebook)** Provide diagnosis of adoption effectiveness, construction methods, exemplary pilot cases, **roles and responsibilities among participants, and business models** to minimize the trial and error of adopting companies (2021).
- **(Development and Security Guidelines)** Define the necessary technical and security requirements for the process from blockchain construction to service development (2020).

* Develop and distribute guidelines that include considerations for personal data protection and security based on the construction method (public/private) and performance measurement to enhance technical and security robustness.

④ **(ISMS Certification for Virtual Asset Service Providers)** Following the amendment of the **Act on Reporting and Use of Certain Financial Transaction Information** (March 2020), virtual asset service providers are required to obtain ISMS certification for reporting purposes. Enhancements to ISMS will support this requirement*.

* Virtual asset service providers must report their business names, etc., to the head of the Financial Intelligence Unit (FIU), and if ISMS certification is not obtained, the report may not be accepted (Article 7, Paragraphs 1 and 3).

- Develop ISMS inspection items **focused on enhancing the security of information protection for virtual asset service providers*** (2020), and conduct verification and application (2021).

* Inspection items for virtual asset service providers include virtual asset wallets, key management, abnormal transactions, and anti-money laundering.

◇ Promotion of Innovative Pilot Projects Linked to Regulatory Free Zones

- **(Current Status and Issues)** While **public and private sector** pilot projects are being operated, continuous efforts are required to **maintain the innovation of these projects**.
- **(Promotion Strategy)** Support projects that can be expanded nationwide by linking them with regulatory free zones, promoting systematic support for **private sector participation and technology development**.

- 1 **(Linkage with Free Zone Projects)** For projects that face **institutional challenges** or are **easily scalable nationwide**, conduct verification projects in regulatory free zones (2021~).
 - **Leverage the regulatory exemption system** within the free zones to push forward pilot projects that go beyond existing limitations.
 - **Pre-verify potential issues** when expanding **blockchain systems established through free zone projects** (e.g., identity verification, logistics, payment processing) nationwide.
 - **Establish verification clusters** within the free zones in collaboration with **educational institutions, technology suppliers, and demand companies**.
- 2 **(Improvement of Support System)** To actively reflect innovative ideas from the private sector, **integrate** previously separated public and private sector pilot projects **into a unified operation** (2021~).
 - Incorporate expert opinions from industry, academia, and research institutes, select challenging projects, and recruit operators, **including public sector bodies and private companies**.
 - **Expand the proportion of multi-year support projects** to encourage the dissemination of successful projects' outcomes.
- 3 **(Strengthening Inter-Project Linkages)** Link with other projects such as R&D and corporate innovation support (2021~).
 - **(R&D)** Apply the results of **R&D projects to pilot projects** to secure application cases and enhance the innovation of pilot projects through technologically challenging initiatives.
 - **(Corporate Innovation Support)** Systematically support the linkage of projects that have undergone **technology verification/consulting** with pilot projects, leading to the production of real services.

◇ Training Blockchain Specialists

□ Current Status and Issues

- Currently, **approximately 2,700 individuals are being trained** annually through blockchain education programs.
- **The demand for mid- to high-level talent is gradually increasing** to develop commercial services, but **there is a lack of educational programs** to meet this demand.

□ Strategic Plan

- **Expand educational programs for training mid- to high-level talent** such as master's and doctoral students, while **systematically managing existing programs** to improve the quality of education.
- **Operate an integrated education information system** to allow education seekers to easily search for needed programs and strengthen job placement links with companies.

1 (Responding to Market Demand) Strengthen the focus on training specialist personnel while operating practical workforce training flexibly according to market conditions.

- (Specialist Personnel) Enhance the training of high-level personnel through university technology development and research.

- Expand support targets* for Blockchain Graduate School Research Centers (ITRC) to establish a foundation for focused research on blockchain technology.

From 3 universities in 2018 → 4 universities in 2020 → 5 universities in 2022 (plan).

- (Practical Workforce) Operate the “Blockchain Composite Education Center” flexibly by increasing specialized educational programs in response to the **growing demand for high-level talent** in the market (2021~).

※ In the future, adjust the number of trainees per course based on demand surveys such as blockchain industry surveys.

2 (Talent Development Guide) Develop a talent development guide to **systematize the knowledge and skills required for blockchain industry job performance** and present growth paths (2021~).

- (Job Competency Standards) Classify specialized blockchain jobs* centered on the industry and present the knowledge and skills that experts in each field should possess.

* Examples include blockchain test management, application service implementation, platform implementation.

- (Standard Curriculum) Present growth paths for experts in each area of blockchain and develop learning tracks to effectively acquire specialized knowledge and skills.
- ③ (Integrated System) Establish and operate a “**Blockchain Talent Development Integrated System**” to comprehensively manage educational information dispersed across ministries, universities, institutions, and regions (2021~).
 - Collect and provide information on blockchain specialist training projects to enable users to **systematically plan their educational paths**.
 - * Provide comprehensive blockchain education across the country, match required competencies by job, and support systematic management to complete job competencies.
 - Provide **information on the qualifications of blockchain-educated experts** to match them with companies requiring specific skills and job roles.

Reference 5 Major Status of Blockchain Talent Development		
Category	Training Institutions	Key Features
Graduate Schools	R&D and Training of Master's and Doctoral-Level Personnel (ITRC) - Sogang University, Chung-Ang University, POSTECH	· Training of key technology R&D personnel (40 people per year per university)
	Blockchain-Related Departments Established - Sogang University, POSTECH, Dongguk University, Korea University, Hanyang University, Yonsei University, Kookmin University, Konkuk University, Inha University, etc.	· Graduate schools specializing in ICT and information security · Practical-centered CEO courses · Departments established through the establishment of research institutes
Government-Supported Institutions	NIPA (National IT Industry Promotion Agency) - Operation of Blockchain Composite Education Space	· Introductory (1 week, 720 people), Development (2 weeks, 240 people) · Professional (24 weeks (including 12 weeks of corporate training), 20 people)
	Innovative Growth Youth Talent Intensive Training (IITP) - Baekseok University, FnInnoEdu, Korea Radio Promotion Association, Korea Standards Association	· Intensive project-based education focused on project execution with expert mentoring (6 months, 168 people) · Linked to employment and startup opportunities with 44 partner companies
Local Governments	- Gyeonggi-do Economic Science Promotion Agency Blockchain Campus - Seoul New Deal Job Customization Project - Regional Industry Promotion Agencies and Technoparks	· General (3-day) / Professional (4-day) courses · Developer training courses linked to employment/startup and industrial applications
Associations and Secondary Education Institutions	Korea Blockchain Industry Promotion Association Industrial Education Research Institute, Korea Information Industry Association	· Mid-to-short term expert courses and introductory courses
Private Companies	University and corporate partnership education: Dongguk University + Andus, Kookmin University + Unblock, Korea University + KEB Hana Bank, etc.	· Exchange and education support through MOUs between universities and companies

◇ Enhancing Public Awareness

- (Current Status and Issues)** Efforts are being made* to raise public awareness; however, **awareness of blockchain technology applications beyond virtual assets remains low.**
* TechBiz Conference, Blockchain Promotion Week, etc., are being operated.
- (Strategic Plan) Provide opportunities to experience real-world use cases** through conferences, idea contests, and discussions on policy directions through **private sector participation councils.**

1 **(Information Provision)** Organize events and educational programs that provide direct and indirect experiences with blockchain technology to expand understanding and awareness.

- **Plan to expand the Blockchain Promotion Week** (second half of 2020) **by inviting international government agencies and blockchain experts** (such as those from Ethereum, Hyperledger, etc.) to provide insights into blockchain industry trends.
- **Operate programs that increase public awareness** of blockchain technology by linking with existing educational programs (SW, bridging the digital divide, etc.) (2021~).
- **Publish a casebook** based on pilot project results **to help** non-industry professionals easily **understand blockchain service adoption cases** (second half of 2020).

2 **(Participation Expansion)** Provide **opportunities for direct public participation** (second half of 2020).

- **Operate a public participation group to gather opinions** on blockchain pilot projects, **conduct company visits and interviews, and create content** on use cases to enhance public awareness.
- **Hold an idea contest to discover creative services** that integrate the latest technologies such as IoT, AI, and Big Data.
- **Host academic conferences to discuss solutions for social issues** through blockchain and **to develop policy alternatives.**

3 **(Public-Private Cooperation)** Establish and operate a **public-private council for blockchain technology and policy** to discuss the development of blockchain policies and address challenges faced by private companies (second half of 2020).

* Participants include relevant ministries, associated agencies, industry representatives (large corporations, SMEs), and academic experts.

Reference 6**List of Key Initiatives and Relevant Ministries**

Initiative	Relevant Ministry (Department)
1. Comprehensive Implementation of Blockchain in Seven Key Areas	
(1) Implementation of Online Voting System	National Election Commission (Information Management Division) Ministry of Science and ICT (Digital Society Planning Division)
(2) Enhancing the Transparency of Donation Management Platforms	Ministry of Science and ICT (Digital Society Planning Division)
(3) Establishing a System to Prevent Overlapping Social Welfare Payments	Ministry of Health and Welfare (Welfare Information Operations Division) Ministry of Science and ICT (Digital Society Planning Division)
(4) Expanding Renewable Energy Certificate (REC) Trading Services	Ministry of Trade, Industry, and Energy (New and Renewable Energy Policy Division) Ministry of Science and ICT (Digital Society Planning Division)
(5) Introduction of Digital Currency Linked with Regulatory Free Zones	Busan Metropolitan City (Smart City Promotion Division) Ministry of SMEs and Startups (Regulatory Free Zone Division) Ministry of Science and ICT (Digital Society Planning Division)
(6) Promoting Real Estate Transaction Services Based on Smart Contracts	Ministry of Land, Infrastructure, and Transport (Spatial Information System Division)
(7) Establishing an Integrated Customer Management System for Postal Services	Ministry of Science and ICT (Postal Business Headquarters Management Planning Office, Digital Society Planning Division)
(8) Identifying Additional Blockchain Expansion Projects	Ministry of Science and ICT (Digital Society Planning Division)

Initiative	Relevant Ministry (Department)
2. Activation of Decentralized Identity (DID) Services as Infrastructure for the Contactless Economy	
(1) Establishing a Government-Wide Integrated Public Platform	Ministry of Science and ICT (Digital Society Planning Division) Ministry of the Interior and Safety (Digital Security Policy Division) Military Manpower Administration (Information Planning Division)
(2) Supporting Interoperability Between DIDs and Integration with Other Authentication Methods	Ministry of Science and ICT (Digital Society Planning Division, Information Security Planning Division)
(3) Identifying and Applying Innovative DID Services	Ministry of Science and ICT (Digital Society Planning Division)
(4) Building Governance for the Activation of the DID Ecosystem	Participating Ministries in the DID Council Ministry of Science and ICT (Digital Society Planning Division)
3. Establishing an Integrated Support System for Blockchain Enterprises	
(1) Supporting the Activation of Blockchain-as-a-Service (BaaS)	Ministry of Science and ICT (Digital Society Planning Division)
(2) Supporting the Discovery of Service Models	
(3) Establishing a Technology Innovation Support Center	
(4) Supporting Corporate Entry into Southeast Asian Markets	
4. Development of Next-Generation Core Blockchain Technologies	
(1) Promoting the Development of Core and Converged Technologies	Ministry of Science and ICT (Digital Society Planning Division)
(2) Strengthening Responses to Global Standards	Ministry of Science and ICT (Digital Society Planning Division, Information and Communication Broadcasting Technology Policy Division)

Initiative	Relevant Ministry (Department)
5. Fostering a Blockchain Innovation Ecosystem	
(1) Improving Legal Systems and Creating Guidelines	① Legal System Improvement Legislatively Competent Ministry: Ministry of Science and ICT (Digital Society Planning Division)
	② Linking with Regulatory Sandboxes Ministry of Science and ICT (Digital Society Planning Division, Digital New Industry Regulatory Division)
	③ Creating Guidelines National Intelligence Service, Ministry of Science and ICT (Digital Society Planning Division)
	④ ISMS Certification for Virtual Asset Service Providers Ministry of Science and ICT (Cybersecurity Response Division)
(2) Promoting Innovative Pilot Projects	① Linking with Regulatory Free Zones Ministry of Science and ICT (Digital Society Planning Division) Ministry of SMEs and Startups (Regulatory Free Zone Division) Busan Metropolitan City (Smart City Promotion Division)
	② Improving the Support System Ministry of Science and ICT (Digital Society Planning Division)
	③ Strengthening Inter-Project Linkages
(3) Training Specialized Personnel	① Training of Specialist and Practical Workforce Ministry of Science and ICT (Digital Society Planning Division, Information Communication Industry Base Division, Software Policy Division)
	② Creating a Talent Development Guide Ministry of Science and ICT (Digital Society Planning Division)
	③ Establishing and Operating an Integrated System
(4) Enhancing Public Awareness	① Providing Information
	② Expanding Participation
	③ Public-Private Cooperation