Chapter 3

The Digital Economy in the Republic of Korea

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Chapter 3
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1. Introduction

Digital transformation (DX) and digital economy (DE) are two pivotal concepts that encapsulate the profound societal and economic changes driven by the extensive application of digital technologies. Leveraging technologies such as the Internet of Things (IoT), artificial intelligence (AI), cloud computing, and big data; they change the way we interact, work, and conduct business in today's digital age.

DX represents the innovative application of these digital technologies to revamp traditional societal and economic models. In a business context, DX leverages digital technologies to not only revolutionise operational methods and services (KIAT, 2022) but also transform business models and set new directions for the industry (IBM, 2011). Further, the Organisation for Economic Co-operation and Development (2019) extends this concept to include the diffusion of business models facilitated by digital technologies, culminating in productivity enhancements.

The rise of the term DE aligns with corporate DX efforts aimed at profit, signifying a shift in economic practices (KDI, 2021). Initially referred to 'e-commerce economy', where the trade of goods and services occurs via the internet, the concept of the DE is extended to the entire set of economic activities based on digital technologies, incorporating various business models and industries (KDI, 2020). The DE now refers to not only a wide variety of digital products and services (e.g. information and communication technology (ICT) and network devices, software and content, search platforms, social network sites, and over-the-top media services) but also digitalisation of business and economic activities induced by digital technologies (KDI, 2020). This shift is expected to bring many substantial changes to our social and economic landscapes, as discussed in the following section.

Since the novel coronavirus disease (COVID-19) pandemic, DX and the DE have rapidly transformed the Republic of Korea's societal and economic realms. The pandemic propelled a digital-centric shift, embedding digital technology into everyday innovations, from remote work to daily life activities. Technologies such as XR/VR and Digital Twin amplify the burgeoning metaverse, illustrated by events including Travis Scott's Fortnite concert and Blackpink's Zepeto fan meet, drawing global audiences in the millions. However, this goes beyond pure entertainment as in this digitally-driven landscape, companies deeply rooted in the digital sphere gain an international advantage. The blending of digital technologies has led platform companies to reshape traditional business lines, forming powerful economic and industry ecosystems (NIA, 2022c).

Looking forward, there are predictions suggesting digital platforms could govern 50%–80% of all societal systems by 2035 (NIA, 2022d). This digital metamorphosis can address economic and societal concerns by driving technological growth, optimising labour, and maximising individual potential. Moreover, it can counter societal issues, particularly environmental threats, crimes, and rising social costs, with predictive services (NIA, 2022c). However, the post-COVID-19 DX and social change highlight the dual-faced nature of this digital shift, presenting both opportunities and risks (NIA, 2022b).

Whilst digitalisation was once an optional trajectory, DX has become a vital trend for societal adaptation in the post-pandemic era. As the Republic of Korea continues to seize these opportunities and tackle associated challenges, it fortifies its position as a key player in the global DE.

2. Current Status of the Digital Economy and Digital Transformation in the Republic of Korea

The Republic of Korea stands at the forefront of DX, consistently pushing the boundaries of technological innovation and adaptation. This section delves into the nation's current standing in DE and DX, evaluating its digital competitiveness, digital governance initiatives, and the preparedness of domestic economic and social actors for digital change. Through a comprehensive lens, the strengths, challenges, and potential of the Republic of Korea's digital landscape are explored.

2.1. Digital Competitiveness

According to the International Institute for Management Development (IMD, 2021), the Republic of Korea's digital competitiveness ranked 12th (out of 64 countries) in 2021, which is an indication of its forward-looking approach to DX. This evaluation considers three primary dimensions: knowledge, technology, and future preparedness, each comprising several subfactors (see Table 3.1 for details).

Table 3.1. The Republic of Korea's Digital Competitiveness Performance

Overall Ranking	Ranking for Individual Factors	Ranking for Individual Subfactors		
12	15 (knowledge)	26 (talent)	16 (training and education)	3 (scientific concentration)
	13 (technology)	23 (regulatory framework)	16 (capital)	7 (technological framework)
	5 (future readiness)	2 (adaptive attitudes)	5 (business agility)	16 (IT integration)

Source: Adapted by the author from IMD (2021).

In the knowledge category, which encompasses talent, training and education, and scientific concentration, the Republic of Korea has a varied performance. The nation excels in scientific concentration, reflecting the country's strong emphasis on and successful integration of science in its digital initiatives. This is also evident in the country's superior patent activities at the global level, demonstrating the nation's potential for digital transition (NIA, 2022b). However, the country ranks low in the talent and training and education subfactors, suggesting there is room for improvement in developing and attracting digital talents (IMD, 2021).

The Republic of Korea presents a mixed picture in the technology category comprising the regulatory framework, capital, and the technological framework. The country ranks high in the technological framework, showing a strong technological infrastructure conducive to digital innovation. However, the regulatory framework for DX is placed low, suggesting a need for further enhancements in policy and regulations to facilitate DX (IMD, 2021).

Finally, the Republic of Korea stands strong in the future readiness category, which includes adaptive attitudes, business agility, and information technology (IT) integration. The country ranks 2nd in adaptive attitudes, reflecting the high level of societal openness to technology-driven changes, and 5th in business agility, suggesting that businesses are capable of quickly adapting to changes in the digital environment. However, IT integration ranks lower at 16th, implying a need for greater integration of IT into businesses and services to enhance digital competitiveness (IMD, 2021).

2.2. Digital Governance

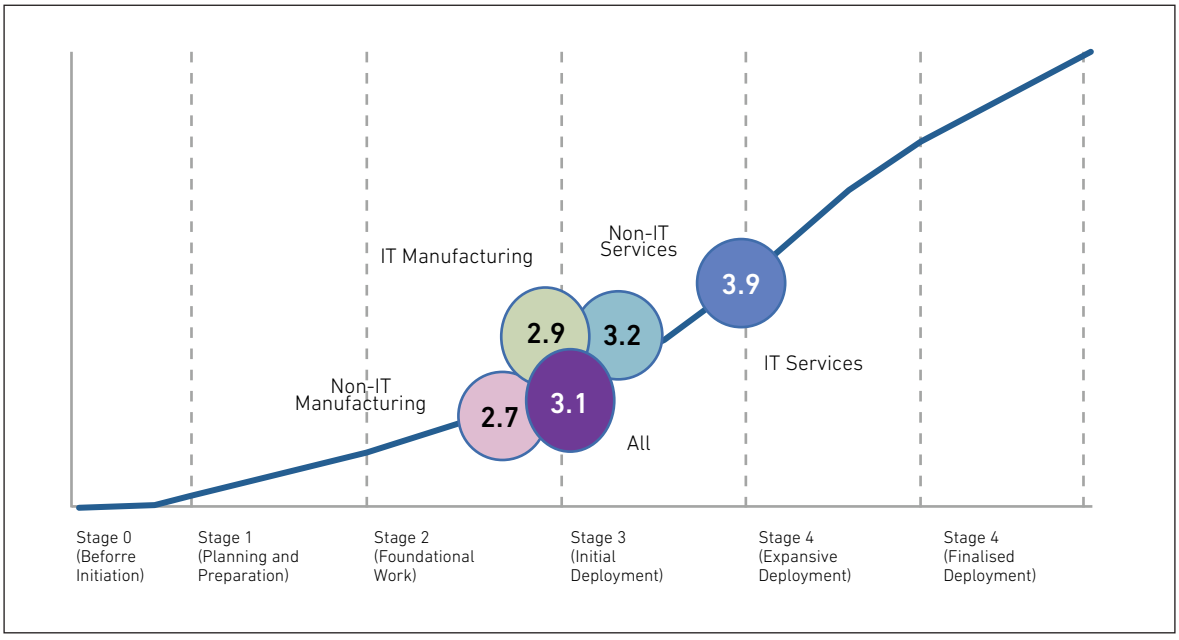
The Republic of Korea is also a global leader in digital governance, consistently earning high marks in the United Nations' e-government survey, underscoring its commitment to digital innovation in governance (UN, 2018, 2020). The nation excels in online government services, as reflected in its world-leading position for the delivery of digital public services, based on the evaluation of national government websites (UN, 2020). This achievement indicates an effective, user-centric approach, enhancing transparency and accountability. Furthermore, the country ranks 4th globally for its telecommunications infrastructure, backed by extensive broadband and ultra-fast internet (UN, 2020). The combination of advanced online services and top-notch telecommunications infrastructure underpins the success of the Republic of Korea's digital governance, setting a benchmark for many other countries. Yet, according to statistics from the OECD (2021), the Republic of Korea ranked 12th (out of 30) in the proactiveness dimension, which assesses the ability to anticipate citizen needs and deliver services quickly. This signifies that there is room for improvement, and the country's ongoing efforts to advance in this area will further solidify its position as a global leader in digital governance.

2.3. Industry Readiness for Digital Transformation

In terms of the Republic of Korea's industry readiness for DX, it varies between small and medium-sized enterprises (SMEs) and larger enterprises. A 2021 study by the Ministry of Trade, Industry and Energy revealed that whilst 93.1% of medium-sized enterprises acknowledged the importance of DX, just 19.5% had begun such initiatives. In contrast, larger corporations exhibited a more favourable digital transition rate at 48.9% compared to SMEs at 29.9% (KIAT, 2022).

As shown in Figure 3.1, a survey conducted by the Korea Institute for Advancement of Technology in 2021 showed that, on average, domestic companies were at the Initial Deployment (Level 3) phase of DX. Notably, IT services are near the Expansive Deployment (Level 4) phase with a score of 3.9 out of 5, implying that industries intertwined with digital technologies adapt faster to DX. However, the manufacturing sector trailed due to the substantial costs and intricacies of digitising manufacturing infrastructure and processes (KIAT, 2022).

Figure 3.1. Digital Transformation Readiness of Key Industries in the Republic of Korea



IT = information technology.

Source: Adapted from KIAT (2022).

In assessing digital readiness facets – planning, infrastructure, technology, and organisational culture – all sectors fell below the average score of 3 points. Planning, encompassing roadmaps and DX strategies, scored the lowest at 2.7 points, pointing to a strategic planning deficit. Infrastructure, particularly concerning DX personnel, fared better at 3.6 points, but ownership of specific DX units was lacking at 2.5 points. Overall, companies displayed a modest grasp of digital technology yet lagged in organisational culture adaptation, suggesting a need for a deeper cultural shift towards DX (KIAT, 2022).

2.4. Citizen Readiness for Digital Transformation

The Republic of Korea's swift post-COVID-19 move towards digitalisation has intensified the existing digital divides, especially amongst vulnerable groups such as the elderly, the disabled, farmers, fishers, and low-income individuals. This illuminates the Republic of Korea's unpreparedness of DX amongst certain demographics and their struggle to adapt and benefit from the digital revolution, which is a critical challenge that needs addressing to ensure an inclusive DE and DX (NIA, 2022b).

Despite the broader population's adoption and utilisation of online economic activities such as shopping, banking, and the use of new technologies, including 5G and wearable devices, these trends have not extended evenly to all societal segments. According to the 2021 Digital Information Gap Survey, using the digital literacy of the general population as a benchmark at 100, vulnerable segments only score 75.4% (NIA, 2021). Although they possess considerable digital access (94.4%), there is a concerning decline in their utilisation (77.6%) and capability (63.8%). Specifically, the elderly's digital literacy stands at just 69.1% (NIA, 2022b). Similarly, whilst non-face-to-face interactions, pivotal for DE expansion, have surged by 50.5% for the general populace, they remain at approximately 20% for these marginalised groups (NIA, 2022b). Hence, for the Republic of Korea to truly harness its DE potential and preserve its global image, the emphasis must be on creating an inclusive DE and DX, particularly focusing on SMEs' productivity and bridging the digital gap amongst vulnerable groups.

3. Efforts and Progress at the Policy Level

The Republic of Korea's rise as a digital powerhouse has been anchored by visionary policy decisions since the 1980s. Charting its proactive approach to the digital era, this section highlights key policy milestones and strategic endeavours that have positioned the nation at the forefront of global digital innovation and transformation.

3.1. Early Policy Efforts

Recognising the promise and potential of the information era, the Republic of Korea initiated a series of policy efforts beginning in the 1980s. Notably, the 1980s saw the groundwork for DX with the National Basic Computing Network project, laying the foundations for the country's leap into the information age. As the 1990s dawned, the Republic of Korea's response to the global IT wave became evident. The establishment of the Ministry of Information and Communication in 1994 and the comprehensive Cyber Korea 21 strategy unveiled in 1999 signalled the country's commitment to becoming an internet powerhouse. These earlier policy endeavours underscore the nation's vision, paving the way for subsequent digital economic strategies and frameworks in the context of the 4th Industrial Revolution and digital transition (KDI, 2020).

In response to the 4th Industrial Revolution, characterised by significant intelligent technology advancements, the Republic of Korea introduced the I-KOREA 4.0 plan in 2017 (NIA, 2022b). This strategy aimed to foster innovation-led growth using intelligent technologies to address socioeconomic challenges. By 2018, the 6th National Informatization Basic Plan was rolled out, highlighting the country's vision in the digital sphere. In 2019, a national AI strategy was crafted, spotlighting AI's potential in industry and societal problem-solving. A pivotal change in 2021 was the transition from the Act on Informatization to the Act on Intelligent Informatization, forming a blueprint for innovations in super connectivity and intelligence towards an intelligent information society (NIA, 2022b). These policy initiatives underscore the Republic of Korea's dedication to the digital epoch, paving the way for its future DX strategies amidst global challenges such as the COVID-19 pandemic (NIA, 2022b).

3.2. Recent Policy Efforts Towards Digital Transformation

Efforts and progress at the policy level have been substantial, reflecting the forward-thinking attitude of authorities towards DX. One such noteworthy achievement is the declaration of the New York Initiative on 21 September 2022. In a keynote speech delivered at the Digital Vision Forum, hosted by New York University, President Yoon Seok Yoel announced the Republic of Korea's vision for DX to the world. This vision emphasised the role of the Republic of Korea as a global model in the digital age and highlighted its commitment to continue striving for a responsible role in the international community (NIA, 2022a).

On 28 September 2022, following the New York Vision declaration, the Republic of Korea unveiled its Digital Strategy (summarised in Table 3.2). This roadmap recognises digital technology's capacity to tackle domestic and global challenges, including low growth, polarisation, and the COVID-19 pandemic. It aspires to transform the country into a top-tier digital powerhouse by setting out five strategic goals and 19 tasks. Central to the strategy is the drive for rapid innovation, world-leading digital capabilities, and a private sector-led digital innovation culture, all aiming for a holistic DE and society (NIA, 2022a).

In tandem with these endeavours, on 22 September 2022, the Republic of Korea further demonstrated its commitment by establishing the Digital Platform Government Committee (DPGC). Created in response to the needs of the Intelligent Information Society, the DPGC consists of 23 members from civil and government representatives and is split into six specialised subcommittees: AI and data, infrastructure, services, work style innovation, industry ecosystem, and information protection. Central to its operation are the principles of data and platform, signalling the government's intent to foster collaboration and innovation (NIA, 2022a).

Table 3.2. Strategies and Tasks Identified in the Republic of Korea's Digital Strategy

Strategies	Tasks
I. World-leading Digital capabilities	• Secure the six DX technologies to counter tech hegemony • Ensure sufficient digital resources • Build a faster, more secure network • Achieving a digital talent wealth by training 1 million people • Fostering a digital platform industry that crosses boundaries • Enabling K-digital to drive global markets
II. Expanding DE	• Make hospitality business more competitive • Advancing to the future of manufacturing • New growth engines for agriculture, livestock, and fisheries
III. An Inclusive Digital Society	• Creating safer, more comfortable places to live • Digital coverage for all citizens • Digitally reimagining communities
IV. Digital Platform Government Together	• Implementing innovation infrastructure and promoting full openness and utilisation of data • Transforming the way government works with AI and data technologies • Ensuring a safe and reliable experience
V. Innovative Digital Culture	• Establish a culture of civilian-led DX • Regulations to avoid stifling innovation and conflict resolution • Establish basic laws for the DE and society • Going global with DX

DE = digital economy, DX = digital transformation.

Source: Adapted by the author from NIA (2022a).

Nevertheless, the DPGC's principal objective goes beyond just collaboration; it seeks a transformation in public services through a holistic digital platform integrating data from various governmental entities. This consolidated methodology aspires to provide streamlined, anticipatory, and customised services to citizens. Amongst its offerings are the MyAI portal tailored for personalised welfare needs and the 'one-site total service' consolidating various administrative functions. Given its pivotal role, three key ministries – the Ministry of Science and ICT, the Ministry of the Interior and Safety, and the Personal Information Protection Commission –supervise the DPGC's operations, signalling the regime's unwavering commitment to a unified and digital-first governance model (NIA, 2022a).

3.3. Policy Efforts at Ministry Level

Various ministries in the Republic of Korea have also implemented strategies to reinforce digital competitiveness. In July 2020, the Ministry of SMEs and Startups prioritised AI, initiating smart factories and leveraging the consequential data. Similarly, the Ministry of Trade, Industry, and Energy unveiled a strategy in August 2020, targeting 17 tasks to amplify the digital capability of industries through its Industry DX Series, which emphasises support policies and significant research and development ventures. Moreover, the Ministry of Employment and Labor has been pivotal in introducing programmes such as K-Digital Credit and K-Digital Training. These initiatives, especially the K-Digital Platform, have been instrumental in fostering digital acumen amongst SME employees, offering them tailored training and access to shared resources. Such concerted efforts across the ministries underscore the Republic of Korea's commitment to advancing its digital infrastructure and education, laying the foundation for a digitally advanced future (KDI, 2021).

Policy efforts across multiple ministries are also evident, as shown in the Comprehensive Plan for Nurturing Digital Talent launched in August 2022. This initiative primarily aims to cultivate digital expertise across all educational levels and targets the development of 1 million talents in areas particularly in AI, software, and cybersecurity by 2026. Two main objectives underpin this plan: first, the enhancement of digital professionals through measures such as the establishment of new departments and expansion of digital universities, and second, the transition to an all-encompassing digital education system, ensuring equitable digital knowledge access for all. Furthermore, to streamline these efforts, the Digital Talent Alliance, an extensive collaboration of 257 organisations, was inaugurated in October 2022, serving as a platform for strategic discussions on nurturing digital talent (NIA, 2022a). As a result, the Ministry of Education collaborates with not only conventional partners (e.g. local governments and local communities of teachers) but also other stakeholders (e.g. the Ministry of Science and ICT, the Ministry of Trade, Industry, and Energy, the Ministry of the Interior and Safety, and academia), to facilitate the transition towards digital-based educational systems, including the development of AI digital textbooks, training and education of digital skills for teachers, and the development of digital infrastructure (MOE, 2023).

3.4. ICT Regulatory Sandbox to Confront Regulatory Lag

In the contemporary digital landscape, where technological advancements consistently outpace established regulatory frameworks, the Republic of Korea grapples with the challenge of 'regulatory lag,' especially pronounced in convergence industries with digital technologies (KDI, 2021). There is thus a pressing need to recalibrate the nation's regulatory blueprint. The prevailing regulatory mechanism, rooted in the Industrial Convergence Promotion Act, follows a pre-emptive approval strategy, subsequently trailed by regulation. However, this methodology is clouded with ambiguities that can impede technological progression (KDI, 2021).

To address these issues of regulatory lag, the government has implemented the ICT Regulatory Sandbox. This is a pioneering initiative managed by the Ministry of Science and ICT and the National IT Industry Promotion Agency. It serves as a controlled environment where emerging technologies and services can be tested without the usual regulatory constraints. By granting temporary permissions for a specified period, innovators can experiment and refine their offerings, ensuring they meet safety and efficiency standards before a full-scale launch. The sandbox provides expedited reviews, temporary permits, and experimental regulation exemptions to test innovative new technologies and services for a limited time. Since its implementation in 2018, the sandbox has enabled market pilots of diverse, innovative services ranging from IoT-based electrical outlets to mobile drivers' licenses. By providing legal certainty and opportunities to demonstrate safety, this controlled regulatory environment facilitates the development and integration of innovative products and business models which may be prohibited under current regulations (MSIT and NIPA, 2021).

However, the pace of government processes can still prove limiting, especially when juxtaposed against the rapid advances in digital technologies. An emerging perspective proposes leveraging the agility of the private sector through an independent convergence certification system. By shifting towards private sector certifications, the Republic of Korea could harmonise the swift adaptability of the private sector with the state's strong emphasis on safety. Such a collaborative model would be particularly beneficial for high-risk products, ensuring that they meet both safety and innovation standards (KDI, 2021).

4. Remaining Issues and Challenges for a Successful Digital Economy and Digital Transformation

As the Republic of Korea continues to establish itself as a global leader in the DE and DX, the nation faces pressing challenges that must be addressed. This chapter examines key issues that are critical for the successful digital future, spanning technological, ethical, labour-related, democratic, and privacy dimensions. By spotlighting these multidimensional challenges, this chapter sets the stage for insightful discourse on establishing policies and frameworks for an inclusive, ethical, and thriving digital country.

4.1. Digital Transformation and the Emerging Divide

As discussed before, the Republic of Korea faces two distinct challenges regarding the digital divide. Within the business realm, there is a pronounced disparity in the digital readiness of SMEs and mid-sized companies. According to KIAT (2022), only 25.5% of these entities are prepared for DX, and this number reduces to 19.5% for the smaller establishments. These figures underscore several barriers, including a deficit in digital expertise, a nascent understanding of DX, and an absence of strategic direction. Whilst the significance of networking, fostering internal innovations, and cross-industry collaboration is increasingly recognised, the requisite policy support remains elusive. Alarmingly, only 7.5% of companies have tapped into this support, mainly in the financial, technological, and workforce training domains (KIAT, 2022). Feedback from these SMEs accentuates an urgent call for more lucid DX-oriented guidance, amplified financial backing, environments that invigorate market dynamics, and dedicated digital proficiency training programs.

The societal context reveals another pressing concern: the deepening digital divide amongst individuals. As highlighted by NIA (2022b), marginalised groups, especially the elderly, grapple with accessing and manoeuvring digital tools. This discrepancy risks sidelining these communities from the multifaceted advantages of the digital epoch. And with the ascension of AI-centric digitalisation, this chasm could further intensify. The swift evolution of digital technology, supplemented by novel technological breakthroughs, can compound this isolation. Whilst past policy initiatives aiming to bridge this digital gap have garnered accolades, leveraging these successes to blueprint future strategies is imperative (NIA, 2022b). The vision should be clear: an inclusive digital metamorphosis where every individual and enterprise, irrespective of their origins or scale, can seamlessly transition into the AI-infused digital frontier.

4.2. Labour Issues

The shifting labour dynamics also pose challenges to the Republic of Korea's DX journey. A notable study by the World Economic Forum in 2018 offers a profound perspective into the evolving global labour landscape. This report unveiled a 71:29 ratio of human to machine labour in 2018, but a proportion projected to shift towards 3:7 by 2030 and a potential 1:9 split by 2040 (WEF, 2018).

Such projections raise compelling questions about the quantity of jobs available for humans. As DX gains momentum and AI expands its influence, there is a tangible risk of diminishing human roles. Whilst reduced human labour might appear advantageous at a glance, the intrinsic fulfilment and societal benefits derived from work cannot be neglected. Therefore, as AI ascends in its significance, identifying and nurturing roles that align with human capabilities and potential become paramount (NIA, 2022b).

4.3. Ethical Issues from the Coexistence of Humans and Robots

With the changing landscape of labour, challenges arise regarding societal norms. Traditionally, our legal and ethical systems emphasised human accountability. However, in the digital era, with the rise of AI and robotics, accountability lines are blurring. Whilst once centred on individual agency, the responsibility now extends to technology creators. This raises pressing questions, such as 'should robots with human-like cognition and emotions have rights?' and 'when AI-driven entities make impactful decisions, who is accountable?' relying solely on human owners for responsibility is becoming outdated. As the Republic of Korea rapidly advances technologically, it is imperative to adapt not only technologically but also ethically and legally. A legal system balancing personal freedoms with technological growth is needed. Through foresight and adaptability, the Republic of Korea can foster a harmonious coexistence between humans and robots, ensuring mutual advancement (NIA, 2022b).

4.4. A Democratic Digital Economy

As the digital domain continues to expand, the unchecked power of tech giants is prompting global calls for transparent and democratic management of digital resources, highlighting the urgency for protective measures against monopolistic behaviours to ensure a competitive market and uphold digital democracy.

Democratising the entire process of production, utilisation, distribution, and allocation of digital resources, including data and information, has become imperative. It is not just about adhering to economic norms but also fostering a sharing economy that aligns with these democratic principles. Recent legal actions against digital behemoths like Google and Facebook in regions like the United States, the United Kingdom, and the European Union emphasise the growing concerns over their monopolisation of data and potential unfair trade practices (KDI, 2020). Their staggering economic influence and societal reach present significant challenges to maintaining a level playing field in the digital arena, a sentiment mirrored by global governmental responses.

The Republic of Korea's imposition of a KRW6.7 billion fine on Facebook, enforced by the Personal Information Protection Commission, is indicative of this broader movement. However, there remains a discernible gap in understanding the depth of these tech giants' revenue streams and operational activities within the Republic of Korea. Equally concerning is the nation's currently insufficient legal framework that falls short of adequately safeguarding its data sovereignty and the privacy of its citizens (KDI, 2020).

In advancing the democratisation of the DE, proactive steps from both the citizenry and the government are essential. The monopolistic behaviours and dominance of domestic and foreign platform companies, digital companies, and data companies can no longer be ignored. It is imperative that our government establish robust antimonopoly regulations and lead the way in global antimonopoly governance (KDI, 2020).

4.5. Privacy in the Digital Age

In today's digital age, vast amounts of information and data on private individuals are exposed to service providers. This has led to escalating concerns about the use and potential misuse of personal data. As the Republic of Korea embarks on its DX, the challenge of safeguarding individual privacy whilst promoting innovation becomes paramount. One of the pivotal strategies adopted to address this challenge is 'pseudonymisation'.

Pseudonymisation is the process of replacing private identifiers with fabricated ones, ensuring data subject privacy. Whilst this approach aims to strike a balance, permitting broader data use whilst substantially reducing privacy violation risks, it also presents a dilemma: although pseudonymised information provides a more accessible pathway to harness data, it simultaneously poses re-identification threats, potentially jeopardising individual privacy. In January 2020, the Republic of Korea took significant steps in data utilisation by amending the Personal Information Protection Act and the Credit Information Act. A key enhancement was the augmented potential for using data, yet the acts introduced an obligation to discard pseudonymised data (KDI, 2021).

Rather than focusing solely on data disposal, it is vital to fortify technical safeguards, ensuring pseudonymised data remains untraceable. Given that limited institutions can merge this data, measures against internal leaks are essential for security. A comprehensive regulatory approach is needed, integrating pseudonymisation, countermeasures against re-identification, and data disposal during redundancy. As technology evolves, enhancing safety mechanisms and ensuring only authorised entities handle pseudonymised data is paramount for robust protection.

4.6. Cybersecurity

Cybersecurity remains a pivotal concern in the journey towards a successful DE and DX, as the importance of securing digital technologies and bridging the technology gap cannot be overstated. The government has thus identified strengthening the national cybersecurity response as a top priority in its digital strategy (NIA, 2022a).

The rapid pace of DX has brought about a surge in services reliant on user data. However, efforts to safeguard this data have not kept pace, particularly evident in emerging environments like smart homes, where the demand for services is rising. Whilst the Republic of Korea has taken steps to address this, such as the establishment of security standards like the Korea Internet & Security Agency's Home and Appliance IoT Security Guide, there is a pressing need for a more comprehensive and systematic institutionalisation to address the challenges. Smart homes, which include appliances and electronics with physical security measures, present a unique challenge. Any compromise in their security could lead to severe consequences, including privacy breaches, fires, and thefts. Thus, proactive support projects, encompassing research and development and system improvements, are essential to strike a balance between data security and service provision in such environments (KIET, 2021).

Moreover, a significant portion of the country's SMEs appear underprepared in the cybersecurity domain. Over half of these enterprises have reported inadequate security systems, emphasising the urgency for more robust measures (KIAT, 2022). Addressing these gaps is essential to foster a DE that ensures prosperity without compromising the safety and privacy of its populace.

5. Conclusion

This chapter provides a comprehensive examination of the Republic of Korea's DE and DX trajectory, emphasising the nation's unwavering commitment to digital excellence. Starting from its roots in the 1990s with the establishment of high-speed ICT networks to its contemporary position as one of the world's top five intellectual property powerhouses, the nation's digital evolution is commendable.

The nation's current status, characterised by strengths in scientific concentration, adaptive attitudes, and infrastructure, is not without challenges. Particularly evident are the obstacles related to talent development, regulations, and the readiness of SMEs to embrace the digital wave. The government's proactive strategies, including the I-Korea 4.0 and the Digital Platform Government Committee, underscore a clear vision for the future and a dedication to achieving an integrated, intelligent digital government. However, key concerns still loom around inclusivity, ethics, labour, privacy, and security, as well as maintaining democratic principles in this digital age.

The past offers us lessons and blueprints for the future. Reflecting on the Republic of Korea's proactive approach 3 decades ago, it becomes imperative today to formulate bold strategies to harness the potential of AI and new digital technologies. The proposed AI-driven Digital Societal System Construction suggests a leap beyond traditional informational systems, emphasising the introduction of AI-based digital societal systems whilst also ensuring safeguard mechanisms against potential adversities (NIA, 2022d). In the digital age, it is essential to be visionary and proactive, shaping and designing the future rather than just predicting it.

To harness the full potential of this digital age, the Republic of Korea must prioritise a few pivotal directions. It is crucial to bridge the existing digital divide by endorsing multidimensional policies that ensure inclusivity. Furthermore, support for SMEs, educational reforms targeting the workforce, and robust ethical and legal frameworks become paramount. The country's ethos should focus on promoting digital democracy and data sovereignty, safeguarding individual privacy.

In conclusion, whilst the Republic of Korea's achievements in DE and DX are noteworthy, the journey is ongoing. With a vision that draws inspiration from the past with strategies for the future, a bright digital horizon awaits the nation. As the nation continues its dedication to strategic planning and visionary action, it not only aspires to maintain its global digital standing but to elevate it, setting a global benchmark for others to follow.

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