

Abstract

National Critical Technologies and Technology Sovereignty in the Digital Transformation Era: Data, Network, and Artificial Intelligence

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The concept of technology sovereignty has gained momentum in the global discourse, as the intensified U.S.-China strategic competition has highlighted the blocization of technology and the importance of supply chain resilience. In particular, in the era of digital transformation, countries are making heavy investments in data (D), network (N), and artificial intelligence (A) in recognition of the significance of DNA technologies. Similar to national sovereignty, DNA constitutes the infrastructure that ensures a country's survival and

prosperity in the digital age. DNA technologies also serve as stepping stones to realizing an intelligent information society. South Korea's DNA policy should be a balanced effort encompassing technological development, standard preemption, and usability enhancement. In short, it is essential to align and create an equilateral DNA ecosystem without prioritizing one specific sector.

The South Korean government should consider issues regarding technical standards, norms, and usability to enhance DNA applicability and technology sovereignty. A multilateral effort with the participation of the government, business sector, and expert groups is necessary, not to mention a high level of cooperation from the tech community for enhanced security. As a convergence of national critical technologies in the digital field, DNA's digital sovereignty can be strengthened by establishing a multilateral tech community based on strategic flexibility and enforcing the organic network of sovereignty-standards-ecosystem. South Korea should also actively contribute to the international community by preemptively responding to the global risks posed by DNA.

Keywords
technology sovereignty, digital transformation, data, network, AI