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Digital Unification Strategy:

A Data-Driven Roadmap for Korean Peninsula Integration

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Preparing Korean Peninsula Integration in the AI Era: Building a “Digital Bridge”

Korean unification can no longer be prepared through political declarations or military and diplomatic decisions alone. Eight decades of division have not merely separated territory and institutions; they have accumulated deep ruptures in language, economic life, administrative experience, historical memory, and social trust. The central question for sustainable integration, therefore, is not simply when unification may occur, but whether Korean society will have the social, institutional, and technological capacity to absorb and manage that moment when it comes. In an era of rapid advances in artificial intelligence, data science, brain engineering, and digital humanities, unification policy must move beyond abstract aspiration and become a sophisticated, data-driven national strategy.

This Expert Notes propose that the Republic of Korea use AI and data proactively to prepare for the future integration of the Korean Peninsula. The argument rests on three pillars. First, AI can help reduce linguistic and cognitive divergence between South and North Korea, laying the groundwork for renewed communication. Second, AI-based simulations can help design policy blueprints for shared prosperity by anticipating the economic, social, and administrative costs and pathways of integration. Third, AI can support the digital preservation of dispersed historical records, testimonies, and lived memories, reconnecting the fragmented memory of the Korean people. Together, these three pillars constitute a “digital bridge” for Korean Peninsula integration.

First, the starting point of unification preparedness must be data. In the AI era, data is a core strategic resource. Even the most advanced algorithms cannot produce reliable policy judgment without high-quality data. Unification planning is no exception. To assess priorities, costs, risks, and opportunities with precision, South Korea needs systematically accumulated data on North Korea's economy, population, public health, education, industry, transportation, language, administration, and regional living conditions.

At present, data on North Korea is dispersed across government agencies, academic researchers, defector testimonies, satellite imagery, international organization reports, media sources, and private research institutes. The problem is not the absence of information, but its fragmentation. These materials are often unstandardized, vary widely in reliability, and are not integrated in a form that can be used effectively for policy design. The first task, therefore, is to build a comprehensive North Korea and unification data platform. This should not be a passive archive, but a national integration infrastructure combining verified datasets, AI analytical models, policy simulation tools, and digital archives.

What matters is not only the quantity of data, but also its context, source, bias, and ethical use. Testimonies and everyday-life records from North Korean citizens are invaluable, but they are also highly sensitive materials involving personal safety, dignity, and privacy. A data strategy for unification must therefore be not only a technological strategy, but also a human rights, ethics, and security strategy.

Second, AI language models should be used to reduce the communication gap between the two Koreas. As division has deepened, South and North Korean language has developed significant differences despite their common linguistic roots. Vocabulary, pronunciation, administrative terminology, technical language, political expressions, and everyday meanings have diverged. After unification, one of the first challenges may not be institutional integration itself, but a subtler problem: people may appear to understand one another's words while interpreting them through very different meanings and experiences.

AI language models can become important tools for addressing this problem. By systematically collecting South and North Korean language data, analyzing usage and context, and building domain-specific terminology maps for education, administration, medicine, law, technology, and public services, South Korea can prepare a practical linguistic infrastructure for integration. For example, AI-based explanation systems could help North Korean citizens understand South Korean administrative services, healthcare, finance, and education. Conversely, integrated language platforms could help South Korean society better understand the expressions, experiences, and emotional contexts of North Korean citizens.

This issue is also important from the perspective of brain engineering and cognitive science. Language is not merely a means of communication; it is tied to cognitive structures through which people understand the world. The same word may trigger very different emotional responses depending on political system, education, propaganda, and lived experience. An AI-based language strategy for integration must therefore go beyond translation. It should serve as a cognitive bridge that helps South and North Koreans understand one another's experiential worlds.

Third, AI simulations should be used to design policy blueprints for shared prosperity. The most frequently raised issue in discussions of unification is cost. But if cost is treated as the only frame, unification becomes perceived merely as a burden. The more important point is that the costs and benefits of integration will vary significantly depending on the pathway chosen. AI simulation can become a powerful policy tool precisely at this point.

If data can be gathered on North Korea's regional industrial structures, population distribution, infrastructure, energy demand, agricultural productivity, healthcare access, education levels, transport networks, and environmental conditions, various integration scenarios can be modeled in advance. Policymakers could assess which regions should receive priority for electricity and transport connectivity, which industries should be reconstructed first, and in what sequence healthcare, education, and housing policies should be introduced to minimize social disruption.

In particular, AI-based digital twin technology could allow the Korean Peninsula to be modeled as an integrated policy experimentation space. Before implementing actual policies, multiple scenarios could be tested virtually. These might include rapid institutional integration, phased economic integration, regional special-zone models, inter-Korean infrastructure development, energy transition cooperation, and responses to food and public health crises. Such tools would help shift unification planning from ideological debate to evidence-based policy design.

AI can also help anticipate and mitigate social conflict after unification. Unemployment, residential mobility, educational disparity, regional inequality, generational tension, and identity conflict are all likely to emerge during the integration process. Anticipating these risks and preparing response strategies in advance is an essential condition for sustainable integration.

Fourth, a digital archive is needed to restore the connection of memory. Unification is not only the integration of institutions; it is also the integration of memory. South and North Koreans share historical and ethnic roots, but they have lived under different national narratives and educational systems since division. In the integration process, the goal should not be to decide whose memory is correct, but to preserve and connect dispersed memories and to create a public space in which suffering, experience, and historical meaning can be understood across the divide.

AI can play a major role in this work. Dispersed documents, photographs, videos, maps, oral testimonies, family records, local histories, memories of war and separation, and records of North Korean everyday life can be digitized, classified, and analyzed. Natural language processing can help categorize large bodies of testimony by theme. Speech recognition can preserve oral histories from elderly separated families and defectors. Image restoration technologies can recover damaged photographs and documents. Geographic information systems can reconstruct vanished villages, migration routes, and family memories on digital maps.

Such a digital memory archive would be more than a historical repository. It could become a foundation for social healing, reconciliation, education, and identity formation after unification. This task is especially urgent as the generation of separated families grows older. With the passage of time, documents disappear, testimonies are lost, and memory becomes impossible to recover. A digital unification strategy is therefore not only a future-oriented strategy; it is also an urgent preservation strategy that must begin now.

Fifth, technology must remain a means; the ultimate goal of integration is *people*. AI and data are not a cure-all for unification. AI can amplify existing biases, and it can make flawed judgments based on incomplete information appear deceptively precise. Data on North Korea is especially incomplete, politically sensitive, and difficult to verify. AI-generated analysis must therefore never be treated as absolute. Expert review, field knowledge, ethical standards, and democratic oversight must operate together.

A unification data strategy must also be designed with security in mind. Data related to North Korea, defector testimonies, location information, human rights records, and administrative or military materials may become targets of cyberattack or political misuse. Data governance, cybersecurity, access control, anonymization, and international cooperation standards must therefore be built into the system from the beginning.

The most important principle is human-centeredness. The purpose of unification preparedness is not to turn North Korea into a dataset. It is to create the conditions under which people from both Koreas can live together with dignity, security, and mutual understanding. AI should not be used as a substitute for human judgment or as a technocratic instrument of control. It should be used as an auxiliary intelligence that reduces human suffering, prevents policy failure, and expands mutual understanding.

Conclusion: Unification Preparedness as Digital State Capacity

Korean Peninsula integration may arrive suddenly, but whether it succeeds will depend on capacities accumulated long before that moment. In the twenty-first century, unification preparedness requires a national infrastructure that combines data, AI, digital archives, simulation, ethical governance, and security.

The Republic of Korea should no longer approach unification only as an abstract ideal or political slogan. It should prepare through data, design through AI, and reconnect through memory. The three pillars of renewed communication, shared prosperity, and restored memory can form the core of a digital roadmap for Korean Peninsula integration.

Unification is not simply the merging of two systems. It is a long-term civilizational project of reconnecting divided language, interrupted social worlds, and fragmented historical memory. AI and data can help make that project more precise, more humane, and more sustainable. What is needed now is not merely to predict when unification will come, but to build the digital state capacity that will allow Korea to manage it when it does.