
Executive Summary

In the 1990s, the Republic of Korea’s public procurement system failed to keep pace with the country’s rapid efforts to develop, diversify, and decentralize its economy. Public offices used paper-based procurement systems that were inefficient and vulnerable to fraud and corruption. The Public Procurement Service (PPS) partnered with private sector contractors to build the Korea Online Electronic Procurement System (KONEPS), a centralized procurement system that was transparent and easy to use for both vendors and purchasers. Over time, the PPS improved the system to enhance security and user-friendliness. KONEPS proved both popular and versatile, saving the government billions of dollars each year while serving policy goals such as promoting innovation, economic diversification, and women-owned businesses.

Introduction

After decades of sustained economic growth and liberalization, Korea had transitioned from a postwar agrarian society into the world’s 11th largest economy by 1994.1 To continue its economic rise, the Korean government invested in global trade and free market reforms while joining the World Trade Organization (WTO) in 1995 and the Organisation for Economic Cooperation and Development (OECD) in 1996. Korea also invested in its domestic

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technology sector to leverage the telecommunications revolution to shift from an industrial economy to a knowledge economy.

However, Korea’s public procurement system, which had played an important role in fostering domestic industries, had not kept pace with the country’s modernization. The PPS, which is the national agency currently under the Ministry of Economy and Finance and is responsible for all the central government’s nonmilitary purchasing contracts, still managed procurement through outdated processes that were based on paperwork and face-to-face meetings. Often, suppliers had to go through a cumbersome process of searching for tender notices on government gazettes and bulletin boards, visiting public offices to register and submit bids, and obtaining required certificates and legal documents. Such systems were confusing, inefficient, onerous, and irregular.

The PPS’s discretion over a large and opaque procurement market allowed unscrupulous officials to selectively withhold information or to make decisions with little accountability. Such positions were highly sought and prone to exploitation. The press reported frequent cases of bid-rigging, collusion, and misconduct involving the PPS. As a 2016 Korean government report later put it, “The traditional face-to-face method of procurement administration between public officials and suppliers was mistrusted by citizens mainly due to the lack of bidding information, nondisclosure of the bidding process and result, etc., and as a result, contained ample possibilities of corruption” (PPS 2016).

Long dismissed as an incidental cost of economic development, procurement fraud gained salience in the mid 1990s when Korea joined global markets and began a crackdown on corruption. Although no single scandal prompted reform, citizens and civic groups complained about waste, fraud, and abuse in public procurement. Their activism mirrored the rise of the global anticorruption movement. In the first Corruption Perceptions Index, which was released by Transparency International in 1995, Korea ranked 27 out of 41 countries, a worrying sign for both Koreans and foreign investors.

The WTO—as well as the provisions in free trade agreements that Korea later signed with the United States, the European Union, and other jurisdictions—committed Korea to provide foreign entrants with open and equal access to its markets under the “non-discrimination doctrine.” In 1997, Korea acceded to the WTO Agreement on Government Procurement, which specifically obliged member states to liberalize procurement markets and to fight procurement corruption. The 1997 Asian financial crisis that destabilized Korea’s economy also focused public attention on inefficiency, corruption, and rules and practices that protected large corporations from competition.

The inefficiencies and inconsistencies of the procurement system posed prohibitive costs to domestic companies in Korea, especially small- and medium-sized enterprises (SMEs). Smaller businesses that were based outside the Seoul capital area, which is Korea’s economic and political hub, felt shut out of procurement markets even in their home regions. Government officials and businesses sought workarounds to avoid procurement processes. Efforts to strengthen local government autonomy also decentralized procurement, and the annual volume of transactions steadily declined from 1997 to 1999. “Every year the number of public procurement projects fell around 3 percent,” said Jae-yong Lee, a former PPS employee who helped implement reform. “It felt like the public and the clients [suppliers and contractors] were turning away from the PPS.”

High-level talks about government reorganization included calls to overhaul, merge, or break up the PPS. “Many PPS officials felt the strong need for a fundamental institutional change in order to secure the organization’s existence,” said Jae-yong Lee. “Every time government reorganization was discussed, the PPS was nominated as a top candidate for restructuring or downsizing.”

In sum, Korea’s haphazard, disjointed procurement system benefited unscrupulous PPS officials and the firms with which they had entrenched relationships. Irregular and inconsistent paperwork requirements raised the transaction costs, corruption risks, and barriers to market entry. Quality declined because of no-bid contracts and as a result of competitive bidding processes that were based solely on price and that disregarded other factors such as service guarantees or contractor experience.
To resolve those issues, the Korean government looked to create a centralized “e-procurement” system. The new system would include a standardized bidding process, with all documents submitted and processed electronically, along with an online marketplace of goods and services available for public procurement.

As the home of leading global information technology (IT) firms and with wide public support for nationwide high-speed internet access, Korea was well positioned to capitalize on rapid technological advances and to promote e-government and e-commerce. The Korean government prioritized e-procurement as an ideal use case for e-government because of its effect on everyday citizens, its potential for cost savings resulting from efficiency gains, and its synergy with growing e-commerce markets. Indeed, a few large entities such as the military were already piloting their own e-procurement systems on a small scale.

The task would not be easy, given the size of the procurement market. In 2001, the amount spent on public procurement in Korea was 67 trillion won (US$56 billion), which was 47 percent of all government expenditures (142 trillion won, or US$118 billion) (Shin and Park 2004). At the time, the PPS handled roughly 30 percent of public procurement nationwide, while the remainder was run by other departments and government agencies such as the military and local governments.

In 2002, the PPS introduced KONEPS, a fully integrated, one-stop, online procurement service. The system covered the entire span of the procurement process, including budgeting, business planning, vendor registration, requests for proposals, submissions, evaluations, and contract management. It linked with more than 140 external systems to share and retrieve data in real time. KONEPS created a single, government-wide, open-procurement market to make competition for public contracts more fair, open, and robust. An integrated electronic market with consistent rules and procedures reduced administrative costs and increased accountability by providing a verifiable record of the whole public procurement process.

### Delivery Challenges

The development of KONEPS was part of a broader shift of the PPS’s organizational culture toward a customer service orientation that focused on serving businesses, other government agencies, and ultimately citizens. Implementing KONEPS within this new model posed several challenges such as coordinating across government agencies, engaging with system users, overcoming corruption and resistance from its beneficiaries, and developing new legislation and technical systems.

### Intergovernmental Coordination

Successive presidential administrations and legislators across party lines supported the project to streamline and digitize procurement. The PPS also benefited from its position under the powerful Ministry of Strategy and Finance, which provided financial, legal, and administrative support. Nevertheless, the long-term project to develop KONEPS required sustained coordination across government agencies. “Since the development of KONEPS required allocation of a large budget, cooperation with the budget and policy authorities was important,” said Ogyu Kwon, who was the PPS administrator from 2002 to 2003.

### Stakeholder Engagement

For KONEPS to succeed, it had to meet the needs and interests of all its users, including private vendors, government officers responsible for procurement, and oversight agencies such as the Korea Fair Trade Commission. The PPS also needed to coordinate with the private sector and other interest groups to collect their feedback for system design. In addition, the PPS had to contract with private IT service providers to develop and operate the system. “Close communication and cooperation between private enterprises contracted to develop the system and PPS employees were essential,” said Ogyu Kwon. “Coordination with the private companies who used the system was also particularly important.”

### Lack of Commitment

Overall, the development of KONEPS substantially increased the PPS headcount because the agency needed new staff members to handle system design, user queries, and data analytics. However, older staff members, who were more comfortable using the paper-based system and accustomed to meeting vendors in person, feared...
the new system would make their knowledge, skills, and relationships redundant.

Initially, many PPS officers, government agencies, and private suppliers resisted change and the adoption of KONEPS, either because they benefited from the old processes or had concerns about the new system. Some government officers feared losing their authority, discretionary power, and even their jobs. Gaining the buy-in of those officials would be critical, because they would be the main administrators and users of KONEPS.

Dr. Dae-sik Kim of the Procurement Research Institute in Korea explained, “It is natural for government officials to fear losing their authority and discretion in the bidding process. Government agencies do not want to delegate their power of selecting suppliers to a central procurement agency. Many officials also fear losing work.”11

Beneficiaries of corruption and collusion, including vendors and procurement officers within government, also sought ways to work around countermeasures and to evade detection, resulting in a perpetual arms race between fraudsters and counter-fraud measures. Bid-rigging and illegal collusion between vendors and purchasers were constant concerns. Such corrupt practices were deterred by using advanced fraud detection with data analytics, which had been facilitated by technical advances and cooperation with oversight agencies, but they were not eliminated.

Legislation and Regulations

The digitalization of procurement administration required new laws, regulations, and administrative decrees. The government also needed to establish mechanisms to prevent falsifications of documents and to ensure the security, reliability, and fairness of electronic transactions. An early pilot of an e-bidding system in 1996 ran into legal difficulties because of uncertainty over the validity and verification of e-records and signatures.

IT Challenges

For users to trust the security and reliability of the e-procurement system, that system had to protect confidential and sensitive information without sacrificing the transparency and open data needed to promote fair competition. Bid submissions often included financial data that were vulnerable to hacking or corporate espionage, and procurement contracts could involve large sums of money. The system had to harmonize and integrate more than 50 external systems and incorporate mechanisms to flag suspicious bids and indicators of collusion. All those tasks required a team of skilled IT personnel for system development, maintenance, and upgrading. However, the PPS started this work with a relatively small IT staff and with few technical resources.

Once the new system was in place, the PPS had to train government users—many of whom had little experience working with electronic systems—and to address their feedback and concerns.

Tracing the Implementation Process

The evolution of KONEPS proceeded incrementally through several stages. Major milestones included the Extensible Markup Language (XML)-based Electronic Data Interchange (EDI) system, which began providing e-bidding, e-contract, and e-guarantee services in 1996; the launch of KONEPS in 2002; the adoption of the Multiple Award Schedule (MAS) system in 2004; and the Bid Rigging Indicator Analysis System (BRIAS) in 2006. Other important elements included the passage of implementation legislation as well as training and communications. Early success in the first phase (1996–2001) led to high-level government attention and funding that facilitated the rapid scaling of KONEPS in a second phase (2001–02).

Piloting an Electronic Data Exchange and Small-Scale E-Procurement Systems

The development of Korea’s e-procurement system began with the launch of the Procurement EDI, an electronic platform for government offices, for the PPS, and for vendors to share procurement-related documents and data. The new system was built on a bidding system for the infrastructure and construction sector, and it was based on optical mark recognition cards that were launched in 1994.

From 1996 to 1997, the PPS piloted the EDI service in key sectors, with support from the National Computerization Agency and private contractors. They selected domestic purchases, facility construction, and

11 Interview by Christine Joo with Dae-sik Kim, May 5, 2020.
accounting as pilot sectors that were based on trading volume, ease of implementation, and potential impact. The PPS began applying EDI services in 10 key tasks of procurement, including bidding, processing, and modifying online procurement requests, contracts, guarantees, and accounting. Twenty central and local government agencies, qualified EDI system companies, and guarantee insurers collaborated on the pilot under the PPS leadership. As the PPS expanded the EDI system for government purchasers and private vendors, cost savings enabled fee reductions that attracted users.

**Improving System Use**

While the perceived success of the 1997 pilot project helped the PPS to secure government support and funding for more ambitious reforms, the PPS learned from its shortcomings. Lessons learned included the need to strengthen coordination and information sharing and to make the system more user-friendly in accordance with a pivot to a “customer-oriented procurement service innovation plan,” which the agency had initiated in November 1999. The plan had three goals: (a) promote e-commerce in procurement work in accordance with the transition to an information-based economy and society, (b) establish a transparent and fair system that meets the standards of advanced countries, and (c) enhance the efficiency of the internal operating system.

To win users’ trust, the PPS emphasized openness and receptiveness to user needs. The PPS publicly released details of the e-bidding process and invited suppliers to visit the PPS office to watch how bid management worked in the bidding room. The PPS established a customer support group, operated a call center to guide suppliers, and created an office space resembling a bank teller’s window to interact directly with clients.

“Because of the negative image of the PPS, it was necessary to transform procurement administration from the user’s perspective and computerize the system to fundamentally eradicate corruption and other irregularities,” said Byung Il Kim. His team introduced a “multiple-reference price system” for all bids to prevent leakage of the expected price. To prevent bid-rigging, the system blindly based its reference prices on average prices with a randomized variation, so that neither procurement officers nor bidders could access price information beforehand. Real-time transparency and external legal and commercial experts’ expanded participation also helped build trust in the process. Finally, Kim and other PPS leaders convened and attended regional meetings with local suppliers and government officials to explain e-procurement plans and to gather their opinions.

The agency collected user feedback from its staff members and clients about potential improvements to procurement systems and practices. For example, in response to concerns regarding the quality of procured goods, the PPS first upgraded and expanded its inventory of items and revised the standards for goods. Then, the PPS strengthened the quality of inspections and the management of post-sale contracts, thereby establishing stricter conditions for procured goods and assigning staff members to conduct regular maintenance checks jointly with suppliers. To reduce the burden on suppliers, the PPS subsidized the cost of returns and exchanges, which followed the lead of e-commerce platforms.

The PPS devoted extra attention to encouraging and supporting SME participation, thus recognizing the challenges that many SMEs faced with limited capacity to focus both on sales and marketing and on research and development. The PPS designated a line of “excellent products” on its exchange to highlight high-performing products that incorporated new technologies produced by SMEs.

**Establishing a Legal and Regulatory Framework for E-Procurement**

From the late 1990s onward, the Korean government introduced new legislation and legal amendments to create a legal and regulatory framework to support e-procurement. A special committee under the economics ministry led the legal reform efforts. “The leadership of the e-government special committee helped to overcome various challenges,” said former PPS administrator Hyong-Jong Min.

One of the most fundamental steps was to permit the use of electronic signatures, which had not been envisioned when Korea’s contract laws were first drafted. In 1999, the Korean government enacted the Framework Act on Electronic Commerce and the Electronic Signature Act to enhance the security and credibility of electronic documents that were instrumental to e-commerce.

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12 Interview by Christine Joo with Byung Il Kim, May 12, 2020.
13 Interview by Christine Joo with Gil Yong Chung, April 20, 2020.
14 Interview by Christine Joo with Hyong-Jong Min, May 14, 2020.
and e-bidding. The E-Signature Act clearly stipulated a standard for encryption used by the private sector in line with OECD guidelines about encryption policy. Those regulations established the terms and conditions for e-bidding and bidding execution, with special provisions for construction, purchasing goods, and other sectors.

To address security issues arising from virtual interactions, the government introduced a certified authentication service for all areas of e-commerce, including internet banking, shopping, and petitioning. The Korean government made a series of legal revisions and new laws to recognize e-bidding and third-party bidding, such as the Agreement on the Application of the Certified Authentication Services of the PPS e-bidding system, which provided certified authentication for e-bidding.

**Expanding the Pilot E-Procurement System**

From 1998 to 2001, the PPS expanded KONEPS to cover issues such as (a) the disclosure of bidding notices, goods and price lists, and bidding results; (b) the support for bidding for small-sum purchases; (c) the registration and management of procurement-related products; and (d) the provision of product and supplier information for ordering. The PPS also expanded the range of procurement services available for e-bidding to include foreign capital and facilities, and it updated the XML document interface.

By the end of 1999, the PPS, end-user purchasing government entities, and suppliers processed a total number of electronic transactions estimated at more than 1.5 million (PPS 2008). The PPS had converted more than 4 million documents to electronic files and had introduced paperless transactions through the e-document sharing system. The expanded electronic system helped to increase the procurement administration’s productivity and efficiency by reducing processing time, document volume, and payment time, which led to an estimated annual budget savings of about 50.2 billion won (US$54 million) (PPS 2008).

To further expand the coverage of e-procurement, the PPS implemented a Procurement EDI and E-Commerce Expansion Project from May 2000 to April 2001. From May to October 2000, the PPS contracted Samsung SDS to manage the technical aspects of developing a computerized e-bidding system. The team felt strong pressure to deliver by the October deadline, which had been established under implementation legislation. “The goal has been established by law,” said Byung Il Kim. "If you don’t succeed by then, you’re breaking the law.” As part of the process, the team carried out a business procedural review to trace and harmonize each organization’s workflow with standardized documents and standard codes for electronic documents.

In September 2000, the PPS opened a pilot website for e-bidding where vendors could register online and sign electronically. On November 3, 2000, the PPS officially launched the website in a grand opening ceremony. The full operation of e-bidding for all government purchasing entities began two months later. In 2001, the PPS launched an e-payment system to replace the mailing of treasury checks with electronic funds transfer payments for suppliers as well as e-guarantee and e-contract services.

The government—encouraged by positive feedback and evaluations of the PPS pilot projects—agreed to introduce KONEPS as an e-procurement system for all government agencies to replace the fragmented and inconsistent procurement systems in use among various public offices.

**Creating a Centralized, Integrated System from the Pilot Project**

As Korea’s e-government initiative began to accelerate, the Dae-jung Kim administration (1998–2003) selected the development of a comprehensive, national e-procurement platform as one of the 11 major tasks for e-government services to increase efficiency, transparency, and equal access (Karippacheril et al. 2016). Initially called the Government to Business or “G2B” project, the program aimed to build a comprehensive e-procurement system that could serve as a single window for public procurement.

To establish a comprehensive, centralized e-procurement system, the Korean government needed the cooperation of all public agencies and the private sector. From 2001 to 2002, the PPS organized meetings with private vendor companies, private economic associations, internet companies, and public institutions to collect their opinions. Sources agreed that the new system needed to be neutral, well-resourced, and

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centralized. The group also raised the need to standardize online transactions because the classification codes for products varied among the different institutions. The G2B Actual Affairs Team held meetings with institutions—including the Integrated Forum on Electronic Commerce, Korea Institute of Distribution and Logistics, and Korea E-Business Association—to determine the features of the electronic catalog and to standardize the government commodity classification and identification codes in alignment with international standards.

The Korean government organized special committees and began conducting year-round training at 23 training centers across the country. The G2B Support Committee, composed of public and private sector experts, oversaw the “G2B working groups,” which were tasked with integrating technology with the existing systems and enacting or revising procurement policies and regulations. An e-commerce policy committee, chaired by the deputy minister of the Ministry of Commerce, Industry, and Energy, devised e-commerce policies. The government also established consumer protection guidelines and a dispute resolution body. Drawing on meetings with those bodies, the Korean government established a legal basis for the G2B operations by revising the enforcement decrees for procurement and government contracts, local finance and procurement, and related regulations. The reforms relied on administrative changes to avoid a lengthy legislative process.

In early 2002, the system implementation work was awarded to a private sector developer, which completed the final development work by September 2002 under PPS supervision. An IT company and a specialized consulting company developed a KONEPS implementation plan that defined the scope and established the conceptual architecture of e-procurement. To accelerate development, the PPS drew on lessons from previous phases in e-service development. The government assisted by revising related laws and regulations, including stipulation and agreement clauses for external institutions.

In 2002, the PPS officially launched KONEPS. To assuage user concerns, the agency demonstrated the system’s innovative use of public key infrastructure (PKI) for data encryption. “At the time, the PKI system was the most advanced and secure system, which helped to create trust in the system,” said Dae-in Kim. “It also contributed to the development of the electronic authentication market and related companies.” A system of open technical standards enabled mutual compatibility and relatively secure electronic transactions with a range of devices.

### Training and Acculturating Staff Members

The implementation of KONEPS involved several challenges in training and communications. The PPS had to form a core staff with advanced technical skills, to train other personnel to use the new system, and to overcome resistance by staff members who were concerned that adopting digitalization would undermine their authority.

Between 1998 and 2002, the number of PPS staff members fell from 1,058 to 935, while the value of the procurement they handled increased by one-third, from $12.8 billion to $17.1 billion (World Bank 2004). Although the PPS outsourced the development of KONEPS to Samsung SDS, the PPS still needed internal, skilled IT employees to effectively monitor and manage the system. The PPS E-Procurement of the Procurement Management Bureau manager, Gil Yong Chung, said that the agency was able to cultivate a team of skilled IT officials by providing various professional development opportunities. A taskforce composed of 20 experienced officials from different divisions of the PPS managed the KONEPS development.

“There was some internal resistance within the PPS,” said Byung Il Kim. “Even if staff did not explicitly object, there was a lot of psychological resistance from staff understandably more comfortable with existing methods. With electronic bidding, those who worked in the actual field would lose their authority. Ultimately, cooperation from the bidding department was needed, but it was not absolute.” Kim said the passage of legislation made it difficult for staff members to object. However, change would come regardless of whether they liked it.

The PPS opened a training facility that educated up to 5,000 people annually through 2- to 3-day residential courses as well as a certification process for procurement officials (Campbell 2017). Vendors and other interested users, including trade associations and private companies, received training through regional PPS offices. Ultimately,
two-thirds of the PPS staff members were certified in IT so they could adapt to new roles and responsibilities (World Bank 2004).

According to Jae-yong Lee, most officials within the PPS agreed that KONEPS would be good for the country, but they were divided over whether it would render the PPS obsolete.19 Pro-KONEPS officials argued convincingly that the e-procurement system would only bolster the procurement market and boost the PPS’s role in contract work. “With the electronic procurement system, no one questions the PPS’s existence,” Lee said. Ultimately, he advised, “There must be active efforts made to promote and explain what happens in internal infrastructure” if we are to ensure that officials without technical backgrounds feel comfortable with the implications of technological progress rather than feeling alienated and uncertain.

Hyong-Jong Min emphasized the importance of strong leadership and a frequent and consistent communication of vision to win over recalcitrant staff members.20 He said that the feeling that the PPS had to either go “digital or die” served as a powerful motivator but that PPS staff members ultimately came to appreciate the benefits of a reduced workload and enhanced efficiency.

Later Efforts to Improve Security and Accessibility

After its 2002 launch, KONEPS continued to expand and evolve to enhance security, user convenience, and social objectives. In 2003, the PPS established a data backup center that maintained the details of all transactions in real time and that ensured uninterrupted service in case of any disruption.

In 2006, Korea introduced the MAS, or stand-by unit-price contracts for suppliers with prespecified features and prices, to increase the diversity of suppliers and promote competition. Those products and prices were then listed in the Online Shopping Mall, which allowed users to explore products and to make purchases directly, with a user-friendly interface resembling widely used e-commerce sites. MAS and the Online Shopping Mall were designed to address user feedback and to improve administrative efficiency from centralized purchasing. Over the next few years, the PPS made the system more responsive to users’ needs by adopting a customer relationship management system and by extending access to mobile devices.

In response to persistent issues of bid-rigging and collusion among vendors, KONEPS adopted an innovative system for real-time information sharing and data analysis that would increase transparency and reduce the opportunities for corruption. The digitization of the entire procurement process through KONEPS enabled all procurement-related information to be shared online in real time; it also reduced private interactions between suppliers and contracting officials. Allowing the PPS and vendors to compare different bidding requirements that were prepared by public institutions reduced anticompetitive practices. The BRIAS, which the Korea Fair Trade Commission initially developed in 2006, applied predictive data analytics to KONEPS bid data to identify risk indicators as well as red flags for fraud and collusion for individual procurement actions. In response to a 2009 report of the Board of Audit and Inspection of Korea about security vulnerabilities, the PPS adopted a biometric fingerprint authentication system for users in 2010.

In 2013, after more than a decade of field experience and legislative negotiations, Korea passed a comprehensive e-procurement law.21 The new law established clear enforcement rules and simplified the legal framework that had evolved since the 1990s. The law detailed rules governing KONEPS operations to promote fair use of the system by government and private entities nationwide.

Outcomes

KONEPS became central to Korea’s public procurement system. The total value of KONEPS transactions increased from 36 trillion won (US$30 billion) in 2002 to 100 trillion won in 2019 (PPS 2019). By 2019, the number of public organizations using the system was 57,734, along with 434,000 suppliers. Since then, the system has become widely used by all levels of government and even by some private entities because of its popularity and ease of use, even though it is not mandatory for all public entities.

The Online Shopping Mall, which composed nearly one-fifth of the volume of KONEPS transactions in 2019,

20 Interview by Christine Joo with Hyong-Jong Min, May 14, 2020.
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featured 535,725 products provided by 9,909 suppliers (PPS 2019). Roughly one-quarter of the KONEPS transactional volume used e-bidding.

Electronic bid submission, data sharing, process automation, reductions in paperwork and fees, and other features of KONEPS saved public and private entities both time and money. For example, the time required to review bidding documents to select a winning bidder was reduced from more than 30 hours to less than 2 hours. A 2008 study conducted by Hanyang University estimates savings from KONEPS at about US$8 billion per year, with about 80 percent of the savings accruing to private sector companies (Lim 2009). Interviewed vendors expressed their satisfaction with the new system. “The bidding and selection process via KONEPS was fair and transparent,” said Hwondon Lim.22

Chang Min Park, who managed a construction supplier, said he appreciated KONEPS’s improved transparency, efficiency, and fairness. Because KONEPS made current bidding notices and real-time bidding information easy to find, he said, “It’s now easy to check bidding procedures and progress.”23

An OECD report noted, “Both buying agency representatives and individuals from companies registered as sellers on KONEPS reported satisfaction with the ease and functionality of the system. One interview subject commented that despite the fact that his volume of business in public procurement has grown dramatically since the introduction of KONEPS, the staff required to process the work has remained relatively constant, thanks to the efficiency benefits of the system” (OECD 2016).

The introduction of KONEPS led to improved transparency and reduced opportunities for bid-rigging and corruption in several ways, such as (a) eliminating direct contact between bidders and contracting officials, (b) digitizing the entire procurement process, (c) making bidding requirements public and transparent, (d) making transactions traceable, and (e) reinforcing compliance with strict protocols by contracting officials. Biometric security, digital PKI encryption, time-stamped bidding, and other fraud detection measures strengthened the integrity of the procurement process. A regular integrity survey of public entities by the National Integrity Commission of Korea showed an increase in the integrity index for the PPS by 27.2 percent over the three years after the launch of KONEPS (OECD 2016). Technical innovations, such as pioneering acceptance of digital signatures, had spillover effects in spurring e-commerce as well.

In 2019, the PPS offered 71 training courses for public procurement officials and suppliers, thereby serving roughly 20,000 domestic and foreign public officials and more than 3,000 private sector representatives (PPS 2019).

Jin-Sung Chung, a PPS procurement manager, noted several ways in which KONEPS improved efficiency, including (a) linking and sharing information among public institutions, (b) simplifying the process for small purchases using electronic catalogs and direct orders, and (c) making product information easily searchable and clearly priced.24 Electronic payments and the introduction of auto-invoicing streamlined the payment process, especially for multivendor contracts. The number of contracts processed by each PPS employee quadrupled.25

KONEPS supported economic growth and diversification by lowering barriers to entry and by fostering competitiveness, thus providing a large and reliable market for e-commerce and leveling the playing field for SMEs. KONEPS’s versatility and ease of use facilitated national policies to promote socially beneficial businesses by labeling and highlighting such products. In 2019, contract awards to SMEs represented 74 percent of the total contract awards for domestic goods and services and for construction works, whereas social enterprises constituted 0.8 percent, women-owned businesses were 9.7 percent, and disabled persons’ businesses were 2.1 percent (PPS 2019).

KONEPS was recognized early by the United Nations and OECD as a best practice model of procurement. Drawing on this success, the government has actively supported the implementation of similar e-procurement systems in several countries including Cameroon, Costa Rica, Jordan, Mongolia, Rwanda, Tunisia, and Vietnam, as well as the Iraqi autonomous region of Kurdistan.

The PPS continues to improve KONEPS, with a next-generation update slated for 2024, which will follow an upgrade project initiated in 2021 (PPS 2019). The next upgrade will use artificial intelligence and data analytics

22 Interview by Christine Joo with Hwondon Lim, May 6, 2020.
23 Interview by Christine Joo with Chang Min Park, May 8, 2020.
24 Interview by Christine Joo with Jin-sung Chung, April 17, 2020.
25 Interview by Christine Joo with Gil Yong Chung, April 20, 2020.
to provide intelligent information–based search and consulting services, with blockchain-backed document storage to better protect security.

Lessons Learned

Demonstrated Early Success and Frequent Training Helped Overcome Institutional Resistance

Early gains through a well-planned and executed pilot helped to reduce internal opposition, engage stakeholders, and build trust. The PPS built off the success of its pilot to expand the electronic process to all steps in procurement and to all government agencies. The PPS implemented a training schedule to persuade government employees that the system was user-friendly and reliable. High-level government communications made clear that the government was committed to the new system and that there would be no going back.

Incremental Development Promoted Reliability, Resilience, and User Trust

KONEPS evolved incrementally from a pilot project to a government-wide platform to a platform used by local governments, quasi-public entities, and even private sector companies. At each stage, the PPS integrated lessons learned and addressed emergent concerns. For example, as e-commerce shifted from desktops to mobile devices, the PPS had to adapt KONEPS and to introduce security measures such as biometric validation to stay ahead of changing system threats.

User-Oriented Design Improved Versatility and Modularity

KONEPS was designed to be adaptable to different institutions so it could facilitate its widespread adoption, even among private companies. This versatile design eased the rollout of new features such as the certification of products and the prioritization of local suppliers. The KONEPS management team continued to monitor the usage rate of the system and checked for system and processing errors. Private contractors and PPS staff members communicated and collaborated closely, drawing on feedback from vendors and client satisfaction surveys to identify and address any difficulties facing system users. “You need to treat the system like a living organism; otherwise the system will easily become outdated,” said Gil Yong Chung.26

Procurement Reform Can Serve Other Public Priorities

Investing in e-procurement ultimately achieved more than cost savings and reduced fraud. The technical and legal advances that were necessary for KONEPS helped spur the growth of the e-commerce sector through promotion of e-signatures and data security protocols. The versatile structure of KONEPS allowed for the promotion of businesses that were considered socially beneficial, such as SMEs, regional businesses, green businesses, and women-owned businesses.

26 Interview by Christine Joo with Gil Yong Chung, April 20, 2020.
References and Further Reading


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# Appendix A: Timeline

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<tr>
<th>Dates</th>
<th>Key Events</th>
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<td>1995</td>
<td>Korea joined the World Trade Organization.</td>
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<td>Korea adopted the local self-government system that granted autonomy to local governments and adopted the Act on the Contracts to Which a State is a Party.</td>
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<tr>
<td>1996</td>
<td>The PPS established the XML-based EDI system and began providing e-bidding, e-contract, and e-guarantee services.</td>
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<td>1997</td>
<td>Opening of the Korean government’s procurement market.</td>
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<td>1999</td>
<td>The Digital Signature Act enabled electronic contracts using e-signature.</td>
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<td>The EDI system was completed, allowing shared use of procurement information among PPS, public buyers, and firms.</td>
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<td>Sep 2000</td>
<td>Pilot homepage for e-bidding was launched, allowing bidder registration and e-signatures.</td>
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<td>May 2001</td>
<td>E-Government Special Committee laid out E-Government Vision and Strategy, and detailed development steps for e-government were to be completed by 2002.</td>
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<td>June–Dec 2001</td>
<td>E-Payment System was launched in June 2001, replacing paper checks and electronic funds transfers.</td>
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<td>2002</td>
<td>KONEPS implementation project was developed through a contract with Samsung SDS.</td>
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<td>Presidential decree No. 17688 implemented a single window for procurement by making it obligatory to publish bidding notices through the designated information processing system (Article 33: Public Notice of Tender, Enforcement Decree of State Contract Act).</td>
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<td>MAS contract system was introduced to boost competition (Article 7: Enforcement Decree of the Government Procurement Act).</td>
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<td>Information Strategy Planning (ISP) was established for business process reengineering and a single-window system for procurement.</td>
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<td>2003</td>
<td>President Roh Moo-hyun (2003–2008) took office and established the Presidential Committee on Government Innovation and Decentralization, which included an e-government committee that published a new strategy and vision.</td>
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<td>2004</td>
<td>KONEPS launched Mobile Information Service, which enabled browsing and searching for tender information via personal digital assistants (PDAs). The United Nations selected KONEPS as the Best Practice Model for E-Procurement.</td>
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<td>2005</td>
<td>KONEPS opened its Mobile Bidding Service, thus enabling bid submission via PDAs.</td>
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<td>The Local Government Contracts Act decentralized procurement, allowing local governments more leeway to set their own rules and policies.</td>
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<td>A pilot began of a radio-frequency identification (RFID) inventory management system.</td>
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<td>2006</td>
<td>The MAS framework contracts system and KONEPS Online Shopping Mall were introduced.</td>
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<td>BRIAS launched by Korea Fair Trade Commission to automatically and statistically analyze bid-rigging indicators on the basis of bid data.</td>
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<tr>
<td>Dates</td>
<td>Key Events</td>
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<tr>
<td>2007</td>
<td>KONEPS won the eAsia Award at the Asia Pacific Council for Trade Facilitation and Electronic Business conference. Management and maintenance of KONEPS began to be contracted out to private enterprises, thus placing PPS contracting officers in charge of only the management of outsourcing contracts and the PPS internal information system.</td>
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<td>2008</td>
<td>PPS implemented safety measures to allow mobile e-bidding on KONEPS (bid submission via mobile phones).</td>
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<td>2009</td>
<td>The RFID inventory management expanded governmentwide. BRIAS became fully operational and enforced by the 2009 Monopoly Regulation and Fair Trade Act.</td>
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<td>2010</td>
<td>PPS adopted the biometric fingerprint authentication system to fight vulnerability to bid-rigging—a problem raised by the 2009 Board of Audit and Inspection of Korea report. The Public Procurement Minimum Green Condition Product program was launched to encourage green technology development and was facilitated by PPS's Integrated Information Network for Green Purchasing in Public Sector.</td>
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<td>2011</td>
<td>Smart E-Government Plan began to shift e-government from desktop based to mobile based.</td>
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<td>2012</td>
<td>Discovery of illegal theft and leakage of limited KONEPS-user tendering information exposed a security vulnerability.</td>
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<td>2013</td>
<td>PPS introduced Subcontract Management System for Government Contracts to allow project owners to manage the subcontracting process automatically. To increase competition, PPS introduced a feature whereby KONEPS automatically selects two additional suppliers at random in addition to those selected by the buying entity. The Electronic Procurement Utilization and Facilitation Act (E-Procurement Act) was enacted to address shortcomings of KONEPS, especially vulnerability to bid-rigging and data leakage. The Data Disclosure Act opened KONEPS to private entities. PPS launched a Public Procurement Data System project to provide policy makers and citizens with complete public procurement transaction data—beyond KONEPS users. PPS established a unified service classification system.</td>
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<td>2015</td>
<td>The Software Industry Promotion Act was passed for SMEs’ participation in e-government projects. PPS took over management of KONEPS from private sector, with PPS staff members directly managing critical activities such as bidding, evaluation, and cybersecurity.</td>
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<tr>
<td>2016</td>
<td>The year saw the launch of an e-procurement shopping mall for venture and start-up firms and launch of the Open Procurement Data Portal.</td>
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<td>2017</td>
<td>Open application programming interfaces on procurement information were established.</td>
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<td>2018</td>
<td>Eighteen types of procurement information—including data of tender notices, bid awards, and contracts—were made available free of charge.</td>
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