TOP 15

Korea has pioneered the use of fingerprint recognition technology to counter proxy bidding and bid rigging in electronic procurement. Vendors' fingerprints act as an electronic key, meaning they can only submit one bid per contract.

The fingerprint recognition system prevents bid rigging, ensuring a level playing field for suppliers and value for the authorities

SMART SECURITY FOR ETHICAL PROCUREMENT

Fingerprint recognition e-bidding in Korea

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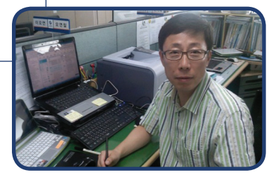

Organizations: Republic of Korea Public Procurement Service (Government)
Theme: Using ICT to improve procurement systems
Country: South Korea

SUMMARY

The Public Procurement Service of Korea introduced the Fingerprint Recognition e-Bidding System in April 2010 to prevent forms of corruption such as illegal proxy bidding and bid-rigging. By reading a bidder's fingerprint electronically and comparing it with pre-registered user data, the adoption of fingerprint recognition technology prevents illegal proxy bidders from participating using borrowed registration certificates. It also means no supplier can enter false bids to skew the tendering process, nor can anyone access submitted bids in an untimely or inappropriate way.
As a result, illegal e-bidding attempts have been dramatically cut. Without compromising the economic efficiency and convenience of electronic tendering, transparency and fairness have been reinforced.

CHALLENGE

Korea's Public Procurement Service (PPS) launched the Korea On-line E-Procurement System in September 2002, making the country's entire public procurement process electronic. It became a world-class e-procurement system, used by 44,000 public organizations and 220,000 suppliers. However, the nature of e-bidding conducted on-line enabled illegal proxy bidding and bid rigging. Suppliers or third-party brokers could participate in electronic bids on behalf of others by borrowing registered suppliers' e-certificates of registration. This meant one broker could submit many bids for a single contract, manipulating the bid price and profiting illegally when the contract was awarded. (Third-party brokers receive on average 2-5 percent of the amount of an awarded contract.)

Investigations by police and prosecutors, reports from other bidders and internal monitoring processes revealed that such illegal practices occurred continuously, causing doubt about the reliability of e-bidding, as well as wasting portions of the national budget.

To eradicate fraudulent practices, the procurement service introduced measures such as a tighter bidder identification system, an informant reward policy and a system for analyzing corrupt activity. However, the great amounts of time and effort required to investigate fraudulent bidding practices and impose administrative measures against the perpetrators meant some of the measures proved ineffective. Korea's procurement service needed an alternative way to increase security around electronic bidding.

INNOVATION

After thoroughly reviewing all available measures, PPS decided to introduce a fingerprint recognition e-bidding system, inviting only qualified and registered bidders to take part. The system allows users to submit bids only when their fingerprint matches a pre-registered fingerprint in a biometric security token. Unlike other authentication certificates, this biometric certification cannot be used by anyone other than the registered bid participant. As a result, the system helps ensure transparency and fairness in the e-bidding process. This ambitious innovation required several key stages:

- ***Finding the right technology***
  The system would revolve around a 'security token', a USB-type device which stores a user's biometric 'e-signature key' (fingerprint) and other personal information. It is a piece of hardware which generates the e-signature key and verifies a user through the coding software installed. Working with five local certified authentication agencies, PPS discussed ways to register fingerprint information in the token after verification of a bidder's identification during the process of issuing a certificate.

  To ensure a stable, reliable system, PPS needed to establish functions and standards for the fingerprint security tokens. For 18 months during 2008-9, the procurement service continuously held discussion meetings with certified authentication agencies and manufacturers, developing and reviewing the technical specifications for the token. The biometric security token chosen for the fingerprint recognition e-bidding system uses the latest technology, making Korea's procurement service the first in the world to use such a method.

- ***Consultation with stakeholders***
  Before implementing the system, PPS staff met with specialist IT manufacturers and the public certification authorities to gather opinions and suggestions. Suppliers' opinions were also gathered online and taken into account before proceeding with the system. Their initial responses were mixed. Supporters agreed that the new system would enhance fairness, transparency and security, while others opposed it on grounds of complexity and additional expense. These concerns were overcome as the program was progressively promoted to bidders via multiple communication channels, including a website, faxes and mailings, and through regional briefing sessions held in partnership with relevant industry associations.

- ***Piloting the system***
  PPS acquired approval for the fingerprint recognition system from the Korea Internet Security Agency, and in November 2009 recruited a trial group of 300 volunteers from among its suppliers to test the system. The suppliers were chosen according to their experience with submitting electronic bids – each used the system more than 20 times a month. In January 2010, an anti-forgery fingerprint test was also successfully completed in the Biometric Research Center in Seoul's Yonsei University, verifying the safety of the system. After successful early testing, initial implementation of the fingerprint recognition system began in February 2010.

- ***Roll-out to users***
  By appointment at local procurement offices nationwide, bidders started to register their fingerprints on the system. An estimated 270,000 potential bidders, including suppliers' representatives and proxy bidders, were required to register. After a thorough verification of bidders' identification by relevant officials, their fingerprints were taken electronically.

  To make the process as smooth as possible for suppliers, PPS allowed them to make an appointment to register at a time and location of their convenience. Suppliers located in remote areas were visited in person by officials who carried out the registration process on their premises. In April 2010, given stable technological trials and successful bidder registration, PPS first introduced the fingerprint recognition system, starting with construction contracts. After a gradual roll-out across sectors, the biometric system was fully implemented in every bidding process by July 2010.

  To boost security, it was reinforced by other new regulations, including the introduction of a measure allowing only one proxy bidder per company. Suppliers wanting to register a proxy bidder had to submit a certificate of employees' insurance to confirm that the proxy bidder was employed by their company.

RESULTS

The introduction of the fingerprint recognition e-bidding system had direct and indirect effects:

- ***Increased transparency, fairness and reliability***
  The system's main objectives – to improve transparency, fairness and reliability – were realized. By reinforcing the verification of bidders' identity, it helped eradicate illegal and manipulative e-bidding practices. As a result, not one case of loaned certificates has been reported since the system's launch – compared to 1,777 cases (worth about US $30 million) uncovered by prosecutors and police involving the illegal lending of certificates prior to implementation. Most of these cases were of a single broker with many e-certificates, gaining inflated profits when the contracts were awarded.

  After the introduction of fingerprint recognition, the Korea Association of Procurement and Supply Management conducted a survey among suppliers who had used the system to participate in e-bidding. The results clearly showed that fingerprint recognition had positive effects on the process, with 78 percent of respondents saying it enhanced transparency, 73 percent reporting improved fairness and 80 percent noting improved reliability. The system prompted more accurate verification of actual bidders and provided a fundamental solution to the problem of loaned e-certificates. Bid rigging was prevented, giving participants a level playing field and enabling the Korean authorities to secure the best prices for goods and services.

- ***Better rights for legal proxies***
  An indirect social benefit of the fingerprint recognition system was that the need for proxies to be registered, requiring their employee's certificate of national insurance, led to an increase in the number of legal proxies with full employment rights. The employees' insurance is a proof of employment in Korea, and covers health, unemployment, pensions and workers' compensation. During the fingerprint registration, a procurement service official checks via the employees' insurance database whether the registrant is actually employed by the supplier.

After its initial success, the fingerprint recognition system is now the universal approach applied in every e-bidding process in Korea. It is continuously being updated and developed to meet user needs and enhance transparency and reliability for bidders.

LESSONS LEARNED

The introduction of the Fingerprint Recognition e-Bidding System was viewed as an exemplary approach to introducing innovation, thanks to its careful incorporation of stakeholders' suggestions and opinions. Despite this, the process still revealed valuable lessons:

- ***Communicate openly***
  Although bidders were widely consulted during the process, the new fingerprint system sparked strong opposition among some in its early stages. They objected to the additional registration process, the cost of purchasing the device and early-stage technical hitches. Through continuous communication and promotions, the procurement service succeeded in convincing users that the system was the fundamental way to eradicate illegal bidding practices and make tendering fairer for them and better for Korea. In order to prevent suppliers becoming disadvantaged by not being registered for the system, PPS hosted meetings with a number of suppliers based in the regions and held six regional briefing sessions in collaboration with the Korea Construction Association. Measures were taken to minimize inconvenience to suppliers, such as allowing registration at a time and location of their choice.

- ***Be flexible where appropriate***
  Although technical trials of the system went smoothly, there were some cases soon after its launch where the device failed to recognize a fingerprint. In such cases, and where bidders were being excluded from a bid due to having not yet registered, a temporary exceptional procedure was enacted. This allowed bidders to submit the bid using the pre-existing method.

- ***Keep on innovating***
  PPS is consistently working to improve the system, both institutionally (so bidders cannot arrange bid-rigging off-line) and technologically. Off-line bid-rigging is by nature difficult to prevent, but by using fingerprint recognition, PSS is preventing multiple tenders from flowing into a single bid through the same computer. It is also examining other biometric information, such as iris, face and voice, for cases where users' fingerprints cannot be recognized, e.g. for people suffering from hyperhidrosis (a condition causing excessive sweating). PPS chose fingerprint recognition because of its wide use with proven technological stability, but is open to alternative options as long as they meet required standards.

With this ongoing innovation, Korea aims to continue its pioneering use of biometric security to promote procurement of the highest ethical standards.

RESOURCES:

http://www.pps.go.kr/english/

Korea's Procurement Service teamed up with Yonsei University in Seoul to carry out anti-forgery fingerprint tests.