

**ELECTION
FRAUD**

REPORTS

CONSOLIDATED ELECTION
REPORT – REPUBLIC OF KOREA
21ST NATIONAL ASSEMBLY
ELECTIONS, 2020

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Introduction

As part of ensuring that democratic elections across the globe maintain the will of the people, organizations monitoring them must constantly and regularly monitor Election Management Bodies (EMB's) ensuring they always maintain transparency as required of them by the electorate and the law. Not only are they accountable to individual voters, but they are also accountable to democratically elected governments who have been put into positions of power by these voters.

Today, elections in certain parts of the world, as has been in the past, are fraught with controversies. There are several reasons as to why this is, but for the most part its simply because people/political parties use unscrupulous means in which to remain or gain the seat of power. It's these acts that lead organizations to constantly review processes and the way in which elections are held. In most cultures around the world, people are taught to win not lose and when the stakes are high the idea of winning at any cost becomes more of a reality.

This is not to say that all people cheat, what it says is that people will go to great lengths to win. Winning a running race fair and square in the good old days was simply achieved when one person crossed the line first before another, there was never any doubt that they had won. Today the outlook is very different, with the dawn of performance enhancing drugs and muscle stimulants, athletes are constantly questioned and tested to ensure that they have not taken a stimulant that would effectively give them the edge over another. Organizations have sprung up around the world over the last number of years to govern the process, ensuring people do not cheat and most importantly making sure that all athletes compete on a level playing field. Why is this important? It is important because everyone needs to have a fair opportunity to take part in the race. It would be very unfair if one person had the edge over another simply because s/he had performance enhancing drugs in their system.

What then is the difference when it comes to winning an election race, when a "performance enhanced" process has been put in place to give another the edge? Nothing, that is why organizations similar to the ones above have sprung up over the years. These organizations have taken it upon themselves to not only ensure that the playing field is level but to ensure that the will of the people is always maintained as is stipulated in any good electoral law governing elections. In every election good or bad, the presence of election monitoring bodies helps to ensure that elections are free, fair and the outcomes thereof are the will of the people.

The aim of this document is to present a case in which possible irregularities may have occurred in the recent 21st National Assembly ROK elections held in April 2020. Given that, this document outlines the electoral system in ROK, the technical reviews and subsequent reports completed and several recommendations that would assist in ensuring that transparency and the will of the people prevails in the next upcoming elections in ROK.

Context

Election day is not the only element of an electoral process but is one of the critical stages of the process which forms part of the overall integrity of the elections. It is the outcome and the reflection of a pre-electoral campaign, the moment when voters express their final choices about policy issues and political forces that they would like to see representing them in their country's governance. Election day procedures are also a reflection of how robust the overall electoral framework is. Overarching elements and long-term processes such as detailed and precise legal frameworks, sub-legal regulations, training and preparedness of election officials and voter education, to name just a few, have an impact on the conduct of election day procedures. Hence the importance of analyzing the elections process and not looking at the technology used and the steps in silo, as it is all complementary, and the violation might be in the link between the steps and, hence jeopardizing the whole process.

Authoring Body	Document	Acceptance Level	Date Ratified
UN	Convention on the Rights of Persons with Disabilities	Signed	July 03, 2013
UN	Convention on the Rights of the Child	Ratified/Acceded	September 21, 1990
UN (CEDAW)	Convention on the Elimination of All Forms of Discrimination against Women	Ratified/Acceded (with reservations)	February 27, 2001
UNGA	International Covenant on Civil and Political Rights	Ratified/Acceded	September 14, 1981
UNGA	International Covenant on Economic, Social and Cultural Rights	Ratified/Acceded	April 10, 1990

This report will have a descriptive comprehensive approach of the elections in the Republic of Korea and assess the observation in regard to the international standards and best practices for free, fair and transparent elections. Republic of Korea is bonded to applying these international standards as it has signed and ratified several international treaties forcing its government to abide by them:

Transparency and honesty in counting and establishment of election results

As a key guarantor of the integrity of election day procedures, international standards and good practice it is required that **votes cast should be counted honestly, results made public within legal timeframes**, and that there is **no possibility for undetected fraud or errors to alter results**. The consistency in the implementation of procedures, overall transparency, and timeliness of the process during this crucial phase, including the resolving of election results disputes, contributes to public trust and acceptance of election results.

Applicable standards include:

- 1966 ICCPR, Article 25 to which ROK has ratified on September 14, 1981
- 1996 UN HRC General Comment No. 25, paragraph 20.

Alternative methods of voting and voting arrangements may entail adjustments to the usual institutional set-up, applicable procedures and timeframes for counting, tabulation, and the announcement of official results. Depending on the solutions identified, the extent of their compliance with the requirement to count and report votes honestly, with the results made public, may vary.

Analysis of the solution implemented by ROK during the last elections:

When considering altering voting methods and arrangements, explicit attention needs to be paid to ensuring that counting and tabulation procedures are adjusted accordingly and this is made public; **any new or ad hoc institutions being involved or procedures are and need to be covered by the legal framework**, with their duties clearly outlined; and that transparency requirements, including for timely publication of detailed election results, are maintained. It is important to have complaints and appeals timelines adjusted to take into account the alternative voting methods being implemented. In addition, regardless of the voting methods and arrangements used, **it is crucial to preserve the right and the ability of contestant representatives, media and observers to follow counting and tabulation processes**.

Section 1 – Electoral Process in the Republic of Korea

Organization of Elections

The organization of the elections of ROK is totally vetted and is legally constituted to the National Elections Commission (NEC).

The NEC of the Republic of Korea

1. Establishment and Status

Establishment: January 21, 1963. The establishment of the NEC as a constitutional body was stipulated in the fifth revision of the constitution in 1962.

Status

The NEC is an independent constitutional body that manages elections and national referendums fairly and deals with administrative affairs concerning political parties and political funds.

The NEC is an independent consensus-based constitutional body on the same level as the National Assembly, the National Government, Judicial Courts, and the Constitutional Court.

2. Election Commissions

Organization and Composition

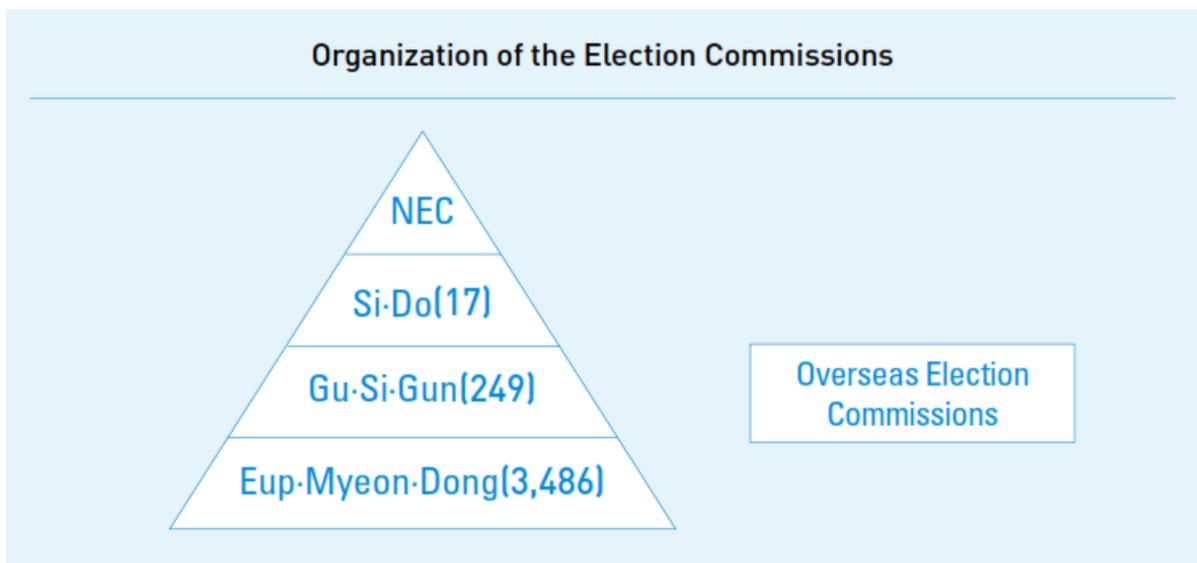
The election commissions in the Republic of Korea form a four-tiered organizational structure, consisting of the National Election Commission, 17 Si/Do election commissions, 249 Gu/Si/Gun election commissions and 3,486 Eup/Myeon/ Dong election commissions.

The NEC overseas election commissions are temporarily established at diplomatic missions for presidential elections and National Assembly elections that are conducted at the end of the term of office.

Composition of the National Election Commission

The NEC is composed of nine commissioners. Three are appointed by the President, three are elected by the National Assembly and three are nominated by the Chief Justice of the Supreme Court.

The commissioners are appointed, elected, or nominated after a confirmation hearing at the National Assembly. The Chairperson is elected by a consensus vote by and from among the commissioners.



Affiliated Agencies

Internet Election News Deliberation Commission (IENDC)

Establishment: The IENDC was founded on March 12, 2014 to ensure the impartiality of election news on the internet.

Organization: The commission is composed of up to eleven commissioners, including one recommended by each political party with a negotiation group in the National Assembly and others recommended by the Press Arbitration Commission, academic media circles and the internet associated press (term of three years).

Mandate: The IENDC is mandated to assess whether election news posted on the internet is fair or not. The commission provides real-time monitoring of election-related news by around three thousand internet media outlets and also deliberates on the request for and makes a decision on formal objections and correction reports filed by political parties or candidates.

National Election Broadcasting Debate Commission (NEBDC)

Establishment: The NEBDC was founded on March 15, 2004 to fairly manage and operate broadcast speeches and debates and establish a sound debate culture.

Organization: An election broadcasting debate commission is established and operated under each election commission including the NEC, Si/Do election commissions and Gu/Si/Gun election commissions. The NEBDC is composed of up to eleven commissioners and the local-level broadcasting debate commissions are composed of nine commissioners, including one recommended by each political party with a negotiation group in the National Assembly and the other members recommended by public broadcasting companies and from academia (term of three years).

Mandate: The NEBDC is mandated to manage the affairs regarding the broadcast speeches and debates for presidential elections and elections for proportional representation members of the National Assembly, and policy debates for public official elections following the termination of office, Policy debates are organized according to the Political Parties Act.

National Election Survey Deliberation Commission (NESDC)

Establishment: The NESDC was founded on March 5, 2014 to ensure the objectivity and credibility of election polls.

Organization: Election survey deliberation commissions are independently set up and operated under the NEC and each Si/Do election commissions. The commissions are composed of up to nine commissioners, with two recommended by each political party with a negotiation group in the National Assembly and the others recommended from among experts from polling companies, legal circles and academia (term of three years).

Mandate: The NESDC is mandated to determine standards for election polls, manage the registration of the companies undertaking election polls, and to deliberate and make a decision on whether an election poll is in violation of the relevant law or legal standards.

Roles and Responsibilities of NEC

1. Management of Various Elections

Management of Elections for Public Officials

The NEC manages presidential elections as well as elections for the National Assembly, heads of local governments and local councils as stipulated by the Public Official Election Act.



Management of Election Expenses

The NEC determines election expense limits and audits the income and expenditure of election expenses.

Management of National Referendums

The NEC manages national referendums that ask the public their opinion on important policies related to diplomacy, national defense and unification and the revision of the Constitution.

Management of Entrusted Elections

The NEC manages entrusted elections according to the Act on Entrusted Elections Including Public Organizations and other relevant regulations. Entrusted elections include those for heads of agricultural, fishery, livestock, and forestry cooperatives.

Management of Residents' Referendums

The NEC manages residents' referendums on important decisions made by local governments seriously affecting and placing undue burden on the residents of a district based on municipal ordinances.

Management of Recall Votes

The NEC manages elections requested by the residents of a district to remove heads of local governments or local council members from their positions prior to the end of their term of office in the case the officials are found to conduct illegal and unfair activities.

Management of Party Elections

The NEC manages party elections if a political party entrusts the election to the NEC in order to nominate candidates for public official elections.

2. Management of Affairs Related to Political Parties and Funds

Management of Affairs Related to Political Parties (Political Parties Act)

Management of affairs related to political party registration, disclosing the implementing of party policies, holding policy debates and supporting the development of policy-based political parties.

Management of Affairs Related to Political Funds (Political Fund Act)

Management of affairs related to Political Fund Associations (PFAs), provision of national subsidies and inspection of their expenditure, the receipt and reimbursement of deposits, receipt, audit and investigation into financial reports and support for administration related to political funds.

3. Civic Education for Democracy

Conducting PR activities to enhance democratic civic consciousness and to create a sound election culture.

Providing education and training for NEC staff, election officials, political party staff, PFA staff, and the general public, as well as developing and distributing education material.

4. Research on Electoral and Political Systems

Research on the political system of Korea and other countries around the world.

Submission of opinions on political law reforms.

Projects for improving the voting and counting systems.

Research on e-voting systems.

5. International Exchange and Cooperation

Exchange with global election management bodies.

Support for studying and improving election laws and systems of countries around the world.

Electoral System of the Republic of Korea

The Republic of Korea is a democratic republic and adopts a presidential system. The Constitution as the supreme law in the country, stipulates provisions regarding elections including suffrage rights, the right to be elected, the composition of the National Assembly, the number of National Assembly members and boundary delimitation, the election process for President and the eligibility requirements for public office. The Constitutional Assembly was founded for the first time in 1948 and continues in 2020 as the 21st National Assembly.

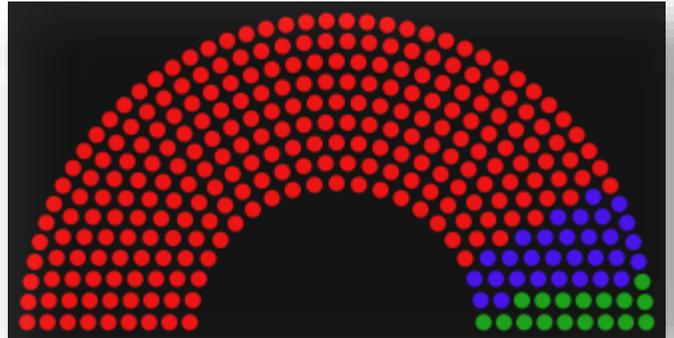
The 21st National Assembly

Electoral System: Hybrid System

The National Assembly have 300 seats, with 253 constituency seats and 47 proportional representation seats, as in previous elections. However, 30 of the PR seats were assigned on the new compensatory basis, while 17 PR seats continue to use the old parallel voting method.

Number of National Assembly members: 300 members divided as follows:
253 constituency seats under first-past-the-post
30 proportional seats under the compensatory additional member system
17 proportional seats under the parallel voting system

Election Day: Wednesday April 15, 2020



Early Voting Period: April 10, 2020 (Fri) - April 11, 2020 (Sat)

Voting Hours: 6am - 6pm

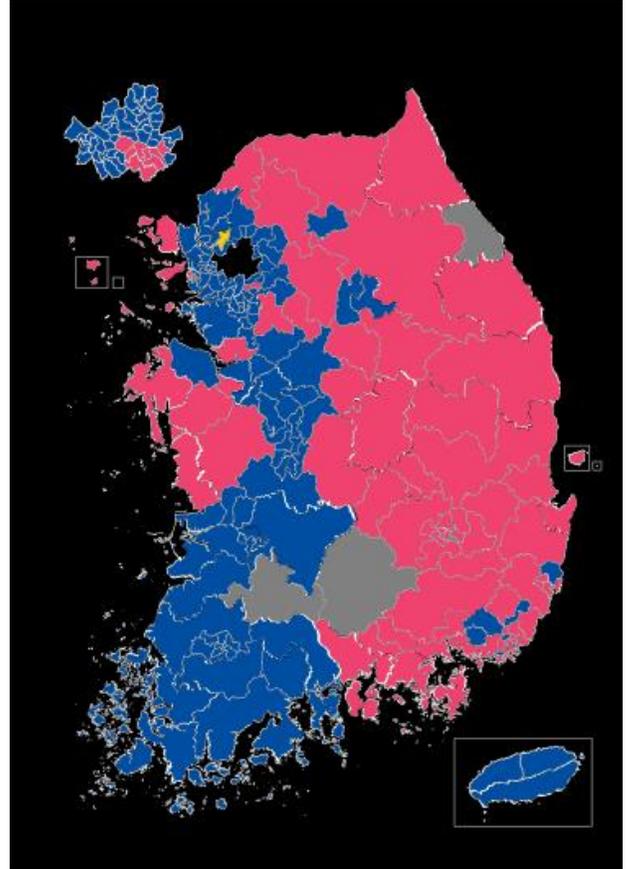
Counting Period: April 15, 2020 (Wed), from 6pm to the completion of counting

Election Constituencies · Elections for Constituency Members of the National Assembly: Single member constituencies

Elections for Proportional Representation Members of the National Assembly: Nationwide multi member constituencies

Voting Method: One person two ballots system

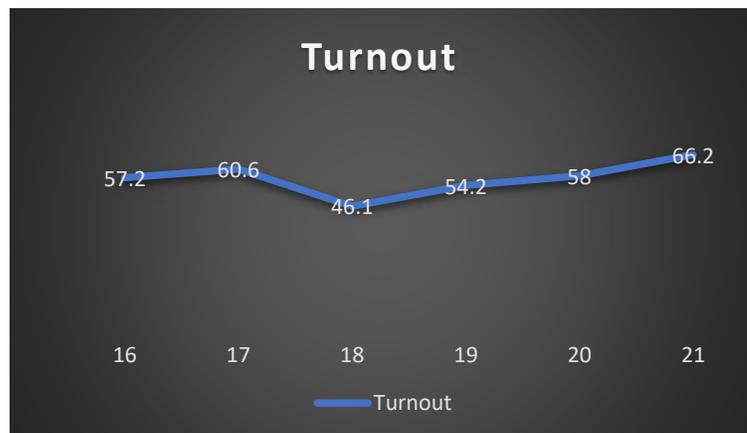
One vote for a constituency member candidate, the other vote for a party. It is possible to vote for a constituency candidate of a different party affiliation than from the party they vote for in proportional representation member elections



Non-mandatory voting

Suffrage: Citizens of the Republic of Korea (Age 18 and older)

Turnout: 66.2%



Voting System

Korea uses a manual marking and single vote system, which requires a voter to mark their ballot paper for a single candidate or political party on their ballot paper. Korea also uses a secret ballot, which ensures that a voter cannot be identified by their ballot paper. In addition, to ensuring everyone can exercise their right to vote, the NEC has introduced early, home, shipboard and overseas voting alongside voting on election day.

Voting System according to the Legal framework

Voting by Marking a Ballot Paper: Casting a ballot by using a marking device.

Single Voting: A voter casts a ballot for only one candidate or political party on a ballot paper.

Secret Voting: A voter cannot be identified by their ballot paper.

Non-mandatory Voting: A voter has the freedom to choose whether they exercise their right to vote or not. Therefore, there is no legal punishment for a voter who does not participate in voting.

Voting on Election Day

Voting Hours: From 6am to 6pm on election day.

Eligible Voters: Voters registered within the competent constituency except those who voted during home voting, shipboard voting, overseas voting and early voting.

Establishment of Polling Stations: One polling station per voting district. (14,330 polling stations and 3,508 early voting stations)

Polling Station Available for Voters: A voter must cast their ballot at their designated polling station according to their resident registered address.

Voting Procedures: Complete voters' ID verification (sign or place a stamp on the voters list, or put a thumbprint on it), Receive ballot papers, make a mark on their ballot papers in the polling booth, Put the ballots in the ballot box.

Early Voting

This system introduced in 2013 allows anybody to cast their ballot at any early voting polling station nationwide during the early voting period prior to election day.

Applicable Elections: Any public official elections held upon the expiration of the term of office and re and by-elections.

Voting Period: For two days from five days prior to election day.

Voting Hours: From 6am to 6pm during the voting period.

Eligible Voters: Any voters except those who are registered for home voting, shipboard voting, and overseas voting.

Establishment of Polling Stations: One polling station per Eup/Myeon/Dong (Additional polling stations may be established in areas with a military base). Total 3,508

Voting Method: Any voter can cast their ballots at any early voting polling station nationwide regardless of their registered constituency.

Voting Procedures: Complete voters' ID verification (sign or place a stamp on the voters list or put a thumbprint on it) → Receive ballot papers (voters casting their ballot within their registered district receive ballot papers and those voting outside their registered district receive ballot papers and a return envelope attached with an address label) → Make a mark on ballot papers in the polling booth → Put the ballots into the early voting ballot box for voters casting within their registered district or put the ballots in the return envelope then into the early voting ballot box for voters voting outside their registered voting district).

** Voters casting their ballot within their registered district: Those whose registered address is in the relevant district where they are casting their ballot during early voting.*

** Voters casting their ballot outside their registered district: Those whose registered address is outside the relevant district where they are casting their ballot during early voting.*

Home Voting

A system that allows those who may not be able to go to a polling station for voting due to a serious physical disability to cast their ballots from their residence by mail.

Applicable Elections: Any public official elections held upon the expiration of the term of office and re and by-elections.

Eligible Voters: A person who is unable to move due to a serious physical disability.

A person who has been admitted in a hospital, a sanitarium, a shelter, or a prison (including detention center).

Soldiers or police officers living in military barracks or a military vessel for a long time located too far from a polling station either during the early voting period or on election day to participate in voting.

Voting Method: The competent election commission sends ballot papers with a return envelope to home voting registered voters by ten days before election day, Home voting voters mark the ballot papers for one candidate or party, Home voting voters put their ballots into their return envelope and send it to the competent election commission by registered mail by 6pm on election day.

Shipboard Voting

A system that allows those who are aboard ships such as deep-sea fishing vessels, outbound passenger ships to cast their ballots at shipboard polling stations during the shipboard voting period using facsimile (including electronic fax).

Applicable Elections: Presidential elections and National Assembly elections held upon the expiration of the term of office.

Eligible Voters: Those who are aboard or going to be aboard ships such as deep-sea fishing vessels, out bound passenger or cargo ships charged under a captain with Korean citizenship.

Voting Period: During a designated period between eight days and five days before election day.

How to Vote: The competent election commissions transmit the ballot papers by facsimile to the captain of the ship who is registered on the shipboard voting application by nine days before election day. Shipboard voters cast their ballots at the polling station installed on ships and transmit their ballots by facsimile (Shipboard voters should submit the original ballots to their captain after putting them into a provided envelope) ^a Si/Do election commissions receive the transmitted ballots by shield fax. Si/Do election commissions send them to the competent Gu/Si/Gun election commissions, the captains should submit the received envelopes containing ballots to the Si/Do election commissions when they arrive in Korea.

Section 2 – Identified inconsistencies and possible irregularities during the 21st National Assembly Elections of 2020

After the 21st National Assembly Elections had been concluded in ROK, a number of well-placed and prominent citizens in the country raised several concerns relating to the elections. These concerns were directly related to inconsistencies and irregularities which they believed had contributed to possible fraud taking place during the consolidation and collation of election results.

The New Institute (NI), after learning of these concerns set about reviewing the evidence presented in order to quantify these serious allegations. Ensuring that it was done in a transparent manner and without being biased, they commissioned recognized as well as leading technical experts and specialists in their field to review amongst other aspects the ballot sorting and counting machines (hereinafter referred to as ‘machines’) as well as the technical aspects of the elective process. These aspects included the reviewing of the technical hardware used to sort and scan the ballots as well as the QR codes printed on all the early voting ballots. Further investigations into processes conducted during the time leading up to, during and after the election were also conducted and analyzed.

While it was understood clearly that NEC was not going to give access to NI specialist to conduct a full review of the various aspects of the election process, NI specialists making use of information they were able to obtain in the public domain started reviews to identify if inconsistencies and/or irregularities may have contributed to possible large scale election fraud. While the process of making use of publicly available data to analyze election fraud, is novel, it can be used to identify irregularities. If or when irregularities are identified making use of this type of data, it would normally warrant further detailed analysis of actual systems and data.

In instances where requests are formally made to Electoral Management Bodies (EMB’s) to review data, systems, processes, results etc. as a direct result of parties not being satisfied of sound electoral processes being followed and these requests are turned down, it raises suspicions.

Regarding the technical analysis of the ROK election data, systems and processes it is important to note that no physical review of the actual hardware and software of the machines had taken place by the technical specialists/experts. The analysis of physical hardware was done by reviewing available soft copy information obtained on the web, social media, associated reports, articles and verbal accounts obtained from individuals that had access to these machines. Therefore, it must be noted that the findings associated with the hardware (machine & servers) and software are not that of a physical comprehensive technical audit. This by no means would imply that the findings are incorrect, on the contrary it would further strengthen the case for a full audit of the physical machines and associated electoral processes and technologies.

Furthermore, using and obtaining data, models and pictures coupled with technical sessions with IT experts, provided these technical specialists an opportunity for tentative analysis. The legal and constitutional provisions governing the introduction of these machines and any form of results transmission procedures, as well as wider aspects of governance and the electoral systems and management thereof were not conducted and aligned to these reviews. This is vitally important when trying to identify issues, technology must be looked at in relation to the entire electoral process and not in a technical vacuum or silo. It must also be aligned to the electoral law and what provisions are made in the law so far as the governance of technology is concerned as well as how the law mitigates possible irregularities with the provisioning of this technology.

The direct impact of a flawed process cuts across the entire electoral process as does a fraudulent outcome of an election. The technology component was reviewed independently and separately

to the broader electoral process in South Korea and the aim of this report is to look at the entire process and identify all key aspects that are of concern. (Editor's Note: Additional research and analysis arranged and/or conducted by NI does consider the broader context (to include domestic and international legal issues) in which voting and election technologies were introduced and utilized in the South Korean election. The research identified particular inconsistencies regarding the level of 'transparency' surrounding the introduction and employment of the technologies, and that gave rise to allegations of electoral wrongdoing.)

When irregularities are identified within an electoral process no matter what that process maybe it has a direct as well as an indirect impact on the results. Democratic electoral codes/laws throughout the world are designed to provide for a free and fair process when it comes to elections regardless of what country you are in. EMB's continuously strive to and work towards ensuring that these codes are always upheld, when irregularities are identified it should be up to that EMB to allow for full audits so as to ensure transparency prevails.

Information Technology Analysis Overview and Findings

The NI after closely scrutinizing the elections in ROK identified that the introduction and the use of the sorting and scanning machines was found to be irregular and that it very possibly led to fraud. This is not a new idea; on the contrary this has been the case since technology first appeared in the 1930's with the introduction of the Lever Machine across major cities in the US. Today, the use of technology in elections from Bio metric Voter Registration Systems (BVRS) to Results Management System (RMS) have in many respects a cloud hanging over them. While technology has provided good working solutions for complex electoral problems, it has also caused more people to doubt its transparency. Paper ballot stuffing is relatively easy to identify and mitigate, electronic ballot stuffing on the other hand is much harder to identify and even harder to mitigate.

With that, technical reports penned by experts both NI commissioned and non NI commissioned, detailed three specific technical aspects of the process which were identified as concerns: the first being the actual capabilities and electronic components of the actual sorting scanning machines, the second being the structural and data composition of the QR codes printed on the early voting ballots and the third being the statistical electorate data which was analyzed independently by Prof. Mebane. In each of the areas identified a series of in-depth analysis was conducted in an attempt to present a case as to why it was deemed problematic. In the case of the electoral data, the specialist (Prof Mebane) analysing it, made use of an eforensics method. This method uses complex algorithms to compute specific sets of data in order to establish and present factual information about the data or to provide an expert opinion on the data.

In each of the analysis conducted and the subsequent reports completed, the authors demonstrated that it would have been possible to have tampered with the results which could have affected the outcome of specific results. Each of the reports while not detailing how it

happened but rather how it could have happened, based their findings (except for the electorate data) on soft copy data that was available to them at the time.

Regarding this document and the reviews of the above-mentioned reports done in order to complete this document, it must be noted that the reports detail enough evidence to warrant a further in-depth investigation to establish the correctness or lack thereof of the evidence presented. Furthermore, and in conjunction to the technical reviews that were analyzed and documented, the NI commissioned several “Summary Reports” which set out to consolidate various sets of information and present it in a manner that could easily be consumed by a wider audience.

These documents referred to as “Summary Reports” must be read with the understanding that they were sometimes done by persons that are not intimately familiar with election management processes or the governance thereof. Several references to other countries making use of technologies associated with the same organization/s that deployed the machines in ROK were made and aligned to the main narrative being that of possible fraud.

It must be noted that one cannot align those technologies with the technologies used in ROK simply because the technologies are firstly vastly different in their architecture and operational outputs, and secondly the electoral processes differ significantly from those in ROK as those countries electoral laws/codes are vastly different.

That been said, it does not detract nor deter from the fact that inconsistencies and irregularities have been documented and should necessitate addressing these with NEC and requesting that further investigations by elections specialists take place.

The overall intention of the various reports was to present the analysis done and the areas of concern, which indicated that tampering more than likely did occur, and to what extent needs to be investigated. The basis of the “Summary Reports” detailed these concerns and suggests that NEC allow for further physical analysis to take place. Independent organizations around the world who promote free, fair, and transparent elections need to review the various findings and address a way forward with NEC.

[Individual Overview of each of the Technical Reports and the associated findings](#)

[Physical hardware evaluation:](#)

As part of the information technology analysis conducted, NI commissioned Benjamin Wilkerson a former Technical Systems Engineer at IBM's semiconductor design department to conduct a technical hardware review/analysis of the machines. While he was unable to have physical access to the machines, he did have a series of pictures of the actual conductors, semiconductors, motherboards, chipsets, and the externals of the actual machines.

He conducted a series of in-depth analyses of the pictures he had obtained and after completing the analyses of the machines he noted the following:

- The machines had 2 CPU's. – **Not a simple sorting machine as per Mr. Wilkerson analysis**
 - Including programable gate arrays *“the Field Programmable Gate Array (FPGA) was used as a H/W component, and this meant that the firmware can be changed at any time to perform certain tasks”* reference taken from his report
- The machines had numerous communications ports – All unsecured (4 USB Ports with 1 of the ports being a high-speed USB and a printer port)
 - *“the ballot sorter has 5 built-in USB ports which makes it possible to send the internal data to the outside and to receive and store/implement firmware or data from the outside.”* reference taken from his report
- The machines have the ability to scan a QR code.

The three points above, as an inclusion of technology into a sorter machine would not have been a problem if the electoral law allowed for them but the electoral law in the ROK does not allow for them.

Article 5 of the Supplementary Provision of the Public Official Election Law states that the ballot sorter (machine) should be a simple sorter and operate standalone without being connected to any other external devices.

*Article 151, Paragraph 6 of the Public Official Election Law, states that only barcodes can be used on the ballot paper. – **QR codes were printed on early voting ballot papers***



Figure 1: Early voting ballots with clearly recognizable QR codes printed on them



Figure 2: Mr. Wilkerson pointing out the comms ports on the machines

What was supposed to be a simple sorting machine was in fact a sophisticated piece of hardware, regardless of whether it was connected to a laptop or not. The analysis Mr. Wilkerson conducted questioned why it was that the machine which was presented and should have been a simple sorter (not in line with the law - *Article 5 of the Supplementary Provision of the Public Official Election Law*) had 2 CPU's, could have external peripherals connected to it and could read a QR code. He further questioned why it was that the chipsets in these machines were in fact programmable when indeed nonprogrammable chipsets would have sufficed for this requirement.

It is important to note at this point that Voter Authentication Devices (VAD's) and Electronic Voting Machines (EVM's) which are far more complex in their design and overall use, are in fact designed and built making use of far fewer complex technologies. Why is it then that a simple sorting machine be architected, designed, and built with such a complex structure?

Mr. Wilkerson's conclusion was:

“As briefly shown above (associated report), a great number of subject matter experts believe that the ballot sorters used in the 21st General Election held on April 15, 2020 were in violation of the Public Official Election Act in three main areas. Each ballot sorter was designed to act as a computer, had gate array components which could be connected to an external central server, and was equipped with a QR code reader. The experts concluded that the ballot sorter was designed and manufactured to do only one job: Manipulation.”

Additional to the reviews and a subsequent report of the machines, he also completed a series of 3 video's which aired on You Tube and further presented what he deemed to be problematic and open to abuse. The issue that presents itself here from a technical point of view is that the machines violated a number of Articles provisioned in the electoral law. The electoral law governs a process and when the law is violated it needs to be addressed.

QR Code evaluation and the Sorter Machine:

In September 2020, Mr. Cho, Chung-Yeol was commissioned by NI to conduct a review of the QR codes which had been found to be printed on ballots used for early voting. This was done simply because the printing of a QR code on a ballot paper is in direct violation of the electoral code. The electoral code makes provision for a bar code and not a QR code. Mr. Cho, Chung-Yeol conducted an in-depth analysis of QR codes and the use of these QR codes and penned a comprehensive report detailing the use of QR codes for early voting during the 2020 presidential elections and the possibility of fraud being committed with the use of these codes. Mr. Wilkerson also pointed out the dangers of QR codes as follows from an expert perspective. *“1- A Program can be inserted 2- The configuration of Xilinx chip can also be changed. 3 - It is possible to change the circuit inside the classifier”* This all being done making use of an embedded QR code.

The legal framework states clearly that barcodes as opposed to QR codes are to be used on ballots. Why would this be? Technically, barcodes being simple in their format are basic digitized encoded information sets, presented in a visual pattern, used mainly for stock control. Barcodes cannot have code embedded in them, unlike QR codes which can.

QR codes on the other hand can be read vertically and horizontally and store significantly more data than a simple barcode which is one-dimensional, storing up to 25 characters. QR codes, however, can store up to 2,509 numeric and alpha characters (numeric and alpha differ). QR codes by their nature can be used willfully as indicated by Mr. Benjamin Wilkerson simply by changing or embedding malice code into readable systems. Additionally, QR codes could be used to link voters to a specific ballot paper. This is achieved by simply linking a voter to a unique number on a ballot paper which in turn is embedded in a QR code. The topic of QR codes being included on ballot papers is one that has many in the election industry discussing at length, simply because it can be used to link voters to an individual vote. In most cases around the world if a code is included on a ballot paper, it is a specific numeric number or at very most a barcode but not a QR code.

The reviews and subsequent reports done by Mr. Cho, Chung-Yeol not only brought to light possible issues with QR codes it questioned why it was that regular ballots did not have QR codes printed on them. Furthermore, he pointed out that the ballot sorters were connected to computers and printers. While this may not seem to be of concern, it does raise several questions, questions that would need to be put to NEC and further independently investigated, investigated in line with the electoral process in ROK. Investigations or reviews of processes need to be done not in isolation. An election as we know it starts at the point at which an E-day is gazetted and ends when the new administration wins. It is by no means a one-day affair.

Statistical Review of Data:

After the reviewing and subsequent documenting of the technical aspects of the machines and the QR codes associated with the early voting ballots, the NI came across an analysis of voting data that was completed by Prof. Mebane. **Anomalies and Frauds in the Korea 2020 Parliamentary*

Election, SMD and PR Voting with Comparison to 2016 SMD - Walter R. Mebane, Jr. † June 1, 2020

Prof. Mebane conducted a statistical review of data making use of data models using eforensics. His statistical review was done several times making use of separate sets of data including different subsets of data (2020 election data) obtained from South Korea. He completed several separate reviews of statistical data and published his findings based on a more refined and dated data set which provided a more accurate account of what may have taken place. His examination of the data from the 2020 Parliamentary Elections presented evidence that fraudulent votes occurred which could have affected the outcome of the election. It was noted in the report that the statistical data model indicated that the manufacturing of fraudulent votes occurred from abstentions and the stealing of votes from opposing parties.

In the opening paragraph of Prof Mebane's final report, he stated the following:

"The 2020 parliamentary election in Korea is controversial, with fraud allegations. I examine data from the election using eforensics, tests from the Election Forensics Toolkit and the spikes test. This paper improves on a previous version ("Frauds in the Korea 2020 Parliamentary Election," April 29, 2020) by using updated complete data and by adding Election Forensics Toolkit and spikes test results. This paper improves on a previous version ("Anomalies and Frauds in the Korea 2020 Parliamentary Election," May 9, 2020) by using a corrected dataset that includes 50 previously omitted independent candidates (May 13, 2020). A subsequent version adds analysis of proportional representation data (May 14, 2020; typo fixed May 21, 2020). The current version adds brief consideration of voting in the 2016 legislative election. The estimates and tests for 2020 all exhibit anomalies that suggest the election data were fraudulently manipulated, although the suggestion is stronger for single-member district voting than for proportional representation voting." - Mebane 1 June 2020

In his conclusion he further stated:

"Taken together the eforensics estimates and EFT and spikes tests exhibit anomalies that strongly suggest the Korea 2020 legislative election SMD data were fraudulently manipulated. Such suggestions regarding the PR data are weaker although not absent. Estimates using 2016 SMD data show eforensics estimates frauds that resemble results seen in many other elections and are likely due to normal political considerations. Such conclusions are always subject to the caveat that apparent frauds may really be consequences of strategic behavior, but that ambiguity can sometimes be mitigated by exploiting a multiplicity of statistics.... An election fraud will not necessarily trigger all of the statistics and tests, but we think a genuine fraud will in general set off many of them" (Hicken and Mebane 2015, 39).

Statistical findings such as Prof Mebane's reported findings should be followed up with further testing of additional data and should further investigate what happened. Most importantly, and in principle perhaps the simplest to do, would be the validation of the physical paper ballots against reported results. Essentially the recounting of single constituencies in an adhoc manner. The statistical findings alone cannot stand as definitive evidence about what happened in the election but provide a starting point. (Editor's Note: Park Sung Hyun, Honorary Statistics Professor, Seoul National University, and Dean of the Korean Academy of Science and Technology conducted statistical analysis of the ROK April 15, 2020 election and concluded the results were 'statistically difficult to understand.' Professor Park's summary assessment and conclusions are included in the larger submission and report accompanying Mr. Nettmann's report.)

Conclusion and Recommendations

It is to be stated that the intention of this document is certainly not to prove or disprove fraud, but rather to ensure that election transparency remains the highest priority in ROK. Indications are that certain inconsistencies were noted which have laid the foundation for further investigations to take place in South Korea. While the investigations were and have been limited it should be in the interests of the EMB in South Korea to clear these investigations by inviting monitoring and election watch organizations to review the process and deliver their findings in an unimpeded manner.

The request by organizations to review EMB's and their processes is not new, it happens regularly around the world. In fact, EMB's invite observer groups regionally as well as locally to observe the various processes of an election. EMB's also, so as to remain transparent, have organizations such as universities and specialist election organizations review their technologies and processes ensuring they maintain good governance, as was seen in Brazil. This type of behavior demonstrates not only transparency but good faith amongst the electorate who are the people that are the first to criticize or praise an elective process. While politicians will remain politicians, political parties change, people change and so should EMB's, changes are inevitable, but the changes must be done in line with the law. This is vitally important as the electoral law is the cornerstone of democratic principles and governs the process.

It is recommended that further election specialists examine the process of elections in ROK paying special attention to the introduction and use of technology. How the technology interacts with elective processes and what mechanisms are in place to ensure that data is secured and not open to manipulation. Additionally, internationally recognized election watch organizations should deploy short term observers during the next upcoming elections so as to observe the process including the consolidation of results at counting centers. Together with the specialists and the observers a comprehensive review of process can be recorded and documented, and shortfalls can be addressed accordingly.

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