DEFINITION OF TERMS

Audit log - A chronological sequence of audit records, each of which contains evidence directly pertaining to and resulting from the execution of a business process or system function. The PCOS provides a printable audit log report that records all its activities.[1]

Automated Election System (AES): A system using appropriate technology which has been demonstrated in the voting, counting, consolidating, canvassing, and transmission of election results, and other electoral processes. [2]

It has three components:
　　a. Election Management System (EMS)
　　　　– Configuration of precinct data
　　　　– Election Mark–Up Language (EML)
　　b. Precinct–Count Optical Scan (PCOS) System
　　　　– Precinct Machine
　　c. Consolidation / Canvassing System (CCS)
　　　　- BOC Computer

Back-up CF Card – The Board of Election Inspectors (BEIs) is instructed to copy the data from the main CF card to the back-up CF card. But the Municipal Board of Canvassers (MBOC) will still use the main CF card in case of failure of transmission.[3]

Broadband Global Area Network (BGAN) – BGAN is a portable global Satellite Internet Network that will enable remote areas in the country with no telecommunication signal to transmit election results to the Comelec main server in Manila.

BGAN is the world's first mobile communications service to deliver broadband data and voice, simultaneously, through a single, truly portable device, anywhere on the internet.[4]

Central Count Optical Scan (CCOS) - A technology wherein an optical ballot scanner, into which optical scan paper ballots marked by hand by the voter are inserted to be counted, is located in every voting center.[5]

Compact Flash (CF) Card - A popular memory card developed by SanDisk in 1994 that uses flash memory to store data on a very small card. A Compact Flash card makes data easy to add to a wide variety of computing devices, including digital cameras and music players, desktop computers, personal digital assistants (PDAs), digital audio recorders, and photo printers.

Based on the Personal Computer Memory Card International Association (PCMCIA) PC Card specifications, a CompactFlash card measures 43 X 36 mm (about the size of a matchbook) and is available with storage capacities ranging up to 1 gigabyte (GB), with higher capacities corresponding to higher prices. CompactFlash is similar in size to the SmartMedia card, but larger than the newer, postage stamp-sized alternatives, MultiMediaCard and Secure Digital (SD) card. There are two different types of CF cards, of different thicknesses (to accommodate different capacities): Type I CF cards are 3.3 mm thick, compared to 5.5 mm for Type II cards.[6]

Flash memory refers to a particular type of EEPROM, or Electronically Erasable Programmable Read Only Memory. It is a memory chip that maintains stored information without requiring a power source. It is often used in portable electronics, like MP3players, and in removable storage devices.

Flash memory differs from regular EEPROM in that EEPROM erases its content one byte at a time. This makes it slow to update. Flash memory can erase its data in entire blocks, making it a preferable technology for applications that require frequent updating of large amounts of data as in the case of a memory stick.[7]

Compensating Controls – Compensating controls may be considered when an entity cannot meet a requirement explicitly as stated, due to legitimate technical or document business constraints but has sufficiently mitigated the risk associated with the requirement through implementation of other controls. (Comelec Resolution 8800 includes the compensating controls to "mitigate risks identified during the source code review and functional testing of the AES.")[8]

Computer Program or Software - A computer program that consists of many instructions to tell a computer what to do. Operating a computer is based on a computer program. A computer program or software can be in source code form or in machine-executable form.[9]

Console Port - In a more general sense, a console is a device through which an operator or computer user can operate the machine. Generally a console has a keyboard through which machine instructions can be entered and a printer or video display through which such instructions are printed or displayed or the messages from the computer can be printed or displayed. On laptops/notebooks, for example, the console includes the display screen, keyboard, and other pointing devices.

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1.
   a. A cabinet for a radio, television set, or phonograph, designed to stand on the floor.
   b. A small freestanding storage cabinet.

2. *Music* The desklike part of an organ that contains the keyboard, stops, and pedals.

3.
   a. A central control panel for a mechanical, electrical, or electronic system
   b. An instrument panel.

4. The portion of a computer or peripheral that houses the apparatus used to operate the machine manually and provides a means of communication between the computer operator and the central processing unit, often in the form of a keyboard.

5. A small storage compartment mounted between bucket seats in an automobile.

6. An often scroll-shaped bracket used for decoration or for supporting a projecting member, such as a cornice or shelf.

7. A console table.[10]

Port:

   1) On computer and telecommunication devices, a *port* (noun) is generally a specific place for being physically connected to some other device, usually with a socket and plug of some kind. Typically, a personal computer is provided with one or more serial ports and usually one parallel port. The serial port supports sequential, one bit-at-a-time transmission to peripheral devices such as scanners and the parallel port supports multiple-bit-at-a-time transmission to devices such as printers.[11]

   Thus, a console port on the PCOS is a socket similar to the one shown/illustrated below which allows another device or computer to be connected to PCOS, making the software and mechanisms inside the POS accessible to the device or computer connected to it via the console port.[12]
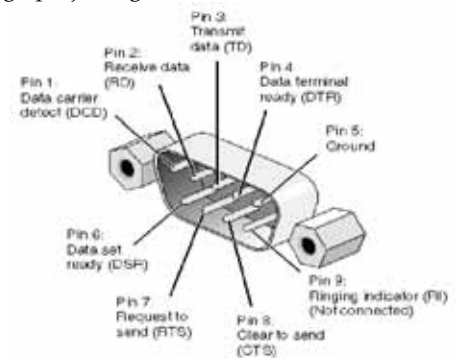
Continuity Plan – Outlines the steps to be taken to address all risks to the election at all points in the process such that failure of elections, whether during the voting, counting, or consolidation may be avoided.[13]

Customization: Modification, conversion, or adaptation of the software to suit the requirements of Philippine laws and the general instructions of Comelec on the conduct of the elections.[14] In the case of the PCOS software, customization will define the parametric data that the PCOS software will need to be usable for the Philippines. The parametric data will be supplied to the PCOS computer using Election Markup Language (EML) files produced by the EMS computers and contained in the compact-flash (CF) cards that the PCOS can read and interpret.[15] Customization will not affect the PCOS election application program which is burned in the PCOS firmware since firmware programs are read-only and thus cannot be modified. Furthermore, any customization done by either Comelec or Smartmatic will not affect the PCOS program, since neither Comelec nor Smartmatic has the right to amend, change, or develop software or firmware or EMS under the License Agreement between Dominion Voting Systems and Smartmatic International Corporation.[16] Since customization cannot amend or change the PCOS program, customization cannot amend or change the source code of the PCOS program.

Digital Signature - "*Digital Signature* refers to an electronic signature consisting of a transformation of an electronic document or an electronic data message using an asymmetric or public cryptosystem such that a person having the initial untransformed electronic document and the signer's public key can accurately determine:
   (I) whether the transformation was created using the private key that corresponds to the signer's public key; and
   (ii) whether the initial electronic document had been altered after the transformation was made".[17]

Direct Recording Electronic (DRE) - A technology wherein a vote is cast directly on a machine by the use of a touchscreen, touchpad, keypad or other device and the machine records the individual votes and calculates the vote totals electronically.[18]

Electronic Transmission – Conveying data in electronic form from one location to another. This definition opened up the meaning of electronic transmission to include, according to Comelec, the conveyance by hand of electronic data stored in electronic storage devices, including CF cards used during the May 10, 2010 elections.[19]

Firmware – A combination of software and hardware. Computer chips that have data or programs recorded on them are firmware.[20]

Geographic Information System (GIS) - A computer-based system for storing, organizing, analyzing and displaying spatial data. It allows the display of reference and thematic maps that can help model, analyze, plan, and manage elections in 2010. Comelec had no functional GIS for the storage and deployment of 82,000 PCOS machines and 1,800 CCS machines as well as the transmission capabilities in the voting centers.

Hash Code – A numerical value derived by subjecting an electronic file (it can be a text file, a source code of a program or its binary equivalent) through a mathematical procedure. The resulting numerical value is unique to the electronic file. In the case of the AES, the numerical value may be used to verify if the same file or program was deployed in all machines by subjecting the same file or program so deployed through the same mathematical procedure to generate the same numerical value.

Initialization Report - A report that the PCOS machine will produce before voting starts. Showing that "zero" votes have been counted for all candidates, it will be printed on a 2 1/4 receipt-type thermal paper.

IP Address – Every computer on a network has a hostname and IP address. The hostname is like a person's name, and the IP address is like his house number. No two houses should have the same number otherwise the postman will have trouble delivering mail.

Machine-executable Program - A computer program has an executable form that the computer can use directly to execute the instructions.[23] As the machine executable is written in machine language of zeroes and ones (binary), it is also called binary executable. Another computer program is usually needed to convert the source code into machine executable. This program is called a compiler: For each high-level instruction in the source code, the compiler needs to "compile" several simple machine language instructions to carry out the intent of that high-level instruction.[24]

Modem – Abbreviation for "modulator/demodulator." Modems allow the transmission of data between computers (digital devices) over analog lines. Modems are required for connectivity where broadband services are unavailable.[25]

Paper-based Election System - A type of automated election system (AES) that uses paper ballots, records and counts votes, tabulates, consolidates, canvasses, and transmits electronically the results of the vote count.[26]

Pilot Testing - According to RA 9369, election automation should first be implemented in two highly-urbanized cities (HUCs), and two provinces each in Luzon, Visayas, and Mindanao before being implemented nationwide.

Precinct Cluster - A group of a maximum of five precincts. With one precinct usually having a maximum of 200 voters, one precinct cluster is expected to have a maximum of 1,000 voters. Each precinct cluster will have one PCOS machine on election day.

Precinct Count Optical Scan (PCOS) - A technology wherein an optical ballot scanner, into which optical scan paper ballots marked by hand by the voter are inserted to be counted, is located in every precinct.[27]

Root User/ System Administrator - Also known as the "super user". A human who can issue any command available on the computer, normally to do system maintenance or to recover from failure. The root user can edit the precinct ERs if he has access to secret keys allowing him to change the election results.

SAES 1800 (Smartmatic Auditable Election System 1800) - Smartmatic's model of the PCOS machine that will be used on election day. Like other PCOS machines, it detects the absence or presence of a mark in predefined positions on a form.

Server – A server is primarily a program that runs on a machine, providing a particular and specific service to other machines connected to the same machine on which it is found.[28]

Source code: Human readable instructions that define what the computer will do.[29] Source code is the human readable version of a computer program. In particular, the source codes of the AES technology selected for implementation refer to the following three items: (i) the source code of the ballot scanning and vote counting

computer program (source code of SAES-1800) that runs on the PCOS computers; (ii) the source code of the vote consolidation and canvassing program (source code of REIS version 2.0) that runs on the CCS Board of Canvassers computers; and (iii) the source code of the Election Management System (EMS) that customizes the PCOS for use in the Philippines, and for use in specific municipalities and cities.

Time and Date Stamps – This refers to the internal time and date settings of the PCOS machines. The time and date stamps on the election returns (ERs) indicate when polls were closed and election results were transmitted from a specific precinct. The audit logs will also show all activities of the PCOS machine and the exact time it took place.

Transparency – The dissemination of regular and accurate information. Simply put, a transparent political regime provides accurate information about itself, its operations, and the country as a whole, or permits information to be collected and made available.[30]

Ultraviolet Security Mark – Invisible markings such as logos that can be detected only through the use of an ultraviolet light to validate the authenticity of a document.

Very Small Aperture Terminal (VSAT) – Similar to the BGAN, the VSAT is a device that is used to transmit and receive data signal through a satellite. The "very small" component of the VSAT acronym refers to the size of the VSAT dish antenna – typically about 4 feet (1.2 m) diameter – that is mounted on a roof, or placed on the ground.[31]

End Notes

1   http://en.wikipedia.org/wiki/Audit_trail
2   RA-9369 Sec. 2, Item 1
3   Comelec Resolution 8786; Revised GI for BEIs
4   See: http://bgansatellite.com/
5   Comelec Advisory Counck Resolution on the 2010 National and Local Elections, Nov. 28, 2008.
6   See: http://searchstorage.techtarget.com/sDefinition/0,,sid5_gci836292,00.html
7   See: http://www.wisegeek.com/what-is-flash-memory.htm
8   http://www.elementps.com/resource-center/glossary-of-terms/COMELEC Resolution 8800 (issued on March 16, 2010)
9   http://simple.wikipedia.org/wiki/Computer_program
10   See: http://www.thefreedictionary.com/console
11   See: http://searchnetworking.techtarget.com/definition/port
12   See:
     http://www.google.com.ph/imglanding?imgurl=http://techpubs.sgi.com/library/dynaweb_docs/linux/SGI_EndUser/book
     s/SGIconsole_HW_CG/sgi_html/figures/pinout.O300.console.port.gif&imgrefurl=http://techpubs.sgi.com/library/tpl/cgi_b
     in/getdoc.cgi%3Fcoll%3Dlinux%26db%3Dbks%26fname%3D/SGI_EndUser/SGIconsole_HW_CG/apb.html&h=357&w=373&
     sz=9&tbnid=Lnlqet91NEWuMM:&tbnh=117&tbnw=122&prev=/images%3Fq%3Dconsole%2Bport&zoom=1&q=console+port
     &hl=en&usg=__E3GR-ZzP3mMYrCypje4EF-HjBNI%3D&sa=X&ei=-kYATZnmC8zHrQfXp-mQDw&ved=0CDYQ9QEwAw
13   Comelec Resolution No. 8800, March 16, 2010
14   Comelec-Smartmatic-TIM Contract for the Provision of an AES for the May 10, 2010 elections, dated July 10, 2009. Page 3,
     Paragraph 2
15   http://www.smartmatic.com/fileadmin/users/docs/SAES/SAES1800_technicalsheet_v2.0.pdf
16   License Agreement between Smartmatic International Corporation and Dominion Voting Systems, dated April 4, 2009. Item 7
     states "... Dominion will retain sole liability to amend, change or develop all software, or firmware or EMS".
17   Rule 2 Section 1.b E-Commerce Act (RA 8792)
18   Comelec Advisory Council Resolution on the 2010 National and Local Elections, Nov. 28, 2008.
19   RA 9369; Angel Averia, Jr.
20   http://support.apple.com/kb/ht1471
21   See Comelec Resolution Nos. 8786 and 8809. Note that it is not only the PCOS that generates an initialization report. The CCS
     laptops also generate initialization reports.
22   Dr. Pablo Manalastas
23   http://en.wikipedia.org/wiki/Computer_program. 3rd sentence.
24   http://en.wikipedia.org/wiki/Compiler
25   cyber.law.harvard.edu/readinessguide/glossary.html
26   RA-9369 Sec. 2, Item 7
27   Comelec Resolution Nov. 28, 2008, op cit.
28   http://voip.about.com/od/voipbasics/g/whatisserver.htm
29   RA-9369 Sec. 2, Item 12
30   Mitchell (1998) in Rosendorff, P. & Vreeland, J. Democracy and Data Dissemination: The effect of political regime
     on transparency (2006) retrieved from http://homepages.nyu.edu/~bpr1/papers/BPRJRV.pdf
31   http://www.globaltt.com/en/services_vsat.html