

COMELEC ADVISORY COUNCIL

Post-election Report on the Use of Automated Election System (AES) in the 2008 ARMM Elections

Submitted to the:
**Joint Congressional Oversight Committee on
Automated Election System
& the
Commission on Elections**

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Table of Contents

I. Executive Summary	3
II. Legal Framework	6
III. Assessment of Procurement Process	7
A. Preparation of Terms of Reference/Request for Proposal	8
B. Conduct of Bidding	9
C. Technical Evaluation	12
IV. Assessment of Automated Election System	
A. Overview of Automated Election System	14
B. Compliance with Minimum System Capabilities (Section 6, RA 9369)...	15
C. Compliance with Other Requirements of RA 9369	18
D. Problems/Issues Encountered	19
1. Conduct of Field Test 1	
2. Conduct of Field Test 2	
3. Conduct of Mock Elections	
4. Actual Elections	
V. Assessment of User Experience	
A. DRE	22
B. OMR	23
VI. Capability Building in the COMELEC	25
VII. Recommendations	
A. Procurement Process	30
B. Automated Election System	30
C. Proposed Changes in Legislation	32
Annexes	

List of Annexes

- | | | |
|-------|---|---|
| Annex | A | – CAC Resolution dated July 12, 2007 |
| | B | – CAC Resolution dated January 31, 2008 |
| | C | – CAC Resolution dated February 22, 2008 |
| | D | – DBM Special Allotment Release Order |
| | E | – COMELEC Invitation to Bid |
| | F | – Letter to COMELEC BAC dated March 2008 |
| | G | – COMELEC Resolution No. 8436 |
| | H | – COMELEC Letter to CAC dated March 31, 2008 re
Smartmatic Motion for Reconsideration |
| | I | – COMELEC Letter to CAC dated May 6, 2008 re: Technical
demonstration |
| | J | – COMELEC Resolution No. 8439 |
| | K | – COMELEC Resolution No. 8440 |
| | L | – CAC Resolution dated May 30, 2008 |
| | M | – CAC Letter to COMELEC re: CAC Participation to COMELEC
BAC Meetings |
| | N | – CICT-NCC Special Order re: Designation to Messrs. Fortes
and Catabona to COMELEC BAC Technical Working Group |
| | O | – CAC Resolution dated April 1, 2008 |
| | P | – CAC Letter to COMELEC dated April 3, 2008/COMELEC
BAC Letter dated April 1, 2008 |
| | Q | – CAC Resolution dated April 26, 2008 |
| | R | – COMELEC Resolution No. 8439 |
| | S | – COMELEC Resolution No. 8440 |
| | T | – Results of Field Tests 1 and 2, and Mock Elections |
| | U | – Consortium on Electoral Reforms (CER) Observers' Report |

I. Executive Summary

The COMELEC Advisory Council (CAC), created by Republic Act 9369, is tasked to recommend to the Commission on Elections (COMELEC) the “appropriate, secure, applicable, and cost effective technology” to be used in the automation of elections.

RA 9369, signed in January 23, 2007, requires a fully-automated election system in the 2010 national and local elections. But first, it should be pilot-tested in at least two highly urbanized cities and two provinces each in Luzon, Visayas and Mindanao in the 2007 elections. However, time constraints made it impossible to implement the project. Hence, upon recommendation of the CAC, the plan to automate the 2007 elections was abandoned.

CAC Resolution dated July 12, 2007 opened the possibility of using an AES in the 2008 ARMM Elections. In the August 14, 2007 meeting of the CAC, the Council agreed to push for the automation of the whole election system from the voting to counting, transmission, and consolidation of results. Subsequently, in January 31, 2008, the CAC issued a resolution recommending that the COMELEC pursue a full automation of the 2008 ARMM Elections using the DRE technology in Maguindanao and the OMR technology for the rest of ARMM.

Bidding was conducted from February 12, 2008 to May 2008. On the whole, the procurement of AES for the 2008 ARMM Elections was successful, owing to the determination of the COMELEC En Banc to pilot a fully automated ARMM election prior to the 2010 National and Local Elections.

However, several problems came across during the course of the bidding. Primarily, the schedule from the preparation of the Terms of Reference/Request for Proposal, the procurement process, and up to the project implementation was very tight. It was also observed that there were some difficulties encountered in determining the technical capabilities of the systems and equipment. Moreover, the participation of CAC and TEC in the procurement process was also limited as only few activities of the COMELEC Bids and Awards Committee were attended by the members of the CAC and TEC.

To assist the COMELEC in the evaluation of the equipment and systems provided by the bidders for the procurement of the Automated Election System (AES) for the August 11, 2008 ARMM Elections, the CICT being the Chairman of the CAC and the

CICT-National Computer Center as member of the TEC provided two (2) technical staff.

Two different kinds of technologies were deployed by COMELEC for the ARMM Elections, the Direct Recording Electronic or DRE and the Optical Mark Reader or OMR. The DRE provided by Smartmatic, uses a touch pad device where voters simply select their choice of candidates by touching selected areas of the touchpad. The DRE technology was deployed in the entire province of Maguindanao. On the other hand, the OMR provided by Avante International Technology Inc., uses paper ballots which contain the names of the candidates and the different races being contested where voters shade or mark the circles corresponding to the names of the candidates they choose to vote for. This technology was deployed in the areas of Lanao del Sur, Shariff Kabunsuan, Basilan, Tawi-Tawi, Sulu and Marawi City.

Successfully used in the 2008 ARMM Elections was the canvassing and consolidation system developed by Smartmatic and procured by the COMELEC. This system combined or merged the two partial results from both systems in order to arrive at the national winners. These elections results were transmitted from the precinct level for the DRE and from counting centers for the OMR up to the national data center in COMELEC's head office in Intramuros.

Prior to the conduct of the actual elections on August 11, 2008, Field Tests and Mock Elections were conducted in order to address the technical problems that may arise.

During the actual elections, various monitors from DOST, PPCRV and CER were deployed by CAC to observe the usability of the technologies used in the election as well as observe the electoral process in general. It was witnessed that the elections were generally peaceful and orderly. However, some technical problems in the operation and use of the DRE and OMR machines contributed to some delays. During the results transmission phase after the closing of the election, it was observed that problems were encountered by the supplier involving the data communication infrastructure. Another cause of delay in the consolidation and transmission process was the physical transportation of the OMR ballots to the counting centers. Details of this are discussed in Section IV.D.

On the usability of the two technologies used in the 2008 ARMM Elections, there were general affirmations from the users of the DRE technology that the voting process was easy and the counting was fast. For the OMR, the ARMM voters had past experiences on this technology which made it easy to relate to and shading the

names of the candidates became an all familiar event. Even as the two technologies were tagged as user-friendly, several problems were also observed during the actual Election Day. There was hardly any opportunity to see and test the DRE before the elections and the secrecy of voting was compromised while votes shaded in the OMR ballot were exposed to tampering. Details of these problems are discussed in Section V.

Based on the problems and issues raised the COMELEC Advisory Council proposes several recommendations on the areas of Procurement Process, Automated Election System and Changes in Legislation. Section VII discusses the details of these recommendations.

On the Procurement Process, there is a need to follow strictly the IRR of RA 9184 - Government Procurement Reform Act and provide for a longer procurement schedule. It is also proposed that a hybrid solution/technology should come from one vendor/provider only for smooth integration of the different technologies and for flawless transmission of results. The COMELEC Advisory Council must also be actively involved in the entire procurement process.

For the Automated Election System, it is proposed that the features and functions of an automated election system must be enhanced to arrest the possibility of fraud. Publicly available networks with the appropriate security measures must be considered for the transmission phase as these are inherently more reliable. There is also a need to formulate a strategic and intensified voters' education campaign at the grassroots level the soonest possible time in preparation for the 2010 National and Local Elections.

Amendments to RA 9369 and other pertinent laws were also proposed. Some of which include deleting the specified number of Election Returns to be printed beyond the eighth (8th) copy and require instead to have all electronically transmitted ERs be posted on the official COMELEC website. There is also a need to include the creation of a Project Management Office within the COMELEC to oversee and supervise the functionalities and responsibilities of the different vendors for proper coordination and accountability on each of the awarded contractors. Further, the cleansing of the computerized voters' list must go hand-in-hand will all the automation efforts for the 2010 National and Local Elections.

II. Legal Framework

Section 8 of Republic Act No. 9369 mandated the creation of a COMELEC Advisory Council (CAC). Members of the CAC include the following:

	Name	Organization
Chairman:	Sec. Ray Anthony Roxas-Chua III	Commission on Information and Communications Technology (CICT)
Members:		
	Usec. Fortunato T. dela Peña	Department of Science and Technology
	Usec. Teodosio C. Sangil, Jr.	Department of Education
Academe:	Manuel C. Ramos, Jr.	University of the Philippines
ICT Professional Organizations:	Renato B. Garcia	Phil Elec. & Telecoms Federation, Inc.
	Lilia C. Guillermo	CIO Forum, Inc.
	Ivan John E. Uy	Phil Computer Society
Non-governmental Electoral Reform Organizations:	Amb. Henrietta T. De Villa	Parish Pastoral Council for Responsible Voting
	Andie C. Lasala	Consortium on Electoral Reforms

As provided for in Section 9 of RA 9369, the Advisory Council has the following functions:

1. Recommend the most appropriate secure, applicable and cost-effective technology to be applied in the AES, in whole or in part, at that specific point in time.
2. Participate as nonvoting members of the Bids and Awards Committee in the conduct of the bidding process for the AES. Members of the Advisory Council representing the ICT professional organizations are hereby excluded from participating in any manner in the Bids and Awards Committee.

3. Participate as nonvoting members of the steering committee tasked with the implementation of the AES. Members of the Advisory Council representing the ICT professional organizations are hereby excluded from participating in any manner in the steering committee.
4. Provide advice and assistance in the review of the systems planning, inception, development, testing, operationalization, and evaluation stages.
5. Provide advice and/or assistance in the identification, assessment and resolution of systems problems or inadequacies as may surface or resurface in the course of the bidding, acquisition, testing, operationalization, re-use, storage or disposition of the AES equipment and/or resources as the case may be.
6. Provide advice and/or assistance in the risk management of the AES especially when a contingency or disaster situation arises.
7. Prepare and submit a written report, which shall be submitted within six months from the date of the election to the oversight committee, evaluating the use of the AES.

III. Assessment of Procurement Process

CAC Resolution dated July 12, 2007 (Annex A) serves as a catalyst for the Advisory Council in assessing the possibility of using an AES in the 2008 ARMM Elections. In the August 14, 2007 meeting of the CAC, they agreed to push for the automation of the whole election system from the voting to counting to transmission to consolidation of results.

Correspondingly, in January 31, 2008, the CAC issued a resolution recommending that the COMELEC pursue a full automation of the 2008 ARMM Elections using the DRE technology in Maguindanao and the OMR technology for the rest of ARMM (Annex B).

The following sections highlight the participation of the CAC and the Technical Evaluation Committee in the procurement of automated election system for the 2008 ARMM Elections in August 11, 2008.

On the whole, the procurement of AES for the 2008 ARMM Elections was successful, owing to the determination of the COMELEC En Banc to pilot a fully automated ARMM election prior to the 2010 National and Local Elections. However,

several problems came across during the course of the bidding. Primarily, the schedule from the preparation of the Terms of Reference/Request for Proposal, the procurement process, and up to the project implementation was very tight.

As recourse, the CAC issued a resolution in February 22, 2008, recommending the postponement of the 2008 ARMM Elections for a period of up to three (3) months to ensure a successful automation (Annex C).

Moreover, technical expertise is a mandatory requirement for the success of projects with this magnitude. It was observed that there were some difficulties encountered in determining the technical capabilities of the systems and equipment.

Participation of CAC and TEC in the procurement process was also limited as only few activities of the COMELEC Bids and Awards Committee were attended by members of the CAC and TEC.

A. Preparation of Terms of Reference/Request for Proposal

The CAC together with the Technical Evaluation Committee conducted in November 27–29, 2007, a vendors' demonstration of various technologies on automated election systems. This demonstration enabled the CAC and the TEC to evaluate the various solutions/technologies on automated elections available in the market, as well as provided guidance in determining the appropriate technology or solution for the automation of the Philippine elections.

In January 2008, the COMELEC presented to the CAC and TEC the draft Terms of Reference/Request for Proposal (TOR/RFP) for the Automation of the 2008 ARMM Elections. A series of meetings were conducted with COMELEC officials and technical staff, the TEC and the CAC, to provide inputs in the preparation of the TOR/RFP.

Due to time constraints, there was not enough time for the CAC and TEC to comprehensively review the TOR/RFP which was due for publication in February 2008.

B. Conduct of Bidding

In February 12, 2008, the Special Allotment Release Order (SARO) with an amount of P867,329,000.00 was released to COMELEC by the Department of Budget and Management, solely for use in the automation of the 2008 ARMM Elections (Annex D). On the same day, the COMELEC published the Invitation to Bid for the following lots (Annex E):

- Lot 1A Electronic Voting System Integrated with Election Management System
- Lot 1B Automated Counting System Integrated with Election Management System
- Lot 2A Secured Electronic Transmission System for Election Results
- Lot 2B Consolidation/Canvassing System; and
- Lot 3 Systems Integration and Overall Project Management

A pre-bid conference was held on February 26, 2008 in which the CAC and TEC participated. A total of eleven (11) vendors acquired the TOR/RFP. These vendors were:

1. Strategic Alliance Holding, Inc
2. Total Information Management Corp
3. Software Improvement
4. Avante International Technology Inc
5. Elad Telecom Inc
6. Hewlett-Packard Phils Corp
7. Mega Data Corp
8. Phil Gaming Management Corp
9. IP Converge Data Center Inc
10. Sandz Solutions Phils Inc
11. Active Business Solution

Deadline for submission of Bid Proposals as well as Opening of Technical Bids were conducted on March 11, 2008. Of the 11 vendors who acquired the TOR/RFP, only two (2) joint ventures submitted bid proposals, Smartmatic-Sahi and Sandz Solutions. The proposal of Sandz Solutions was out rightly disqualified due to non-compliance to eight (8) requirements. Smartmatic-Sahi

submitted proposal for Lots 1A, 2A, 2B and 3 and underwent the technical evaluation process.

Bidding for Lot 1B (OMR) was declared failure. Second bidding for this lot was undertaken and the deadline for submission of bid proposal and opening of bids was held on April 1, 2008. Prior to this activity, pre-bid conference was conducted on March 25, 2008. Of these two activities, the CAC was informed and took part only in the former activity.

To enable the CAC to participate with the bidding activities of the COMELEC Bids and Awards Committee (BAC), the CAC wrote to COMELEC in March 2008 reiterating the provision in Section 9 of Republic Act 9369, which mandates the Advisory Council to *“Participate as nonvoting members of the Bids and Awards Committee in the conduct of the bidding process for the AES...”* The CAC further requested for the schedule of all the activities/events related with the automation process, which will enable the Advisory Council to know where to get involve and participate (Annex F).

In April 11, 2008, COMELEC issued Resolution No. 8436, rejecting the bid proposal of Smartmatic Sahi for Lots 1A, 2A, 2B and 3 for lack of substantial compliance to the TOR/RFP (Annex G). Relatively, the Smartmatic Sahi filed their motion for reconsideration which was referred to the CAC through COMELEC letter dated April 24, 2008 requesting for CAC’s comments and recommendation (Annex H).

For OMR component, the conduct of second bidding was also declared failure. This prompted the COMELEC to resort to Negotiated Procurement as authorized by RA 9184 – Government Procurement Reform Act. Only two (2) bidders, namely Active Business Solution, Inc and Avante International Technology Inc have been declared eligible to participate in the bidding from among those who previously submitted bid proposals. The CAC had minimal participation in the conduct of bidding for this particular lot.

The CAC also participated in the meetings of the Joint Congressional Oversight Committee (JCOC) on Automated Election System. The JCOC in its meeting on May 2, 2008 requested several vendors for a demonstration of automated election systems. The JCOC made certain that the automation of the 2008 ARMM Elections will push through.

In May 6, 2008, the COMELEC invited the CAC for a technical demonstration and evaluation by Smartmatic-Sahi for the DRE component. Avante International Technology Inc and Active Business Solution, Inc also conducted the same for the OMR component (Annex I).

In May 8, 2008 COMELEC issued Resolution No. 8439 awarding to Smartmatic-Sahi the contract for Lot 1A, 2A, 2B and 3. While COMELEC Resolution No. 8440 issued on May 9, 2008 awarded the contract for the procurement of Optical Mark Reader to Avante International Technology Inc. Please refer to Annexes J and K, respectively.

Kick-off meeting for the Automation of 2008 ARMM Elections was held on May 14, 2008.

As stipulated in Sections 9 [11] and 12 [14] of RA 9369, the CAC issued a resolution on May 30, 2008 recommending the list of international certification entities for consideration of the COMELEC (Annex L). However, the COMELEC opted not to undergo the process of international certification due to extreme time-pressure and with their belief that they have substantially complied with the requirements of RA 9369.

Assessing the participation of the CAC in the conduct of bidding for the automation of the 2008 ARMM Elections, the CAC wrote to COMELEC that the CAC was only able to participate in four (4) meetings/activities of the COMELEC Bids and Awards Committee, to wit:

- February 26, 2008 - Pre-bid Conference (First bidding for DRE, OMR, etc.)
- March 11, 2008 - Opening of Technical Bids (First bidding)
- April 1, 2008 - Opening of Technical Bids (Second bidding for Lot 1B-OMR)
- May 6, 2008 - Technical demonstration/evaluation by Smartmatic-Sahi Joint Venture and Avante International Technology, Inc.

The CAC, henceforth, reiterated the provision in Section 9 of Republic Act 9369 and requested COMELEC that the CAC be notified on the future activities of the

Commission leading towards the procurement of an AES for the 2010 National Elections (Annex M).

C. Technical Evaluation

The CICT as Chairman of the CAC and the CICT- National Computer Center (NCC) as member of the Technical Evaluation Committee provided two (2) technical staff to assist the COMELEC in the evaluation of the equipment and systems provided by the bidders for the procurement of the Automated Election System (AES) for the August 11, 2008 ARMM Elections. See Annex N.

The conduct of technical evaluation participated by CICT-NCC representatives was made only for Lots 1A, 1B, and 2A since these lots required delivery of equipment and software with specified functionalities. The majority of the test data were also provided by COMELEC.

During the course of the evaluation, foreign bidder representatives were not fully aware of the extent of the evaluation which caused some delays and misunderstanding during the evaluation, but in the end all went well. The COMELEC on their part was really aware of what they want; and their specifications for the solutions were reflective of their thorough understanding, experience and knowledge of applicable technology.

In the conduct of public bidding for the automation of the 2008 election in the ARMM, only two (2) bidders participated. One bidder was disqualified for non-eligibility, while the other bidder was allowed to submit its bid which subsequently underwent technical evaluation by the COMELEC with the assistance of the CICT-NCC.

Technical evaluation for Lots 1A, 2A and 2B were conducted on March 11 to April 8, 2008. The results of the technical evaluation revealed that the proposal of Smartmatic-Sahi failed to comply with several mandatory technical requirements set out in the Request for Proposal and in the various Bid Bulletins duly issued by the COMELEC Bids and Awards Committee (BAC). See Annex G.

In its March 31, 2008 letter to the CAC, the COMELEC requested for comments and recommendations on whether the bidder (Smartmatic-Sahi) met the specifications prescribed under the RFP for the automation of the 208 ARMM elections. Accordingly, the CAC issued a resolution on April 1, 2008 indicating

that the items for clarification in the technical evaluation report of the DRE component submitted by the BAC-Technical Working Group are considered sufficient compliance (Annex O).

Seeking further clarifications on the above-mentioned CAC resolution through COMELEC BAC letter dated April 1, 2008, the CAC issued a letter dated April 3, 2008 stating that “sufficient compliance” is equivalent to an understanding that 1) the bidder is committing to deliver the required system in conformance with all the technical mandatory requirements within the stipulated timeframe for customization, and 2) that the COMELEC will undertake exhaustive acceptance testing procedures to ensure such conformity prior to final acceptance (Annex P).

With the rejection of the bid proposal of Smartmatic-Sahi for Lots 1A, 2A, 2B and 3 (COMELEC Resolution No. 8436) and the consequent filing of a Motion for Reconsideration of Smartmatic-Sahi, the COMELEC TWG and CICT-NCC representatives conducted re-testing of its equipment.

Similarly, the CAC issued a resolution on April 26, 2008 reiterating its comments in its letter dated April 3, 2008 that Smartmatic-Sahi has demonstrated sufficient compliance with the specifications, and that, accordingly, the COMELEC may proceed with the awarding of the contract in favor of Smartmatic-Sahi (Annex Q).

In May 6, 2008, the COMELEC TWG and CICT-NCC representatives submitted their joint evaluation report showing that the Smartmatic-Sahi has fully complied with all the technical requirements specified in the RFP. As a result, COMELEC issued Resolution No. 8439 on May 8, 2008 awarding the contract for Lots 1A, 2A, 2B and 3 to Smartmatic-Sahi (Annex R).

For the procurement of Optical Mark Reader (OMR, Lot 1B), this resulted in two (2) failures of public bidding. Thus, the COMELEC BAC resorted to Negotiated Procurement as authorized by RA No. 9184. There were only two (2) bidders which have been declared eligible to participate after complying with the entire minimum eligibility requirements, namely Active Business Solution, Inc (ABS) and Avante International Technology, Inc. (Avante).

In May 6 and 7, 2008, the COMELEC TWG and CICT-NCC representatives conducted the technical evaluation of the equipment and system offered by Avante and ABS. The ABS failed to meet thirteen (13) specifications, including those on accuracy and data recovery, while Avante complied with all the specifications prescribed in the RFP.

As a result, COMELEC Resolution No. 8440 issued on May 9, 2008 awarded the contract for the procurement of Lot 1B in favor of Avante International Technology, Inc. See Annex S.

The CICT-NCC representatives to the COMELEC BAC Technical Working Group also participated in the conduct of acceptance testing. COMELEC provided the script to test the customization in the software and items that were not in accordance with the expected output of the script were documented.

It was noted that during the conduct of testing at the warehouse, there were problems encountered regarding the integration of the OMR to the servers. Representatives of both providers (Smartmatic and Avante) were pointing at each other regarding the technical problems. Further, during the field tests and mock elections, both suppliers argued on whose technical configuration were causing the transmission problems.

In the course of Field Tests 1 and 2, and the Mock Elections, there were problems encountered regarding the data transmission. The cause was from voltage of electric current to weak radio frequency signals. Although there was a provision for redundancy, the acceptance team were not able to test it since Smartmatic reasoned that the equipment for this purpose were still in transit and could not be installed during said activities. For the Mock Elections, servers in the Municipal levels were remotely administered, thus causing some problems.

The acceptance team was also able to test the response of the technical support of the Smartmatic during the Field Test 2 and Mock Elections. Problems identified were addressed and solved by the technical support.

IV. Assessment of the Automated Election System

A. Overview of Automated Election System

For the August 2008 ARMM elections, the COMELEC deployed two different kinds of technologies for the automated election system in order to gain experience with using the two dominant automated election technologies as well as gain experience in combining the results from these two systems into a general or overall election outcome.

The first technology is called Optical Mark Reader or OMR. This system uses

paper ballots which contains the names of the candidates and the different races being contested. Voters then shade or mark the circles corresponding to the names of the candidates they choose to vote for.

At the end of the election day, these paper ballots are then brought to a counting center where the ballots are scanned by a machine that detects the voter's marks and counts their votes. This technology was used in all the provinces of ARMM except for the province of Maguindanao. The technology provider for this system was an American company called Avante International Technology (<http://www.avantetech.com/>).

The second technology that was utilized is called Direct Recording Electronic or DRE. This system uses a touch pad device where voters simply select their choice of candidates by touching selected areas of the touchpad. The voter then gets a paper printout that serves to inform the voter that the system recorded the votes properly and accurately. Due to the relatively high cost of using this technology, this DRE technology was deployed only in the province of Maguindanao. The technology provider for the DRE system and also the overall integrator and prime contractor was a Venezuelan based company called Smartmatic (<http://www.smartmatic.com/>).

The transmission of election results at all levels via wireless connections from the precinct level for the DRE and from counting centers for the OMR up to the national data center in COMELEC's head office in Intramuros was required under the TOR/RFP.

To combine or merge the two partial results from both systems in order to arrive at the national winners, a canvassing and consolidation system was developed by Smartmatic and procured by the COMELEC and was successfully used in the August election. The election markup language or EML was specified to be used in order for the two different technologies to interoperate with the canvassing and consolidation system.

B. Compliance with Minimum System Capabilities (Section 6)

The minimum system capabilities as listed in Section 6 of RA9369 were all included in the RFP that was prepared by COMELEC and the winning bidders were able to sufficiently comply with all the requirements of this section of the law.

For both the OMR and DRE machines, assessment was made by CAC observers in determining the compliance to minimum systems configuration as specified in Section 6 of RA 9369. Used was a simple rating scheme of (0) for *non-compliant*, (1) for *least* compliant, (2) for *almost* compliant and (3) for *fully* compliant as observed in the performance on the 2008 ARMM Elections rather than a straightforward scale of pass or fail rating which bears a simple score of 100 % or less.

A. DRE Component

MINIMUM SYSTEM CONFIGURATION (per Sec. 7 [6] of RA 9369)	COMPLIANCE
Adequate security against unauthorized access	0 1 2 ③ NA
Accuracy in recording and reading of votes as well as in the tabulation, consolidation/canvassing, electronic transmission, and storage of results	0 1 ② 3 NA
Error recovery in case of non-catastrophic failure of device	0 1 2 ③ NA
System integrity which ensures physical stability and functioning of the vote recording and counting system	0 1 2 ③ NA
Provision of voter verified paper audit trail	0 1 2 ③ NA
System audibility which provides supporting documents for verifying the correctness of reported election results	0 1 ② 3 NA
An election management system for preparing ballots and programs for use in the casting and counting of votes and to consolidate, report and display election results in the shortest time possible	0 1 ② 3 NA
Accessibility to illiterate and disabled voters	0 1 2 ③ NA
Vote tabulating program for election, referendum or plebiscite	0 1 2 ③ NA
Accurate ballot counters	0 1 2 3 NA
Data retention provision	0 1 2 3 NA
Provide for safekeeping, storing and archiving of physical or paper resource used in the election process	0 1 ② 3 NA
Utilize or generate official ballots as herein defined	0 1 2 3 NA
Provide the voter system of verification to find out whether or not the machine has registered his/her choice	0 1 2 ③ NA
Configure access control for sensitive system data and function	0 1 ② 3 NA

It is to be noted that on “data retention provision”, observers from PPCRV cannot rate this since their monitoring of the conduct of elections did not provide an experience that can be related to this. However, it is a concern whether the USB flash drive, which retains the election results data, was really a “write once read many” (WORM) instrument; the CD is still considered the real WORM instrument.

On “safekeeping, storing and archiving of physical/paper resource used in the election process”, this was rated 2 since there is still the “voter verifiable paper trail (VVPAT) and the USB flash drive. However, the life term of the thermal paper used is not known and the concern on the USB flash drive whether this is a real “write once read many” (WORM) instrument.

For the provision on “utilizing/generating an official ballot”, this was not rated as it is of the understanding that DRE technology does not generate an official paper ballot.

B. OMR Component

MINIMUM SYSTEM CONFIGURATION (per Sec. 7 [6] of RA 9369)	COMPLIANCE
Adequate security against unauthorized access:	0 1 2 ③ NA
Accuracy in recording and reading of votes as well as in the tabulation, consolidation/canvassing, electronic transmission, and storage of results;	0 1 ② 3 NA
Error recovery in case of non-catastrophic failure of device;	0 1 ② 3 NA
System integrity which ensures physical stability and functioning of the vote recording and counting process;	0 ① 2 3 NA
Provision for voter verified paper audit trail;	0 1 2 ③ NA
System auditability which provides supporting documentation for verifying the correctness of reported election results;	0 1 2 ③ NA
An election management system for preparing ballots and programs for use in the casting and counting of votes and to consolidate, report and display election result in the shortest time possible;	0 1 2 ③ NA
Accessibility to illiterates and disable voters;	0 1 2 ③ NA
Vote tabulating program for election, referendum or plebiscite;	0 1 2 ③ NA

Accurate ballot counters;	0	1	2	3	NA
Data retention provision;	0	1	2	3	NA
Provide for the safekeeping, storing and archiving of physical or paper resource used in the election process;	0	1	2	3	NA
Utilize or generate official ballots as herein defined;	0	1	2	3	NA
Provide the voter a system of verification to find out whether or not the machine has registered his choice;	0	1	2	3	NA
Configure access control for sensitive system data and function.	0	1	2	3	NA

C. Compliance with Other Requirements of RA 9369

1. IT Support for the Board of Canvassers (Section 4)

Under RA 9369, the DOST was given the task of training and certifying at least one member of the Board of Election Inspectors in areas where automation was used. In the case of Maguindanao, the BEIs were trained by COMELEC personnel in Cotabato City and a team of DOST personnel then administered four batches of both a written examination and a practical/hands on examination of the trainees. The overall passing rate was approximately 85% which was a very good result.

2. Communication Channels for Electronic Transmissions (Section 7) and Continuity Plan (Section 13)

The communication channels and continuity plan were both prepared by Smartmatic as lead contractor for the project and both items were provided for by Smartmatic as well.

3. Source code review (Section 14)

Due to the very short timeframe of the whole automated election plan and also due to the late finishing date of the vendor to the source code and configuration of the AES, the Technical Evaluation Committee had no more time to conduct a detailed and comprehensive source code review of the entire AES. The Commission chose to exercise its right under RA 9369 to go ahead with the use of the system without the certification due to extraordinary circumstances.

All other provisions of the law such as the official ballot, and counting procedure

were adequately captured in the Request for Proposals developed by COMELEC and vendor compliance with all the items in the RFP were checked by the Commission as well.

D. Problems/Issues Encountered

1. Field Test 1

The first field test exposed only one major problem so far in the entire AES and that was the problem of interoperability between the two systems. Since it was the first time that both vendors worked together and due to different interpretations of the scope of the work, the consolidation did not work properly and further customization and development work was then undertaken by both vendors to remedy the situation.

2. Field Test 2

The second field test gave the opportunity to test the revised system with special emphasis on the problem identified in the first test. Based on the reports from DOST observers and from COMELEC, the problems were resolved satisfactorily and the system was then deemed ready to undergo the next test which was the mock election.

3. Mock Elections

The mock elections were held at various places in ARMM and used non COMELEC personnel as actual voters. According to DOST observers, the results were generally good and the only problems encountered were due to the late arrival of some of the personnel of one of the vendors that resulted in the delayed opening of the start of the elections.

More detailed reports from COMELEC on both field tests and the mock elections may be found in Annex T.

4. Actual Elections

Based on the reports received from various monitors from DOST, PPCRV and CER who personally witnessed the conduct of elections in ARMM, it was observed that the elections were generally peaceful and orderly.

However, some technical problems in the operation and use of the DRE machines contributed to some delays at precinct level. These are:



1. Problems in the initialization of voting machines since some of the BEIs committed repeated errors in punching their pin codes. Designated IT experts had to take over the initialization process to speed up the process because this has caused delay in voting.
2. Operational delays in starting the machine due to defective DREs which were however immediately replaced.
3. Incidents of automatic machine shut down while the voters were casting their votes. It was resolved by replacing the electronic voting machines (EVMs).
4. Many BEIs were unfamiliar with the EVM due to the overnight substitution of BEIs with untrained persons which could have been perpetrated by interested parties.
5. Inasmuch as the voting machines did not have the capacity to validate the identity of the voter through the biometrics, and that it is the BEIs who allow a voter to cast a vote by pressing the activation button, it is a concern that there might be a possibility to manipulate the voting. In Pagalungan, some of the BEIs did not validate the identity of the voters during the actual casting of votes.

For the OMR component, technical problems were also encountered. These are:

1. Valid ballots that were crumpled, folded (to fit in the size of the ballot box) and those that contained unnecessary markings or smudges as well as those lightly shaded ballots were rejected, which slowed down the counting.
2. The number of ballots to be counted per ACM was not as it was projected. There are discrepancies in the counting of ballots between

those who actually voted with results counted. An example of this was experienced in one of the precincts of Shariff Kabunsuan where the actual number of voters is 371 but the machine counted only 276, there was a discrepancy of 95 ballots papers. But, after the BEIs conducted a recount the machine counted 365.

3. Incidents of over voting in some precincts that used OMR, such as Bumbaran, Lanao del Sur, were also encountered because of BEIs voting in their assigned precincts. In these cases the result was invalidated (treated as zero) and COMELEC had to override it.
4. The Counting and Canvassing System (CCS) was not programmed to accommodate failure of elections in some municipalities, such as Balindong, Lanao del Sur and Basilan, thus the machine had to be shut down to force the system to close the counting. There were incidents wherein the system would not close the counting and canvassing since it showed that it didn't count 100% of the total votes from all the precincts though all precincts were able to count the votes.
5. Some ACMs to include laptops and printers overheated, stopped functioning and had to be re-started.
6. Constant paper jamming (of the OMR Ballots).
7. The attached full 196-key Keyboard in the ACM is open to programming intrusion.

During the results transmission phase after the closing of the election, it was observed that problems were encountered by the supplier involving the data communication infrastructure. Specifically, it was reported that in the areas of Buluan, Pagagawan, Talayan and Shariff Aguak, the BEIs had to personally bring the USB flash drive to their respective canvassing centers due to total transmission failure. This incident holds true for several areas in Maguindanao.

The supplier admitted that they used an untried and untested private network that was only installed too close to the Election Day. Not only did this delay the transmission but also compromised the integrity and security of the AES.

Another cause of delay in the consolidation and transmission process was the physical transportation of the OMR ballots to the counting centers. The printing of 30 copies of the election returns of each precinct and counting center also slowed down the canvassing and transmission process, which in turn inconvenienced the BEIs of queuing to wait for their turn before their ballots could be counted and canvassed. See Annex U for the detailed observers' report.



V. Assessment of User Experience

During the conduct of ARMM Elections on August 11, 2008, several monitors from Parish Pastoral Council for Responsible Voting (PPCRV) and Consortium on Electoral Reform (CER) were deployed to various provinces of ARMM. The monitors were tasked to observe the usability of the technologies used in the election as well as observe the electoral process in general.

It should be noted however that some monitors in Shariff Kabunsuan and Maguindanao were prevented from observing the initialization stage of the machines at the counting centers as the election directors refused to acknowledge them as election observers despite the IDs provided by the COMELEC Central Office.

For Maguindanao, the technology used was the Direct Recording Electronic (DRE) while the Optical Mark Reader (OMR) technology was used in the provinces of Lanao del Sur, Shariff Kabunsuan, Basilan, Tawi-Tawi, Sulu and Marawi City.

A. DRE

In general, there were affirmations from the users and election observers in Maguindanao that the use of the DRE technology made the voting process easy and the counting fast. The people enjoyed the idea of pressing the picture of the candidates they would like to vote through the touch pad. It was user-friendly as the voters would say.



However, several problems were observed during the actual Election Day. These are:



1. Many voters and BEIs were unfamiliar with the system since there was hardly any opportunity to see and test the DRE before the elections, this could be attributable to lack of voter education due to time constraints;
2. There were several instances where illiterate voters and those who were not familiar with the new system were being accompanied by another person inside the precincts as coach. The relationship between the voter and his/her companion was not properly validated. These so called coaches do not only guide the voters inside the voting precincts but even control the hand of the voter as to who to vote. Even some of the BEIs and watchers have been seen coaching the voters as well;
3. On the secrecy of voting, there were no booths to cover the DRE machines enabling the voters of another adjacent DRE machine to see the votes being cast; and
4. Size of the candidates' pictures (too small) made the image unclear.

B. OMR

The ARMM voters' past experiences with an OMR Ballot made this technology easy to relate to. Shading the names of the candidates became an all familiar experience because of past automation elections tried in this region. Queuing to get the OMR ballot wasn't a problem for the voters because filling-in the ballot normally utilized the voting area used in the manual system. Overall, in spite of the lack of direct technological exposure of the voters using the OMR system, this process could be deemed user friendly. But there was a downside to the use of the OMR Ballot which includes the following:



1. Votes shaded in the OMR ballot were exposed to tampering. Reports of unscrupulous erasures were documented;

2. The distribution of the official OMR Ballots were likewise exposed to the threat of advance shading;
3. The voters would sometimes accidentally scratch or ink-blot the OMR ballots which hampered its optical scanning;
4. The folding and unfolding of OMR ballots resulted to some extent in time inefficiency at the counting centers;
5. In a number of the PPCRV's poll watchers reports, some BEIs, accidentally perhaps, tore off the bar code of the ballots resulting in their rejection; and
6. The BEIs had the lack of procedural knowledge on the disposition of invalid ballots.



The consequent gains from the use of the OMR (Optical Mark Reader) and DRE (Direct Recording Electronic) technologies were diminished by the inability to use them side-by-side with effective **change management***. There is a need to make all election stakeholders the subject and not the object of technology. Also, there is a need to prepare everyone for change (both psychologically and technically) before change can truly transform everyone's mindset. Moreover, a change in the electoral values must go hand-in-hand with the desired electoral reforms. For in these situational realities, the problem of corruption cannot be solved by technology alone but by the individual and collective conversion of voters, politicians and election stakeholders.

Definitely the lack of time for preparation, training and education on the use of the technologies hindered the full utilization of automation, otherwise the recent ARMM polls could have been an excess of success.

* Change Management can ensure standardized methods, processes and procedures are used for all changes, facilitate efficient and prompt handling of all changes, and maintain the proper balance between the need for change and the potential detrimental impact of changes.

VI. Capability Building in the COMELEC

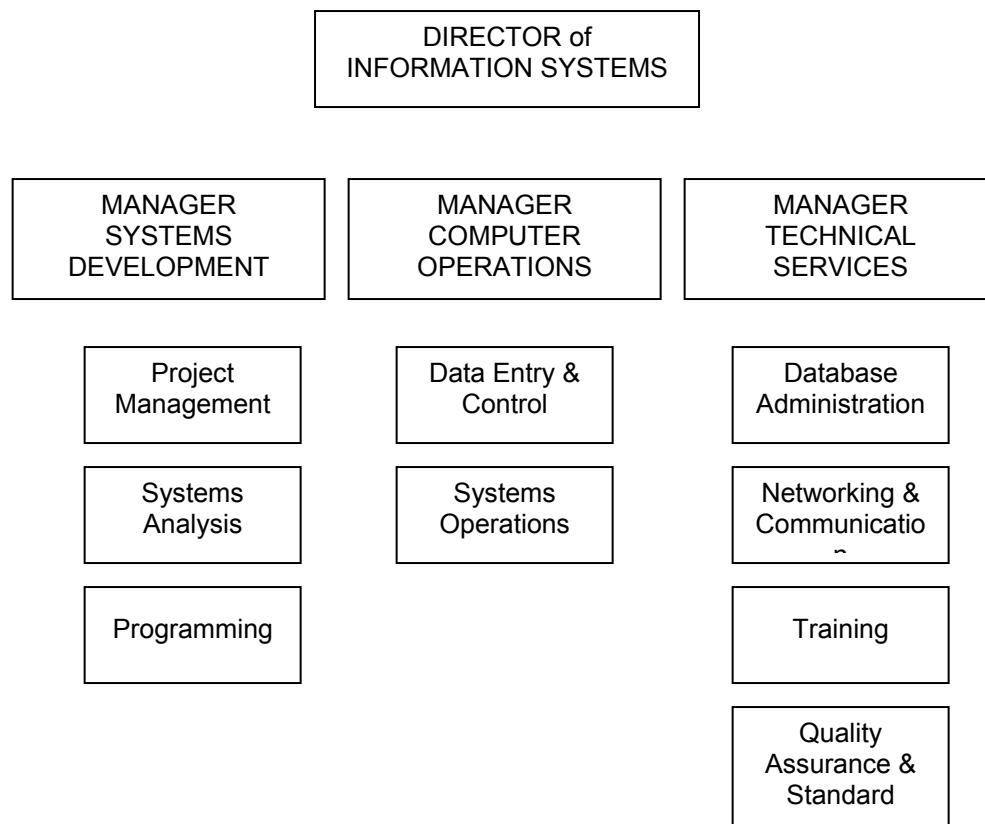
A. IT Organization in COMELEC

The existing IT infrastructure in COMELEC is inadequate to meet the complexities of an automated election process which includes end-user tabulation and computing, multimedia networks, internet and database build-up and maintenance. There are inherent weaknesses in their current IT institutional set-up such that it does not reflect the importance of information technology. There is a pressing need for more and better training in the use and management of IT. There is a lack of IT “champions” within the organization who can promote the effective deployment and use of computerized systems.

Organizational changes are crucial in the COMELEC to succeed in its computerization efforts. The organization of COMELEC’s IT unit should be rationalized and all the tasks that need to be performed by the new IT organization structure will have to be defined. Then a process of identifying what tasks should be done “in-house” or what can be “outsourced” will have to follow. For improved governance, this IT unit should be highly responsive and capable of delivering and operating the many systems required to provide greater access to ELECTION information and improved service delivery.

The IT unit should be able to provide continuity to development and deployment processes, as well as continuous support for already deployed systems. It should be able to: (a). champion the pervasive use of IT within the COMELEC (b). support end-user requirements particularly those in remote field offices (c). adopt best practices that have surfaced and evolved over time (d). sustain operations over the long-term.

Most existing IT organization in government follows the traditional structure where the IT unit is organized along functional lines, such as Systems Development, Computer Operations, and Technical Services.



However, unfortunately, the ever-increasing scope of information technology, communications, and automation has resulted in a number of important IT functions that do not easily fit into the model described, such as:

1. Information systems planning
2. Security administration
3. User helpdesk
4. Software licensing
5. Disaster Recovery planning and implementation

The roles and functions of an IT unit in any organization have evolved to cover a wider scope in view of the pervasive use of computers today. Whereas in the past, IT units could confine their activities to centralized mission-critical business applications, today, the IT unit has to deal with the various complexities. The final step prior to the design of the IT unit's structure is the determination of the best way to source each of the identified IT functions. The criteria for deciding to keep a function in-house include the need for control, the perceived ability of an in-house IT unit to provide the function over the long term, considerations for end-

user support, and cost effectiveness. On the other hand, the criteria for deciding to outsource a function include the availability of service providers locally, the perceived ability of service providers to provide the service better than an in-house unit, and the need for scarce expertise that government cannot maintain, especially if the need is temporary or short term.

B. Election Computerization Project Management

The automation or computerization of elections will be bidded out or outsourced to a vendor or a consortium of vendors which will be significantly responsible for the provision of hardware, software, integration, telecommunications, training, roll-out, and promotions. Thus, it is important that a **Project Methodology and Implementation Plan** should be mandatory.

A Project Management Methodology should contain the overall organization, roles and responsibilities, and project procedures and processes for project monitoring and control, testing and acceptance, conflict resolution, and change order requests. Also, an integrated Implementation Plan or Inception Report detailing the definitive implementation and deployment strategies and activities covering all subprojects should be formally in place and documented.

The primary objectives of the overall project management function are:

1. To co-ordinate and integrate the various activities and sub-projects being undertaken for the computerization
2. To report status and issues to the COMELEC Management Committee related to the project's activities and deliverables.
3. To monitor the project budget and schedule on an on-going basis utilizing project management tools.

The COMELEC and the winning CONTRACTOR shall establish a project executive committee consisting of three (3) senior level executives or officers from each Party (the "Project Management Board").

C. Election Computerization Control and Supervision

The following Committees will serve as the key committees responsible for the oversight, control, and supervision of the project. These committees are:

1. Joint Congressional Oversight Committee (JCOC)
2. COMELEC Management Steering Committee
3. Project Management Board (PMB)
 - i. COMELEC Project Director
 - ii. CONTRACTOR Project Director
4. System Owners and Subcommittees

COMELEC Management Steering Committee (COMSTC)

The COMELEC Management Steering Committee is chaired by the Chairman of the COMELEC and is composed of all the COMMISSIONERS and the members of the PMB, as described below. It has the overall responsibility for ensuring the implementation of the AUTOMATED systems within the agreed timetable and budget in accordance with COMELEC policy and change order directions.

Project Management Board (PMB)

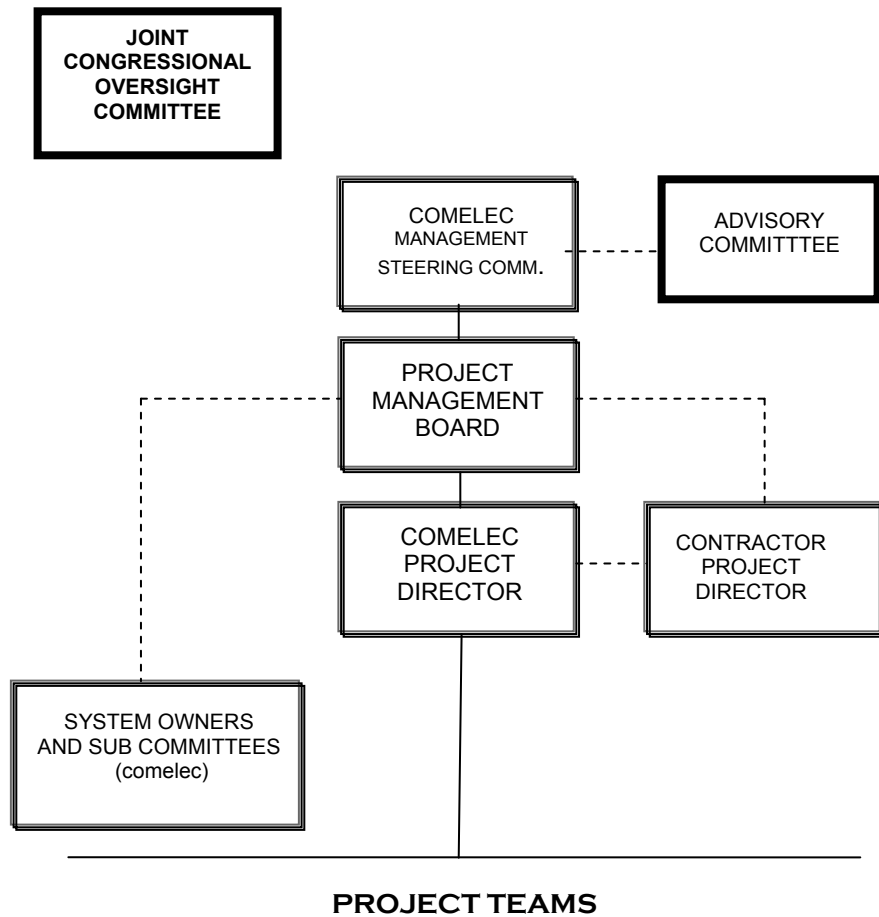
The Project Management Board (PMB) consisting of three (3) senior level executives from the COMELEC and the CONTRACTOR shall have overall Project responsibility and management, shall establish appropriate Project leadership, and shall be responsible for resolving any matters arising under the contract. Insofar as the day to day project monitoring activities, both the COMELEC and the CONTRACTOR shall appoint their Project Directors who will be responsible for ensuring that the project schedule is followed, that project expectations are met and that the overall quality and completeness of the project deliverables is satisfactory.

It is headed by one of the COMELEC Commissioners, designated as the overall Project Director of the entire project team with full management authority over all personnel working on the project. Directly responsible for the entire project, the Project Director reports on the quality of the project to the COMSTC, performs strategic and tactical planning on the major areas of the project, and acts as primary negotiator for contract negotiations involving Change Orders.

System Owners and Subcommittees

The subcommittees are composed of Personnel from the Service/ directorates most affected by the system (Expert Users). These groups ensure the required number of users and commitment of qualified user personnel to the Project.

COMMITTEE STRUCTURE & ROLES



VII. Recommendations

A. Procurement Process

Below are the proposed recommendations for an effective procurement process:

1. The procuring agency must follow strictly the IRR of RA 9184 – Government Procurement Reform Act to avoid suspicion on the awarding of the contract and get the COMELEC Advisory Council actively involved in the entire procurement process.
2. There are certain system configuration compliance requirements that COMELEC's own technical IT staff must be familiar with or knowledgeable of. The services of key experts may supplement that from within the CAC, TEC, or COMELEC as stipulated in Section 9 of RA 9369.
3. The early preparation of the Terms of Reference (TOR) and Project Management Timeframes must characterize all on-going automation efforts for the upcoming 2010 national and local elections.
4. Hybrid solution/technology should come from one vendor/provider only for smooth integration of the different technologies and for flawless transmission of results.

B. AES

Following are the proposed recommendations to address the problems and issues on the use of an Automated Election System (AES):

1. The features and functions of the awarded OMR and DRE technology used can still be enhanced to arrest the possibility of fraud. There was a report submitted by Avante to COMELEC regarding changing the data of election results remotely from Manila head office by Smartmatic-Sahi that if left unchecked can lead to widespread vote reduction and padding.
2. The consolidation system was already bought by COMELEC; the Encryption/Decryption modules must be delivered by Smartmatic in order to use the consolidation system with future election automation suppliers.

3. Publicly available networks, with the appropriate security measures should be considered for the transmission phase as these are inherently more reliable.
4. A DRE system must print a paper ballot before the electronic image is stored and must contain machine-readable markings of the actual votes casts (e.g. bar codes) to facilitate recount and to provide additional security against ballot tampering.
5. There must be a module or sub-system available to automate the recount process using the machine-readable (bar codes) impressions on the ballot.
6. The voter and the BEIs should authenticate the machine-generated ballot before it is dropped in the ballot box.
7. Adopt the technology or combination of technologies that eliminates or considerably lessens human handling.
8. For OMR technology, there is a need to change the ballot boxes to avoid folding of OMR ballots (to refer to the design done by Engr. Ferrer of COMELEC targeted for the 2004 Election Automation).
9. Mandate that certification of all the devices for counting, transmission, and canvassing as stated in Sections 9 [11] and 12 [14] of RA 9369 are properly and strictly followed to ensure actual compliance to the minimum system configurations specified in Section 7 [6] of RA 9369 aside from those specified in the Terms Of Reference (TOR) for the Request For Proposal (RFP) and reduce all possibilities of electoral failure, fraud, and/or cheats.
10. As per Section 11 of RA 9369, involve the TEC in determining the criteria for evaluation and certification of the AES based on the recommendations of the international certification and accreditation bodies, such as Information Systems Audit and Control Association (ISACA), www.isaca.org. This shall be from TOR preparation to post-election review. The TEC may seek such other expertise as may be required in reference to item VII.A.2.

11. Conduct a Post-Audit review of the software program and system processes done.
12. Conduct a random survey on the user-friendliness, security, and manageability of the system with election officers, BEIs, accredited citizens' arm and voters.
13. Review the conduct of Project Management by the agency and its deputies and contractors.
14. Formulate a strategic and intensified voter's education campaign at the grassroots level the soonest time possible in preparation for the 2010 elections – at least 6 months prior to elections. Alternative strategies such as audio-visual (e.g. instructional videos) materials, education and information tours/roadshows in malls, including universities and schools with a big voting (first time and otherwise) population, should be considered so as to familiarize the voters with the use of electronic/automated voting machines.
15. Despite the provision in law for a DOST certification to an IT specialized BEI member, a programmed and systemic training program (and not just one training session), must characterize the training of all BEI members. And to further disseminate this training scheme the joint instruction of BEIs could be done hand-in-hand with local PPCRV Pollwatchers. In effective **change management**, project implementers must first undergo rigid training so that its **trickle effect** to the voters at the precinct level becomes more efficient.
16. Review physical environment of polling precincts vis-à-vis the automated election system.

C. Proposed Changes in Legislation

1. Amend Section 19 [22] of RA 9369 by deleting the specified number of Election Returns (ERs) to be printed beyond the eighth (8th) copy, i.e. to the thirtieth (30th) copies and retain its original set of eight (8) copies and require instead to have all electronically transmitted ERs be posted on the official COMELEC website simultaneously while it is sent to the board of canvassers and those needing extra copies to download them from the official website.

2. Amend Section 229 of Article XIX of BP 881 under subtitle Canvass and Proclamation pertaining to the *Manner of Delivery and Transmittal of Election Returns* that have been the basis on the sequence of transmission prescribed in Section 19 [22] of RA 9369 to electronically transmit the ERs in a chronological manner when in actuality once they are transmitted, the data can concurrently be transmitted to the host center for immediate consolidation of votes and can be viewed by all through an official election website.
3. Amend Sections 27, 28, and 29 of RA 7166 pertaining to; 1) Number of Copies of ERs and their distribution; 2) Canvassing of Provincial, District, City, Municipal board of canvassers; and 3) Number of Certificates of Canvass (including Statement of Votes), that can be generated automatically with fully a secured and certified integrated system. This is also with reference to Sections 21 and 22 of RA 8436 stipulating the same as recommended in above items 2 and 3.
4. Expand the provisions for the steering committee stated in Section 9 [9(3), 11] of RA 9369 to include the creation of a Project Management Office within the Commission to oversee and supervise the functionalities and responsibilities of the different vendors for proper coordination and accountability on each of the awarded contractors. Third party arbitration may be created as deemed necessary to settle any disputes that may arise that covers technical, administrative matters and/or procedural concerns.
5. Create a provision that should include Change Management for parties affected by the reforms brought about by this innovation which can also be inserted in Section 26 [31] of RA 9369 under Stakeholder Education and Training and expand the coverage to all concerned stakeholders using expertise of third parties outside the Commission.
6. Insert a provision for the CAC and for the TEC to include among its functions and duties as defined in Section 9 [9 & 11] of RA 9369 the applicability and usability of Internet voting or other forms of automated elections for Overseas Absentee Voting as stipulated in Section 18.7 of RA 9189 for purposes of counting and canvassing.
7. Add a new definition of term for “Instructions/Users’ Manual” in Section 2 [2.12] of RA 9369 in addition to the word “Source Code”. The new definition

will read as follows “An Instruction/Users’ Manual refers to the document that expresses the features, functions and operations of the AES to be used by the election officials and the voters”.

8. With the new term indicated in item number 7, amend Section 12 [14] of RA 9369 in the *Opening of Source Code for Review* instead to “Opening of Instructions/Users’ Manual” and all references to the term “Source Code” in the same section to “Instructions/Users’ Manual” as the former refers to system software codes of computer programs that may be subjected to alterations causing widespread fraud at a grand scale.
9. The cleansing of the computerized voter’s list must go hand-in-hand with all automation efforts for the 2010 Polls. Placing the voter’s list online as a strategy for this undertaking enables a collective effort between the voters and the Commission to eliminate discrepancies in the list, especially purging it of dead weight.
10. General registration is strongly recommended for critical areas, i.e. ARMM, etc., known for multi-registrants and under-age registrants. Completion of the use of biometrics in identifying voters is likewise highly recommended.
11. Formulate policies and adopt innovative measures that will attract first time voters and make registration accessible to them, i.e. setting up of COMELEC strategic registration centers, extend registration on some specified Saturdays to accommodate students, and involve its accredited citizens’ arm and media in its information and promotion campaign for this.