A Review/Analysis

of

Smartmatic-TIM Corp.'s "Mock Elections Summary Report"

Dated August 3, 2012

on the Mock Elections Conducted on July 24-25, 2012 at the House of Representative's Hearing of the Committee on Suffrage & Electoral Reforms (CSER)

By: transparentelections.org.ph

MOCK ELECTION RESULTS REVEAL SMARTMATIC'S PCOS VOTE COUNT IS NOT ACCURATE

Required Accuracy Rating is **99.995%** or **1 error in 20,000 marks**

Audit of Mock Election shows an accuracy rate of **97.21519%** or **557 errors in 20,000 marks**

Smartmatic's PCOS does not comply with the accuracy rate required under the Request for Proposal for the Automation of the 2010 National and Local Elections

SMARTMATIC'S METHOD OF DETERMINING VARIANCE IS FLAWED

No.	Candidates for President	Manual Count	PCOS Count	Manual Count – PCOS Count
25	Holliday, Darren (LP)	10	13	**-3**
26	Honnet, Guillaume (SJS)	18	15	**3**
	Total	28	28	**0**

Using the logic of Smartmatic, then the accuracy rate is an illogical 100%!!!!

electronic Dagdag Bawas?

The above matrix is an excerpt from the Results table for President in Smartmatic's Report, with the last column added to show the Variances per Candidate

SMARTMATIC'S METHOD OF DERIVING THE PERCENTAGE MATCH IS SEVERELY FLAWED

Smartmatic says:	We say:
Percentage Match is 99.98710%	Percentage Match is 42.13198%

Summary of Key Facts for the Audit*

Total number of ballots used	1,000
Total number of ballots scanned	958
Total number of ballots rejected	42
Number of ballots with confusing marks	9
Number of positions audited	4

- *42 Ballots were not scanned and were rejected by the PCOS for various reasons (see page 7 of Smartmatic's Report)*
- *"9 ballots were considered confusing and were isolated for later study and interpretation" (see page 9 of Smartmatic's Report)*
- *Positions audited include: President, Senator, Party List, and House Member (see page 4 of Smartmatic's Report)*

*** See Page 10 of Smartmatic's Report**

Summary of Key Facts for the Audit*

Total number of marks counted by the PCOS (for positions subject to audit)	8,295
Total number of marks counted manually (for positions subject to audit)	8,402
Variance	107
Percentage of Match Between Manual and Electronic Count	99.98710%

- *The Variance and Percentage of Match Between Manual and Electronic Count values were derived by Smartmatic.*
- *Smartmatic's Report does not indicate whether the result of the Manual Count includes vote marks on the 9 ballots found to be confusing and set aside for "later study and interpretation".*

*** See Page 10 of Smartmatic's Report**

SMARTMATIC'S METHOD OF DETERMINING VARIANCE IS FLAWED

VARIANCE

Smartmatic says:	We say:
VARIANCE = 107	VARIANCE = 231

VARIANCE

Deducing from Smartmatic's Report, VARIANCE is the difference between the Manual Count and the PCOS Count, so…

VARIANCE = Manual Count – PCOS Count

VARIANCE = 8,402 – 8,295

VARIANCE = 107

VARIANCE

What caused the VARIANCE?

The detailed results for positions audited (***President, Senator, Party List, and House Member***) reveal differences and exact matches between Manual Count and PCOS Count per candidate.

Let us examine an excerpt from the results for President. The first 10 in the list of 55 candidates were considered to simplify the analysis.

VARIANCE

No.	Candidates for President	Manual Count	PCOS Count	Manual Count – PCOS Count
1	Abubakar, Aminudin (NPC)	**173**	**169**	**4**
2	Aceves, Tonho (NAD)	**44**	**44**	**0**
3	Achouche, Mohammed (ANAKPAWIS)	**19**	**20**	**-1**
4	Acquart, Clement (NP)	**10**	**11**	**-1**
5	Andry Shevchenko (NAD)	**14**	**14**	**0**
6	Cristiano Ronaldo (PDP-LABAN)	**7**	**6**	**1**
7	Dan-phil, Itulua (LM)	**8**	**8**	**0**
8	Daniel, Daniel (OCKSTEDDY)	**24**	**28**	**-4**
9	Daniel, Dzierzega (SALAMIN)	**7**	**8**	**-1**
10	Daniel, Geoffray (SALINGKET)	**9**	**8**	**1**
	TOTAL	**315**	**316**	**-1**

The above matrix is an excerpt from the Results table for President in Smartmatic's Report, with the last column added to show the Variances per Candidate

VARIANCE

From the excerpt, following the Smartmatic method, that is, Manual Count – PCOS Count, the following are observed:

1. Negative, positive, and 0 variances among the candidates
2. The variances, positive or negative, are indicative of the instances when the Manual Count differed with the PCOS Count.
3. In the case of the excerpt, the Variance is –1.

Smartmatic explains:

"Manual audit is subject to human interpretation. The simplest way to conduct an audit is to manually count the votes in the ballot paper on a per candidate basis and compare it with the machine-tabulated results. Therefore it also follows that the most logical way to show these results is to do a comparison between the two on a per candidate basis. Note however, that manual audit is always subject to human interpretation. Therefore these figures will almost always not match. There will be times when the machine will have a higher count, and vice-versa. Presenting the results in this way will only increase the variance between the two figures, creating a negative impact regarding the machine's accuracy."*

WE AGREE!

*Page 15 of Smartmatic's Report (underscoring supplied)

Smartmatic explains further:

"A more "accurate" way of presenting the results is to sum the number of votes tallied per position for both the machine and the human count, and compare the variance. This way, the overall number of votes tallied is taken into consideration and the entire position being audited is taken as a whole, as opposed to doing it on a "per candidate" basis."*

WE DON'T AGREE!

Because some positive and negative variances per candidate cancel each other out if the Variance is derived from the totals of Manual Count and PCOS Count, which is illustrated in the next slide.

* Page 15 of Smartmatic's Report (underscoring supplied)

VARIANCE

Recall the formula, Variance = Manual Count – PCOS Count. In this example, t**he Variance computation shows that the positive and negative variance cancel each other out.**

No.	Candidates	Manual Count	PCOS Count	Manual Count – PCOS Count
25	Holliday, Darren (LP)	10	13	**-3**
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	Total	28	28	**0**

Using the logic of Smartmatic, then the accuracy rate is an illogical 100%!!!!

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VARIANCE

Smartmatic preferred to present the resulting VARIANCE based on the whole (what Smartmatic refers to as the "more 'accurate' way"), meaning, the total Manual Count minus total PCOS Count for all candidates to avoid the "increase (in) the variance between the two figures, creating a negative impact regarding the machine's accuracy"* and because the resulting variance is lesser than what it actually is.

* See Explanatory Note on Page 15 of Smartmatic's Report

VARIANCE

The ACCURATE way of determining the VARIANCE is to **tally the number of times that the Manual Count differed with the PCOS Count**, regardless of whether the variance between the Manual Count and PCOS Count per candidate is positive or negative.

The sum of the absolute values (regardless of + or -) of the variance between the Manual Count and PCOS Count per candidate is the number of times that the Manual Count differed with the PCOS Count. This is the ACTUAL Variance.

In this excerpt from the Results of the Manual Count and PCOS Count for President, Smartmatic would say that the Variance is **–1**. We say that the Variance is 13.

No	Candidate	Manual Count	PCOS Count	Manual Count – PCOS Count	Absolute Values of the # of Times the Manual Count Differed w/ the PCOS Count
1	Abubakar, Aminudin (NPC)	**173**	**169**	**4**	**4**
2	Aceves, Tonho (NAD)	**44**	**44**	**0**	**0**
3	Achouche, Mohammed (ANAKPAWIS)	**19**	**20**	**-1**	**1**
4	Acquart, Clement (NP)	**10**	**11**	**-1**	**1**
5	Andry Shevchenko (NAD)	**14**	**14**	**0**	**0**
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8	Daniel, Daniel (OCKSTEDDY)	**24**	**28**	**-4**	**4**
9	Daniel, Dzierzega (SALAMIN)	**7**	**8**	**-1**	**1**
10	Daniel, Geoffray (SALINGKET)	**9**	**8**	**1**	**1**
	TOTAL	**315**	**316**	**-1**	**13**

Last two columns added to show the Variances per Candidate and number of instances that the Manual Count differed with the PCOS Count.

VARIANCE

By adding all the absolute values computed from the (Manual Count – PCOS Count) for each candidate in the 4 positions covered by the audit, we determined the VARIANCE to be

231

Not 107 which Smartmatic claims it to be.

SMARTMATIC'S METHOD OF DERIVING THE PERCENTAGE MATCH IS SEVERELY FLAWED

For simplicity, we refer to this factor as "Percentage Match" in the succeeding slides

Note that the Percentage Match is not referred to in RA9369. We simply reviewed Smartmatic's method.

Percentage Match

Smartmatic says:	We say:
Percentage Match is 99.98710%	Percentage Match is 42.13198%

Percentage Match

Smartmatic says:

Total number of marks counted by the PCOS (for positions subject to audit)	8,295
Variance	107
Percentage of Match Between Manual and PCOS Counts	99.98710%

How did Smartmatic compute for the Percentage Match?

Percentage Match

This formula seems to have been used:

Percentage Match = 100(?) – (Variance/PCOS Count)

So that:

Percentage Match = 100 – (107 / 8,295)
Percentage Match = 100 – 0.012899
Percentage Match = 99.98710

***Strangely**, the percent symbol (%) was appended to the computed result, so that:*

Percentage Match = 99.98710**%**

Another possibility is …

Percentage Match = 1 – (Variance/PCOS Count)

Percentage Match = 1 – (107 / 8,295)

Percentage Match = 1 – 0.012899

Percentage Match = 0.98710

Percentage Match = **99**.98710**%**

Percentage Match

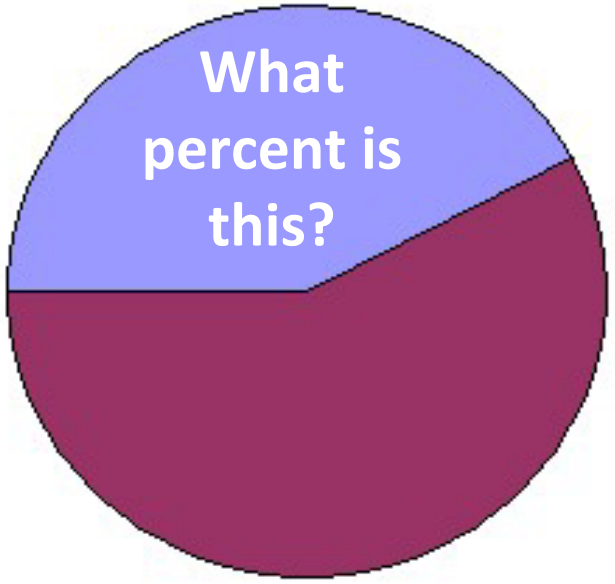
The method used by Smartmatic for computing for the Percentage Match is **mathematically incorrect.**

1. The factor “Variance/PCOS Count” cannot be used to determine the portion of the results where the Manual Count and PCOS Count per candidate matched.
2. Appending the percent symbol (%) is procedurally incorrect.
3. **Smartmatic’s manner of determining the percentage value is mathematically incorrect.**

Percentage Match

So, what should the Percentage Match be?

We all learned in elementary arithmetic that percentage is the fraction of a whole expressed in percentage notation.



Percentage Match

To determine the Percentage Match, the results of Manual Count and PCOS Count per candidate were reviewed, and we found:

Positions Covered by the Audit	Number of Candidates
President	55
Senators	55
Party List	55
House Member	32
Total	197

Percentage Match

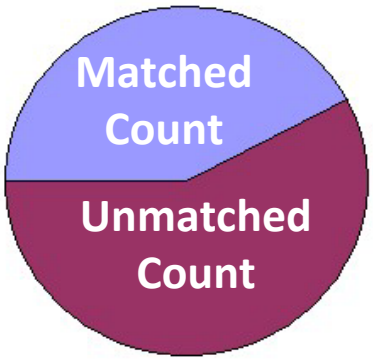
We also found:

Total Number of Candidates in all Positions Audited	197
Number of Candidates whose Manual Count matched the PCOS Count	83
Number of Candidates whose Manual Count did not match the PCOS Count	114

The whole consists of 197 candidates.

Percentage Match

And, deducing from Smartmatic's label "Percentage of Match Between Manual and Electronic Count", the Percentage Match is the ratio of the Number of Candidates whose Manual Count matched the PCOS Count vis-à-vis the Total Number of Candidates in all Positions Audited expressed as a percentage value.

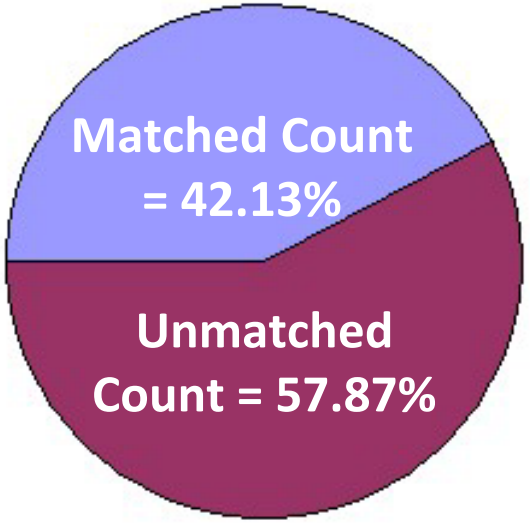


Percentage Match

Thus,

Percentage Match = Number of Candidates Whose Manual Count Matched the PCOS Count / Total Number of Candidates in all Positions Audited x 100%

Percentage Match = 83/197 x 100%
Percentage Match = 0.4213198 x 100%
Percentage Match = **42.13198%**



On Accuracy:
MOCK ELECTION RESULTS REVEAL SMARTMATIC'S PCOS VOTE COUNT IS NOT ACCURATE

Accuracy

COMELEC, in its Request for Proposal for the automation of the 2010 National and Local Elections, required an Accuracy Rate of 99.995% which means 1 error in 20,000 marks.

Accuracy

Accuracy Rate = (1 – Variance/PCOS Count) x 100%

The Variance, as we have determined, is 231
The PCOS count presented by Smartmatic is 8,295

Therefore,

Accuracy Rate = (1 – 231/8295) x 100%
Accuracy Rate = (1 – .0278481) x 100%
Accuracy Rate = 97.21519%

Accuracy

The Accuracy Rate of 97.21519% translates to 557 errors in 20,000 marks, an **error rate that is 557 times** the defined standard of 1 error in 20,000 marks!

James Jimenez, Comelec Spokesperson, said on ANC* that this was “only a demo” anyway. Assuming that, why did Smartmatic have to present the results using this mathematically flawed method?

Percentage Match

This formula seems to have been used:

Percentage Match = 100(?) – (Variance/PCOS Count)

so that,

Percentage Match = 100 – (107 / 8,295)

Percentage Match = 100 – 0.012899

Percentage Match = 99.98710

***Strangely**, the percent symbol (**%**) was appended to the computed result, so that:*

Percentage Match = 99.98710**%**

* Aired on August 31, 2012

Why does the COMELEC insist on using the Smartmatic-TIM supplied PCOS machines for the 2013 Elections when it falls short of the 99.995% Accuracy Rate, a requirement that the COMELEC itself defined for the 2010 NLE?

We challenge the COMELEC to release to transparentelections.org.ph, AESWatch, and other similar organizations the detailed working papers of the Random Manual Audit conducted by the PPCRV following the 2010 National and Local Elections for review.

Being the technical arms of Comelec as stipulated in RA 9369, we request the CAC and TEC to review the results of Mock Elections and submit their respective evaluations?

May we also respectfully request the Joint Congressional Oversight Committee through the Senate Oversight Committee on 2013 Elections to conduct an evaluation of the PCOS as provided in RA9369?

Thank You