Clarification of AVANTE's position on Election and Voting System Integrity

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In recent weeks, AVANTE found itself being cited as an unwilling participant of a national debate on voting system integrity[1][2][3][4]**.** In this paper, we will clarify and explain the company's positions.

On the escrowing and disclosure of all source codes used in elections:

AVANTE entered into the voting business in 2000. We introduced the first voter-verified paper record for electronic voting systems in March 2001. Since then, it has been a long journey with limited success.

A main objective of AVANTE participating in the voting industry, besides business profitability, was to introduce a better voting system enhancing not only integrity and accuracy, but also the transparency of the process. For example, AVANTE pioneered electronic voting systems with a voter verified paper record that provides for one-to-one verification and authentication of each electronic ballot cast with a corresponding paper record.[5]

A key part of the criteria for transparency of the electronic voting process includes the transparency of the complete process and the availability of checks and balances in each critical step of the balloting process. One requirement is to make available for inspection all source code developed and under control of the system developer. AVANTE was always first to agree to provide source code to qualified third party reviewers along with providing it to State agencies and their designated independent evaluating parties.

The difficulty in source code escrow and disclosure is more related to the word "ALL" in State election codes and some new Federal election codes being proposed. It is made particularly more difficult when all voting systems must comply with the various accessibility requirements included in Federal election codes such as HAVA and Section 508.

This conclusion and interpretation is corroborated by some of the most respected election integrity proponents including Bev Harris[6] of "Black Box Voting" and open source proponents such as Alan Dechert[7] of "Open Source Consortium" where similar requirements are proposed in Holt's Bill. Of course, the academics involved in election integrity basically all

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[1] Voting Machine Vendors – We Can't and We Won't by Bo Lipari

[2] Avante's (Not Very Good) Offer to New York Voters by andi novick

[3] Exposé: Holt bill was revised by Microsoft, Diebold and ES&S by Mark Crispin Miller

[4] Connecting the Dots? Rush Holt, HR 811, and Avante International by Rebecca Mercuri

[5] http://www.avantetech.com/products/elections/dre/

[6] Bev Harris: "The bill says all software and firmware source code must be released. The picture shows that vendors don't even have it and won't be able to get it, due to use of third party components, many from foreign countries. This means the whole system would need a top-to-bottom redesign (unfunded mandate to the tune of what -- $5 billion?). If it's even possible." http://www.bbvforums.org/forums/messages/19523/46677.html?1177167705

[7] "I didn't say it was "necessary to run voting system apps on closed-source operating systems." For example, the language says all "firmware." What about a harddrive controller? What about a video driver? and so on. For manufacturers of such COTS components as these, there isn't enough money in voting systems to even begin to make them want to disclose their source for such items. There is a way there from here. But it's not via Holt 811 for 2008. It's going to take a while to get all the open/disclosed products available -- with some incentives to get there." Alan D. http://gnosis.python-hosting.com/voting-project/February.2007/0036.html

agree with the goals of disclosure, but also explain that the implementation can only be achieved over a period of several years.

The practical aspects of any complex electronic system being completely independent of any outside components is not impossible but very difficult requiring substantial time, money and resources. It's actually counter-productive if the intent is to ensure system integrity, accuracy, and transparency. After all, the execution codes (not the source codes) are what are actually installed in the system to carry out the voting functions. ALL execution codes are placed in escrow and are protected with SHA-1 hash code that is required for all election systems. Source codes make writing the machine-execution codes faster and easier to understand but are not the functional part of the system. An experienced programmer can modify the execution code without modifying the source code.

When one is required to provide voting accessibility such as multiple languages in both displayable and voice-assisted formats anytime under the voter's control, it becomes dramatically more difficult. If one were to provide "independent" reading back of the paper records or marked ballots, the only possibility is to use third party synthesized voices that require another few years of development time and would definitely end with inferior systems when finished. Those that have tried Microsoft's speech engines will agree that doing it well in English is not all that easy let alone trying in other alternate languages.

When a vendor develops its system based on open source operating system such as Linux, it may be possible to provide more of the required source codes of the overall voting system. But if one dares to be true to the stated election codes, it is currently not possible to provide 100% of ALL source codes. This is not possible for DRE with or without voter-verified paper records. It is equally impossible for optical scan systems or ballot marking devices.[8]

Of course, there may be a chance that the New York State legislature may have the same intent, as do other states, that what is really required is "ALL" of the source codes developed by the voting system providers but not "ALL" of the source codes from third parties.

On AVANTE's willingness to serve New York State with a good voting system that meets the New York State Election Codes of Source Code Escrow
As a NJ company, we have received more business and had more success in New York State than in NJ. More than half of NY State used AVANTE ballot marking devices with outstanding success in 2006.[9] We are grateful for the opportunities to serve. Where possible, AVANTE will jump through any barriers to provide all source codes within the company's control.

AVANTE was the first to initiate talks with Microsoft to provide their source code. We have also worked with all other component providers to make source code available. However, even if Microsoft agrees to provide source code beyond their current approach of online inspection, all of the voting companies will be far from achieving even 50% of all source code. Vendors would have to find all compilers source codes. If Intel and AMD processors have embedded codes in their microprocessor that are not open, we will have to get them. There are a host of other embedded components mentioned by Bev Harris and Alan Dechert as well.

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[8] http://www.avantetech.com/uploads/pdf/New%20York%20State-Comments%20On%20Source%20Code%20Disclosure-final.pdf
[9] http://www.avantetech.com/products/elections/ballotmarking/

We understand that some activists in New York State are pro optical scan systems. However, they may be misled that the optical scan systems manufacturers have all of their source codes available. Some Japanese microprocessors and other embedded components may have source codes that are difficult to get as well. The New York Election Codes requires all source codes that cover not only the scanner unit but also the election management systems that generate, print, tabulate as well as consolidate complex ballots. Here, almost every system in the market today uses the Microsoft operating systems and SQL-Server databases.

For the optical scan system to be a viable solution, it must couple with a "ballot marking device" solution. Some may think that the Windows CE operating system, that many optical systems use, is open source and thus enables some of the current ballot-marking devices to meet escrow requirements. But, Windows CE being open source is far from being true. Microsoft has only agreed to made part of the operating system source codes available, NOT ALL.[10]

AVANTE has made and explained the same points to the elected officials and legislature of NY State. We made these points out of deep respect by being truthful. There is no intent to slight the State Election Codes. If any of the statements made by some staff members caused confusion, we apologize for this misunderstanding.

On the issue of paper ballot vs DRE (Direct Recording Electronic) with VVPR (Voter Verified Paper Record) for New York State

AVANTE has long taken the position that DREs with a properly engineered VVPR is the best voting solution for the United States on the basis of meeting all of the requirements. It's the only method that can help to eliminate voter errors.

The caveat is that the DRE and VVPR must be properly engineered so that commonly observed errors and privacy concerns are not introduced. We believe the dramatic failures of some of the DREs with VVPR have nothing to do with the concept of the system but everything to do with problems in engineering and design. We have published several white papers with this opinion.[11] [12]

AVANTE knows that its position is not the same as some of the activist groups. It is particularly true on the virtue of DREs with VVPR vs Precinct-base Optical Scan voting solutions. In many ways, the "devils" or potential problems of DRE with VVPR are well known and have been studied over the last few years. They have been addressed in election codes as well as in certification requirements.

However, one cannot say the same of optical scan system. The "devils" and problems of paper ballot tampering were known decades ago when New York and New Jersey changed from paper balloting to the current direct recording mechanical lever voting systems.[13] But

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[10] *"With Windows Embedded CE 6.0 Microsoft takes another leap forward in making source available. The amount of source code available increased to a total of 3.9M lines of code in Windows Embedded CE 6.0 from 2.5M lines with CE 5.0. This represents a 56% increase! Developers can access more source code than they did before. This large amount of source code can now be easily discovered by navigating the Windows Embedded CE 6.0 Shared Source Diagrams. Starting from a high level representation of the Operating System, you can click your way down to the actual source files to know whether they are shared or not."* What's new with Windows Embedded CE 6.0 Shared Source

[11] In search of secure and accurate electronic voting solutions-A manufacturer's perspective (Rev. B)

[12] Comparing Tabulation of Paper Ballots using Optical Scanning Electronic and Tabulation of Direct Recording Electronic with Voter Verified Paper Ballots (Rev. C)

[13] Election Administration in the United States. Brookings; Joseph Harris. 1934; http://vote.nist.gov/electi admin.htm

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the problems have been forgotten. The current optical scan system and relevant processes have not been improved over the last twenty or more years.

AVANTE has advocated that a proper name for the optical scan system may be best described as "direct recording optical scan electronic" (DROSE).

The current crop of optical scan systems scan the paper ballot and tell the voter if there are any over-voted or under-voted contests. It does NOT tell the voter how the system is actually reading and recording the deciphered ballot. Upon acceptance by the voters, even though they have no idea of how the system is registering their votes other than by faith, it then records the electronic data directly into the tallies. The tallies are recorded in flash memory and used as transfer medium. The vulnerabilities of using such transfer media are known and been proven by Harri Hursti and Thompson to be easily changed without a trace[14]. While it may be true that there are paper ballots marked by the voters stored in the ballot box, there is no corresponding process control in the current New York State or any other State Election Codes. Some state laws even forbid manual reviewing of the paper ballots. Paper ballots whether they are precinct-based or central counts, can be tampered with and substituted. No fault absentee ballots are subject to even more potential integrity issues.

The mentioned optical scan voting problems and potential lack of proper control with paper ballot handling is also inadequately addressed by the EAC Voting System Standards. The reason? All of the human resources in this field have been committed to eliminating the problems in DRE voting systems.

Is there an optical scan system solution that will address these issues? Yes. Mr. Harri Hursti has explained such a system in "Black Box Voting's" website.[15] An optical scan system should capture digital images of all of the ballots as they are submitted to form an electronic audit trail of the paper ballots. It is a "reverse" of the VVPR to the electronic ballots. AVANTE believe it should also provide the voters with the display of exactly how the system is recording the paper ballot as deciphered by the optical scan electronic system.[16]

On the issues of AVANTE suing the "big three" for patent infringement
AVANTE spent millions over seven years to develop and promote the use of VVPR, digital imaging of paper ballots, ballot marking devices, and other related technologies and applications. As a business entity, we are prudent enough to invest in intellectual property to protect our interests. Protecting private property, including intellectual property, is a founding principle of our nation and a rule followed by successful business organizations. It is one of keys that make this country strong. The patent infringement suit brought by AVANTE exerts our rights to recover the value of our intellectual property after all amicable efforts failed.

It is not the intention of the Company to drive any other company out of business or jurisdictions from using their chosen voting solutions. AVANTE has offered licensing to all of its competitors but was universally ignored.

In any case, one may wonder why and how such legal action and protection would be an issue to anyone interested in voting system integrity, accuracy and transparency?

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[14] Hursti I report -- Critical security flaws in the Diebold optical scan: http://www.blackboxvoting.org/BBVreport.pdf

[15] Harri Hursti's invention, http://www.bbvforums.org/forums/messages/1954/10268.html

[16] http://www.avantetech.com/products/elections/optical/

On the issue of AVANTE being located in Mercer County, New Jersey, the home State of Congressman Holt

AVANTE, as a company has not contributed any money to any politician including Congressman Holt. None of the owners have donated more than $100 to any national figure or party.

The fact that the company and Congressman Holt happen to reside in Mercer County NJ is coincidental. The coincidence also applies to Mercer County based Princeton University and many of their professors involved in election integrity. For the record, the company and its founders have been residing in Mercer County for at least 27 years and more than 37 years in the State of New Jersey.

As a company, we have not received any favorable treatment from our home State of NJ or from any national elected officials. This fact is self-evident.

For the record, AVANTE intentionally keeps an arm-length relationship with those involved in election integrity as to avoid potential allegations such as those we are seeing today. We will continue to provide help to those that make requests. That includes things like loaning a DRE with VVPR and facilities free-of-charge for a Newsweek article on Ms Rebecca Mercuri when she was a pro DRE with VVPR expert few years ago.

It is also fact that AVANTE has not paid anyone involved in the election integrity business in any way including donations or consultancies or even as paid expert witnesses.

Also for the record, AVANTE does not belong to any trade lobbying organizations and has not joined the Election Technology Council or its predecessor ITAA. AVANTE continues to maintain its independence and voices its support to the those promoting election integrity.

We all treasure the right to disagree with a particular legislation or actions of our political leaders. AVANTE has written its differing opinions to HR 811 drafts of Congressman Holt, the Senate bills on the election system reform, and EAC proposed election guidelines. AVANTE did not have the privilege to pre-view any bills or guidelines being proposed. No one in AVANTE had been consulted by anyone for these bills. We still do not agree with some of the provisions in these bills. However, we support the passing of HR 811 and believe it to be a needed enhancement of HAVA.

AVANTE has deep respect of the tireless efforts by election integrity activists, academics, and technology experts. Their efforts have contributed to the continuous and numerous improvements of the voting systems and processes. It is sad for anyone interested in promoting the democratic process and election system integrity to have some in this group resorting to smearing and defamation tactics because of disagreement or dissatisfaction.