

COMPUTER ETHICS AND DEMOCRACY ESSAY#1, USING AN ANALOGY

DUE: Monday, April 2, 2012

Your purpose in this first writing assignment is to research the "touch screen voting issue," think about the computer ethics issue, explain it concisely, and then analyze it according to the criteria given below.

I have attached two web articles to this assignment about the issue. You may use these articles as a starting point, but you must also find at least 2 more articles from reliable sources (as we discussed last semester) on this issue.

This is to be a short paper, approximately three pages long, double spaced. You must email the paper to croyden@cs.holycross.edu by 10:00 a.m., April 2, 2012 **and** turn in a printed version in class the same day.

Your paper should be written in six sections. Give each of these sections the title shown below in bold face. Skip a line between each section. Here are the sections:

Section I. Names.: The first thing in this section should be your own name. On the next line, name the course (MONT 113G), the assignment (Essay #1. Computer Ethics and Democracy -Analogy), and the title of your essay. These four items should appear on separate lines, single spaced.

Section II. The Technology Issues: Everyone taking this course now has some experience and some technical expertise about computers. Explain to your reader the most important points in your article /topic pertaining to the technical issues. Assume the reader is a reasonably intelligent undergraduate liberal arts student. Be concise, but don't leave out any details important to the ethical issue.

Section III. Stakeholders/The Human Values at Stake:

In this section, explain to your reader why the technical issues in this article/issue are important to humans. List all the "players" and tell what is at stake for them in the ethical issue. What people, groups of people, and/or organizations either care or should care about this issue/decision? How are they affected, directly or indirectly, by the issue/decision? What are the costs and benefits, the risks and opportunities, involved? The questions should not be answered one after another in your section. Instead, think about all these questions and then write a concise answer to the following broad question:

"Who are the stakeholders in this situation, and what human values do they have at stake?"

Section IV. An Analogy: Use an analogy (or several) to explain your reasoning about this issue. Try to pick an analogy in which the technological component has been removed, so that you have a more familiar situation to analyze. (Remember: Using an analogy effectively requires more than just a statement. You must explain why the situation/activity is the same, and how it is comparable or different. When you make an ethical argument based on an analogy, you should illustrate the ethical differences and similarities between two situations. If the difference(s) is(are) are too significant, the analogy may not be applicable.) You might choose two analogies and explain why you think one is more appropriate than the other. Whatever analogy or analogies you decide to focus on should illuminate the ethical issue. Don't argue about what is right in this section; that's for your last section. In this section, discuss the analogy or analogies, and their similarities and differences to the situation.

Section V. Conclusion: Based on your analogy or analogies, explain what you think is the right thing to do/right action to take. You are required to take and defend a position on this issue. "I'm not sure what to do" is not an acceptable conclusion. You don't have to be certain, but you do have to make a decision. Your essay should talk about what is right to do.

I'm looking for clear thinking in this (and subsequent) papers. Clear thinking is revealed in clear writing. Spelling, grammar, and style all count. Follow the instructions above carefully.

One of the aims in this course is to become more aware of the technical decisions being made in our society, and how they change our society and our lives. This paper gives you a chance to look for one such decision, to consider it in detail, and then to explain it to the rest of us by using an analogy.

Section VI. Reference(s): You should research the topic for your essay. Describe carefully where your reader could find the references you used in preparing to write the essay. For each website you cite, include the URL, the title of the site (if available) article, the title of the magazine or program, the date of publication, page numbers, the date you accessed it, and the date it was last updated (if available), and (if available) the author. If no author is listed, but an organization is listed, then list that organization. In addition to identifying your primary source(s), if you use someone else's words or ideas anywhere in your paper, you should indicate that use with quotes or with a paragraph set

off with indentations and blank lines. Always advertise your sources and use complete endnotes. To not do so risks the serious charge of plagiarism. (One good source for citations is The Little, Brown, Handbook, 2nd Edition, by H. Ramsey Fowler. Endnotes are discussed on pages 480-489.)

<http://www.pbs.org/cringely/pulpit/pulpit20031204.html>

PBS | I, Cringely. Archived Column

accessed 8-24-2004

DECEMBER 4, 2003

No Confidence Vote: Why the Current Touch Screen Voting Fiasco Was Pretty Much Inevitable

By Robert X. Cringely

If you spend any time on the Internet in the U.S., it is almost impossible not to know about the scandal involving touch screen voting machines. I mentioned it a few months ago, and my goal at that time was to goad the big newspapers into looking at the story, with the idea that if there was any truth to it, the New York Times and Washington Post ought to be on the story. Well, now they are, especially the Times, which this week ran an op-ed piece by Paul Krugman that ought to make a lot of politicians very uncomfortable. Depending on whom you read, either computerized voting is being used to help American voters or to hurt them. The American Civil Liberties Union said in California that certain counties in the recent recall election were disenfranchised by not having touch screen voting, while other organizations suggest that touch screens were used to steal elections in Georgia. I don't know about any of this, but I do know about Information Technology, so I suggest we look at this issue in a way that nobody else seems to be -- as an IT problem.

Voting is nothing more than gathering and validating data on a huge scale, which these days is almost entirely the province of IT. And like many other really big IT projects, this touch screen voting thing came about as a knee-jerk reaction to some earlier problem, in this case the 2000 Florida election with its hanging chads and controversial outcome. Punch card voting was too unreliable, it was decided, so we needed something more complex and expensive because the response to any IT problem is to spend more money making things more complex.

So the U.S. government threw \$3.5 billion on the table to pay for modernizing voting throughout the land, which is to say making it more expensive and more complicated. That's a lot of money and it attracted a lot of interest. One company in particular, Diebold Systems, went so far as to buy a smaller company that made voting machines just to get into the market. Diebold thought that being in the automated teller business was a good starting point for changing the way America votes.

You can read in many other places about the trials of Diebold as it attempted to build its touch screen voting system. I'm not here to write about FTP sites or whether voting machines can or can't be messed with over the Internet. We're looking at this as an IT project, remember? This isn't politics (at least not in this particular column) it's engineering. And one thing engineers of great big IT systems know is that they are never on time, never on budget, and sometimes don't work at all.

Software development projects fail all the time, no matter what their size. The Standish Group, an IT-research firm in West Yarmouth, Mass., has been keeping track of this phenomenon since 1994, and the good news is that we are doing much better at completing projects than we used to. The bad news is that in 2000, only 28 percent of software projects could be classed as complete successes (meaning they were executed on time and on budget), while 23 percent failed outright (meaning that they were abandoned). Those numbers are improvements over a 16 percent success rate and a 31 percent failure rate when the first study was done in 1994.

I can't imagine too many business owners liking those odds, but the picture does get darker. If 28 percent of software projects were complete successes in 2000, then 72 percent were at least partial failures. And in software, even partial failure generally means getting absolutely nothing for your money.

According to the Standish Group, more than \$275 billion will be spent on software development this year, covering about 250,000 projects. That means that if the recent success and failure percentages apply, \$63 billion in development costs will go down the toilet in 2003 alone.

What does this have to do with voting machines? It says that this whole idea of changing by 2004 the way every American votes was probably doomed from the beginning. Whether political motivations were involved or not, the odds were always against this thing coming in on schedule or on budget.

Then why do we do it this way? The "it" in this case doesn't mean just this voting project. Why do we undertake these massive IT projects that almost inevitably fail?

The answer is simple -- because there is lots of money to be made whether the darned thing works or not, and not much of a penalty if it doesn't work. Two hundred and seventy-five billion is a lot of money to spend on software development, especially if 72 percent of that money will be either wasted completely or used to develop something that doesn't work intended.

Does that begin to sound like the current state of this voting fiasco?

So we were stupid to expect this thing to work as planned. Except that as far as I can tell, there wasn't really a plan. Here's what I think happened. This is, unfortunately, far too common in the IT world. After the last presidential election, there was a government outcry for an electronic voting system. Firms like Diebold who make ATMs, check out systems and kiosk systems said, "Hey, we can make a voting machine out of one of our products." That was probably the total extent of thinking and requirements put together by the government agencies and the vendors.

In the case of this voting fiasco, there was a wonderful confluence of events. There was a vague product requirement coming from an agency that doesn't really understand technology (the U.S. Congress), foisting a system on other government agencies that may not have asked for it. There was a relatively small time frame for development and a lot of money. Finally, the government did not allow for even the notion of failure. By 2004, darn it, we'd all have touch screen voting.

Oh, and there are only three vendors, all of whom have precisely the same motivation (to make as much money as possible) and understanding (that Congress would buy its way out of technical trouble if it had to). This gave the vendors every reason to put their third string people on the project because doing so would mean more profit, not less.

One definition of insanity is doing the same thing over and over again, somehow expecting a different outcome. In this instance, the issue isn't whether Diebold and the other vendors were insane (they aren't), but whether the government is.

Now against this backdrop of failure, I can't help but make one technical observation that I think has been missed by most of the other people covering this story. One of the key issues in touch screen voting is the presence or absence of a so-called paper trail. There doesn't seem to be any way in these systems to verify that the numbers coming out are the numbers that went in. There is no print-out from the machine, no receipt given to the voter, no way of auditing the election at all. This is what bugs the conspiracy theorists, that we just have to trust the voting machine developers -- folks whose actions strongly suggest that they haven't been worthy of our trust.

So who decided that these voting machines wouldn't create a paper trail and so couldn't be audited? Did the U.S. Elections Commission or some other government agency specifically require that the machines NOT be auditable? Or did the vendors come up with that wrinkle all by themselves? The answer to this question is crucial, so crucial that I am eager for one of my readers to enlighten me. If you know the answer for a fact, please get in touch.

Having the voting machines not be auditable seems to have been a bad move on somebody's part, whoever that somebody is.

Now here's the really interesting part. Forgetting for a moment Diebold's voting machines, let's look at the other equipment they make. Diebold makes a lot of ATM machines. They make machines that sell tickets for trains and subways. They make store checkout scanners, including self-service scanners. They make machines that allow access to buildings for people with magnetic cards. They make machines that use magnetic cards for payment in closed systems like university dining rooms. All of these are machines that involve data input that results in a transaction, just like a voting machine. But unlike a voting machine, every one of these other kinds of Diebold machines -- EVERY ONE -- creates a paper trail and can be audited. Would Citibank have it any other way? Would Home Depot? Would the CIA? Of course not. These machines affect the livelihood of their owners. If they can't be audited they can't be trusted. If they can't be trusted they won't be used.

Now back to those voting machines. If EVERY OTHER kind of machine you make includes an auditable paper trail, wouldn't it seem logical to include such a capability in the voting machines, too? Given that what you are doing is adapting existing technology to a new purpose, wouldn't it be logical to carry over to voting machines this capability that is so important in every other kind of transaction device?

This confuses me. I'd love to know who said to leave the feature out and why?

Next week: the answer.

<http://www.pbs.org/cringely/pulpit/pulpit20031211.html>

PBS | I, Cringely. Archived Column

accessed 8-24-2004

DECEMBER 11, 2003

Follow the Money: Why the Best Voting Technology May Be No Technology at All

By Robert X. Cringely

This is my follow-up to last week's column about the U.S. voting technology fiasco as an IT problem. We don't seem to do a very good job of running elections in this country. Our answer is to throw more technology at the problem, and last week, I suspected that our proposed solutions would just make the problems worse, not better. And I still feel that way, but this week, I have a solution to propose, and I promise you it isn't what you expect.

Last week, I questioned why the new touch screen voting machines coming into use don't create a result that can be audited. That is, they don't produce a paper trail. The rationale for not giving each voter a receipt that shows how he or she voted and can be used for later verification has always been that this would enable vote selling. If you could prove with an official receipt that you voted for Mr. Big, then it would be practical for Mr. Big to buy your vote, becoming Mayor Big. So receipts are bad, or at least, they can be bad. But that doesn't mean that auditing an election is bad, though many people -- some of them election officials -- make that illogical jump.

These same people also claim that receipts are bad because printers are unreliable or need to be refilled with paper, which they fear poll workers would be unable to do. We don't seem to have a problem printing ATM receipts or lotto cards, but then maybe the folks down at 7-11 are more technically sophisticated.

I asked the question, "Who decided to leave out this auditing capability?" The ability to audit is actually required by the Help America Vote Act of 2001, which is providing the \$3.9 billion needed to buy all those touch screen voting machines. Or at least it appears to be required. Certainly, most of the Congressmen and Senators who voted for the Act thought it was required. But then the language was changed slightly in a conference committee, and for some reason, though the auditing requirement remains, most systems aren't auditable. Huh? The best explanation for this that I have seen so far says that the new machines are "able" to be audited in the same sense that I am "able" to fly a Boeing 747. I am a sentient being with basic motor skills just like all 747 pilots, so I am "able" to fly a 747. So we are "able" to audit these machines. We just don't know how.

But it would be a mistake to think that with touch screen voting we are necessarily giving up an auditing capability that we traditionally have had. The old lever voting machines that were used in the U.S. for most of the last century produced no paper trail, just lists of total votes.

Still, auditing in some form would be a good idea now because we seem to be entering a period when electronic elections can be subject to voter fraud on a massive scale. Rather than buying votes one at a time, the bogeyman is stealing votes en masse. Or even worse, it could be stealing votes on a very intelligent basis to just shade an election in a way that would go undetected. As President Kennedy once joked, his wealthy father might be willing to buy him an election, but he wouldn't buy a landslide.

There are lots of auditing ideas and systems under consideration. Many people don't see how these could work given the difficulty of rounding up all those receipts, but others point out that if even a random one percent of votes were audited, it would be a powerful discouragement to voting fraud.

My favorite voter receipt idea is the Vreceipt, which creates an auditable receipt that can't be read by the voter or by Mr. Big.

Now underlying all this is a deep distrust of the new technology and the people behind it. Software for these machines tends to be proprietary and hidden even from the officials who are supposed to "certify" that the code is accepted. This certification is a joke in that bug patches are routinely distributed after certification --- patches that ought to be re-certified, but aren't. Even worse, some of the software is considered to be off-the-shelf and not subject to certification. This applies to Windows CE, which is used in many new voting machines. But Windows CE isn't really an off-the-shelf product. Microsoft distributes it in the form of source code that is compiled for each target hardware device. So here is software that can be supremely compromised, yet the certification officials never even take a look at it.

And there's the big problem -- the people running the elections aren't actually running them. Vendors are doing that. Election officials don't know how their equipment works and won't know if it works wrong.

This is lunacy.

And it is also patronage. There is a lot of money in replacing all those machines, and that money is going primarily to the usual suspects. Remember that every public crisis in America is an opportunity for someone to make money.

In the last week, I have heard from all the voting machine companies and from some of their workers. I have heard from election officials and voting reform advocates. I have heard from all sides, including those who think I am a nut. I could take all that information those people have dumped on me and drag this thing out for another week or two in agonizing detail. I could write about the Open Source voting software being developed in Australia or the hard-wired electronic voting machines being used successfully in India. But I choose not to do that in favor of making a couple simple suggestions.

First, the area where technology might be useful but isn't being used much, as far as I can tell, is voter validation. This could be a pretty straightforward database application that simply ensures that people are who they say they are, and they only get to vote once. The Help America Vote Act and its \$3.9 billion don't touch this problem. If I were even more of a cynic than I am, I might suggest that's because it is often easier to disenfranchise specific blocks of voters by losing or corrupting their registration data than any other way.

As for voting itself, I think we have made a horrible decision to solve this problem with technology. While the voting technology we have been considering is flawed, the best answer doesn't have to be some other voting technology that is somehow better. We turn to technology because it supposedly eliminates human error. I suggest that we add humans to the process in order to eliminate technological errors. And we'd save a lot of money in the process.

My model for smart voting is Canada. The Canadians are watching our election problems and laughing their butts off. They think we are crazy, and they are right.

Forget touch screens and electronic voting. In Canadian Federal elections, two barely-paid representatives of each party, known as "scrutineers," are present all day at the voting place. If there are more political parties, there are more scrutineers. To vote, you write an "X" with a pencil in a one centimeter circle beside the candidate's name, fold the ballot up and stuff it into a box. Later, the scrutineers AND ANY VOTER WHO WANTS TO WATCH all sit at a table for about half an hour and count every ballot, keeping a tally for each candidate. If the counts agree at the end of the process, the results are phoned-in and everyone goes home. If they don't, you do it again. Fairness is achieved by balanced self-interest, not by technology. The population of Canada is about the same as California, so the elections are of comparable scale. In the last Canadian Federal election the entire vote was counted in four hours. Why does it take us 30 days or more?

The 2002-2003 budget for Elections Canada is just over \$57 million U.S. dollars, or \$1.81 per Canadian citizen. It is extremely hard to get an equivalent per-citizen figure for U.S. elections, but trust me, it is a LOT higher. This week, San Francisco held a runoff mayoral election that cost \$2.5 million, or \$3.27 per citizen of the city. And this was for just one election, not a whole year of them.

We are spending \$3.9 billion or \$10 per citizen for new voting machines. Canada just prints ballots.

No voting system is perfect. Elections have been stolen and voters disenfranchised with paper ballots, too. But our approach of throwing technology at a problem with a result that election reliability is not improved, that it may well be compromised in new and even scarier ways, and that this all costs billions that could be put to better use makes no sense at all.