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The Modern Democratic Revolution: An Objective Survey of Internet-Based Elections

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Executive Summary

Traditionally, the process of registering citizens to vote, preparing ballots, conducting elections and tabulating results has been one of the most disjointed, inefficient and resource intensive of all government projects. As a result, the Internet is now being called upon, as it has been in almost every other industry, to help revolutionize the system.

Internet voting has been referred to as the ultimate challenge in network security and data encryption. Currently, internet-based election systems are in the early stages of development and testing. A number of organizations (both public and private) are competing to be the first-to-market with their Internet-based voting systems. The organizations are utilizing some of the best engineers, scientists, and technologies in the world to create the extremely complex systems and infrastructures that will be required to conduct secure elections over the Internet.

The movement toward Internet-based elections is, of course, a highly controversial topic. Interest groups have formed on both sides of the issue and have been passionately arguing their cases for quite some time. Proponents of Internet voting believe that the new technology will increase voter participation, add a much needed element of convenience to the voting process, allow the electorate to be more knowledgeable and informed, greatly increase the efficiency and security of elections, and make access to the democratic process more widely available. Critics of Internet voting claim that the technology required to properly authenticate voters and assure the accuracy and integrity of the election system either does not exist or is not widespread enough in society to be equitable and effective. They also argue that the "digital divide" would further skew political power toward affluent non-minorities; that making it easier to vote will cheapen the value of our most sacred right; and that private companies cannot be trusted authorities in the administration of public sector elections.

This paper is as an initial attempt to identify and aggregate the facts and arguments put forth by all sides of the Internet voting issue and to provide an overview of the current political and social climate. Furthermore, the paper will focus on the potential benefits and drawbacks of this new technology, and will address the policy changes and technological advances that are being made in order to address potential problems.

This report is not an attempt to draw conclusions as to the path that should be followed in the development, certification or implementation of Internet-based election systems. Rather, it is intended as a source of unbiased, factual, rational information. Hopefully, any conclusions reached and decisions made with regard to this issue will be well-informed and based on accurate, factual information rather than emotion and hype. This, of course, is an on-going research project. Future information, links and updates can be found by visiting our web site at www.SecurePoll.com.

The Traditional Election System

In the United States, the primary components of traditional voting systems differ slightly from state to state. For the sake of brevity, this section will focus on the election systems in the states of Washington and Texas. According to David Elliot of the Washington Secretary of State's office, voter registration is currently accomplished through "hard card", or paper, documentation that is completed by the voter and returned to an election office for inclusion in the voter registration list. The forms allow voters to provide information about their qualifications for voting as well as a physical signature. The signature performs two important tasks. First, it attests to an oath, under penalty of perjury, that the voter has filled in the form truthfully. Second, it serves as positive identification, which secures the voter's absentee ballot and initiative rights. Unfortunately, the current voter registration system is largely an honor system. Each county election department currently accepts the voter registration forms at face value and enters the voter onto the roles with little or no further investigation. (Elliott, 1999)

The next step in the election process is the development of the ballot. Election officials must carefully create a separate ballot, which adheres to standards and guidelines set forth by law, for each precinct. Once the ballots have been created they must be printed in sufficient quantity to serve the estimated number of voters who will turn out to vote on Election Day. The formula for deciding how many ballots to print is rather unscientific in most states. Texas, for example, simply orders the number of ballots used in the previous election plus 25%. This tends to lead to a large amount of waste either in unused ballots, or in expensive emergency printing if a poll runs out of ballots too soon. (Hanshaw, 1999)

Once the ballots have been printed, they must be individually inspected and entered into a ballot register. The ballots are then placed in storage until Election Day. When they are removed from storage, the ballots must again be manually inspected to ensure that no tampering has occurred. Needless to say, this is an extremely labor and resource intensive process.

The absentee voting process is entirely separate from the normal election process. In the State of Washington, voters are required to request absentee ballots either in person, via letter, or over the telephone (this applies to many other states as well). An ongoing request may also be made, which allows the voter to receive an absentee ballot for all future elections (some states require an annual request for an absentee ballot). Absentee ballots are either handed to the voter over-the-counter or delivered by the U.S. Postal Service. The voter must fill out his/her ballot and seal it inside a security envelope. The security envelope is then sealed inside another envelope that has an oath printed on it that the voter must sign. The ballot must then be returned to the election office either in person or via the Postal Service. At the election office the absentee ballot signature is checked against the voter's file signature. Once verified, it is the only ballot that will be accepted from the voter. The outer envelope is then opened and removed

leaving the security envelope sealed with the ballot inside for later opening. This separation of the ballot from all identifying materials insures the voter's secrecy and anonymity. On Election Day, all of the security envelopes are opened and the ballots are processed and counted. (Elliott, 1999) This sounds like a complicated process, and it is. The current system is extremely inefficient and opportunities for fraud exist throughout the process.

How Would Internet Voting be Different?

When discussions of Internet voting take place, there is a tendency to lump all of the different proposals into the same basket. However, this is not an accurate representation of the variety of ideas that exist. For example, proposals for online voting systems include: voting from home via email; voting from home via a web link to the ballot; and voting from a regional polling center (a traditional polling site) which is equipped with an internet connection.

One proposal calls for Internet voting to be accomplished as a virtual imitation of the current absentee voting process. The only difference would be that ballots would be requested and distributed via secure e-mail. The ballot could then be completed by the voter and either printed out, signed and returned through the U.S. Postal Service, or electronically verified and returned to the election office through secure e-mail. The main advantages of this method, versus one using a web site, are that it would be less intimidating for voters with little or no Internet experience and less susceptible to transmission bottlenecks during high Internet traffic times. Also, each vote could be handled as an individual transaction through an integrated voter registration system. (Elliott, 1999)

Another proposal would utilize Web sites where voters could log in through secure means, verify their identities, and vote on an electronic ballot. This could be accomplished through Internet access from the home, office, library, school or any other point where Internet access is available. Voting could also take place over several days. This method has the advantage of being similar to most other Web transactions. The voter would login, provide an identification key through a secure connection, and vote. The transaction would occur in real-time. The Web site could also provide online help and information for the voter as they complete their ballot. In addition, the ballot could be presented in a variety of languages and the voter could take as much time as needed. This option might also include online voter registration once the technical authentication barriers are removed. (Elliott, 1999)

For the more conservative electoral administrator, regional voting centers could use Web technology to modernize traditional polling sites. Voting would be conducted at computer equipped regional voting centers and the Internet would be used as the communications medium. Once poll workers positively identify the voter, the correct electronic ballot could be delivered over the Internet directly to the polling

station. A voting terminal would then display the voter's ballot, and the vote would be cast. This method would provide security and convenience for the voter and would make the system much more efficient. The voter could utilize any polling site within his or her immediate geographic area because all ballot styles would be available at any site via the web. However, the voter could not vote at more than one polling location because the entire election would be linked through a central database. This system would successfully disconnect delivery of the ballot from geographic location. Currently, a voter's ballot can only be found at the poll site in his or her neighborhood. The existence of Internet technology makes this model possible by allowing for rapid identification of the voter and rapid return of the appropriate ballot. (Elliott, 1999) Furthermore, voter registration could be made more efficient and integrated into the system, even allowing registration the same day as the election.

The next system would incorporate many of the innovations of Internet voting, but maintain the security of hard copy registration forms. A few weeks before the election, a voter could visit the designated Web site and print out a form declaring that he would like to vote online. The form would be signed and mailed to the local election authority. The authorities would verify that the signature matches the one on the original registration form at the county courthouse and would also record the digital identity of the computer from which the voter downloaded the form. The voter would then be sent a PIN that would only work from that computer. On Election Day, the voter would log into the election web site using his PIN and mark his choices on a web-based ballot. When finished voting, the ballot would be encrypted so that it can't be read or altered during transmission. Upon arrival at the central computer, a record would be made that the voter had cast his ballot and a separate record would be made of the contents of the ballot. These records would be separated so that elections officials are able to verify who voted without seeing how they voted. Another copy of the data could be burned onto a CD as a backup. (Kantor, 1999)

Argument in favor of I-Voting

- **Participation**

Advanced research into Internet-based elections is being fueled by a growing interest among public officials and interest groups that are frustrated by ever-dwindling participation numbers at the polls. In 1996, over 100 million people who were eligible to vote did not do so, and in 1998 the turnout rate for the general election in the United States was only 44.9 percent, ranking 138th in a list of 170 Democratic nations. (Kantor, 1999) This same year only 15 percent of people between the ages of 18 and 24 voted. Proponents of Internet voting claim that this Internet savvy age group would show up at the polls in record numbers if they were allowed to vote online. Jim Adler, president of VoteHere.net, said, "If you

look at who votes right now, the youth do not vote. They are on the Internet in droves, and it is expected that they will begin to move to voting as the Internet does." (Blitzer, 1999)

Proponents argue that the chief value of the traditional voting ritual is to convey the significance of voting to democratic citizens. However, once the ritual becomes a deterrent to the act itself, as it clearly has, it ceases to serve its purpose. With Internet voting, more of us will be able to exercise our right to vote and fulfill our civic responsibilities. We just won't meet in a church basement to do it. The trade-off of higher participation for poorer visuals seems to be one well worth making. (Weisberg, 1999)

"Given how low voter turnout is, it is hard to say that the ritual of going and standing in line at the polls is any longer anything that attracts people to voting," said Alan Brinkley, a history professor at Columbia University. "I suppose one could argue that what one would see would be the diminishing of the civic quality of voting, but there are already many ways people can vote without going to the polls." (Kornblut, 1999) Purists, who are worried about the blow the Internet might inflict on civic tradition, should consider the pummeling democracy is taking from a turned-off electorate. Every tool of the communications age should be used to restart this vital engine of democracy. (Citizens in..., 1999)

- **Convenience**

Perhaps the most compelling argument in favor of Internet voting is the convenience factor. Convenience encourages participation, which should lead to a stronger electorate. In a recent USA Today article, technology columnist Kevin Maney equated traveling to a voting booth in order to participate in an election to being forced to go to the Post Office in order to send e-mail. (Maney, 1999) Steps have already been taken in the electoral process to take the burden off of the voter. For example, the Federal Election Commission is already making it easier for Web surfers to register to vote. By visiting the FEC home page, computer users can download a voter registration form, print it, fill it out and then mail it to the local election official (if they live in one of the 22 states that it agreed to accept the online form). John Surina, the FEC staff director, said that the idea for the online form began after the agency worked with states to design a common registration form for the new "motor voter" law. Officials also realized that an online form could both reduce the states' costs and make it easier for people to register. Before you can vote, you need to have registered, often several weeks before an election. Then you must go to the designated polling site and stand in line to cast your vote. If you're going to be away from home on Election Day, you have to think ahead about getting an absentee ballot. Internet voting would eliminate these hassles. (Weisberg, 1999)

Surina also commented that, " With the growth of political sites of all persuasions on the World Wide Web, no one party stands to gain disproportionately from the online form." The reason that it is still not

possible to actually register to vote online is that states require a prospective voter to physically sign his or her registration affidavit. (FEC Offers..., 1996) This may change with the creation of digital signatures or other electronic identity verification systems.

In Texas, the Early Voter Program is an example of a program that was put in place to increase convenience in the election process and hopefully improve turnout as well. For early voting, polling booths are set up in shopping malls and other public areas a week before the main election for anyone who wants to cast their ballot early.

Oregon has gone even further. It is now using a vote by mail system exclusively. This was implemented because the electorate wanted the convenience of voting from home on their "own" time.

Bringing elections, registration, and initiative petitions to cyberspace by legalizing Internet voting and employing digital certificates will piggyback on the growing ubiquity of the Internet. It will allow people to do something online that they want to do anyway, but have, of late, not been able to do because they are too busy and the traditional process is to inconvenient, not because they are too apathetic. (Strassman, 8/15/1999)

Internet voting causes purists to wince at what seems like a blow to the civic tradition of going to the polling place, but online voting is currently being considered as an addition to, not a replacement for, the old-fashioned ballot. It would be a convenience, like a ride to the polls or an absentee ballot, to make voting easier and more widely available. (Citizens in..., 1999) Iowa election officials envisioned having both options available at the precincts so busy people could drop in at any site in their voting district, which would add a convenience format akin to absentee voting. (Kornblut, 1999)

Some activists raise the objection that it is wrong to make it easier for people to vote at all, since only by showing a requisite amount of effort can citizens legitimately earn the right to vote. One could argue that the flaw in this argument is that there is no constitutional requirement that a citizen need to endure certain arbitrary hardships to earn the right to vote. A constitutional right is a right precisely because one does not need to do anything, beyond being a citizen, to earn it. (Strassman, 8/15/1999)

Other critics of Internet voting say that the State may be making it easier for some people to vote, but not others. After all, voting from home or work is only possible if one has a computer and an Internet connection. Studies done by the Department of Commerce have shown that these Internet connections do not occur proportionally across racial, gender, or socioeconomic lines. However, proponents say that the current system is not completely fair either because many people have work schedules or other conflicts that prevent them from visiting their designated polling place on Election Day. Internet voting would offer these people an option that they did not previously have and would simply enable them to exercise their right to vote.

- **Knowledge**

At the most critical point in an election, the point at which the vote is actually being cast, voters have traditionally had little or no information available to them about the candidates or issues that are on the ballot. While most people have heard of the candidates who are running for the most important offices, and might even remember where they stand on a few of issues, such knowledge is alarmingly absent for the majority of the candidates and issues on the ballot. Many people end up voting for names that they recognize, or simply think sound nice, or voting on the basis of party affiliation rather than the candidate's qualifications. Internet voting would allow officially approved information on each candidate to be readily available to the voter while he or she is actually in the voting booth. No longer will they have to rely on faulty memory, advertising propaganda or word association in choosing our political representatives. It will revolutionize the way that campaigns are financed and run. (Maney, 1999)

Jon Allison, director of communications for the Ohio Secretary of State's office commented that, "For potential voters, the internet is an opportunity to access anything they need to know about voting, 24 hours a day, instantly." The Ohio Web site offers, among other things, candidate questionnaires and voting records of incumbent candidates. "It's not only a matter of convenience; it's really a way for us to more fully inform voters, not just with information that we're required by law to provide them with, but by complementing that with other helpful data, such as links to other state offices and voter information sites." (Hayes, 1998)

- **Efficiency, Streamlining & Consolidation of the Process**

One argument that election directors are quick to pick up on is that Internet voting may be the quickest, cheapest, and most efficient way to administer elections and count votes. An Internet-based voting system would free up geographic location as an absolute requirement for where you vote. Add extremely cheap touch screen voting stations, and voters may begin to say, "Hey why can't I just do this from home." (Clift, 1999) Once Internet voting is widely available over personal Internet devices, the true efficiency of the Internet will finally be realized for this historically segmented and inefficient process.

Examples of public entities harnessing the power of the Web are everywhere. Interactive election Web sites are proving to be extremely beneficial to state and county officials, who report decreases in the volume of phone calls to their offices, and an increase in interest among voters in additional aspects of the elections. (Hayes, 1998)

In most election divisions of county clerk's offices, the use of the Internet began as a way to answer thousands of redundant questions that are posed to them during the election season, such as how to

register and where to vote. However, officials quickly recognized that the medium possessed far greater potential than simply acting as a community fact sheet. Instead, the Internet offers a way to communicate directly with the electorate, and many observers believe that today's election Web sites are simply a staging ground for a more ambitious goal: online voting. (Hayes, 1998)

The dollar amounts that could be gained in efficiency and consolidation are still speculative, but a state like Texas, for example, could probably cut considerable costs. As of today, there are 3200 separate entities in Texas, each of which can use its own system of voting, provided that the State approves the system. The counties are responsible for integrating all of the voting processes on Election Day. Then another funneling effect occurs in the Secretary of State's Office. Tedious duties such as counting every ballot twice and double checking the process to avoid human error costs millions of dollars. Often, public administrators consider Internet voting not because the voter would be more informed or the turnout would increase, but simply because an online voting system would cost less and save time.

Critics argue that we do not really know the true costs of an Internet election because one has not been conducted on a Statewide or Federal level. They also contend that the social costs could cancel out any monetary efficiency that would be created.

- **Security/Authenticity/Accuracy**

Security is the number one concern for election officials because stuffing virtual ballot boxes in a public election could have dire consequences. The most important step in assuring the security of a voting system is the verification of individual voters. You have to be sure that the voters are actual voters, that each person only gets one vote, that the tabulation method is accurate, and that the provisional ballots are reconciled with the Internet ballots. (Robinson, 1999) This is indeed a difficult technical issue. In fact, some experts have said that recreating the extremely complex election process on a computer is one of the most difficult programming and cryptographic challenges ever to have been attempted. However, this is where the public and private organizations that are developing Internet voting systems shine. They have focused an enormous amount of energy and resources on overcoming the technical challenges of secure Internet voting. A number of companies already have working systems in place and are testing them for use in public elections.

- **Natural Progression**

One could argue that Internet voting isn't nearly as radical as it sounds. First of all, a large and growing proportion of Americans (about 50 percent of Washington state's electorate and a quarter of Californians) already mail in their votes via absentee ballots. Oregon, the most aggressive remote-voting

state, has abolished polling places entirely and now conducts elections exclusively by mail. Local jurisdictions in 15 other states have also conducted all-mail elections. While online elections would use fancier technology, they are based on the same premise: that you can send polling authorities a document that will serve as your proxy. Second, Americans have already been voting by computer for years. Most polling places use one of three computer-based technologies: punch cards, optical scans, or electronic recording. Less than one-fifth of the electorate uses old-fashioned mechanical lever machines, which aren't even being made any more. Most experts expect the next generation of voting technology to be Internet based. Once voters start using Internet terminals at polling places, it is a short step to using the same technology from home or work. (Kantor, 1999) Third, a large part of our society is moving online. According to Lou Gerstner, chairman and CEO of IBM, about 62,000 new users are getting online every day in the United States. The growth in online population is occurring even faster outside the United States. (Garretson, 1999) By equipping the Internet to facilitate democracy we will connect with one another and other democracies around the world like never before.

Public opinion seems to be favoring the move to Internet elections as well. In July, ABC News conducted a poll of voter attitudes toward online voting, and 48% of respondents said they would support online voting if it could be secure from fraud. Even more encouraging, 61% of 18-34 year olds, a group that has been notoriously absent from the polls, said that they would support Internet voting. Such a strong support for this new technology seems to be a justification for a study on the subject. Bill Jones, California's Secretary of State, claimed that these numbers support that fact that younger voters want this tool, even if others don't, and that it should be provided to them. (Politics Online, 1999)

Proponents of Internet voting argue that all of the trends toward voter service in elections would be further served by the concept of online voting. Most county and state election offices already have a Web presence and voters can find information about the logistics of voting and voter registration in addition to contact numbers and e-mail addresses for other questions online. Additionally, online voter pamphlets and election results are becoming ubiquitous. (Elliott, 1999)

Other advocates claim, from a historical perspective, that Internet voting is less of a leap than it might seem. When you think about it, voting his long been a fusion of public and private, of tradition and technology. The secret ballot was a Progressive Era reform. Voting machines, which utilized primitive, punch card computer processing came into widespread use in the 1960s. Recent innovations have led to the fact that we already vote privately by computer, we just visit a public place to do so. This is not saying that nothing will be lost when we all vote from remote terminals instead of at the local polling place. However, what we stand to lose is ephemeral, while what we stand to gain from Internet voting is very real. (Weisberg, 1999)

- **Access**

One of the biggest arguments in favor of Internet voting is the increase in access to the democratic process that it would offer. This idea was addressed by Marc Strassman, Director of Business Development for Votation.com. First, he recognizes the fact that, in the past, barriers have been erected between citizens and their right to vote. Among these barriers have been: not owning property, not being of European extraction, not being of the male gender, not being able to pay a poll tax, and not being able to interpret a section of the U.S. Constitution to the satisfaction of election officials. Next, he states that none of these barriers exist in the law today, but there ARE barriers to voting that exist in an era of two-career or single-parent families, perpetual traffic jams, extreme professional and personal demands on one's time, and other obstacles to exercising the franchise. Mr. Strassman believes that Internet voting will make some difference in people's ability to participate in the selection of the candidates who and policies which will govern them. In his own words, Mr. Strassman believes that, " A well implemented Internet voting system, such as that mandated by the California Internet Voting Initiative, has the potential, by making it easier for everyone to vote, to remedy the current disparity which, in fact, results in much higher voting participation rates for older and whiter voters." (Strassman, 8/15/1999)

One could argue that this access will only be available to the “haves” leaving the “have nots” on the other side of the “Digital Divide.” When opponents of Internet voting raise objections dealing with the issue of access, they typically claim that access to computers and the Internet is already stratified by race and class, so Internet voting will be similarly stratified (Valelly, 1999). This is a credible concern. In fact, on Dec. 9, 1999, President Bill Clinton set a national goal of connecting every American to the Internet in order to make high-tech advantages as universally available as the telephone. In a Rose Garden announcement, the president said that it was his aim to "finally slam shut the digital divide between computer haves and have-nots." Leaders of the computer and telecommunications industries, as well as educators and civil rights activists joined the president. "We must connect all of our citizens to the Internet, not just in schools and libraries but in homes, small businesses and community centers," Clinton said. "And we must help all Americans gain the skills they need to make the most of the connection." Clinton said he would devote his next "New Markets" poverty tour in the spring to focus on the technology gap in struggling communities. The President's initiative did not set any deadlines, but it directed the federal government to commit itself to work toward universal access of the Internet. Commerce Secretary William Daley was charged to work with the private sector and nonprofit groups to develop a national strategy to achieve the goal. In closing, the president said that 50 percent of America's schools and over 80 percent of its classrooms are currently wired to the Internet. He said that all schools should be connected by the end of next year. (Hunt, 1999)

On the opposite end of the social spectrum, John Dvorak published an article in Forbes Magazine that questioned the existence of a Digital Divide. He claimed that the term "Digital Divide" is Washington's favorite new buzzword in referring to a society of information haves and have-nots. Dvorak explains that, "It is intended to symbolize a new type of society in which a lucky few have all the data while the masses stumble around in the darkness of permanent ignorance." The author argues that, since it is so difficult to find an economic problem in this golden age of fast growth and unemployment, the key is to paint a vivid portrait of future hardship. He further explains that, "The Digital Divide is a scary vision, so addressing this serious sounding issue is great cover for otherwise ridiculous proposals."

Dvorak argues that educators use the Digital Divide as a great way to shift the blame away from their poor performance in educating our children and on to slow Internet connections. Rather than explaining why American kids do not perform on par with the rest of the world, it is much easier to just demand a bigger technology budget. For telephone companies, the digital divide is a way to change the subject away from their slow rollout of high-speed Internet access. Companies are now lobbying Congress to change the 1996 Telecom Act so they can have early access to the long distance data market. Proponents of big government are also using the phrase to argue for extending universal service to the Internet economy. Politicians considered telephones to be so important that the government had to regulate the telecom industry to insure universal service for all Americans. However, unregulated televisions are now in more homes than universally guaranteed telephones. The argument has also been made that we didn't need the government to provide universal hamburgers; McDonald's solved the problem on its own. (Dvorak, 1999)

From another perspective, the California Internet Voting Initiative is extreme in its commitment to making Internet based voting easily accessible to every single eligible voter, not just owners and users of super-new and super-powerful home and office computers. To illustrate the realistic nature of this goal consider the following: Sega is now selling a game-playing machine with a built-in modem that can deliver Web access (and, hence Internet voting access, once a method for storing and using digital certificates in these machines can be formulated and implemented); Sprint PCS, AirTouch and other cell phone makers have announced systems providing Internet access through cellular phones; the cost of computers keeps dropping and access to them and their daily use are moving past commonplace into the realm of "background". Even in the face of all of these developments, the California Internet Voting Initiative still spells out how computers in schools, libraries, and even public kiosks in shopping malls and elsewhere should be made available for those voters who want to vote online but don't have access to the Internet either at home or work. (Strassman, 8/15/1999)

No one is seriously advocating that Internet voting should replace traditional voting anytime soon. So long as it is an optional alternative, Internet voting would make it easier for some people to vote (especially the handicapped, people living abroad and frequent travelers) without inconveniencing anyone else. This would be a classic win-win situation. Over the next decade, access to the Internet is forecast to become extremely cheap or free and quasi-ubiquitous. But for those who still can't afford or don't want private access at home, there could be public Internet terminals at libraries, schools, grocery stores, bus stations, fuel pumps, and ATMs as well. Internet voting might actually be a boon to the poor, who often can't miss work to vote as easily as higher income people can. (Weisberg, 1999)

Aside from the poor and undereducated, election officials hope that this new technology will help other disadvantaged people in society to strengthen their voice as well. David Eliot, Assistant Director of Elections in the state of Washington believes that Internet voting could increase accessibility to the ballot for the sensory and mobility impaired. He pointed out that Senate Bill 511 mandates much higher levels of accessibility than current systems can provide. If a person with special needs already has Web access designed for their needs, they could be enabled to vote when election capabilities come to the Web. (Elliott, 1999)

Drawbacks of Internet Voting

Deborah Phillips, president of the Voting Integrity Project, has brought up a number of potential problems for Internet voting. These include such things as hackers trying to crash the system, people attempting to cast someone else's ballot, loss of voting privacy, and a lack of computer access for some communities or social groups that might skew results. (Thomsen, 1999) All of these concerns are valid and deserve to be discussed.

- **Security**

Whenever someone is using the Internet for an important transaction of information, security is always of chief concern. One potential weaknesses of Internet voting is its vulnerability to a variety of hacker created problems. These include "jamming", "man in the middle" hacks and "page jacking". Jamming is caused by a hacker who overloads a Web site with requests for information; thus jamming the lines and preventing legitimate interaction with the site. Man in the middle sites are designed to mislead the user into thinking they are on the correct Web site when in fact they are on the hacker's Web site. The fake site collects the user's identifying information for later fraudulent use and leaves the user thinking that he/she has properly completed business with the legitimate site. The hacker can then use the identifying information gathered at the fake site to conduct fraudulent transactions at the real site. Page

jacking consists of leading a user off to an imposter Web site. Once there, the user's browser can be disabled or the user can be shown advertising or other information. The user generally has some difficulty communicating with the intended Web site because of the roadblocks presented by the page jacker. (Elliott, 1999)

While everyone has read stories about hackers breaking into computer systems, there are many other security concerns that are just as important. For example, insuring the privacy of the voter is of utmost concern. Methods must be devised that provide verifiable privacy, and most importantly, the voter must trust the system. Another concern is the accuracy of the voting system in collecting and counting the votes. Internet voting systems must be proven to be at least as accurate and reliable as the current recording and tabulation methods. Finally, there is the issue of authentication and verification of the voter. Systems must be developed which ensure that the right person is voting and that that person only gets one vote. (Elliott, 1999)

On an individual level, most existing Internet voting systems are about as secure as an absentee ballot. Just as you could sign an absentee ballot and let someone else fill it out, there is little to stop you from allowing someone to vote using your computer and PIN, or to stop someone else from forcing you to turn yours over. However, a person would have to obtain thousands of PINs and computers to influence any election. The election officials are far more worried about mass cheating. Since traditional polling places are scattered in thousands of locations around the country, large-scale fraud is almost impossible. However, if a federal election were to be run from a central server, there would be a much more realistic chance of someone affecting the outcome of an election. To this end, the Voting Integrity Project, a nonprofit group that monitors election soundness, calls nationwide Internet voting "a large, non-moving, target to potential vote thieves or hackers." (Kantor, 1999)

- **Digital Divide**

Information tools, such as the personal computer and the Internet, are increasingly critical to economic success and personal advancement. In July of 1999, the National Telecommunications and Information Administration issued a report that found a growing gap between those with access to these tools and those without. As information technology plays an ever-increasing role in Americans' economic and social lives, the prospect that some groups will be left behind in the information age can have serious repercussions. The so-called Digital Divide threatens to impede the health of our communities, the development of a skilled workforce, and the economic welfare of our nation. Closing the Digital Divide is an essential part of President Clinton's *New Markets Initiative*, which seeks to bring America's prosperity to economically under-served areas. (Digital Divide..., 1999) With the phenomenon of the Digital Divide

as a very real social obstacle, critics of Internet voting argue that it will further alienate of those who are not 'wired.'

Any state that implements online voting may have to contend with legal issues of equal representation. The Voting Rights Act, which was passed in 1965 as an attempt to end discrimination against blacks, prohibits several states and counties (mostly Southern) from making any changes in voting procedures without federal approval. This clause applies to even small changes that could reduce minority participation. Given the possible existence of a Digital Divide between "well-wired" white and Asian voters and less technology-equipped blacks and Latinos, online elections could be seen as an infringement on voting rights. (Kantor, 1999)

In general, there are two groups that might be left behind by the adoption of Internet voting: communities (including nations) with little penetration of technology, and individual voters without access to Internet connections. If entire states lag behind in the transition to electronic voting, the consequences could be dire. For instance, the infrastructure that would have to be put in place to accommodate Internet voting would also enable e-commerce at a high-level. Jurisdictions that delay while others move forward will suffer the inevitable effects of being unable to compete effectively, economically, culturally and in terms of quality of life. Also, voters without access to computers in jurisdictions using electronic voting will have to go, as they always have, to a polling place to cast their vote, but it has been hypothesized that turnout will not increase as mush as it might in areas with high concentrations of Internet use. (Strassman, 5/6/1999)

In 1998, the U.S. Commerce Department estimated that only 26.2 percent of American households with computers used the Internet. Of those, an overwhelming number were white. "Most studies show that the type of Internet user most likely to access online voting is a male, 35 or under, with average income, and a college education - not exactly your average voter in America," said Deborah Phillips of the Voting Integrity Project. (Blitzer, 1999) As a result of the imbalance on the Web, the Federal Election Commission determined this September that "it is highly unlikely that the Department of Justice would pre-clear any law implementing widespread Internet voting at the present time." The FEC paper went on to say, "In spite of the phenomenal growth of Internet usage, access must be made available to all Americans in order for it to play a significant role in the democratic process." (Kornblut, 1999)

- **Civic Disillusionment/Cheapening of the Vote**

Next to security and access, civic disillusionment is one of the biggest arguments used by the critics of Internet voting. They argue that it would make elections less of a community event, which might create a greater gap between citizens and government, thereby decreasing participation. (Thomsen, 1999)

"Voting should be a quasi-religious experience," says Tracy Westen, president of the California-based Democracy Network. "It should be a philosophical and ethical commitment, and the ceremonial aspects are important. You go to the polling place, you see the flag, you walk into the booth, you take your kids with you, and you hand in your ballot. Those things are important." (Hartigan, 1999)

In a article published in *The New Republic,* Rick Valelly, an associate professor of political science at Swarthmore College, stated that Internet voting will not only fail to reverse voter apathy, but will actually lead us in the wrong direction. He believes that voting is more than the simple act of indicating one's political preference, it is a vital public ritual that increases social solidarity and binds citizens together. Furthermore, he states that the history of voting in America clearly shows that the psychological mechanics of voting have a huge impact on the quality of our public life. The basic problem with Internet voting, according to Valelly, is not equal access or the potential for fraud, but rather the fact that Internet voting will transform voting, an inherently public activity, into a private one. Even with the secret ballot, the mechanics of voting are still explicitly designed to remind us that, in principle, we are all equal members of a political community. On election day, we leave our homes and offices, travel to a polling place, and physically mingle with the people who are plainly our equals that day, no matter what other differences we have. Voting, as it is currently done, is a civic ritual. This ritual is not valuable just because it makes us feel good about ourselves. It also gets us to think about public issues differently than we would otherwise. While it is generally assumed that people vote on the basis of their pocketbooks, surveys show that most people actually focus on things such as the national good, not their own narrow self-interests, when they vote. Mr. Valelly believes that this change in focus is the result of people being obliged to leave their homes and enter the public sphere, as they do when they vote, which tends to make them more public-minded. (Valelly, 1999)

Curtis Gans of the Committee for the Study of the American Electorate agrees with Mr. Valelly: "We're sacrificing the one remaining communal act that we have in our society, that is, people getting together at the polls on Election Day." (Weisberg, 1999) According to Mr. Gans, the communitarian objection to Internet voting generally goes something like this: Around the world, people struggle and die for the right to vote, just as people in this country once did. If you have ever seen the once disenfranchised standing in line all-day to cast the first ballot a lifetime in South Africa or Guatemala, it is hard not to be appalled at how cavalierly people treat voting in this country. It is tempting to say that anyone unwilling to sacrifice an hour to exercise the right to vote doesn't much deserve it. Having to take a bit of trouble to vote reminds you that voting is the cornerstone of all our rights. By eliminating this ritual, Internet voting stands to diminish the meaning attached to it. (Weisberg, 1999)

However, Wolf Blitzer, CNN Washington correspondent, contends that tradition alone may not be enough to outweigh the convenience of voting over the Internet. After all, bad weather, long lines and confusion at polling places are often part of the Election Day tradition as well. (Blitzer, 1999)

- **Distrust**

A pervasive distrust of government has been on the rise since Nixon's Watergate scandal. Warnings of "Big Brother" and the central control of information are of high concern for critics. Many people believe that managers of Internet voting systems would have the potential to significantly influence public elections if strong precautions are not taken. (Elliott, 1999) In response to this concern, one Internet voting company, VoteHere.net, has developed a voting system that eliminates the threat of insider manipulation by taking themselves out of tabulation process completely. Confidence in the election system is a very important issue for all voters, even those who choose to vote through traditional methods. People will likely question the overall effectiveness of the voting system if they do not trust or understand the Internet component.

The lack of a paper trail is also a potential difficulty in gaining trust for Internet voting. All of the potential Internet voting systems will have electronic audit trails, while existing technologies have provided paper audit trails in the form of ballots, signed absentee voting envelopes and poll books at the polling sites. Some states already use technologies that do not have a paper audit trail and that are legally covered under the FEC guidelines for voting equipment. Nonetheless, people who are not accustomed to voting systems that lack a paper trail will likely pose significant acceptance issues. (Elliott, 1999)

- **Capacity/Bottlenecks**

Another downside to Internet voting is the potential for bottlenecks, which causes problems similar to jamming, except that the jam is caused by an overwhelming number of legitimate contacts occurring simultaneously rather than a hacker. The solution to this is to create over-capacity, either by spreading the voting period over several weeks, or by using higher-capacity equipment than is expected to be needed. Internet capacity problems have previously been experienced on Election Day from large numbers of people attempting to view election results on the Web. Further research must be done to determine what "adequate capacity" should entail for Internet voting servers and equipment. (Elliott, 1999)

- **Electronic Limitations**

Internet voting is demanding because it requires easy access and perfect security at the same time. Voter identities have to be verified and equipment has to be built to withstand the inevitable rush of data on Election Day. (Robinson, 1999) Without the use of biometric technology, it would be difficult for an election official to be sure who is casting a vote remotely. The only current guarantee seems to be that there will only be one vote per registered voter. As technology and Internet voting systems improve, hopefully this issue will be adequately resolved.

- **Past Failures**

On Nov. 2, 1998 ABC News posted erroneous results of various political races on their Web site - before a single ballot had even been cast (the general election was to be held the next day). The error occurred when ABCNews.com tested web pages for its election coverage that contained dummy data. The pages went live because of human error. The network later issued an apology on their Web site and said that no bias was intended by the results that were posted, and that the predictions did not reflect the reporting or news judgment of ABC News. Nonetheless, critics of Internet voting cite problems such as this to illustrate the unforeseen consequences of having instant access to potentially incorrect or fraudulent information over the Internet. They say that hundreds or thousands of potential voters could be unduly influenced by "News" reports, which they believed to be factual. (Ohlson, 11/3/1998)

As more and more Internet elections are carried out in the coming months, critics expect to see a number of fundamental problems with the voting systems themselves that may slow down the growth of the industry for quite some time.

Political Setting and Policy Requirements

- **Digital Signatures**

Most Internet voting systems that are in development would require each voter to have a "digital certificate," an advanced type of account number that is capable of "digitally signing" any document generated by computer, including an Internet ballot. During the digital signing process, the ballot would be encrypted so that it cannot be read (or altered) while in transit to the "virtual polling place" (the server used by the electoral jurisdiction). When it arrives at the official server, the powerful computer would retrieve the voter's "public key" from a trusted Certificate Authority and use it to decrypt the encrypted ballot. If the ballot file decrypts properly, the official server will know two things: it was sent by the person who signed it, and it has not been tampered with since he or she signed it. Authenticated identity and non-tampering are two of the most important things that need to be established by the Internet voting

system. The use of digital certificates to generate digitally signed ballots makes it possible to determine both the identity of the sender and the integrity of the ballot to degree of certainty far exceeding that which now exists with the current means used for traditional voting. (Strassman, 5/6/1999)

It has been suggested that digital signature technology is the key to securing the Internet voting process. Digital signatures provide the best level of security in electronic transactions, however they are not inexpensive, and questions about funding are important. If the government provides a digital signature for all voters, the cost would be very high. Conversely, if voters who are willing to buy a digital signature are the only ones who are allowed to vote over the Internet, then economic barriers to participation are being created. Additionally, there are several "classes" or security levels of digital signatures. Some digital signatures are obtained without requiring any personal identification, while others require high levels of identification, including personal interviews. (Elliott, 1999)

On November 9, 1999 a bill to set a national standard for making electronic signatures as legal as paper signatures won approval by the U.S. House of Representatives, despite objections from consumer advocates. A similar measure, the Millennium Digital Commerce Act, passed the U.S. Senate on November 19, 1999 and is presently awaiting passage in the House. (Senate Bill 761, 1999) This Congressional action was introduced in order to leapfrog state legislatures by setting a national benchmark for states that haven't yet determine a policy. Many states have adopted or are considering legislation that would make electronic signatures legally binding for some types of transactions. State laws vary on the types of signatures and transactions that are covered despite efforts by the National Conference of Commissioners on Uniform State Laws to win ratification of a single standard, the Uniform Electronic Transactions Act. So far, only California has adopted the standardized proposal, albeit with several changes.

- **Standards**

When forming Internet voting standards, it is important to keep in mind that commercial goals are driving the development of Internet voting systems. Accepting that this is the engine for development, the question to ask is how we might integrate the needs of both businesses and democracies? In short, if we can engineer the best technical methods to facilitate electronic commerce, how can we best engineer the Internet in order to ensure that important aspects of democracy remained upheld and cherished? (Clift, 1998)

All voting systems and their software are reviewed against the Federal Election Commission guidelines for voting systems. These standards are set forth by the National Association of State Election Directors, and the testing is performed by national testing laboratories in Huntsville, Alabama. Currently,

these standards do not contain any reference to Internet voting systems. Internet voting will necessitate the creation of new areas of standards. Among other things, there will need to be new software review benchmarks, platform review standards, standards for security systems and standards for logic testing. (Elliott, 1999)

Government regulators are responsible for making sure that any voting system is accurate and secure. Historically, vendors have developed and sold voting systems to local election authorities, and most efforts at regulation have come as the result of problems experienced in the field. In other words, the government has not been a designer or creator of voting systems, it is been a customer and regulator. In developing Internet voting systems, experts on both sides of the issue argue that the government should work proactively with vendors to define standards and to set minimum acceptable guidelines, while allowing innovation and competition in marketplace to benefit the development of the technology. (Elliott, 1999)

- **Criminal Statutes**

In the same way that we have laws pertaining to current voting systems, there will need to be new sections of law created to punish certain behaviors in order for Internet voting to be effective. Among other things, these new laws should discourage and punish:

1. Buying, stealing, selling or giving away a digital signature for the purpose of fraudulent voting.
2. Coercion of a voter.
3. Hacking voting systems or individual votes.
4. Jamming a voting system by reducing or eliminating access to the system for legitimate voters who wish to take part in an Internet-based election.
5. Spamming the voting system in order to reduce the ability of election officials to respond to legitimate voter requests.
6. Invasion of privacy by attacking a ballot or Web site with the intent to examine votes or change votes. (Elliott, 1999)

Without an established legal framework for this process, the government will end up taking a reactive approach, which will harm our democracy and further alienate the electorate from the elected officials. In addition, extra resources would need to be allocated for the aggressive enforcement of these laws. It is a well-known fact that laws alone will not curtail crime.

- **Political Self-Interest**

The most formidable obstacle to online voting may be entrenched interests that are threatened by change. In Oregon, vote-by-mail took a decade to go from proposal to implementation because of skepticism by citizens and politicians. "It's like campaign finance reform - the people who control it are products of the system," says online voting evangelist Marc Strassman. Phil Kiesling, Oregon's Secretary of State and a champion of vote-by-mail, agrees, "The question behind closed doors is, 'Will this help our candidate?' There's clearly a strain of people who hope for low turnout."

Michael Hirshland, who used to work for Sen. Orrin Hatch and is now venture capitalist, notes that Internet voting could alter the dynamics of party politics. He states that, "If the net were to create a sudden surge in voter turnout, maybe online voters wouldn't be the same politically as those who currently go to the polls. Politicians don't like such scary gambles. Government bodies can be slow-moving and motivated by things other than efficiency." (Maney, 1999)

- **National Voter Registration Act**

The National Voter Registration Act of 1993 mandates active voter registration programs in all state agencies and offices and makes voter registration a part of nearly every face-to-face transaction in government. The NVRA also goes to great links to improve address maintenance and requires " fail safe" voting for all states. (Elliott, 1999) This statute has set the stage for Internet voting. As soon as it is technologically feasible, the next logical step would be to offer voter registration over the Internet, and then to allow people to cast their ballot over the Internet as well.

The Present

- **Current Web Voting Efforts**

How quickly state and local governments move toward or away from Internet voting will be determined, to a large degree, by the political environment and the laws governing the elections processes in the prospective jurisdictions. (Hayes, 1998) At the federal level, both President Clinton and Rep. Jesse Jackson Jr., among others, have joined the Internet voting movement.

- **State Efforts**

Election officials in California, Florida, Washington, Iowa, Minnesota, Alaska, New Mexico and a number of other states are currently examining online voting. For the most part, they are following the lead of private organizations, most notably universities and unions, who are already conducting their internal elections over the Internet. Interest groups are also pushing the government toward the Internet. For example, in California, the Campaign for Digital Democracy is collecting digital petitions for a ballot

initiative that would legalize Internet voting. Software companies are also eager to showcase their Internet voting systems, and have held or are planning online elections in Iowa, Washington, Virginia, Arizona and Alaska. (Kantor, 1999)

By law, states are responsible for conducting the election process, and many of them have gone high-tech in their efforts to administer the polls more effectively. As early as the 1998 midterm elections, a number of new World Wide Web sites were unveiled, complete with features ranging from digital voter pamphlets to interactive precinct locators and "live" election returns. (Hayes, 1998) Some of the more ambitious, innovative, and troubling state projects are described below:

- In April of 1999, residents of the Puget Sound city of Shelton, Washington, cast their votes on questions such as whether the Pioneer school district should have "full day kindergarten every day of the school year," and made American electoral history. Of the 560 votes cast on the special ballot, 103 were "e-votes." This was the first time that voters in United States had cast ballots over the Internet. (Valelly, 1999)

- In Minnesota, counties are completely responsible for administering elections, so Hennepin County has put up a Web site that is even more extensive than the one designed by the Minnesota Secretary of State's office. Its features include an interactive precinct polling site locator and an official sample ballot for each precinct.

- Rhode Island, meanwhile, has run into some problems resulting from its organizational structure. The state has two organizations responsible for administering elections: the Elections Division within the Secretary of State's office, which is charged with putting together the ballots, and the Board of Elections, which processes election results. Although each has its own Web site, the divided responsibilities make for fewer resources to go around. Thus, the Board of Elections, which put its Internet site up this summer, has to make do with one part-time employee to input and update data and handle comments and inquiries. "There are several features that people have asked for and that we would love to have, but right now it is impossible because of the time required to input that information," said Web site administer Beverly Chase.

- Oregon, on the other hand, possesses plenty of resources but less flexibility. Though the state officials have come up with some unique features, attempts at additional innovation have been hindered by the state's decentralized voter registration model, not to mention a political environment that typically includes many minority parties and grass-roots organizations. As a

result, the Web site provides no links to candidate sites, and the possibility of live election returns is impossible until the state moves to a centralized system. (Hayes, 1998)

- The 2000 Arizona Democratic primary election will be the 25th in the nation, so it probably won't get a lot of attention. However, state party leaders plan to allow voters to cast ballots for the March 11 primary over the Internet, a first for a presidential primary or any binding vote for public office in the country. Party officials are still finalizing the details of how the election will run, but their plan is to set up 36 to 43 voting locations, with at least one in every legislative district and county. Computers will be set up to allow Internet voting at each polling location as well as from home computers. Paper ballots will also be available. To vote online from home, voters would fill out a form they can download from the party's Web site, choose a personal identification code, sign the form, and mail it to the party. Once the signature is verified, confirmation would be sent to the voter by e-mail. On Election Day, the voter would open the party's Web site, enter the identification code and cast the electronic ballot. At the polling places, the check-in would be done in person before the voter is cleared to fill out the Internet ballot. A lot could be riding on Arizona's experiment with Internet voting. California and Washington are considering similar Internet voting programs, and other states are watching. If Arizona succeeds, others are bound to follow. (Thomsen, 1999)

- In March of 1999, California Secretary of State, Bill Jones, convened the first meeting of the state's new online voting task force, making California the first state to organize a commission to look into online voting. The California task force was to meet monthly and present findings by the end of 1999 to Jones' office. The state Legislature would still have to approve Internet voting before it could be used to conduct any political elections. The final report was released on January 18, 2000 and can be viewed at www.ss.ca.gov.

- Washington Secretary of State Ralph Munro was quick to ask his State's legislature to create a similar task force. The main focus of this group will be to discuss voter authentication, privacy and the likelihood that cyber voting will overtake existing voting methods. (Misenti, 1999) However, according to a source in the Secretary of State's Office, the Republican controlled legislature has banned the commission and there is no word as to when the commission will reconvene. Events like this typify the political obstacles that were discussed earlier.

- On January 24, 2000, three districts in the state of Alaska will use Internet voting for their presidential primary straw poll. VoteHere.net, a voting company based in Seattle, will provide the service. 3,500 registered Republicans in the remote area of Alaska, roughly the size of Texas, are expected to participate in Internet-based voting for the first time. With few connecting roads into this region, the Internet is a primary method of keeping connected with the rest of the world. According to the US Department of Commerce, 62.4% of households in Alaska, the highest of any state in the U.S., had a computer in 1998, and 44.1% of those had Internet access. Thomas McKay, chairman of the Alaska Republican Party, said, "There has been a high level of interest and excitement over this project. Many people in the bush feel neglected and we are trying to counter that perception by using this breakthrough technology to bring democracy to their doorsteps. Due to natural barriers, it has been difficult for these U.S. citizens to participate in the democratic process." Kathleen Dalton, a member of the Alaska Republican Straw Poll Committee, commented, "Internet voting will open up a completely new domain to an Alaskan population that is handicapped by vast distances, lack of land transportation routes, and slow or interrupted postal service in winter months." (VoteHere.net..., 1999)

- In response to voter apathy, the Secretary of State's office in Iowa conducted a new pilot program in the 1999 municipal election where it asked voters to vote once in the traditional way, and then again on the Internet. The Internet vote was non-binding and was taken after the voters had cast their regular ballots. High school students from the area were selected to staff the Internet polls in the chosen precincts. The ultimate goal of Internet voting, according to Iowa election officials, would be to increase participation by young voters, who are already schooled in computer technology and the Internet, and to provide a choice for busy families and voters in rural areas. (Hazlett, 1999) More than 85 percent of the 1253 participants in the volunteer pilot project said that they would vote online again. Iowa will be testing Internet voting again in January of 2000 when high school students statewide will cast ballots in a mock presidential caucus. (Hartigan, 1999)

- Some of the nation's largest states appear ready to get serious about Internet voting. California hopes to try online voting next year, at least in mock elections. New York State Sen. Kemp Hannon will introduce legislation in 2000 that will legalize electronic voting. In Texas, which already authorizes e-mail voting from outer space for astronauts, elections director Ann McGeehan says "there's more and more interest from citizens." (Wolf, "Glitches...", 1999) The

latest mock election in Washington will come in February, when Thurston County lets voters test Internet voting after they cast their real presidential primary ballots. "We really want to have Internet voting," says Gary McIntosh, the state's election director. "We're encouraged by what we have seen." Florida has also invited vendors to demonstrate how Internet voting could be used at polling places during local elections. Officials say they can save money by replacing voting machines that cost up to $7000 with $600 personal computers or Internet appliances that would be even cheaper. (Wolf, "Glitches...", 1999)

- However, not everyone is on the bandwagon. Louisiana Republicans considered online voting for their January presidential caucuses, but backed out. "Computers go down all-time, especially mine," says Connie Chittom, the party's deputy the chairwoman. New Mexico election officials also studied online voting and decided to stay offline. Their reasons included security issues. "New Mexico will be happily going to its polling places on Election Day," says Denise Lamb, the state's elections director. (Wolf, "Glitches...", 1999)

- **International Efforts**

It should be noted that this trend is not limited to the United States. Other democracies, such as Brazil and the UK, have indicated their interest in conducting future Internet elections. The British Home Office recently recommended Internet voting as one of several possible responses to the declining electoral participation in the United Kingdom. (Valelly, 1999)

- **Federal Voter Assistance Program**

On November 9, 1999, under a pilot program run by the Department of Defense's Federal Voting Assistance Program, approximately 350 soldiers and other U.S. service members overseas will be allowed to vote in the November 2000 general elections via the Internet. Service members from five states (South Carolina, Florida, Missouri, Texas and Utah) will vote in the pilot project. As part of the project, the states will be asked to identify specific localities that may participate in the project as well. (Ohlson, 1999) If future testing of the FVAP program goes well, all Americans living abroad may soon have the opportunity to vote on line. (Kantor, 1999)

- **Schools**
  - On October 26, 1999 more than 5000 Virginia high school students from 15 schools cast online ballots for the same candidates and issues that their parents would be considering on Election

Day. At the time, this was the largest mock election in Internet history. The University of Virginia's Center for Governmental Studies and Youth Leadership Initiative sponsored the election, and the software and technical expertise to manage the election was provided by VoteHere.net. In addition to providing the students a lesson in civic responsibility, the groups involved were hoping to test the secrecy of the ballot and the integrity of the election. A poll worker, who authenticated the students' identities, gave each student a floppy disk. The students then inserted their disks into a polling station PC and opened an Internet-based ballot. When the polls closed, the outcome of the election was available almost immediately. (Caterinicchia, 1999) Events such as this are necessary to dispel fears and satisfy the critics of Internet voting. The tests are necessary in order to challenge the system. Jim Adler, CEO of Votehere.net, says "Protection of the ballot and protection of the election are paramount. It is important to set the bar high." (Wolf, "Glitches...", 1999) Most proponents favor moving slowly toward Internet voting, giving technology a chance to catch up.

- Schoolchildren in Iowa will cast sample online ballots the week before the state's first-in-the-nation presidential caucuses on January 24, 2000. This test was scheduled following successful mock elections in two different Iowa counties in December. (Wolf, "Glitches...", 1999)

- The University of California-Davis joined the ranks of the technologically elite on Nov. 16, 1999 by eliminating paper and scantron ballots from the campus elections. For the first time, students were allowed to log onto the Internet and vote for their student body representatives. Student body President Phong La believed the new voting system would be beneficial. "Voter turnout will increase with online voting," he said. "The new process gives students more time to vote, and they can vote from home or on-campus." In an effort to make the process of voting on-campus easier, the Memorial Union computer lab was used only for voting purposes during the election, and UC Davis arranged for two computers to be placed inside the campus Coffee House for student voting. In order to participate in the election, students had to obtain a password from the University's Information Technology department. The University also made use of Internet technology by providing links to the text of ballot measures that the students were voting on. (McDaniel, 1999)

Universities seem to favor Internet voting, but a majority of the ones that have attempted it have done it "in house." There is a fear of opening their systems to an outside provider where email addresses and

social security numbers could be accessed. Often, administrative regulations prohibit outsourcing their election services even with the possibility of significant cost savings.

The Future

Voter interest in Internet voting is growing and should continue to grow. The government's job will be to provide the convenience of an online voting system without compromising Democratic values. The current voting process has the advantage of being based on commonly understood systems, like the U.S. mail, traditional poll sites, and the telephone. The Internet, while people are rapidly learning how to use it, is still largely unknown. People do not understand all of the information that is moving in and out of their computers while they are online, nor do they understand the underlying infrastructure or technology of the Internet. These are legitimate, important issues that must be addressed in order to decrease the barriers to acceptance of Internet voting technology. (Elliott, 1999) The following cutting-edge technologies may be the keys that will finally make Internet voting, along with many other things, possible in the near future:

- **Biometrics**

Cautious advocates of Internet voting claim that the technology must catch up to the concept. In particular, the process of voter authentication could be greatly improved with the introduction of biometric technology. Software designers hope to eventually use biometrics, such as voice and fingerprint recognition, to verify each voter's identity. (Kantor, 1999) Biometric security devices such as fingerprint reading keypads and retina scanning lasers may soon be ready for mass production. Some biometric developers believe they have hit on a biometric platform that will be widely accepted, a fingerprint reader in a mouse. Kevin Tahan, an analyst at EBI securities, who has been following biometrics for a little over four years, stated that, "The biggest market research firms are making comments that, after Y2K, the biggest IT push is going to be biometric security." The federal government, for example, recently allocated $15 million for the implementation of biometric security. (Kerstetter, 1999)

- **Net Appliances**

According to International Data Corporation, Internet appliances such as television set-top boxes, Web enabled telephones, and video game consoles will gain popularity with the growth of Internet and with consumers' desire for more access. The study showed that the dominance of the PC as an end-user access device would be over within six years, as Internet appliances become the hot commodities in United States. IDC expects Internet appliance shipments to surpass PC shipments and account for the

majority of the market by 2004 or 2005. (Ohlson, 6/18/1998) The exciting part about this development is the dramatic decrease in the price of an Internet connection. With Internet declining in price, and inexpensive Internet appliances being developed, online connections should become significantly cheaper than they are today. This increase in access should go a long way toward helping to bridge the "Digital Divide."

- **Smartcards**

By 2000, state Departments of Motor Vehicles will begin issuing driver's licenses and state identification cards on "smart cards," credit card-size objects with a computer chip and electronic memory inside them. Preloaded on the smart cards will be each person's unique digital certificate. These personal digital certificates could also be sent by e-mail from the DMV directly to the home or work computer(s) of anyone who requests them. The smart cards and digital certificates should soon be in the hands of everyone eligible to vote. This technology will allow Internet voting systems to achieve an even greater level of security because each individual ballot would be created and digitally signed by the voter's personal digital certificate before it is sent to the electoral server. (Strassman, 5/6/1999)

Bibliography

"Citizens in Cyberspace." Boston Globe. Editorial. November 4, 1999. Page A 26.

"Digital Divide Summit." NTIA.gov. United States Department of Commerce. December 9, 1999.

"FEC Offers A New Way to Register to Vote." CNN.com. April 12, 1996.

"Politics Online." Nightline transcript. ABC News. November 8, 1999.

"VoteHere.net to Conduct First Binding Internet Election." Press Release. VoteHere.net. December 10, 1999.

Blitzer, Wolf. "Internet Revolution Pushing Way Into Voting Booth." CNN.com. November 3, 1999.

Caterinicchia, Dan. "Virginia to Conduct Internet-Based Mock Election." CNN.com. October 25, 1999.

Clift, Steven. "Democracy is Online." On The Internet Magazine. Internet Society. March/April 1998.

Clift, Steven. "Voting." E-Mail List Serve Posting. Democracy Online Newswire. November 10, 1999.

Dvorak, John C. "The 'Digital Divide' Smokescreen." Forbes.com. November 23, 1999.

Elliott, David M. "Examining Internet Voting in Washington." Washington Secretary of State's Office. White Paper. 1999.

Garretson, Rob. "US on the Road to Online Voting." CNN.com. June 17, 1999.

Hanshaw, Elizabeth. Texas Secretary of State's Office. Personal Interview. September 23, 1999.

Hartigan, Patti. "No Landslide Yet for e-Voting." Boston Globe Online. November 5, 1999.

Hayes, Heather. "Democracy Online Project to Find Out Exactly How Web Affects Elections." CNN.com. October 15, 1999.

Hayes, Heather. "Digital Democracy Adds Up." Civic.com. November 1998.

Hazlett, Judi. "Officials Work Out Details for Non-Binding Test of Internet Voting." The Sioux City Journal. October 21, 1999.

Hunt, Terence. "Clinton: 'Net Access for All Americans'." Chicago Tribune. December 9, 1999.

Kantor, Jodi. "Internet Voting is to Democracy what Amazon.com is to Books." CNN.com. November 9, 1999.

Kerstetter, Jim. "Get Ready for the Biometric Mouse!" MSNBC.com. November 14, 1999.

Kornblut, Anne E. "Iowa to Put Internet Voting to the Test." Boston Globe Online. November 1, 1999.

Maney, Kevin. "A Plea for Virtual Voting." USA Today. November 8, 1999.

McDaniel, Mike. "Online Voting Makes Debut this Week at UC-Davis." The California Aggie via U-WIRE. November 15, 1999.

Millennium Digital Commerce Act. Senate Bill 761. Passed November 19, 1999.

Misenti, Meg. "California, Washington Ponder Internet Voting." CNN.com. March 25, 1999.

Ohlson, Kathleen. "ABC Posts Election 'Results' Before Elections Begin." Computerworld.com. November 3, 1998.

Ohlson, Kathleen. "DoD Plans Internet Voting Pilot for '00 Elections." Computerworld.com. July 2, 1999.

Ohlson, Kathleen. "Will Net Appliances Edge Out PCs?" PC World. June 18, 1998.

Robinson, Sean. "One Day, Voting May be Just A Mouse Click Away." DJC.com. September 14, 1999.

Strassman, Marc. "Internet Voting Circa 2002." IntellectualCapital.com. May 6, 1999.

Strassman, Marc. "Reply to Deborah Phillips." E-Mail List Serve Posting. Campaign for Digital Democracy. August 15, 1999.

Thomsen, Scott. "Arizona Plans Internet Primary." ABCNews.com. November 28, 1999.

Valelly, Rick. "Voting Alone." The New Republic. September 20, 1999.

Weisberg, Jacob. "Voting Online." Slate Online Magazine. October 26, 1999.

Wolf, Richard. "Glitches Must be Worked Out for e-Voting." USA Today. December 7, 1999.

Wolf, Richard. "States to Test Online Voting." USA Today. December 7, 1999.