To obtain a copy of The Digital State, contact Jill Murphy at 202-289-8928 or send email to pff@aol.com. The cost is $30.00 for the full report.

The Digital State
Executive Summary

Foreword

It is perhaps easy to forget that the first "Web browser," Mosaic, was invented by a University of Illinois graduate student, Mark Andreeson, less than four years ago. Since then, the Internet has become a worldwide phenomenon, heralding a Digital Revolution that will change almost every aspect of our lives.

The Digital Revolution challenges all of our institutions to change the way they do business, and government is no exception. The potential benefits of such change are enormous. It can increase the efficiency of government operations, make government services far more customer friendly, and open the democratic process itself in ways unimaginable just a few years ago.

As state governments scramble to adapt to the Digital Revolution, they face a number of obstacles -- some as simple as outmoded procurement regulations, others as complex as the privacy concerns that attend increased citizen access to government information.

In early 1997, The Progress & Freedom Foundation undertook, in conjunction with IBM's Institute for Electronic Government, to study the extent to which states are using digital technologies in a number of key areas. Over the course of five months, we collected and analyzed data gathered off the Internet, by direct contacts with state officials and from secondary sources. The results of that research are presented in this report.

It is our hope that the data and analysis presented here will have the effect of spurring states on to greater efforts to incorporate digital technologies into their operations. As the report indicates, many states have made tremendous progress already, to the benefit of their citizens and taxpayers. In particular, we hope that our efforts to identify "best practices" in each of several areas will be helpful as states seek to benchmark their own efforts and identify models.

As with any project of this magnitude, a number of people contributed to its success. A few, however, deserve special mention. The project would not have been possible without the vision and leadership of Janet Caldow, Director of IBM's Institute for Electronic Government. Her support from the beginning and throughout the project was essential to its success. Brad Lips, a Research Associate at the Foundation, was responsible for the bulk of the analysis and much of the writing. Most of the data collection was undertaken by PFF Research Associate Elizabeth Wright. We are very grateful to them and to everyone who worked so hard to bring this report to fruition.

Jeffrey A. Eisenach

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Purpose and Methodology

The Progress & Freedom Foundation, in conjunction with IBM's Institute for Electronic Government, has examined the extent to which digital information technologies, including Internet-based technologies, are being implemented by state and local governments. The major goals of this project were to:

- **Analyze Overall Progress by the States**
- **Identify Major Opportunities for Digital Technology Implementation**
- **Identify and Assess "Best Practices"**
- **Identify Strengths and Weaknesses in Each State's Efforts**

Implementation of digital technologies by state and local governments is proceeding at a breathtaking pace. From education to taxes, regulation to welfare, "electronic democracy" to the criminal justice system, state and local governments are seizing the opportunities afforded by new technologies for more efficient, more interactive communications with constituents.

We believe that states that are proactive in developing advanced information services will benefit tremendously. Just as the growth and economic development of regions has traditionally been dictated by transportation infrastructure (waterways, highway systems, airports), quickly climbing the ramp to becoming a "digital state" will be crucial to reaping the benefits of the Information Age. In this context, the challenge for this study was three-fold:

- **Identify Key Information Technology Applications:** Determine which technologies are being applied in which specific areas of government.
- **Develop Metrics for Each Major Area of Application:** Devise standards or benchmarks that can be applied to measure the degree of progress by each government entity.
- **Obtain Current Information in a Fast-Moving Environment:** Through the Internet, through contacts with state government organizations or through direct contact with responsible officials, get the latest possible information about activities in each jurisdiction.

Accordingly, the work of this study began by identifying eight major areas of governmental activities where digital technologies are being applied:

- **Digital Democracy:** The application of digital technology, largely through the Internet, to permit improved citizen access to laws, legislators and the democratic process.
- **Higher Education:** Utilization of digital technologies, including but not limited to the Internet, for learning and communication, as well as for administrative functions such as applications and student loans.
- **Elementary and Secondary Education:** Utilization of digital technologies to enhance learning opportunities in grades K-12, including availability of computers and on-line access to the Internet.
- **Business Regulation:** Availability of regulations, forms, on-line assistance and/or the ability to actually submit required "paperwork" using the Internet or in digital form.
- **Revenue and Taxation:** Use of digital technologies to store and retrieve taxpayer information, and/or the ability for taxpayers to obtain information, submit returns or correspond with revenue authorities on-line.
- **Social Services:** Application of technologies such as electronic benefits transfer and "smart cards" for benefits delivery, and/or the availability of on-line information regarding program eligibility, application, etc.
- **Law Enforcement and the Courts:** Utilization of digital technologies by the judicial system, including on-line access to court opinions, use of digital communications by police agencies and the presence or absence of "digital signature" capability for contracts and filings.
- **Other Initiatives:** Ongoing efforts in state government to proactively plan for developments in information technology and to encourage state employees to get connected

For each of these seven areas, PFF developed a list of specific applications, and, for each application, established a set of benchmark criteria, ranked on a simple scale of zero to three. (See Appendix Two.) In some cases — for example, the ratio of students to computers in K-12 classrooms – the benchmarks are quantitative. In most cases, however, more qualitative judgments were required.

Data collection involved extensive use of the Internet. Researchers visited literally hundreds of Web sites to search for descriptive information about

state programs and to actually test the availability of various functions. In addition, contacts were made and materials obtained from state government organizations and publications (e.g. *Government Technology* magazine), and — when necessary — telephone calls and/or "snail mail" was utilized as a backup.

Finally, because the implementation of new technologies is an ongoing process, we summarized our findings and sent state-specific material to all fifty governors to provide an opportunity to inform us of any gaps in our research. We are confident, however, that progress will continue among state governments in utilizing digital technologies, and we will take pleasure in seeing the results of the first edition of this study rapidly become out-of-date.

Applications of Digital Technologies

Certainly, the central finding of our research is that the Internet and other digital technologies are transforming the way in which individuals can interact with the state, and vice versa. The rise of new forms of interactive media, such as the Internet, has decentralized information storage. As a consequence, individuals are empowered to be more knowledgeable of and more involved in the affairs of their government. Attending college lectures through teleconference, monitoring the status of proposed state legislation, receiving answers to specific tax or regulatory questions—all of these activities can be done on the Internet. This report sheds light on the progress being made on delivering upon the promise of new technologies in all fifty states.

Because this is the first study of its type, we are unable to make time-series comparisons. Nevertheless, we believe it safe to say that if we had we asked the same questions just three or four years ago, around the time of the progress and Freedom Foundation's founding, we would have reported a much more primitive landscape than the one we see today. We expect that our future projects in this area will show further progress and that our benchmarks will continue to be raised, in synch with the increasing technological sophistication of the American citizenry and continued investment in information technology from private and public enterprises alike.

Notwithstanding the fact that this is really a moving picture, we think our snapshot of the Digital State in 1997 allows for some interesting observations. Obviously, we see that some applications of digital technologies are moving forward more rapidly than others. Table One shows, on a scale of zero-100, the extent to which digital technologies have been applied to various areas of government activity.

Figure One:
Leading Applications of Digital Technology

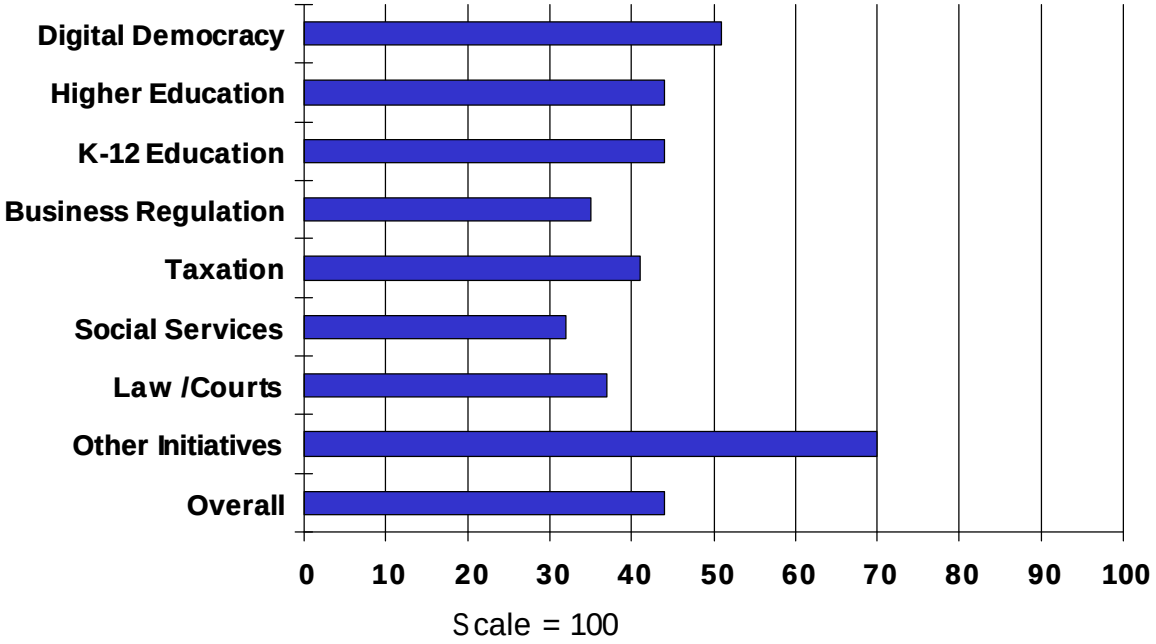

Figure One demonstrates the significant progress states are making in improving elementary and secondary schools' access to computers, including on-line access to the Internet. Additionally, "digital democracy" applications — for example, the availability of on-line access to new laws, or the ability to E-mail one's state legislator — are developing rapidly. At the other end of the spectrum, digital technologies are only beginning to be applied to facilitate compliance by business with state regulation, or to automate social service benefit programs.

This research also provides an opportunity to compare and contrast the efforts of the various states, both overall and on a "technology-by-technology" basis. In the next several sections of this report, we review the major applications being studied, in order to present for each: 1) an overall progress report on how the states did, 2) a list of the top ten states in the category, and 3) a note on "best practices" drawn from one of the leading states in the area.

Digital Democracy

Rank	State	Points
1	Alaska	92
2	Wisconsin	79
3	Indiana	75
3	Kansas	75
3	Washington	75
3	Wyoming	75
7	Arizona	71
7	Florida	71
7	Missouri	71
7	Virginia	71

In our first category, we assessed the extent to which citizens have access to laws, legislators and the democratic process through the Internet. Among our findings, we were impressed to discover that a majority of state governments displayed proposed legislation on Web sites. It was also common for governors' e-mail addresses to be hot-linked to the site and for citizens to be able to access an archive of existing state statutes. On the other hand, few states allowed for citizens to directly comment on specific pieces of legislation and only Alaska appeared to be utilizing the Web for voting on referendums, petitions or local initiatives (although South Carolina does have a similar pilot program in place).

With the exceptions of Vermont and New Hampshire, the New England region, by and large, scored below average in this category. In contrast, four of the five states in the Pacific region were solidly in the top half of the range. Table One displays our state-by-state findings, with Alaska and Wisconsin leading the pack in embracing the opportunities of digital democracy.

BEST PRACTICES
ALASKA

Alaska's Information and Teleconferencing Section of the Legislative Affairs Agency certainly appears to be fulfilling its goals "to provide Alaskans with the objective information they need to make informed decisions about the public policy choices confronting the Legislature and to provide legislators with open lines of communication with Alaskans." Within the state government Web site, one can find profiles and e-mail links to all Alaska's state legislators as well as the governor and members of his staff. States that scored poorly in our study should emulate Alaska's Bill Action and Status Inquiry System (BASIS), which is an extremely thorough database of existing and proposed legislation, capable of being searched in more than a dozen ways (by subject, sponsor, status, etc.).

Higher Education

Rank	State	Points
1	Indiana	80
2	Michigan	78
3	Oregon	72
4	Virginia	67
5	Washington	67
6	Illinois	60
7	Mississippi	60
8	Maryland	58
9	Five states tied for ninth place	56

As shown in Table Two, progress in the area of Higher Education is somewhat less rapid than Digital Democracy applications. Researchers for this report expected to find that individuals could obtain information about — or even apply for — financial aid on line. Similarly, it was anticipated that state universities would be accepting applications for admissions through their Web sites. And there were high expectations for the availability of on-line (or "televised") courses.

At present, these expectations are being met in only a few states, although most public institutions of higher learning appear to recognize the importance of keeping pace with new digital technologies. We expect that this category will continue to develop rapidly over the next few years.

Elementary and Secondary Education

Given the national focus on improving K-12 education, it is perhaps not surprising that most states are doing better on this front. According to data published in early 1997 by the Education Testing Services Policy Information Center, most states have a majority of their elementary and secondary schools on-line. Around 20% of states had student to multimedia computer ratios of 1:16 or better, although it was more common to find between 25-49 students per multimedia computer.

Rank	State	Points
1	Arizona	89
1	Georgia	89
3	Indiana	78
3	Michigan	78
3	New Jersey	78
3	North Carolina	78
3	Oregon	78
7	Six states tied for eighth place	67

Less encouraging was states' success in disseminating material on local school performance, as most states had no "School Report Cards" available on-line. In some cases, it is proactive local school districts that are making efforts to involve parents by allowing them to access information on children's school performance on-line.

Business Regulation

One of the clear findings of this study is that states are not effectively using digital technologies to facilitate compliance with business regulation. Researchers expected to find regulatory codes, new business applications, required "paperwork" and procurement documents available through the Internet. As shown in Table Four, few states have made such progress. In fact, nine states earned no points whatsoever along the four different measures we used in this category.

Rank	State	Points
1	Arizona	75
1	Florida	75
1	Kansas	75
1	Maryland	75
1	Massachusetts	75
6	Oregon	67
7	Indiana	58
7	Michigan	58
7	Missouri	58
7	North Carolina	58
7	Washington	58
7	Wisconsin	58

While no individual state stands out as having thoroughly embraced the opportunities inherent in this category, we recommend looking to the Web sites of Arizona, Florida, Kansas, Maryland, and Massachusetts — each scored 75 on our zero to 100 point scale — for effective illustrations of how state governments can make their IT resources friendly to businesses and entrepreneurs.

Taxation

State revenue authorities appear to be doing a somewhat better — or at least more even — job of applying digital technologies than their regulatory brethren. Here, researchers looked for many of the same capabilities as in the regulatory area: the availability of tax forms, the ability to submit tax information via e-mail, on-line help facilities and so forth. As shown in Table Five, all but three states offer some or all of these capabilities, and roughly 40% have a fairly complete index of tax forms available to be downloaded.

Rank	State	Points
1	Maryland	93
2	Kansas	80
2	Wisconsin	80
4	Florida	73
4	Massachusetts	73
4	New Mexico	73
7	Missouri	67
7	Oklahoma	67
9	Four states tied for ninth place	60

The best in this category — including Maryland, Kansas, Florida, Massachusetts and New Mexico — offer sophisticated on-line help facilities and/or are in the process of implementing digital record-keeping systems that will greatly facilitate their ability to respond to taxpayer inquiries.

Health, Welfare and Social Services

Much has been written in recent months about the impact of "devolution" on America's welfare programs, especially with respect to the increased burdens being placed on state social service agencies and administrators. As shown in Table Six, the concerns that have been expressed about the ability of state agencies to meet the demands of the new system appear to be valid —at least with respect to their digital technology applications.

Rank	State	Points
1	Oklahoma	58
2	Montana	52
3	New Jersey	50
3	New Mexico	50
3	Washington	50
3	Wisconsin	50
7	Illinois	48
7	Maryland	48
7	Oregon	48
10	Delaware	46

A majority of states were found to have no general help mailbox on-line, no digital record-keeping system, and no benefit forms on-line (much less the ability to actual apply on-line). While most states offer on-line job search assistance of some sort, much-heralded experiments with Electronic Benefits Transfer and "Smart Card" systems are, with few exceptions, just that: experiments. In fact, forty-four states scored less than 50 on the zero to 100 scale that we used to measure success in implementing digital technologies to deliver social services. Although no region was especially strong in this category, the South scored on average a very disappointing 27 on our zero-100 scale, despite the fact that the region contains Oklahoma, which scored #1 in this component of our study.

Law Enforcement and the Courts

Another area in which development is proceeding only slowly concerns the legal and judicial system. As shown in Table Seven, fewer than one-fifth of the states score better than "fifty percent" with respect to this category. Researchers here were measuring the ability to find court opinions available on-line, the utilization of digital technologies for law enforcement communication and the ability to reach public safety officials via the Web. While many states have begun putting State

Rank	State	Points
1	Washington	73
2	Florida	67
3	Michigan	60
3	Missouri	60
3	New Mexico	60
6	California	53
6	Montana	53
6	New Jersey	53
6	North Carolina	53
6	Wisconsin	53

Supreme and Appellate Court decisions on-line, we found less evidence that law enforcement bodies are harnessing new technologies currently available. The most developed programs that we found were in Washington state, Florida, Missouri, Michigan and New Mexico.

From a regional perspective, the Northeast appears to be lagging behind in this area, scoring on average 31 points, where the other three regions placed in the upper 30's in our zero-100 scale.

Other Initiatives

Our final category (see Table Eight) assesses the level of ongoing effort being channeled by state governments into IT applications. The large majority of states score very highly here—due to success in organizing a formal Information Technology Commission (often headed by a cabinet-level Chief Information Officer) and ongoing efforts to increase bandwidth in order to increase the efficiency of Internet resources.

Rank	State	Points
1	Utah	100
1	Washington	100
3	Maine	93
4	Delaware	92
4	Massachusetts	92
6	Minnesota	87
6	Nebraska	87
6	Wyoming	87
9	Georgia	83
9	New York	83

There was less consensus about the merits of building an intranet for the state government: respondents were fairly evenly divided between those that have an intranet, those in the process of constructing one, and those that are not (sometimes because intranets already exist at the agency level). We also found it difficult to locate good data regarding state employees' access to the Internet, but we believe this can generally be depicted as limited at best, and often negligible.

State by State Results:
A Digital Report Card

Rank	State	Points
1	Washington	66
2	Wisconsin	63
3	Florida	62
3	Oregon	62
5	Maryland	60
6	Arizona	58
7	Indiana	57
7	New Jersey	57
9	Missouri	55
10	Michigan	54

In the end, this research project also permits overall cross-state comparisons on progress in implementing digital technologies. Such comparisons must be drawn with caution, for much of our analysis is qualitative developments in all of these areas are moving very rapidly. Our "snapshot" risks missing the speed with which individual states are moving forward.

With these caveats in mind, it still seems possible to venture some judgment of which states appear to be making the most rapid progress in applying digital technologies to the business of government. Though each state has both areas of relative strength and weakness in regard to digital technology implementation, the top ten scores go to states that ranked reasonably high across our spectrum of categories.

As Table Nine shows, Washington state tops our list of the most digital states in 1997. Its 66 points ranked well above the average score (44), and it is noteworthy that Washington scored among the top ten states in 8 of our 9 categories.

Perhaps the more important finding apparent from Table Nine, however, is this: No state scores above 66 out of a possible 100 points, with 50% of the states scoring below 46. In short, many states have a long way to go to maximize the use of digital technologies, in particular Mississippi, Rhode Island, Connecticut, South Dakota and Hawaii, which pulled up the rear end in our study. Moreover, since even the "winners" have clear areas of weakness, we believe all states need to continue to pursue opportunities to capitalize on innovation in information technology. And one further thing is assured: by the time states reach the benchmarks set in this study, the bar will have moved again, probably a good distance.

OVERALL BEST PRACTICES
WASHINGTON

Winning our Digital State Award for 1997 is the state of Washington, which excels in several categories and shows weakness in few. A visit to the Washington state Web site provides a good primer in what the effective implementation of digital technologies can provide. In terms of Digital Democracy, Washington provides complete state statutes and proposed legislation along with amendments, tracking and voting. Citizens can send e-mail to most legislators and to the governor via hot-linked e-mail addresses, and comments on proposed legislation can be sent to the sponsoring representative.

As discussed previously, Washington ranks #1 in applying digital technologies to law enforcement and the courts, benefiting from an integrated criminal information management system and a number of counties that have law enforcement officers actively using computers for digital communications. The state puts court opinions on its Web site, and has many police officers' e-mail addresses live on the Web.

Where does Washington have room for improvement? Most noticeably, the state is only fair on K-12 Education, and could benefit from trying to supply parents' with more information on individual schools and districts. Between 51%-75% of Washington's public schools have Internet access, according to the most recent available information, and there are between 17 and 24 students for each multimedia computer. While Washington scores in the top 20% for both our Revenue and Social Services categories, the state does not permit on-line filing capacity for either and does not have forms available for download regarding eligibility for social benefits.

Of course, in the world of digital technologies, resting on laurels is a fast road to obsolescence. The question is whether Washington can maintain its lead in the race to become a true digital state, at the same time that the definition of that term evolves with the introduction of new technology. Given that our research shows that a state commission oversees information technology policy and that it is busy with efforts to upgrade bandwidth by laying fiber OC1 lines (check that this makes sense), we are optimistic that Washington state can continue to be a leader in the digital technology implementation.

Conclusions

As suggested above, the research reported here is a rough attempt at quantifying an ongoing process with many moving parts; conclusions should be drawn with caution. This having been said, three things seem clear:

- First, as remarked at the outset, the progress toward effectively applying new digital technologies over recent years has been impressive. There appears to be an emerging consensus that 1) the dawning "Information Age" requires government institutions to be more accessible to constituents and 2) the Internet and other digital technologies can be used to achieve this goal. That said, virtually every state studied — even the "winners" — still has a long way to go in opening all their functions to new technologies. Each state has at least one significant area of weakness. Virtually none of the states studied can be proud of their efforts in areas such as social service and Business Regulation applications.

- Second, there is a wide gap between the "best" states and those at the back of the pack. States that fall behind in the implementation of these technologies may find themselves caught in a vicious (downward) spiral: unable to attract high-tech businesses, saddled with increasingly obsolete systems and offering substandard levels of government service to an increasingly demanding populace. The race to become a "digital state" is one no state can afford to lose.

- Third, in virtually every state studied here, rapid progress is being made — or at least planned. Just as the digital revolution itself has caused the private sector to "manage at the speed of change," so too are state governments feeling the need for rapid progress. For those states now in the lead, this thought should serve as a caution against any instinct to rest on their laurels. Those that have some catching up to do can take solace in the fact that this race has only just begun.

A private, non-profit, non-partisan idea center established in 1993, The Progress & Freedom Foundation studies the impact of the digital revolution and its implications for public policy.

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