By Thomas Davis and Mark Trebian

The U.S. Department of Commerce popularized the phrase “the digital divide” in its Falling through the Net series of reports. The fourth report, Falling through the Net: Toward Digital Inclusion, published in October 2000, stated:

“Groups that have traditionally been digital ‘have-nots’ are now making dramatic gains.... Nonetheless, a digital divide remains or has expanded slightly in some cases, even while Internet access and computer ownership are rising rapidly for almost all groups. For example, our most recent data show that divides still exist between those with different levels of income and education, different racial and ethnic groups, old and young, single- and dual-parent families, and those with and without disabilities.”

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Only 18.9 percent of Native Americans have access to the Internet, as compared with the national average of 62.6 percent.

Data collected by the Benton Foundation for its report “Native Network: Telecommunications and Information Technology in Indian Country” help to describe the depth of the digital divide in Indian country.

Out of the 185 schools supported by the Bureau of Indian Affairs on Reservations, 76 are connected to the Department of Interior’s Internet service. Some schools have Classroom cable drops, which can be used to connect computers once facilities and equipment become available and the line is physically worked out.

At some reservations, such as the San Carlos Reservation in Arizona and the Navajo Reservation in New Mexico, Arizona, and Utah, more than 80 percent of the population lack home telephone service and use pay phones and mobile phones.

As of August 1998, TribalWeb, a page on the Web site of the Seminole Tribe of Florida, showed that 100 tribes (out of 575) have official Web sites accessible to the public.

These data make plain three facts. First, Indian country is on one side of the digital divide that is threatening to separate the have and the have-nots of America. Second, the divide is more fundamentally than in the past. Second, substantial parts of Indian country are away from the action of modernization technology to the future of Native Americans and have made sporadic, though sometimes unsuccessful, efforts into the digital divide. Third, the rates of success realized by tribes and Indian organizations in efforts to end the digital divide are substantially lower. Some tribes have all of their schools networked and have an impressive list of Web-based accomplishments. Others do not even have basic telephone service to reservation homes.

What causes the digital divide so crucial?

During the recent Democratic Party presidential primary in the state of Arizona, voters used the Internet to cast their ballots online. Participation in the primary process soared, but many of Arizona’s Native Americans who were online did not have the chance to participate in the online experiment because they did not have Internet access.

In July 2000, Thomas Davis talked with Shannon Burger, then a writer/reporter with EDUCAUSE, about the tribal community and AN-MSI.

SB: What kinds of challenges does the tribal community face in terms of how does technology fit in?

TD: Tribal communities are the poorest county in the United States and the third-poorest county in the United States. They serve the territories and largest percentage of children in poverty in the nation. And the problems within Indian country in some ways seem endless, so in my lifetime I’ve seen enormous progress. But even though you can say you’ve seen enormous progress, the fact remains that the divide can hardly be measured merely by the presence of computers. The nature of the challenge is that during times of tremendous change, sometimes—not always—the social order can shift. What will the tribal (college) presidents want is to try to seize the initiative to make sure that whatever happens, the digital divide is maintained. Some tribes have all of their schools networked and have an impressive list of Web-based accomplishments. Others do not even have basic telephone service to reservation homes.

What is the Indian Country Digital Divide?

For the purposes of this project, the digital divide for Indian country is framed within the definition of the Digital Divide that the National Telecommunications and Information Administration, working with partners in the private sector, has developed. That definition states that the divide is, “the gap between those who are well-equipped to use the Internet—or who have access to it—and those who are not.”

This definition acknowledges that the divide is not just a technology gap but an economic one as well. The divide is also a social problem, affecting individuals and communities throughout the United States. The National Telecommunications and Information Administration has identified five factors that contribute to the digital divide:

1. Cost:
   - The cost of Internet access
   - The cost of computers and software
   - The cost of training

2.技能:
   - A lack of understanding of how to use the Internet
   - A lack of knowledge of how to use the Internet
   - A lack of understanding of how to use the Internet

3. 不足:
   - A lack of access to transportation
   - A lack of access to transportation
   - A lack of access to transportation

4. 地理位置:
   - A lack of access to telecommunications infrastructure
   - A lack of access to telecommunications infrastructure
   - A lack of access to telecommunications infrastructure

5. 无知:
   - A lack of understanding of how to use the Internet
   - A lack of understanding of how to use the Internet
   - A lack of understanding of how to use the Internet

These factors combine to create a situation in which some people are able to access the Internet and others are not. The digital divide is not just a technical problem; it is also a social and economic problem.

EDUCAUSE is working with U.S. tribal colleges, Hispanic-serving institutions, and historically black colleges and universities to improve Internet access to campus networks and their technical support, and advanced use of the networks. The vehicle is a four-year, $6 million National Science Foundation award entitled “NSF Advanced Networking Project With Minority-Serving Institutions (AN-MSI).” In January 2000, 100 of the 350 minority-serving institutions responded to an invitation to join the project in order to define their networking requirements and to develop and implement solutions. Finding that they have many common networking problems, the three communities are working together to address these issues, even though in some cases they are choosing different ways of implementing solutions. Thomas Davis and Mark Treibian are among the leaders of the tribal college activities within AN-MSI.

Official committees of AN-MSI provide a good summary of the project’s activities:

Executive Awareness—assisting campus decision-makers in visualizing and planning for effective integration of the Internet in their institutions

Resource Development—locating additional funding to make possible the improvements developed by AN-MSI

Network Technology—addressing the networking technological, operational, and support issues facing minority-serving institutions, including campus network planning, local consulting and training, and remote technical support centers

Internet Connectivity—developing wireless/satellite pilot projects, innovative wired technology, and cooperative connectivity projects

Applications—investigating emerging high-performance applications and assisting other applications making use of the improved networks

Evaluation—assessing the project’s effectiveness and modifying the project as appropriate

The campus network architecture guidelines, remote technical support concept, and other procedures and capabilities being developed through AN-MSI are applicable to minority-serving institutions but also to other communities facing similar problems. More detailed information about the project, including results and progress, can be found on the Web site (http://www.anmsi.org). Inquiries are invited.

—Dave Staudt, AN-MSI Project Director

In July 2000, Thomas Davis talked with Shannon Burger, then a writer/reporter with EDUCAUSE, about the tribal community and AN-MSI.

SB: What kinds of challenges does the tribal community face in terms of how does technology fit in?

TD: Tribal communities are powerful community. Tribal people are using this technology to increase their access to the skills and knowledge that is needed to move these communities forward.

SB: What is the Indian Country Digital Divide?

TD: It has provided a tremendous service for tribal colleges. It has allowed us to bring together our technicians, for instance, into a circle where they can have conversations and learning opportunities to make them part of this process of forming a consensus vision. And that ongoing conversation, whatever the right role in bringing about—combined with the conversations with the presidents themselves and with the library community and with the instructional community and with the student community within the tribal colleges—is a blessing. I don’t think that AN-MSI has come anywhere near to providing what it’s going to provide over time.

TD: It was a dream. I think if we’re patient with the process and if we’re able to listen to all these different voices, within the tribal colleges and then use that listening and the visions that come out of that listening and the community to form useful partnerships with businesses and government, that the results of AN-MSI are going to be forged within Indian country in even more fundamental ways.

SB: So you’re hopeful?

TD: Yeah. There’s always hope. If nothing else, there’s always hope. Every tribe has a certain willingness, because if there wasn’t a certain willingness, there would have been no involvement of AN-MSI. It was not easy to get us involved with AN-MSI, and we’re now finding that we’re not a real one, even though we’ve been part of the digital divide for a long time and have made sporadic, though sometimes unsuccessful, efforts into the digital divide.

SB: What is AN-MSI’s role in the digital divide?

TD: AN-MSI has done anything for tribal colleges. It has provided a tremendous service for tribal colleges. It has allowed us to bring together our technicians, for instance, into a circle where they can have conversations and learning opportunities to make them part of this process of forming a consensus vision. And that ongoing conversation, whatever the right role in bringing about—combined with the conversations with the presidents themselves and with the library community and with the instructional community and with the student community within the tribal colleges—is a blessing. I don’t think that AN-MSI has come anywhere near to providing what it’s going to provide over time.

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Poor targeting of specific government programs to reservations has left many questioning the long-term viability of new economy companies and a shakeout in the dot-com revolution has left many Native Americans to tap the new wealth.

By some estimates, up to 30 percent of the nation’s workforce now need to possess significant IT skills to hold their jobs. At a National Computational Science Alliance (NCSA) Chautauqua conference held at Boston University in 1999, Larry Smarr, then the executive director of NCSA, estimated that 50 percent of all the nation’s jobs would require significant IT skills within the next five years, if not sooner. Cisco and Microsoft, two “new economy” companies, have already identified the number and number-two positions in the world based on net worth. On the one hand, recent stock market volatility in the new economy sector is reshuffling the net worth of high-technology companies, and a shakeout in the dot-com revolution has left many questioning the long-term viability of new economy companies and a shakeout in the dot-com revolution has left many Native Americans to tap the new wealth.

In communities long caught in the vicious cycles of despair and despair, the training will add value, and the greater disenfranchisement looms as poor, minority, and rural populations will have less access to the power of casting votes if the Arizona Democratic Primary model spreads and will face the growing wind of economic isolation in the information age. Such isolation, if permitted to deepen, will most likely continue and intensify the generational social isolation that has been persistent and destabilizing (in terms of crime rates and other social problems) since World War II.

In Indian country, ending the digital divide will be particularly difficult. This has been noted in a number of major reports. Evans Craig of the University of New Mexico High Performance Computing Center has reviewed the seven major reports on the digital divide in Indian country and has identified a number of barriers slowing the adoption of technology both on reservations and in urban Native American communities:

- Distress of specific new technologies
- Geographic remoteness
- Weak economic bases in tribal communities
- Lack of private investment on tribal lands
- Poor targeting of specific government policies for improving technology infrastructures in Native American communities
- Lack of protection of Native American intellectual property rights over the Internet

As a result of these barriers, technological and human infrastructures on reservations are not upgraded, and Indian community members lack access to information and educational opportunities. Indian people do not have an equal chance to get on the nation’s emerging “information highway.”

This plan requires that training programs ramp up a generation of technology. Currently the speed of processors is doubling every eighteen months. Two generations of increased processing speed have resulted in significant body parts of application software that will not operate on obsolete machines. Skills gained from one generation can be useful but are obviously not as valuable as skills mastered on advanced systems. Still, putting together complex efforts and the resources to implement those efforts takes time. To achieve the skills and infrastructure necessary to solve the puzzle of the digital divide, communities must build training and infrastructure around tomorrow’s, not today’s, technology. Populating Indian country with obsolete, or soon-to-be obsolete, computers and connections achieves only minor progress that still leaves poor communities behind the technological curve. Such efforts cannot end the digital divide. All they can accomplish is an illusion of progress. AIIHEC looked to the East for inspiration and particularly to the experience of Japan after World War II. Part of the economic miracle in Japan following the war was the reconstruction of the Japanese industrial infrastructure during the war. When Japan started rebuilding, the country’s leaders tried to see into the future and build an infrastructure that was superior to the aging infrastructure of the United States. The result was that after several decades of...
effort, the Japanese had built one of the world's strongest economies from the ashes of war. AHEC is trying to achieve a similar economic miracle for Indian country by creating a state-of-the-art information age infrastructure.

The Strategy for Ending the Digital Divide in Indian Country
TCU presidents have taken the first steps toward ending the digital divide in Indian country by forming the AHEC High Technology Committee and giving the committee two goals:

1. To improve the existing human, hardware, and software technology at each TCU to enable it to fulfill its own objectives related to the needs of the students and communities it serves.
2. To develop tribally and culturally centered applications of information technology.

Achieving these goals will seed expertise throughout the nation's reservations. TCUs currently serve students from a significant number of the nation's reservations and urban communities. Some colleges, such as Lac Courte Oreilles Ojibwa Community College in northern Wisconsin, are planning baccalaureate programs in IT to be delivered using a variety of distance media.

The objectives that fall under these goals are comprehensive in their approach. Some address connectivity, calling for high-speed T1 to DS1 connectivity at every TCU. Others specify the development of more comprehensive technology plans at the national, regional, and local levels. Still others address resource development, the building of reservation community technology centers, and the need to increase the number of computers in Native American households.

A series of objectives call for the development of a number of national technology resources for the TCUs themselves. These include the formation of a national digital library, a distributed management and communications environment designed to serve the needs of the digital divide initiative, and a distributed support network for individual campus computer hardware and software problems. Other objectives address human resource efforts, such as internships, externships, professional development, and scholarship programs developed in concert with private industry.

Some of the objectives declare AHEC's intention to construct, at individual schools, a high-performance cluster technology that can use parallel processing techniques to develop a national TCU supercomputing grid. These objectives are designed to lead to projects that will build a computational research and application capability in a number of different discipline areas. Objectives in this section of the plan also call for wireless connectivity efforts in order to build on the expertise created when the TCUs founded their national satellite-based interactive video network. The need for better telephony in many tribal communities is also addressed.

Educational objectives outline efforts designed to improve science and technology programs at TCUs, building on the work undertaken by AHEC’s Alliance for Minority Participation programs, managed by Salah Kootenai College and funded by the National Science Foundation. Also included are objectives relating to strengthening research and distance education capabilities and the technology skills of faculty and staff.

The last objectives address promoting e-commerce; developing technology endowments at each of the TCUs; and building partnerships between TCUs, private industry, the federal government, research alliances, mainstream colleges, and private foundations.

Some of the projects called for in these objectives are currently being implemented. A virtual library is being built in partnership with IBM, the W. K. Kellogg Foundation, and the University of Michigan’s School of Information. This library will contain local collections generated at each of the TCUs, as well as a national database of Internet links, a sophisticated library reference section, online journals and magazines, and collections of multimedia documents of potential interest to tribal students, faculty, and community members.

AHEC is also building a distributed support system for TCU technicians in partnership with EDUCAUSE, the largest higher education association dedicated to information technology. This system will include searchable online hardware and software technical manuals; a database that catalogs technological expertise in the TCU community so that technicians can help each other solve IT questions and challenges; a real-time online and telephone capability so that people can find an expert quickly when they need help; and a reference system that will engage technical experts at EDUCAUSE member colleges and universities.

In addition, the University of New Mexico’s High Performance Computing Center, the University of Illinois at Urbana-Champaign, NCSA, EDUCAUSE, and the AHEC High Technology Committee have teamed up to provide a number of training opportunities for TCU presidents and computer technicians. This effort has been ongoing for the past three years but is still considered to be in the developmental stage. All of the TCUs’ digital divide efforts were accelerated with a unique conference designed to forge a partnership between the private sector, private foundations, and federal agencies. Using a model developed from meetings held between Senator Jeff Bingaman of New Mexico and Lee Buchanan of the Advanced Research Projects Agency, the conference involved executives and technology experts in interactive simulations that encourage creative problem-solving and decision-making. This “game” format explored the challenges and opportunities of the new information age economy as it relates to Indian country.

During the conference, the attendees spent two days playing by a predefined set of rules that specify teams of players, allowed interactions, forced group...
reporting periods, and a method of assessing outcomes. Different interest groups were layered into teams and given objectives that ensured intensive discussion and debate. Over the two days, teams adopted strategies and then interacted with competing teams’ “moves” based on those strategies, leading to outcomes that may or may not have been consistent with individual attendees’ goals but that led toward a plan with a high probability for real-world success. The objectives of this conference included the following:

- Develop partnerships, teamwork, and a spirit of cooperation among a defined set of stakeholders in the Native American digital divide
- Increase awareness of the needs, desires, and motivations of different stakeholders
- Bring potential conflict out in the open and manage it productively
- Explore long-term strategies and policies

The projects produced at the conference are (1) a detailed strategic plan about how to end the digital divide in Indian country, coordinated with the planning work already completed by the AIHEC Board of Directors and the High Technology Committee, (2) identification of the resources needed to actually accomplish the task of ending the divide, (3) beginning partnerships that cut across government and social boundaries. Close collaboration is necessary to avoid the imposition of solutions that fail short because of lack of vision. The information age has arrived, bringing with it new markets and new opportunities for those traditionally left behind. Indian people will achieve equal opportunity when they participate in shaping their own destiny by getting involved in the leading edge of technological development.

Conclusion

Ending the digital divide in Indian country requires allowing tribal communities to craft their own solutions based on their unique environments and needs. This is the only way to permanently end the economic disparities between those communities that have a technological advantage and the tribal communities that do not. Careful planning in the application of the latest in technological advances in order to build the capability necessary to bring tribal communities out of poverty will require partnerships that cut across governmental and social boundaries. Close collaboration is necessary to avoid the imposition of solutions that fail short because of lack of vision. The information age has arrived, bringing with it new markets and new opportunities for those traditionally left behind. Indian people will achieve equal opportunity when they participate in shaping their own destiny by getting involved in the leading edge of technological development.

Notes

4. Larry Smart, Presidential Information Technology Advisory Council panel discussion, Boston University’s Chautauqua, August 1999.
6. These two goals were developed at an AIHEC Board of Directors’ brainstorming session in Billings, Montana, March 1999.
7. Adopted by a formal vote at an AIHEC High Technology Committee meeting held in Washington, D.C., February 2002.
8. The Circle of Prosperity Conference was held in Palo Alto, California, on October 15–17, 2000. The “National Framework” that will be the result of the conference will be released during the winter of 2001.
9. The conference was modeled after Prosperity Games, a novel type of forum for simulating and exploring complex issues in a variety of areas (economics, politics, environment, education, etc.) from a variety of perspectives ranging from a global viewpoint down to the details of customer/supplier/market interactions in specific industries. Prosperity Games are an outgrowth of exercise/simulation and seminar war games that use game theory to develop the best strategies to cope with situations of conflict and cooperation. The concept was developed by J. Paz VanDenber and Marshall Berman from Santa Natural Laboratories for a variety of applications. For more information about Prosperity Games, contact Marshall Berman (phone: 513-943-4209; e-mail: mberman@pandanet.com).