Barriers and Recommendations to the Implementation and Use of Advanced Technology in Native American Communities

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Government studies have consistently documented significant disparities in access to technology between Native American and non-Native American communities. With advanced technologies, such as the Internet, this disparity is a growing concern. Native communities are being left behind as the "digital divide" between the information have's and have-not's continues to exist, and in many cases is actually widening (McConnaughey & Lader, 1999). In a memorandum on economic development in American Indian and Alaska Native Communities, President William Clinton (1998) brings this concern to light; "American Indian and Alaska Native communities stand to benefit greatly from the Information Age, yet are in grave danger of being left behind."

Through focusing on the barriers to the implementation and the use of advanced technology we can hope to educate ourselves on how to bring about fundamental changes in Native American communities. Reviewing the literature and data available, presenting this information, and giving recommendations for the next steps are necessary so that all communities may benefit from a diverse culture where information is shared equally among all people.

Barriers to Implementation and Use of Advanced Technology

Basic Infrastructure Barriers

The lack of basic infrastructure is a barrier to the implementation of advanced technology in Native American communities. Basic infrastructure includes telephones, electricity, transmission lines, roads, pipes, and cables. In essence, basic infrastructure are the essential and necessary foundations needed to keep towns and cities functioning and are essential for

maintaining an average standard of living. Basic infrastructure also includes utilities, water, sewage and housing. While all of these are important considerations for communities, telephone penetration is one basic infrastructure need that is directly relevant to the implementation of advanced technology.

Telephone penetration is the most commonly used measure to report on basic infrastructure in Native American communities. In Falling Through the Net III: Defining the Digital Divide (1999), the National Telecommunications Information Administration (NTIA) reported that 76.3% of Native Americans living in Native communities had telephones. In a similar report prepared for the Economic Development Administration, Assessment of Technology Infrastructure in Native Communities (1999), it was reported that only 39% of rural households in Native American communities had telephones. This report also cites a 1995 multi-agency data analysis that concludes that 53% of Native American homes on reservations did not have a telephone. Each of these studies demonstrates that telephone penetration rates among Native Americans fall well below the rate of 94% for white households as reported by the 1990 Census. This identifies a dramatic gap in telephone penetration in our country (McConnaughey & Lader, 1999).

This gap in telephone penetration is described as “appalling” in an overview of a Federal Communications Commission (FCC) public hearing (1999) and therefore places Native Americans living on reservations at a “tremendous disadvantage in society” (p.1). Some of the reasons cited in the overview include lack of access to emergency medical care, employment, commercial, and educational opportunities that telephone and Internet access provides. Without telephone and Internet access Native Americans are at distinct disadvantage in participating in the benefits of society.

In addition to the low penetration rate among Native American communities, those households that have access to telephone service may not be able to afford the charges associated with this service. Riley, Nassersharif and Mullen (1999) report that in Native communities connection charges averaged $78, monthly costs for basic service averaged $100, and long distance service within the community averaged $126. That amounts to an average of $304 for the first month and $226 for every month thereafter. With the poor economic conditions on most reservations, this is much too high a price to pay for telephone service.

Economic Barriers

Overall, Native Americans are one of the most impoverished minority groups in the U.S. According to Casey, et al. (1999), the statistics complied by the 1990 Census show that the poverty rate for Native Americans was 31% compared to 13% for all Americans and the unemployment rate for Native Americans was 14.4% compared to 6.3% for all Americans. In addition, the per capita income for all Americans is $14,420 and the per capita for Native Americans is $8,234, while the per capita for Native Americans living on reservations or trust lands is only $4,478. The high poverty and high unemployment rate among Native Americans is a reflection of the weak economic base within their communities. While gaming operations has increased the economic wealth of a few Native American communities, this has not been the case for the majority (Riley, et al., 1999). Economic barriers pose a significant hurdle to implementing advanced technology infrastructure in Native American communities.

Without adequate financial resources, Native American communities are unable to promote economic development and implement advanced technology that could assist them in overcoming their economic weakness.

> Today, many Native American communities find themselves in a vicious circle. The weak economic base of these communities makes it difficult to support infrastructure investment. And in turn, the poor state of infrastructure undermines their ability to undertake and attract successful economic development initiatives (Riley, et al., 1999, p. 2).

As a result of this economic paradox, most Native American communities are dependent on a combination of government assistance and private grants. Historically, there has been a lack of successful strategies and government incentive programs that promote economic self-sufficiency through private investment and other economic development activities.

The failure of investment strategies is partly due to the fact that policies often address Native American communities as though they are the same as one another. This is an ignorant view towards the many diverse Native Americans groups, as Native communities are far from a homogenous group. For an economic program to be successful, it needs to be consistent with the unique needs of the community affected by the process (Duffy & Stubben, 1998; Anderson, 1999).

Political Barriers

The Bureau of Indian Affairs (BIA) was created in 1824. Originally a part of the War Department, the BIA's function was to "act as a trustee for tribal lands and monies" and to assist in the assimilation of Native Americans into American society (Casey, et al., 1999, p.5). Through the Reorganization Act of 1934 and the Indian Self-Determination and Education Assistance Act of 1975, government policies towards Native Americans has slowly changed. The focus has shifted from assimilation towards self-governance, autonomy, and cultural preservation.

For tribal governments the shift towards self-governance is not happening quickly enough. Most Native American people feel that the BIA are ineffective managers of the tribes' monies. For instance, BIA administrative overhead costs erode the tribes' financial resources. Moreover, the BIA bureaucracy is not adequately responsive to the different needs of individual tribes. Native American community members have a much greater sense of their local spending needs and priorities. Native communities, as they become more politically independent, are realizing that they can increase economic efficiencies through local control and the elimination of federal government bureaucracy. Poor management and inefficiencies of the BIA further delay the process of implementation of advanced technologies in Native American communities (Duffy & Stubben, 2000). Political self-governance will increase the tribal ability to manage their resources more efficiently.

There are dozens of governmental agencies that have funding policies aimed at assisting Native American communities with the development and implementation of advanced technology; the Indian Health Services (IHS), BIA, Rural Utility Service (RUS), National Aeronautics and Space Administration (NASA), and Department of Defense (DOD), to name a few. While it is fortunate that there are multiple sources from which Native American communities can receive funds through, it is as equally unfortunate that each of these agencies has their own requirements and procedures in applying for and obtaining funds. For Native Americancommunities, understanding the various requirements and procedures of each agency presents obstacles in accessing funding and program opportunities (Riley, 1999). When taken into account the reality that these requirements and procedures may change for each application, the obstacle in accessing funding and program opportunities is compounded.

In addition to understanding the multitude of differing requirements put forth by each agency, there are also inconsistencies that exist within each agency. These inconsistencies are too numerous to adequately address within the scope of this paper, but the most profound inconsistency presented is the electronic submission requirement of grant and funding applications (Riley, 1999). How are tribes, who are statistically under-connected, supposed to apply for assistance when the means of doing to is beyond their reach? It is apparent that there is a lack of understanding toward local realities in Native American communities. It also apparent that there is a clear need for better collaboration and consistency of interagency policies and procedures.

Confounding the issue of collaboration within agencies are current federal policies that are inconsistent with federal law concerning tribal sovereignty. The FCC, for instance, still does not have a Native American policy. Such a policy is needed to define the responsibilities of the FCC, Indian Nations, states, and service carriers (Telecommunications Technology, 1995; Twist, 2000). Many Native American communities feel, in the absence of a formal FCC Native American policy, that they are unable to negotiate directly with the FCC and service carriers. Instead, states inappropriately interfere in telecommunications technology decisions and set policies that are counterproductive to the needs of Native Americans (Twist, 2000). Due to their unique and legal treaty relationship with the federal government, tribes should instead be able to set policy directly with the FCC. Without federal telecommunication policies that recognize Indian laws and treaties, the best interest of Native Americans will be difficult to address and further undermines their political sovereignty (Twist, 2000).

Education and Workforce Training Barriers

It has been proven that access to information has a direct correlation to the level of one's education. Households at higher education levels are nine times more likely to own computers and access the Internet than households that have only an elementary education level (McConnaughey & Lader, 1999). Since the obtainment of a high school education is extremely low for Native Americans, it makes sense then that Native communities are lagging in their access to advanced technology. This creates a significant barrier that must be overcome. In order for Native American communities to become a part of the technology future, they must begin with the education of their community members, both young and old.

While there has been progress in educating Native American children at the K-12 level, education and training for adult members within the community is virtually non-existent. While the federal government provides for opportunities to receive computers through grants and funding programs, the training on how to use them is left up to the tribal community. This presents a dilemma, as there are very few Native Americans who are trained in the areas of advanced technology, and the suspicion that many Native Americans have towards outsiders hampers any education opportunities. This leaves Native American communities with inadequate resources to train their members.

Native American communities are beginning to realize the disadvantage they are at by not having technically trained workers. With any new advanced technology venture, Native American communities are consistently required to hire costly outside contractors for assistance. As a result, they may feel frustration at losing revenue to outside contractors' high wages. Technically trained community members would create a workforce capable of performing in a high-tech world, alleviating the need to rely on outside assistance.

For some Native American communities the surrounding cities offer a wide array of technical training, but this is a challenge unto itself. First of all, many community members find it a burden to travel off of the reservation due to economic, transportation, and cultural barriers. Second, finding programs that are culturally relevant is nearly impossible. Very few educational materials or teaching techniques have been developed for Native Americans who wish to study technology. These challenges create a lack of enthusiasm towards learning about technology. Better local solutions are needed to entice Native Americans to take the steps to educate themselves in the advanced technology fields.

Cultural Barriers

While the rest of the world is jumping on to the information superhighway, Native Americans are unique in that they have serious and fundamental concerns related to protecting their cultural heritage and limiting access of outsiders by means of the Internet. The growing interest in Native American art and culture, coupled with the penetration of the Internet, opens the door for cultural exploitation and misuse of what is considered sacred by Native American people. Non-Natives may intentionally or unintentionally misuse Native American cultural symbols, stories, traditions, and ceremonies with their new unfettered access to these historically precious artifacts of Native American culture. While sharing their culture with the rest of the world may help to broaden public awareness, it could also work to promote the continuation of negative stereotypes of Native Americans (Telecommunications Technology, 1995). For these reasons, many Native Americans have legitimate concerns about their culture being a casualty on the information superhighway.

Another cultural barrier is the significant distrust that has developed between Native Americans and altruistic outsiders. Over the years, there has been “faulty and inappropriate

advice by well-meaning but ill-informed ethnocentric outside expert advisors" (Duffy & Stubben, 1998, p. 3). This has resulted in a serious distrust towards any do-gooders that want to help Native American people. While many damaged relations with non-Natives have been the result of intentional and brutal attacks on Native American people and their way of life; some of the greatest damage has come without malice. With this in mind, newcomers must build trust through a long process of building community relations built on respect and good behavior.

Native American's are concerned that cultural sacrifices will have to be made to technologically connect their communities. For a community whose cultural identity and values are based in oral traditions that are passed from generation to generation, the Internet can be seen as a threat to their way of life. The transmission of cultural information has historically been shared in context of personal relationships. Traditionally, considerable judgement is given to whether the recipient of culturally sensitive information is able to appropriately understand and properly use this information. Premature access to cultural information undermines a tradition that has spanned from time immemorial.

Analysis

It is disconcerting that the definition and inclusion as to who is Native American is slightly different in each study. Two examples are the inclusion of Native Hawaiians in the Telecommunications Technology and Native Americans report and the inclusion of self-identified Native Americans in Falling Through the Net III: Defining the Digital Divide. This variance of inclusion in these studies makes it difficult to understand and keep track of which barriers relate to which people. In addition to the variance of inclusion is the ethnic terminology used throughout. Natives, Native Americans, and Indians are used interchangeably depending on the author's preference. Although this may be a result of generational preferences

found within the Native American communities, it would be helpful to readers if the body of literature found some common terminology.

There is clearly a need for more research into the implementation and use of technology infrastructure in Native American communities. Several authors felt that the current information was lacking in some form (Casey, et al., 1999; Riley, et al., 1999; Telecommunications Technology, 1995; Anderson, 1999). Most of the data available relies on dated data. Moreover, most of the economic data available is "highly aggregated", (Riley, et al., 1999), providing compiled data from multiple sources. This has the potential of detracting from the specific needs of individual Native American communities.

In addition, there are very few reports that deal with technology and Native Americans. Many reports fail to cite Native American figures because their representation in the study is too low to be considered statistically significant. The most comprehensive report addressing Native Americans and advanced technology is the Assessment of Technology Infrastructure in Native Communities (1999). Although this report is fairly current, the absence of more reports of this nature hampers strategic federal planning.

It would seem appropriate, at this point in time, to focus on further research pertaining to individual Native American communities so that there is no ambiguity as to the issues being faced. By compiling data from different sources and differently defined Native American communities it is difficult to tell what is first and foremost important to the development of individual communities. However, we cannot discount the importance of further comprehensive studies to assess the needs of Native Americans. While there are limitations, complied data has many great advantages for presenting comprehensive data on Native American communities.

The research on technology and Native Americans brings to light the existence of inconsistencies within government agencies. Some authors believe that the obvious way to solve this would be the creation of interagency agreements that would serve to improve communication among these agencies and also improve the communication between agencies and Native American communities (Casey, et al, 1999; Riley, et al, 1999; Telecommunications Technology, 1995). But in creating interagency agreements, each agency would have to first clearly understand their own policies towards Native American communities and then would have to report their understanding to other agencies. If done correctly, an interagency policy could solve the inconsistencies that Native American communities deal with daily. If not done correctly, it could actually lead to more frustrating bureaucracy.

The Native American communities could address the inconsistencies by creating their own interagency department. This department would need to employ people who know how to navigate multi-agency oversight and who are familiar with inter-tribal policies. The tribal governments need to allow this department to manage all of the communications between the community and the agencies. Currently, each department within Native American communities is individually responsible for understanding and applying for their own separate funds. Allowing one central interagency department in each Native American community to be the liaison between the tribe and government agencies would lead to better management of resources and time.

Sovereignty is an issue that is misunderstood by most people. Among federal government agencies, there is a lack of understanding as to how tribal sovereignty effects them. This lack of understanding necessitates the need for a clear definition of sovereignty and the issues that are

applicable. Research and education on this topic would be a valuable tool to address political barriers.

Duffy and Stubben (1998) refer to the relationship between Native American communities and the BIA as paternalistic. Native American communities have become dependent on external decision-making based on a history of dominance and the BIA has assumed that role out of necessity. As Native American communities become more technologically advanced they want to manage their funds themselves. The BIA, on the other hand, wants to mange the funds they are providing, feeling pressure to show accountability for taxpayer money and to maintain political control. This is the cause of tension and conflict based on mutual distrust between Native Americans and the BIA. For the first time in history, Native American communities are in a position to take control of their futures by assuming the leadership role. The laws surrounding sovereignty should allow them to do so.

One important issue that is not discussed in the literature is inter-tribal politics and conflicts. Native Americans primary relations are very family and clan centered. However, just like any family, not all of the members get along. Over the years, feuding families located on the same reservation have fought for scarce resources and power. In order for policies to benefit all members of the community, Native American communities must heal relationships among themselves.

Recommendations to the Implementation and Use of Advanced Technology

Implementing advanced technology in Native American communities is a complex and multi-faceted challenge. Some of the main barriers include lack of basic infrastructure, as well as economic, political, educational, and cultural issues. Several authors emphasize that there is

no one solution or approach that will close the technological disparities in Native American communities (Casey, et al., 1999; Riley, et al., 1999; Telecommunications Technology, 1995).

Telephone penetration is cited as being the primary barrier in the implementation of advanced technology. Twist (2000) reports that more than 558 Indian Nations have called for a government-to-government policy to address telephone penetration. The development of this policy and other related technology policies should include significant levels of tribal participation and culturally trained government employees to best serve Native American communities. In addition, government policy should be consistent with federal law concerning tribal sovereignty and Indian law. Ultimately, government policy should include culturally sensitive interagency strategies to provide direction and comprehensive coordination (Casey, et al., 1999; Riley, et al., 1999; Telecommunications Technology, 1995; Twist, 2000).

Economical development efforts have historically failed. According to Duffy and Stubben (1998), planning has missed the point by not taking into account Native American considerations. Native American cultures, values, religions, and traditional decision making processes that coexist within tribal councils need to play a vital part in any economic plan that effects Native American communities. Accordingly, it is apparent that development of an economic plan needs to be congruent with the values of the community and involve community members and leadership. When economic plans are developed and executed by the tribes, it will serve as a source of empowerment and spur new initiatives into action.

The lack of economic development funding is the main obstacle to stimulating a prosperous economy. Tribal governments desperately need increased capital and incentive funding, from both the government and the private sector, to invigorate the local economy of

Native American communities. This needs to include funding for technology infrastructure and must reflect the unique conditions facing each tribal community (Riley, et al., 1999).

The role of education is critical to the future of tribal development. Currently there is a lack of advanced technology trained workers in Native American communities. To address this, the federal government needs to increase funding towards distance learning and the technology needed to take such classes. "Virtual workforce development" through the use of the Internet provides high quality, technology workforces at much lower costs than traditional technical education (Casey, 1999, p. 15). The creation of culturally relevant and sensitive materials and teaching methods is also very important. Through educating members of the community, Native Americans can take greater control over their technological futures (Telecommunications Technology, 1995).

Another way to address the education challenges is through training agreements with local educational institutions. These agreements could bring classrooms to the reservations. As stated earlier, the fact that many tribal members do no like to, or are unable to, leave the reservation for training would not be an issue if the classrooms were offered on the reservation.

Native Americans run the risk of being exploited by technology. Therefore, Native Americans need to be active participants in the policymaking process. Native American community representatives should be present at federal, state, and county meetings that deal with technology infrastructure development within the surrounding communities. This will ensure that their voices are heard and that appropriate policies are put in place to protect their culture and to maintain their privacy (Casey, et al., 1999; Telecommunications Technology, 1995).

Conclusion

Native American communities face dramatic barriers to accessing, implementing, and using advanced technology. These barriers include a lack of basic infrastructure, poor economic conditions, limited education and workforce training, inadequate political conditions, and deficient cultural understandings. While no one solution will solve this technology gap, the barriers need to be addressed to alleviate these barriers from hampering the progress of Native American communities.

The existence of the technology gap in Native American communities further threatens their livelihood as the world moves further into the digital age. However, technology is a double edge sword of both expanding opportunity and oppressive exploitation. Therefore, it is critical that remedies to address technological gaps be culturally sensitive and include significant input from the Native American communities at all stages. Native Americans have the right to manage their futures and we will all be the beneficiaries of a more diverse and technologically literate world.

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