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Building an Information Infrastructure

Christopher E. Hoy

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How we provide education, how farmers and manufacturers do business in local and global economies, and how rapidly-improving technologies will drive life in the 21st century remain somewhat mysterious.

Christopher E. Hoy has been at the forefront of a movement to develop a telecommunications infrastructure in the state of Nebraska. Hoy was hired as the Director of Special Projects by the Nebraska Department of Economic Development in 1991. Two years later he initiated a project called The Global Community Initiative. As part of that project, Hoy organized more than 45 community information technology committees in rural Nebraska and developed a model planning process for them to follow. He describes this effort as a statewide grass-roots organizing effort designed to stimulate demand for advanced information technologies and creative applications in small businesses. Currently, he directs a $680,000 Small Business Administration grant titled "Innovative Applications of Technology for Small Businesses." Through this project he has been able to continue supporting rural communities throughout Nebraska in their efforts to apply the skills of advanced information technologies.

Hoy's article is followed by commentaries from Diane Tilton, executive director of the Sunrise County Economic Council in Washington County, and Harry Dresser, associate headmaster at Gould Academy, Bethel, Maine.

by Christopher E. Hoy

Phase I: The Creation of Local Information Technology Committees

In 1993, the current director of the Nebraska Department of Economic Development said to me, "I need a staff person willing to travel to the rural areas of this state, who will find out what rural citizens want in terms of telecommunications, and who then will figure out what the state ought to do to make whatever is wanted happen." I said, "That person is me."

At first, the director disagreed, pointing out that I was a complete disaster when it comes to technology. But I reminded him that while many folks assume people my age never will be able to figure out this stuff, my lack of technological capacity makes me somewhat non-threatening. I also come from a marketing background in which the dumbest thing you can do is to not understand your customers. Not only did I want to travel the state seeking people's opinions, I actually believed it was a good idea. Consequently, I was hired as that staff person.

During the last three years, I have spent untold hours in the coffee and pie shops of Nebraska, asking people what they think about telecommunications and what they think the state should be doing. Initially, many of those people couldn't believe someone from the state had bothered to travel to their hometown just to ask their opinion. Despite their disbelief, they did talk with me,

often for a long, long time. The longer I talked to people in Nebraska, the more apparent it became that the one area where I could exercise the greatest influence in advancing a telecommunications infrastructure there was to focus on the users; to be precise, potential users--those who either didn't have or didn't yet perceive a need for telecommunications infrastructure.

Defining the Telecommunications Infrastructure

Historically, when state government invests in infrastructure, it targets such items as roads, bridges, and buildings. However, an information infrastructure entails four components:

- Physical infrastructure: Essentially, the switches and pipes;
- Appliances: Such as two-way video conferencing equipment, computers, and fax machines;
- Content: Basically, the voice, video, and data that travels over the pipes; and,
- Users.

After conversing with many people throughout Nebraska, I concluded that the Global Community Initiative probably could have its greatest impact if it focused primarily on users. In fact, efforts in this area would have the greatest effect on the other three information infrastructure components. I became convinced of this when I looked at the available statistics.

In 1993, we estimated that 2 to 5 percent of Nebraska citizens were teleliterate; that is, people who know the information revolution is not about computing. Many people can sit at a computer and manipulate data. Far fewer understand what a network really is or fully comprehend the benefits and values of the Information Age. How many Nebraskans could discuss this stuff in human terms? Just 2 to 5 percent.

I once read a report that said during the early days of commercial aviation few people chose to fly, even though they had planes, airports, and business plans. People were not flying in sufficient numbers to support the industry. Why? Researchers eventually learned it had to do with people's perception of safety. It was quite complex psychologically.

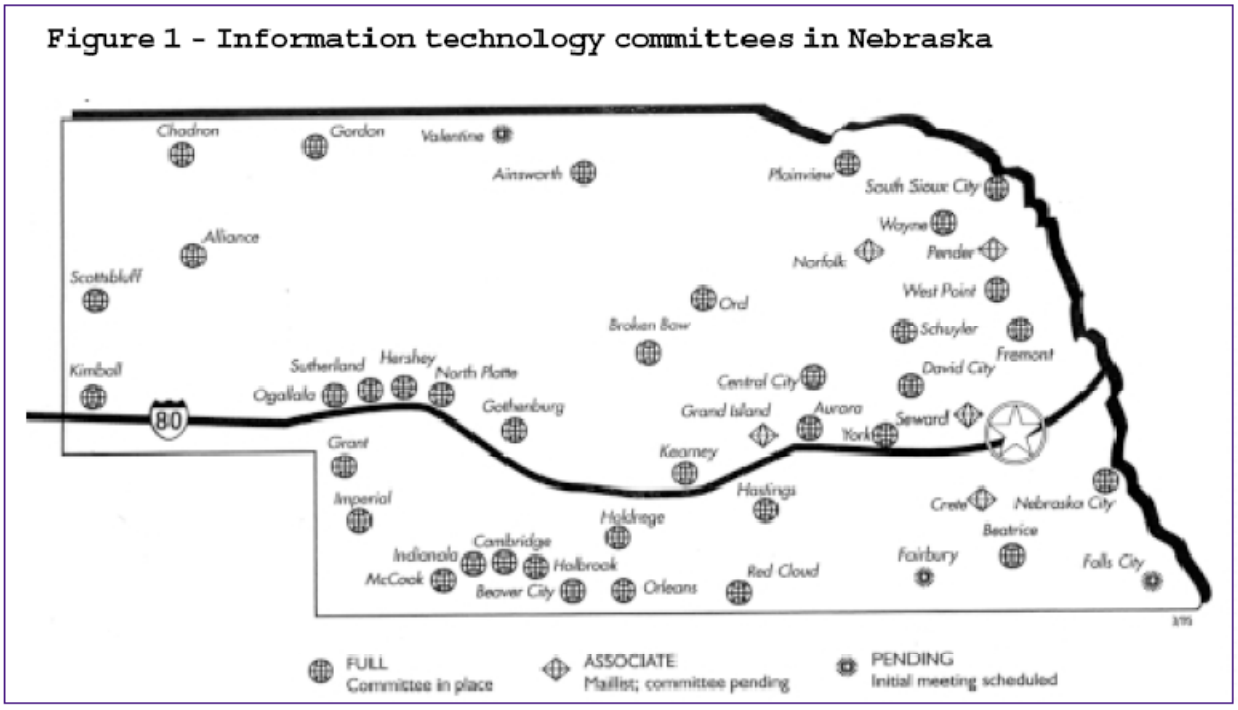
I realized, in the context of the airline analogy, that the only way we would reduce telecommunications costs, the only way to get infrastructure providers to feel confident about making new investments, and the only way to achieve innovation--which is where the new jobs are--was to expand the number of people who understand what is happening.

At a recent telecommunications conference in Aspen, Colorado, a fellow who works for a think tank in Washington, D.C., said, "You realize, of course, that the problem will not be the 'have' and 'have-nots' (in terms of infrastructure, appliances, and content). The problem is the 'wants' and the' want-nots'. There are not enough of us to make this thing economically viable. During the Industrial Age, the advertising industry evolved to explain the value and benefit of industrial products so that demand was created, sales occurred, and the process worked." He concluded, "The telecommunications industry needs to have some effort like that in place as well, or this is going to be one long, slow process."

Creating Awareness: Information Technology Committees

When the Global Community Initiative was started in 1993, one of the most basic psychological barriers was that of awareness. Most people had never seen it, used it, or had it explained to them in a way that they could understand its value and benefit. Without such an understanding, people were not willing to spend time and money to get closer to it and use it. That became my primary focus. I put together a lecture and road show. I used my laptop computer and some other demonstration equipment. Good staff people accompanied me. Today, I can go to any town meeting and convince most of the people in the room in two hours that there is significant value in these new information technologies. I can demonstrate how the information economy works, and why information technologies are the most important evolutionary leap since the invention of fire.

Since 1993, I have established more than fifty information technology committees throughout Nebraska. These translate to about 750 people working on technology issues (See Fig. 1). I found the people with a passion for information technologies; I found them in every community. I identified them as being interested enough in the subject to organize them- selves and eventually do something positive in their communities. I have yet to go to a town where I could not find at least three people who declare, "This is it. I must do this! Where do I start?" Or, "What is this communications technology stuff all about? I am the mayor and I really don't know anything about this communications technology, but I like it!"



I respond by telling them that if they have the passion and the interest, they will survive the hard work necessary to establish their community as an information technology participant. I tell them that caring about information technologies is the primary ingredient in ensuring success. Ultimately, if a dozen individuals are rallied to the cause in a community, they can form an

effective information technology committee. Once the committee is formed, we train them. For me, that's incredibly rewarding. When I am walking around a room full of excited people, I really get wild. I've had people jump up and scream, "I can see!" I love to see the lights go on. I love going back later to see what they've accomplished.

My initial goal was to get fifty communities involved. Using the 80-20 Rule, I calculated that to develop the ten best practices that will help the rest of the communities proceed in a logical manner, I would need to initiate at least fifty information technology committees. That process has taken nearly three years.

Phase II: Adding Value

Creating the fifty information technology committees was Phase I of the Global Community Initiative. We had the money, and the plan--a human infrastructure network, and a public employee (me) able to go implement it. The Global Community Initiative has turned out to be a bottom-up, grass-roots organizing effort, catalyzed by my ability to go back to the state capitol, acquire state resources, and then focus them on what people wanted.

Phase II of the initiative has entailed working with the information technology committees, primarily by connecting them to the information they need in order to think strategically about technology. Usually, a committee consists of ten to fifteen core people. One of its roles is to determine how to transmit its knowledge to the rest of the community. Frequently, the committees have worked to establish community technology learning centers, which often are located in the local library. Other committees have sponsored technology fairs and other types of awareness-generating projects.

Hamilton County, Nebraska has an information technology committee. The chairperson of the task force is the vice president of a local phone company. He not only understands telecommunications, he's interested in the outcomes because he will be a financial beneficiary. He also is an attorney and a very progressive and visible state leader. When he calls a meeting, people show up. When he directs a project, things happen. The progress that has been made in Hamilton County is phenomenal, with the committee's strategic plan containing seven county-wide goals. All those goals, such as satellite downlinks and connecting the schools, were arrived at by consensus thinking. The committee surveyed Hamilton County residents about what they felt should be done, opting to get their input rather than making decisions on behalf of others. It worked. The chair- person tells me the committee will accomplish six of its seven goals this year. Clearly, when you ask people what they want, you involve local resources. That builds cooperation and energy.

Innovative Applications

This past year, the Department of Economic Development was awarded a $680,000 grant by the Small Business Administration to stimulate "Innovative Applications of Technology for Small Businesses." This grant provided new resources to each of the communities participating in the Global Community Initiative. As a result, I'm driving a number of cutting-edge projects. We're building eight community bulletin board systems. The subcontractor is a certified economic

developer whose purpose is to train citizens in the use of digitized information for economic development purposes.

We also are attempting to build two telebusiness centers. Despite initial skepticism about locating telework centers in Nebraska, we've pushed forward. Ireland, for example, is doing half the electronic work for the Western Hemisphere because it figured out the economic advantages of telework a number of years ago. If a country has an educated, teleliterate population, it has the capacity to compete in a huge global market for telework. I am proceeding with the assumption that we can bring telework to Nebraska. If successful, we'll affect the rate of outmigration Nebraska has experienced in recent years. We have created the infrastructure; now we're creating the capacity.

To advance the telework concept, I engaged a national telebusiness consultant who works out of Omaha. Recently, this consultant joined me in a visit to an Omaha bank that is looking for a site in the U.S. to place thirty to forty electronic jobs. The banker was surprised to learn we had the capacity to do the work in Nebraska. Before our visit, he did not know there were local people willing and able to fill those jobs.

One way the initiative spreads the word about information technologies is by conducting local seminars on conducting business electronically. The seminars are designed to create interest in technology among small business entrepreneurs. When we show a businessperson or entrepreneur how the control of information is a value-added piece of the new economy, the lights go on, even when only 10 percent of the participants are affected to the degree that they change some aspect of their business. That's how it starts. Once small business owners see how commerce on the Internet actually works and how they can make money from a universal and ubiquitous commodity called "information," their interest is piqued.

Another way to create interest in information technologies is through a World Wide Web page called Community Information Technology (http://www.nol.org). We provided scholarships to members of the information technology committees so they could freely access the information posted on the page for a specified period of time. Another approach is through a Small Business Administration grant that helped us sponsor the creation of a web environment at the Nebraska Library Commission. Information technology committee members can access the page and educate themselves about information available on the Internet. Through this process, I have concluded that public libraries are the community institution that can make the strongest contribution to teleliteracy in rural America. We are planning a tri-state consortium (Colorado, Kansas, and Nebraska) to develop an educational product for librarians interested in preparing themselves for new technology-based roles in their towns. Librarians understand how information is organized, but some hesitate to get involved in a major transformation of their institution from a quiet, passive place to an aggressive, proactive member of the community.

Finally, we have initiated a series of Internet training courses through our community college system, and I publish a monthly newsletter over the Internet.

All of these are important pieces of the Phase II effort, because if local community members are to develop the capacity, they need to use the Internet and the web regularly.

Information Infrastructure: Demand Versus Supply

The Global Community Initiative has spent the past three years building a human infrastructure to help us deliver information and create demand. Although difficult, it has paid off. In early 1995, the second-largest telephone company in Nebraska--Lincoln Telephone--decided to offer Internet access to its own exchanges and to others across the state. When the company approached a community, it looked for three conditions:

- Sufficient demand: The company would ask the local information technology group for a list of sixty-five to seventy-five people who had committed to sign up for Internet service.
- A central office capable of handling electronic switching.
- An agent, such as a radio station, school, or small business, with a person to service the equipment occasionally and a person to sell accounts.

With these conditions met, the company has moved forward with the Internet. In the meantime, the telephone association has decided to aggregate all the remaining smaller communities into one market to determine whether it can get enough participants to support local dial-up in every Nebraska community. Within twelve to eighteen months, every community in Nebraska will have local access to the Internet.

Demand, then, drives this process. It has turned out to be a most crucial ingredient. There is some disagreement about this, but demand is the answer to many of our telecommunications problems. The other three components of the information infrastructure are not less important. Many believe the switches and wires must come first. But I believe it is easier to engage in community technology planning with people who understand the issues.

We repeatedly have discovered that building the infrastructure absent the human component is not enough. Iowa is a good example of a state that has built an expensive fiber network. The assumption was that Iowans were lacking access and that once it was provided, users would be attracted like flies to honey. But we have found that many people simply do not "get it" until they have experienced it. Most of us want to see a pragmatic application of a concept before we invest time and money. The Internet and other information technologies are subject to this scrutiny.

Creating Capacity

In the old days--two or three years ago--economic development specialists went to communities and "explained" things to people. They were the experts with answers and solutions; local citizens were their students. Today, the focus is on creating capacity within the community. Today, state employees work more concertedly to leave behind a base of knowledge that allows communities to function as reasoning, self-sufficient entities. Today, we talk about human engineering rather than physics.

Our goal in developing the Global Community Initiative was to identify people who lived in rural Nebraska communities who were willing to take part in a statewide capacity-building

initiative. Our primary criterion in identifying these people was whether or not they cared. If they did, and if they were interested in absorbing a process that could lead them to the capacity to reason their way through strategic thinking about information and technology, then we were able to make great progress.

The human capacity-building approach runs counter to the traditional approach of the government providing money to support an idea before the community has determined whether there is sufficient capacity in place to absorb or support the idea. Ideally, the community takes the time to develop a level of capacity before the money is invested. Ultimately, we want communities to understand the opportunities that might come along and to determine if they fit. If the community has the capacity to grasp the concepts, then the resources may show up. It is much less likely to happen the other way around, because people with money are very cautious and are not going to give the community the money first.

Once a community has built a human network and added value to it through capacity-building measures, it can move forward. The community is ready to respond to good ideas and good opportunities. Today, if the initiative acquires new resources, we can contact the leaders of communities with information technology committees. We know who they are, their depth of capabilities, and whether they would be likely to perceive a new concept as an opportunity.

That’s what capacity really means. If an opportunity floated by, like a leaf on a stream, would you see it and know enough to grab it? Would you know whether it was a good fit for your town? And, if you grabbed the opportunity, could you make something happen?

What is the State's Responsibility?

Fundamentally at issue, of course, is who will do it? For state government, the issue typically has to do with determining the appropriate use of public resources. When is it appropriate for the government to be involved versus the private sector or some other interest group?

Maine currently is grappling with that issue. The state has not yet decided where the leadership will be applied to the elements of its overall plan. Maine is not unique. It is participating in a debate that is occurring all across the U.S.

Frequently, people in state government ask if state government should be paying for what I do. The governor of Kansas recently asked me the same question. In response, I suggested a four-point scale to conceptualize a state’s role in building an information infrastructure. Under this scale, the lowest possible score would be four, which would apply to a state that actually was hindering capacity building in telecommunications. A score of three would be given to a neutral state; one that is neither into information technologies nor out of it. A two would be applied to "a responsible state," one that recognizes there are certain functions only a state can do well (taxes and tax incentives, regulation, etc.). The highest rating would go to a state seeking to achieve excellence. That state has taken a strategic position relative to goals, outcomes, and measures it was causing to occur that were perceived to be worthwhile.

Conclusion

In Nebraska, we have taken an active role to stimulate demand as a strategy for creating an information infrastructure that will lead to innovation and new jobs. I believe stimulating demand is the answer to almost all the other telecommunications challenges we face.

It is clear that on one hand, there needs to be a bottom-up effort to identify people with local decision-making power. On the other hand, the state needs to bring its influence to the regulatory environment, Internet providers, and policy making. These two dynamics must meet in the middle. In short, because of the need to customize responses to local circumstances, government needs information from the grass-roots arena in order to shape policy correctly.

In 1996, when it appears as if government will get serious about looking at these issues, I feel hopeful. There even are indicators that some states will draft sensible telecommunications policy.

I have my fingers crossed they will do it well. I am certain we can.

Christopher E. Hoy serves as director of special projects at the Nebraska Department of Economic Development, a post he has held since 1991. His current focus is helping develop a statewide strategy for telecommunications.

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