# Building Intellectual Infrastructure: The Human Side of IT Development

Building Information Age Communities Conference

Friday, April 12, 2002—Aurora, Nebraska

# Building Intellectual Infrastructure

- Tom Rolfes, Office of the CIO/NITC
  - Importance of intellectual infrastructure
  - Community resources
- Alan Wibbels, ESU 10
  - Center for Emerging Technology
  - Cisco Networking Academies
- Jeanne Saathoff, Kearney Public Library
  - Promotion of information technology literacy

# Building Intellectual Infrastructure

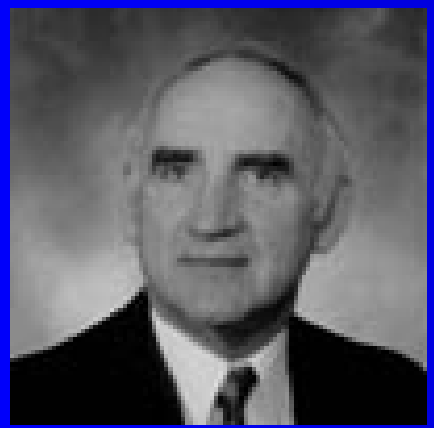
Enter “intellectual infrastructure” into Google.com and what do you find?

TECHNOLOGIES ACROSS NEBRASKA

Videos About the Project PARTNERSHIP
Directory Resources FAQ Course Listings Toolkit

# Building Intellectual Infrastructure

Ask anyone in Nebraska about intellectual infrastructure and where will they send you?



Bob Sweeney
*Chief Executive Officer*
AIM Institute

# Building Intellectual Infrastructure

## What is intellectual infrastructure?

**Intellectual infrastructure** refers to the human capital--the knowledge, skills, and abilities--required for both civic involvement and IT development. In order to prosper in the Information Age, communities need tech savvy business and community leaders, a skilled workforce, and IT support services.

# Building Intellectual Infrastructure

Intellectual Infrastructure is often confused with **computer literacy**.

Literacy about computers might call for a minimal level of familiarity with hardware or technological tools like word processors, e-mail, and Web browsers.

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The National Committee for Computer Literacy discriminates between literacy and **fluency**--the notion of *fluency* is the ability to reformulate knowledge, to express one's self creatively and appropriately, and to produce and generate information (rather than simply to comprehend it).

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For this reason, the National Committee for Computer Literacy chose "**F**luency with **I**nformation **T**echnology," or **FIT**ness, as a label for the robust understanding of what is needed to use information technology effectively across a broad range of applications.

# Building Intellectual Infrastructure

- **FIT**ness requires that persons understand information technology broadly enough to be able to apply it productively at work and in their everyday lives, to recognize when information technology would assist or impede the achievement of a goal, and to continually adapt to the changes in and advancement of information technology.

# Building Intellectual Infrastructure

- **FIT**ness therefore requires a deeper, more essential understanding and mastery of information technology for information processing, communication, and problem solving than does computer literacy as traditionally defined.

# Building Intellectual Infrastructure

**Intellectual Infrastructure** is a relatively new term but fills an important gap in the understanding and process of moving from a “traditional economy” community to an “emerging information age” community to an “information age” community.

# Building Intellectual Infrastructure

- Traditional economy community = relying on pre-information age goods and services for survival
- Emerging Information Age community = showing some signs of physical infrastructure or intellectual infrastructure development
- Information age community = has ample physical infrastructure and citizens know how to increase their information technology knowledge and skills and use it for the community's benefit

# Building Intellectual Infrastructure

Intellectual Infrastructure is a difficult condition to measure; much more challenging than physical infrastructure.

Different communities and institutions achieve it in different ways. Probably not all attributes are common to any one community.

Suffice it to say, “You’ll know it when you see it”.

# Building Intellectual Infrastructure

Just like physical telecommunications infrastructure, intellectual infrastructure may involve many different components:

*educational attainment
*willingness to get things done
*technical education and training
*critical mass of change agents
*knowledge of change management
*dissatisfaction with status quo
*lifelong learning opportunities
*positive 'can-do' attitude
*support groups
*stakeholder analysis
*research and development

# Building Intellectual Infrastructure

Let's go back to our definition:

Intellectual infrastructure refers to the human capital--the knowledge, skills, and abilities-- required for both civic involvement and IT development.

# Building Intellectual Infrastructure

Educational Attainment—some possible measures:

- High school graduation rate
- SAT Test scores
- College completion rate
- Attendance at two-year colleges
- Number of high school technical courses taken
- Community's average adult education level
- High school graduate retention rate (how many graduates stay or return to the community after college)
- Proficiency on the ISTE Educational Technology Standards (www.iste.org)

# Building Intellectual Infrastructure

Lifelong learning—Does your community provide citizens the opportunity to continue their learning journey?

- Community college courses/workshops
- University Extension workshops
- Cisco Academies
- Public library courses/workshops
- Master Navigator Program
- High school student offerings
- Web links for on-line training
- Grant-funded or special projects

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This learning can be:

- Directed—used to increase specific skills of a particular subgroup at a specific time (e.g. Web training for community webmaster); or
- General—used to improve the overall fluency of the citizenry through many different approaches and programs

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Do your community members possess a willingness to get things done and a positive ‘can-do’ attitude?

It will simply not suffice to delegate an assignment and not have it be completed.

- Be sure to surround yourself with ambitious, tactful people.
- Follow up with task group or committee members.
- Meet frequently to discuss blockers, hurdles, and red tape that slow down progress.
- Assist team members to find a way around barriers.

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Has your community enlisted the assistance of paid and donated instruction to provide technical education and training on a "just-in-time" basis?

- Technology support groups
  - Senior citizens center
  - Business or Chamber of Commerce
  - Nonprofit groups
- Directory of assistance/expertise
  - Web site roster of community "experts" willing to assist with technology problems in different areas
  - Sources of on-line or telephone assistance for hardware, software problems

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Has your community inventoried your "movers and shakers"? (stakeholder analysis) Has your community gathered a critical mass of change agents?

Some key participants on your **technology committee** might include:

- Mayor or city manager or city council members
- Banker and/or major business owners
- Economic developer or chamber of commerce president
- Educator or administrator
- Representatives from agriculture, libraries, health care
- Grant writer
- "Worker Bees" and "Idea Generators"

# Building Intellectual Infrastructure

Change management: Conflict arises whenever change or progress is detected.

Dissatisfaction with status quo: TTWWADI and TTWIAB are the enemy!

Research and development: What are your community's

- top 5 employers?
- top 5 grossing businesses?
- top 5 most un-exploited products or services?

Would a Regional or County-wide effort be preferred?

# Building Intellectual Infrastructure

Network, Network, Network….

- Subscribe to rural economic development listserves, e-newsletters, NITC.news
- Seek out "jobalikes" and "birds of a feather" locally, statewide, nationally
- Go to I.T. development meetings and conferences
- Replicate other communities' projects (Not ©)
- Advertise/communicate/celebrate even the most modest successes

# Building Intellectual Infrastructure

In summary, Intellectual Infrastructure is:

*As much a progressive attitude as it is a measurable commodity;

*A necessary component in becoming an "Information Age Community";

*Probably as important to community development as the physical infrastructure;

*A quality to which every community member can contribute.

# Are the Small Towns Worth Saving?

By **Michael Nolan** *The Death of a Vision*

"Inevitably I am reconciled to the reality that change is not an option. In the emerging global economy competition is merciless and national borders are becoming irrelevant. To sustain themselves, rural communities must rethink their own artificial parochial boundaries that impede economic progress. They must align with the new information technologies and use them to add value to their schools, hospitals, libraries and businesses. They must rediscover the interdependencies they have with other communities and build upon them regionally. They must reinvent the vision of their pioneer ancestors."

# States Look to "Clusters of Innovation" to Drive Their Economies

Web Posted - 04/11/02

*Article Source: National Governors Association*

Getting governors to rethink their economic development strategies - to develop and nurture "clusters of innovation" - so their states can compete in the 21st century global marketplace and strengthen the national economy was the focus of a recent National Governors Association (NGA) and Council on Competitiveness meeting in Denver, Colorado.

Jeff Grogan and Kurt Dassel of The Monitor Group, an international consulting company and co-sponsor of the Council's Clusters of Innovation project, presented the concept behind how clusters can enhance productivity and spur innovation by bringing together technology, information, specialized talent, competing and collaborating companies, and academic institutions.

# Building Intellectual Infrastructure

For more information:

http://www.nitc.state.ne.us/toolkit

http://technologiesacrossnebraska.unl.edu

http://www.esu10.org

http://www.kearneylib.org/

# Building Intellectual Infrastructure

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