

The Race to Prosperity in the New Economy:
State Strategies to Lead, Succeed

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Abstract

This paper summarizes reviews of benchmarking studies and case studies of successful efforts to address the New Economy. It provides a list of common features of successful communities and states and proposes several action steps for Wisconsin to take to compete effectively in the New Economy.

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I. Introduction

Wisconsin's Economic Summit provides a unique opportunity to focus our state's attention on the challenges of the future. Based on the pre-summit interest that has been expressed in these issues, our state is poised to compete with others in the New Economy and the emerging global market.

As we realize the tremendous potential value of this opportunity, we should be mindful of the actions and initiatives that have taken place in other states. Some of these important background considerations are set forth in this paper. In the final analysis, as the Wisconsin Economic Summit unfolds, and more particularly, after the Summit is completed, the sense of shared vision and shared action that we take in Wisconsin will determine the effectiveness of our state's actions in meeting the challenges present at this unique moment in our state's proud history.

Four key ideas should be taken from this paper:

- First, developing businesses to participate in the New Economy requires distinct actions by the state and by communities. This cannot be done at each level alone, but can be done together.
- Second, our state needs to provide the right tax structure, funds for commercialization of university-based innovations, and a technology infrastructure.
- Third, support organizations need to be created, often housed within universities.
- Finally, organizations that provide social networking for technology-based firms need to be created at the regional level.

II. Background

The Information Age has arrived, and the transition to the New Economy promises to be a revolution for service organizations that excel in this new era. In many ways, the New Economy is really the "Information Economy," and it is in this environment that state governments and state-supported educational institutions will compete and vie for the competitive edge that will lead to the goal of ensuring long-term growth in high-income jobs and careers.

The reality of this competition is evidenced by nearly every state at least thinking about the issue of how to be successful in the New Economy. Some states and regions have developed task forces (Arizona, North Carolina, San Diego, Philadelphia) or an infrastructure (Southern Technology Council) to study this issue. These groups have developed reports and web sites to summarize their findings.

This paper provides an overview of the results of those studies that have taken place in or by other states. The purpose of this paper is to benchmark successful practices for state and local entities as well as to identify a series of initiatives begun by states and communities that have not yet been demonstrated to be successful. The anecdotal information presented in this paper gives us information about what our competing states are doing today or are planning to do tomorrow that may well affect how we approach this issue. By studying these general trends, we can help shape and influence the Wisconsin Economic Summit toward those goals or initiatives that are most likely to be successful on the basis of our assessment of the activities that have taken place in other states.

This paper is best read as a follow-up to the paper written by Don Nichols: *Wisconsin Manufacturing in the Global Economy: Its Past, Present and Future*. In that paper, which was also written for the Summit, Professor Nichols provides a context for this paper in clearly defining what the term “New Economy” can mean for Wisconsin.

Nichols argues that we should encourage the development of high value-added organizations; those operating at high levels of information and knowledge management using state of the art technology. This development has two components: 1) building on the existing base of manufacturing organizations, and 2) encouraging the development of new businesses. Nichols’ framework and analysis is so well reasoned that it is not repeated here. Such a limited effort would fail to capture the full essence of the crucial underpinnings to our endeavors associated with Wisconsin’s Summit.

In the table that follows, a listing of the main state and regional economic reports and activities that have been completed to date shows the broad scope of ongoing efforts to deal with the challenges inherent in the New Economy.

While these reports showcase many different trends, one key element that is found in each of these initiatives is the **essential requirement for strong local and state participation in this process**. The examples cited as benchmarks for success are specific communities and cities. While there was usually state influence through either regulations, economic incentives or assistance in creating networks, specific activities driving successful competition in the New Economy were local or regional in nature.

Table 1

**Various State and Local Reports
Relating to the New Economy**

Location	Source	Essence
Southern States	Interstate Migration of Recent Science and Engineering Graduates	Data
US	State Strategies for the New Economy	Plan
US/Wisconsin	The State New Economy Index	Data
Arizona	Web site	Action/Plan
North Carolina	NC documents – Vision 2030	Action/Plan/ Event
Georgia	Best Practices/NC New Economy	Data/Plan
Pennsylvania	Best Practices/NC New Economy	Data/Plan
Utah	Best Practices/NC New Economy	Data/Plan
Kansas	North Carolina New Economy	Data
New Jersey	North Carolina New Economy	Data
Virginia	North Carolina New Economy	Data
Minnesota	Summit on Minnesota’s Economy – September 2000	Event
San Diego CA	Developing High Technology Communities in San Diego	Action
Austin TX	Case study, Web site	Action
Philadelphia	John F. Street Transition Team	Plan

III. Key Background Data

The Progressive Policy Institute has identified 17 unique indicators of the New Economy Index, grouped into five general categories (see www.ppionline.org for a more complete list and Wisconsin’s rank):

- Knowledge Jobs
- Globalization
- Economic Dynamism
- Digital Economy
- Innovation Capacity

As reported in that study, Wisconsin ranks 32nd overall in that Index rating system. However, probing beneath the surface, there are interesting differences between the various categories. For example:

- In the Digital Economy (extent to which digital technologies are used in the state) Wisconsin had a rank of 14, but this was driven primarily by state government use of technology (ranked 2nd nationally), followed by technology

in schools, commercial use and personal use, which all ranked in the bottom half of the 50 states.

- The other four categories were fairly consistent, ranging from ranks of 27th to 39th.

These results are consistent with other data that show that Wisconsin has a higher rate of brain drain, lower levels of investment, and a lower number of technology-related jobs than other states. In other words, regardless of how you view our past actions, it is clear that our state has plenty to do to become more competitive in each of the five indices that are cited as key to the New Economy.

We know that Wisconsin has high quality post-secondary educational opportunity. This is a source of pride for us. However, we also know that our state is having trouble retaining those students that we educate and graduate. This is one of the central challenges that our state faces in the New Economy: how to become more competitive for the talent we already have here in Wisconsin!

A national study of interstate migration of science and engineering graduates indicated again that Wisconsin had a net loss of these individuals. (The migration variable used was the ratio of college graduates employed in a state compared to the number produced by that state). Of interest was what characteristics of states were related to higher or lower levels of interstate migration. The study reported that industrial and economic variables did not affect migration of such individuals but other variables did.

The percentage of students remaining in the state to attend college was related to several variables however the two of most interest here were the number of students attending college in the state and the non-resident tuition rate. The study indicated that retention of science and engineering graduates was positively related to students attending college in state – more students enrolled in college the higher the ratio of those employed in the state rather than outside the state.

An interesting finding of the study for Wisconsin to consider is states with lower non-resident tuition costs had higher net migration. Clearly this is an opportunity for Wisconsin to attract students from other states to attend our universities. Not only does it provide an increase in revenues through tuition and other student expenses, it also increases the likelihood of a positive effect on the net migration of college-educated people. The challenge will be to encourage out-of-state students (other than those from Minnesota) to attend Wisconsin Universities, particularly the comprehensives. Reduction of our non-resident tuition rates is worthy of review.

IV. Common Threads for State Strategies

The North Carolina Vision 2030 Project indicated that as of late 1999 a collection of 13 states had adopted a formal science and technology component to their statewide economic development plans. They identified four tenets that these plans had in common (page 5 of their report). The first four tenets are listed below. The remaining tenets are common threads that appear in the success stories about San Diego, North Carolina, Utah or Austin.

Ten Major Tenets or Common Threads Emerging From New Economy Efforts

1. Maintaining and strengthening the R&D capacity of the state's colleges and universities and assisting commercialization of university research.
2. Encouraging home grown businesses by providing support of entrepreneurs and small technology-based firms rather than focusing exclusively on recruiting technology firms
3. Facilitating the incorporation of new technologies into processes and products through increasing the skill of the workforce and capacity building of established firms.
4. Fostering university-industry partnerships through formal organizations housed on university campuses.
5. Establishing communication networks among high-technology firms, and between these firms and educational institutions and government.
6. Creating entities that help transition start-up innovations into high-technology businesses.
7. Developing an integrated approach through formal consortia of local governments or similar entities.
8. Developing the technical infrastructure to support technology and communication.
9. Developing educational systems from pre-kindergarten through high school to give students access to technology.
10. Having a champion, often from a university, that leads the effort.

V. Implications for Wisconsin

An analysis of the ten tenets or common threads set forth above provides an overview of some of the major opportunities facing Wisconsin as we prepare for this Economic Summit:

- **Tenet 1- Maintain and Strengthen R & D Capacity of Universities and Commercialization.** Many of the states reviewed have established an important role for R & D capacity of universities and commercialization. The University of Wisconsin-Madison Research Park and the Wisconsin Alumni Research Foundation (WARF) are excellent examples of implementing this tenet. Both are often cited as benchmarks for other state universities to emulate. This tenet could be expanded to other campuses in the UW System. UW-Madison also has the University Industry Relations Office that assists faculty and staff regarding intellectual property rights, patent processes, etc. WARF provides support for actually obtaining the patent and helps with licensing, but it is not clear what assistance is provided for actually starting a business based upon an invention.

Despite being cited as benchmarks of success, they represent only a piece of what can be done to strengthen commercialization of R & D efforts at universities. In 1999, North Carolina created \$50 million in non-profit venture funds housed within a variety of universities to invest in university spin-offs and bioscience start-ups. Some universities provide significant technical assistance for faculty/staff to actually start a business.

- **Tenet 2 – Develop Own versus Recruiting.** States and communities grow their own by creating support networks that include not only funding, but also technical support to start or expand businesses. For example, Pennsylvania has created industrial resource centers that provide financial and technical support to manufacturers to improve their technologies and operations. North Carolina has developed the Small Business and Technology Development Center that supports technology development and commercialization of that technology. Its 17 offices across the state serve 12,000 clients annually. This is a statewide program that is the largest inter-institutional program within North Carolina.
- **Tenet 3 – Increase Skill of the Workforce.** A number of states have developed programs to provide basic technology education throughout the population. For example, Georgia has developed a program to provide pre-kindergarten for all children. At the other end of the educational pipeline, Georgia provides financial aid for all students who have maintained a B average to attend public universities. Pennsylvania has just begun a program to provide up to \$3000 per year to university students who are majoring in science or technology programs. They must maintain a B average, complete an internship, and work in Pennsylvania for as many years as they receive funding.

- **Tenet 4 – Foster University and Industry Partnerships.** North Carolina has put venture capital funds on three of its campuses. UT Austin created IC2 and the Austin Technology Incubator. And the University of California San Diego created CONNECT. All of these encourage university – industry partnerships.

What appears to be the most comprehensive is CONNECT (www.connect.org). While attached to UC San Diego, it uses no state funds at this point. Its mission is to be an interactive, community-based organization to provide assistance to high-tech and life sciences companies to improve the knowledge of local infrastructure, to create linkages between UCSD and local industry and to stimulate local economic development.

CONNECT provides courses for starting and financing a tech company, early start companies, a technology finance forum that assists companies that have already received some venture capital, and several other support activities. They help create networks of individuals. On the organization’s web site you can link to a number of related networks of technology focused organizations.

- **Tenet 5 – Establish Communication Networks.** Communities that have been successful in developing high value added companies have developed formal organizational networks. San Diego has several such key organizations. The San Diego Regional Development Corporation is comprised of a coalition of private sector individuals and government officials. This group helped form CONNECT and developed proposals to attract major research centers to the San Diego area. This group includes representatives from many communities and governments in the area.

Two other organizations are of interest – San Diego Association of Governments and San Diego Regional Technology Alliance. The former is comprised of 18 cities, county government, port authority, etc. It does regional planning in a number of areas and creates a strategic plan for the San Diego area. The latter is a non-profit organization created by the state legislature to foster and support technology-based development. It provides assistance to entrepreneurs and to small businesses, offers technology-based services and conducts regional studies on technology-related issues.

There are other networks of individuals and companies involved in high-tech activities. For example, Biotech in San Diego is a network for executives in the biotech industry. BIOCOM is another San Diego network for members of the life sciences community with the mission to promote growth in all sectors of the industry. They provide monthly breakfasts and education programs.

- **Tenet 6 – Create Entities that Support High-Tech Startups.** These entities are usually attached to a university and provide very specific technical assistance to start-ups or small businesses. Examples can be found in North Carolina, Georgia, and Pennsylvania. Georgia provides support services through Advanced Technology Development Center (a part

of Economic Development Institute headquartered at Georgia Tech with 13 regional offices). They provide assistance with strategic planning, financing and marketing for start-up companies. Another program they support is creating partnerships between small and large companies. Small companies learn from larger companies and large companies use the smaller, more innovative companies to develop new technologies and products.

- **Tenet 7 – Integrate Support Organizations.** In reviewing each hot community (San Diego, Austin, North Carolina), it was clear that a number of organizations had been developed to assist high-technology companies. What was not clear is how these various entities worked together. North Carolina created several such support organizations, but then recognized that there was difficulty creating an integrated set of support activities from them. We can learn from these experiences and create local networking organizations that have an integrating role.

Each region in our state has several organizations designed to assist businesses and entrepreneurs (e.g., economic development agencies, small business development agencies, etc.). Some states have created organizations with a statewide presence to integrate the efforts of such support organizations (e.g., the Kansas Technology Enterprise Corporation and New Jersey’s Commission on Science and Technology). Statewide organizations may represent examples of effective coordinating units because they control funds for entities that provide support for technology development and infusion.

- **Tenet 8 – Create a Technical Infrastructure to Support Technology.** This includes a great variety of activities, ranging from cost of broadband width access to state government use of technology. For example, Virginia provides access to high capacity broadband that costs the same for urban and rural areas. Given that our state has large rural areas, creating this infrastructure could provide unique opportunities for locating or developing high-tech companies in those areas. This is important not only economically, but also to give all citizens and areas of the state access to the new technology.

Virginia also created a Secretary of Technology to oversee state technology functions. Pennsylvania announced a new initiative to ensure that government effectively used technology to provide quality service to its constituents. Having state government lead the way by the use of technology sends a message to high tech companies that we are serious about supporting these businesses.

- **Tenet 9 – Develop Educational Systems.** Most of the states engaged in high-tech have also invested in education from kindergarten through universities. Previously several examples cited what states were doing to support education. As mentioned, Pennsylvania is providing support for students enrolled in science or technology programs with the stipulation that they remain in the state and work. Given the strength of our educational system, it can be viewed as one of our core competencies. I

could not find examples of specific Wisconsin communities developing educational systems specifically to encourage students to major in science or technology programs.

- **Tenet 10 – Have A Champion Lead the Effort.** In reviewing the histories of Austin and San Diego, there are a number of similarities (building networks, creating entities to support high-tech, and university involvement). The other common characteristic is the presence of a champion. For San Diego it was Richard Atkinson (now president of the University of California System), President of UC San Diego. In Austin it was George Kozmetsky, former dean of the business school. In both communities these individuals led the development of the core networks, support entities, and linked the university to the community. This is a model that deserves closer examination.

While these tenets provide a blueprint for a successful New Economy, it is also important to review what other states are proposing. Arizona's web site provides examples such as Pennsylvania, which is proposing to do the following:

- Develop a **technology-focused marketing campaign;**
- Attract or expand **anchor firms to serve as catalysts;**
- Establish a **public/private joint fund** for young high-tech firms to grow;
- Seek opportunities to establish a **laboratory for the next generation;**
- Develop a system to **supply skilled workers;**
- Establish a true **technology-intensive business climate;** and
- Establish a research and **technology network** among universities and industries.

This listing of ideas and priorities essentially reads like a blueprint for any state in the country. If this outlines the idealized direction that should guide our future efforts, the question remains as to how we create our unique approach that capitalizes on our core competencies.

VI. Elements of The Wisconsin Plan for the New Economy

There appear to be several components to successful state and regional strategies (or at least some approaches that are being tried). The following five strategies appear most promising for Wisconsin:

Strategies

1. **The basic development of ideas and innovations must come from both universities and industry.** This is a complex issue and cannot be dealt with effectively in this paper. While UW-Madison can play a key role, we must assist existing businesses in implementing high-tech solutions (particularly to the labor shortage). This can and should be a state level effort with leadership from university and government.

While reluctant to suggest creating a committee, it appears to be the only way to effectively deal with this issue. A task force should address the issues raised in Don Nichols' paper regarding developing technology solutions within manufacturing, but it also should review tax structure, effective use of technology by state government, and creating entities that assist in the commercialization of innovations. This task force should review what CONNECT and IC2 do to support new ventures.

2. **It is necessary to create the technical infrastructure.** Do our rural areas have access to high-speed broadband width communications? We cite our quality of life, pastoral settings for high quality of life, but these are irrelevant for high-tech workers if they cannot have high-speed access for communications. These workers use their home computer for work. If we do not have the infrastructure to support them, we won't attract them.
3. **Develop local social networks to support high-tech companies.** They need to exist at least in the major population centers of the state – Madison, Milwaukee and Green Bay/Fox Valley. The two best examples of developing these networks are Austin and San Diego, and in both cases the university played the catalyst role. An aggressive approach by the universities in the area is needed if it is not being done now.
4. **Create in each area a regional government entity that develops a strategy for the area.** This is particularly an issue for Milwaukee and the Green Bay/Fox Cities. In neither does there appear to be a strategic development plan for the region.
5. **Support university-industry partnerships.** Data indicate that companies that have universities as partners have greater rates of return than those who do not have universities as partners (15% versus 30% for small companies, and 30% versus 42% for large). Formal organizations on campuses that encourage university-industry partnerships appear to be a key component to developing innovations. Madison and Milwaukee campuses have entities that do some of that, but a review of their mission and benchmarking against CONNECT at UC San Diego, or IC2 at UT Austin or ATDC at George Tech might be useful.

The comprehensive universities have the opportunity to develop such units if they do not already exist. These entities may also seek to develop specific

expertise, as the Nichols' paper suggests in manufacturing. The Fox Valley could develop expertise in innovation in papermaking or insurance given the large number of such organizations there. A champion is needed. At the University of Wisconsin-Oshkosh, for example, we have experienced considerable success with a special outreach operation, the Center for Community Partnerships, a not for profit organization attached to the university. Our campus experience informs us of the value of having a semi-independent and freestanding center that can respond and adapt to the changing external needs of the competitive marketplace. This is true for the services that we provide to the private sector as well as to the non-profit and governmental sectors.

Moving beyond the top five strategies outlined above, a series of four additional concepts are also worth pursuing. These initiatives will likely take longer to have an impact on the structure of our economic base. These are actions that do not have a track record of proven success, but are being tried by various states. See Arizona web site for a description of some of these initiatives - www.commerce.state.az.us/neweconomy/resources.htm

Concepts

1. **Communication.** Create educational communication networks, which our state has done fairly well, particularly within regions. The mood of the public seems to be moving toward an expectation that the traditional bureaucratic lines of educational responsibility and territory (colleges/universities vs. public K-12 schools, public vs. private, technical college vs. university, etc.) will no longer be a barrier to effective and results-oriented cooperation.
2. **Technology.** Ensure that children from pre-kindergarten to high school have access to technology by providing state funding to support local programs.
3. **Leadership/Coordination.** Develop a state level position that monitors and recommends actions to impact the high-technology environment.
4. **Non-Resident Students.** Given that the data suggest that those who earn a degree in a state are more likely to stay, and given that one of our core competencies in the state is our educational system, we should develop a strategy to attract non-resident students, particularly to the comprehensive universities. This would include a review of non-resident tuition.

VII. Conclusion

The dawn of this new era is an exciting, stimulating time of challenge and change. It provides opportunities for our state to develop a new vision of its future and to develop a key strategy for our state's relative effectiveness in meeting the challenge of the New Economy. States or regions that are successful in fostering and attracting high-tech applications companies operate

within a set of state and local initiatives of the sort that we can anticipate emerging from the Wisconsin Economic Summit.

As we prepare for Wisconsin's Summit, therefore, our state needs to set the tone and provide some of the basic entities to support innovation, while each region creates a strategic development plan to focus on specific areas of the New Economy. To accomplish this, a state task force should be formed to assess current status and develop specific recommendations. Within each region, a champion should lead the development of networks and creation of entities that support the commercialization of innovations. Finally, in each region a governmental consortium should create a strategic direction for that region, which may differ from region to region.

The main emphasis here is linking the public with the private sector. Searching for the right mix of state and local governmental action with the speed and resiliency of the free private market should place Wisconsin in a position to be competitive and successful with the actions that are being undertaken by other states and regions.

Bibliography

About the Southern Technology Council.
<http://www.southern.org/aboutSTC.htm>

Biocom. <http://www.biocom.org/>

Capital Area Training Foundation. "Greater Austin @ Work High School Career Fair."
http://www.austinchamber.org/Do_Business...e_Development/Career_Fairs/High_School/

Conn, Robert W. "The Research University Complex in a New Era: An Inquiry and Implications for its Relationship with Industry." (August 1999).

Connect. <http://www.connect.org/membership/intro.html>

Developing High - Technology Communities in San Diego. "A report on the strategies and actions leading to the growth of robust technology clusters in San Diego." (December 1999).

Engleking, Susan. "Austin's economic growth: A case study in futuristic planning." Economic Development Review; Schiller Park 16 (1999).

Fowler, Tom. "Austin: Texas' all-purpose answer to San Francisco." bizjournals.com/sanfrancisco (February 11, 2000).

High Technology. <http://www.commerce.state.az.us/high%20technology.htm>

Information Technology Resources Board. "The Diminishing Pool of Skilled Federal Information Technology Executives: IT Brain Drain Report." (March 1998).

"John F. Street Transition Team." New Economy Committee. Summary Recommendations: New Economy Transition Team Findings & Recommendations. (February 29, 2000).

Kelly, Jason. "Austin Stands Apart." Upside; Foster City 12 (February 2000).

Maddern, Scott. "High - Tech Brain Drain."
http://www.americasnetwork.com/issues/2000issues/20000201/20000201_high.htm

Miller, Cliff. "Task Force Told of State's Need for 'Brain Gain'." The Post-Crescent (Wed. 14 - June 2000).

Nichols, Donald A. Wisconsin Manufacturing in the Global Economy: Its Past, Present and Future. Madison, (The University of Wisconsin-Madison: October 2000).

North Carolina – Forces for Change – an Economy in Transition.
North Carolina’s Regions: Transitioning to the Knowledge Economy

Osterman, Paul. Revolutionizing Work.
http://www.ppion.ine.org/ppi_ci.cfm?knlgArealD=126&contentID=126&contentID=950

San Diego Tech Coast Angels. <http://www.connect.org/angels/main.html>

State Strategies for the New Economy. Washington: National Governors’ Association.

“Stopping the Student Brain Drain.” Philadelphia Business Journal. (March 6, 2000).

Summit on Minnesota’s Economy. (September 20, 2000).<http://www1.umn.edu/summit/NewFiles/confinfo.html>,

“The Knowledge Economy: Knowledge Producers and Knowledge Users.” The New Economy Index. <http://www.neweconomyindex.org/knowledge.html>

The State New Economy Index: The Rankings.
[wysiwyg://51/http://www.neweconomyindex.org/states/rankings.html](http://www.neweconomyindex.org/states/rankings.html)

The State New Economy Index: The States.
[wysiwyg://7/http://www.neweconomyindex.org/states/Wisconsin.html](http://www.neweconomyindex.org/states/Wisconsin.html)

Tornatzky, Louis G. Ph.D., Gray, Denis Ph.D., Tarant, Stephanie A., Howe, Julie E. Ph.D. “Where Have all the Students Gone?” Interstate Migration of Recent Science and Engineering Graduates. A Benchmarking Report of the Southern Technology Council. (February 1998).

UT/Austin Entrepreneurial Career Day for the Technology Industry.
http://www.austinchamber.org/Do_Busines...orce_Development/Career_Fairs/Software/

Washburne, Carolyn Kott. “Brain Gain.” Corporate Report Wisconsin (March 2000).

“Where Have all the Students Gone? Interstate Migration of Recent Science and Engineering Graduates.” <http://www.southern.org/migrate.htm>

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