Industry Clusters: Part of Indiana's Strategic Planning Toolkit

These have been tough economic times for Indiana and the Midwest. But Indiana has been through tough economic times before. In 1985, after a particularly severe recession, Gov. Orr and the Indiana General Assembly established an entity for charting Indiana's economic future, the Indiana Economic Development Council (IEDC). Since then, the council has worked with communities throughout Indiana to develop and implement a series of economic development plans.

This year the IEDC, in partnership with the Indiana Department of Commerce, has embarked on a new phase of planning to help assess the Indiana economy. The process began in May and will continue through the end of this year, culminating in a roadmap for Indiana and its regions.

Editor's Note: The following is an excerpt from the preliminary state-level cluster analysis developed for the IEDC by Christine Nolan, area educator in Purdue University's Cooperative Extension Service. This cluster analysis is only one of the many parts to the entire planning process.

Preliminary Identification of Indiana's Clusters

Several studies have already taken place in Indiana, resulting in the early targeting of four clusters for further development: life sciences, 21st century logistics, advanced manufacturing and information technology.

The IEDC analysis[1] builds upon the previous definition of clusters and introduces a number of new clusters in an attempt to present regions with an expanded range of choices and knowledge regarding their comparative advantages.

Methods for Analyzing the Cluster Data

Location Quotients: Location quotients show where clusters and industry sectors in particular localities are more strongly represented than they are in the nation as a whole.[2] If a cluster's location quotient is greater than one, it means the locality is more specialized in those industries than the nation and is likely producing for export as well as local consumption. Note that, in this context, the term "specialized" means more concentrated in a state or region than in the nation as a whole.

The dynamics of specialization are also measured by comparing year-to-year changes in the location quotients. The clusters are then sorted according to a method developed by the Boston Consulting Group to show which are more or less specialized than the nation and whether they are increasing or decreasing in their degree of specialization. This sorting process results in four categories of clusters:

- **Stars:** specialized, with increasing specialization
- **Mature:** specialized, with decreasing specialization
- **Emerging:** unspecialized, with increasing specialization
- **Transforming:** unspecialized, with decreasing specialization

In Figure 1, each industry cluster is located in one of these four quandrants. The vertical axis of the chart shows specialization (or concentration), while the horizontal axis indicates

The 2004 Economic Development Strategic Planning Process

More so than with previous plans, this year's effort makes a conscious attempt to include in the statewide process participation from those who are responsible for its eventual implementation. Advisory board members and staff from each of the 12 Commerce regions, as well as professionals from a wide array of state agencies and economic development entities across the state are participating in the process:

April – May 2004
- Retain consultants
- Form a steering committee and subcommittees
- Begin visits across the state

June – July 2004
- Data collection and analysis underway
- Launch website geared toward planning
- First series of meetings held throughout the state

August – September 2004
- Launch survey
- Additional regional meetings
- Complete regional and community SWOT analysis
- Complete statewide and area-wide SWOT reports and cluster analysis
- Reach a consensus on statewide and regional visions

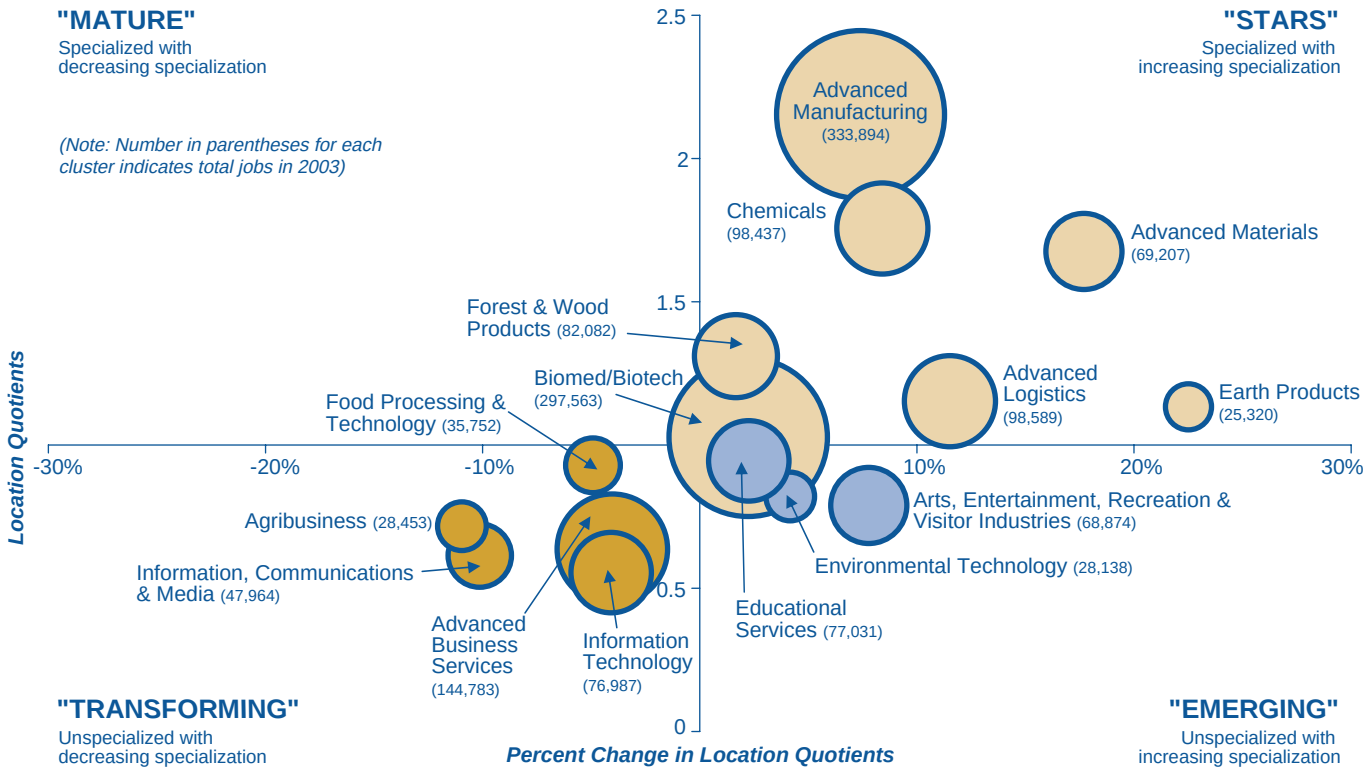
October 2004
- Propose, discuss and adopt benchmarks
- Meet with subcommittees about strategies for economic drivers
- Meet with regions about strategies for economic drivers

November 2004
- Develop first draft of the statewide strategic plan
- Get draft of the statewide strategic plan vetted (two weeks)
- Discuss plan for continued intrastate coordination and tracking of performance
- Final version of statewide strategic plan completed

December 2004
- Complete regional plans and obtain adoption by all partners in each area
- Release statewide strategic plan
- Release regional plans

Figure 1: Specialization and Change in Indiana's Industry Clusters, 1998 to 2003

Indiana has seven specialized industry clusters



Source: Indiana Economic Development Council and Purdue University Cooperative Extension Service, based on County Business Patterns and ES-202 data

whether specialization is increasing or decreasing.

Different policy approaches are appropriate for the clusters according to which category they fall into. For example, "emerging" clusters and industries present targets of opportunity for future development, as they are currently increasing in strength and importance in the local economy, even if they are not yet specialized. "Emerging" clusters and industries will have different needs than those that are "stars" or "mature." (Note: No "mature" industry clusters currently exist at the statewide level.)

Shift-Share Analysis: Location quotients do not give a full picture of how the composition of local employment differs from national patterns or explain how the performance of the local economy differs from that of the nation. Shift-share analysis, on the other hand, seeks to explain changes in an economy by decomposing actual changes that have occurred into three main sources:

- **National Share:** The influence of national growth or decline on an industry or cluster. The change in national employment is applied to the change in local employment in the industry or cluster.
- **Industry Mix:** The rate of growth in each industry at the national level. As with the national component, the change in employment by the industry overall is applied to the change in local employment in the industry. A large, positive number in the industry mix (also known as industry share) column tells us that a locality has the good fortune to possess a favorable share of industries that are growing at the national level.
- **Regional Shift:** The national share and the industry share reveal the changes that would have occurred in the local economy if it corresponded exactly to national and industrial structure and trends. When these two shares are subtracted from the actual shift in employment, a residual change remains. This change, the "regional

shift," reveals the effects on local employment of factors that are special to Indiana. The regional shift (also known as regional share) effect tells us that certain industries enjoy advantages (or disadvantages in the case of declines) from the regional economy and from factors such as labor force skills, access to transportation, excellent supply chains and efficient service delivery.

This relationship is summarized: Change of Employment in Industry – National Share – Industry Mix = Regional Shift.

In shift-share analysis, industries with the largest regional share effect on growth and a positive industry share are said to be the best targets for economic development efforts. The same holds true for industry clusters, but there are some additional considerations since the industries in a cluster often perform differently.

Advanced Manufacturing in Indiana

Between 1998 and 2003, Indiana lost 51,052 jobs in its advanced manufacturing cluster. This is not surprising since the manufacturing sector as a whole was hard-hit in the recent nationwide recession. Despite these losses, the advanced manufacturing cluster in Indiana increased in specialization compared to the nation. The reason for this is likely to be the even faster decrease in the cluster size at the national level. Indiana has a weak regional share advantage in advanced manufacturing.

Specialized Clusters

Of the seven industry clusters in Indiana that were specialized (according to 2003 data), the degree of specialization was highest in advanced manufacturing, chemicals and advanced materials. The remaining clusters were only weakly concentrated in the state, although the advanced logistics and earth products clusters showed a strong rate of growth in employment between 1998 and 2003. Advanced logistics was the only specialized cluster in Indiana showing a competitive advantage in both industry mix and regional shift shares of growth.

Emerging Clusters

Indiana's "emerging" clusters in 2003 included arts and entertainment, environmental technology and educational services. Of these three, arts, entertainment, recreation and visitor industries had the strongest rate of growth in specialization between 1998 and 2003, while environmental technology had the strongest rate of employment growth. Both the arts and the environmental technology clusters had positive rates in the share of industry mix and regional shift, indicating a competitive advantage in these two clusters.

Transforming Clusters

Five of the state's clusters fell into the "transforming" category, meaning that they suffered decreases in both employment and specialization when compared to the United States. Decreases occurred in three clusters that support other business and industry: advanced business services, information technology, and information, communications and media. As these clusters are important for the health and capacity of other state driver industries, it will be important for Indiana to examine the causes of their declines.

It is noteworthy that Indiana has a smaller proportion of its employment in professional and technical services and information services than do some neighboring states. These sectors are both key components of the advanced business services cluster, a cluster that is increasingly important to the local capacity to produce the technologically advanced and knowledge-based services to support the driver industries required in the new global economy.

Notes

1. The data presented are preliminary. Input from local experts and business leaders during the planning process will be essential in enhancing both data and analysis for regional use.
2. Location Quotient = (R1/R2)/(N1/N2), where:
   R1 = Regional Employment in Industry X
   R2 = Total Regional Employment
   N1 = National Employment in Industry X
   N2 = Total National Employment
   If LQ < 1, Region is less specialized in industry X and needs to import goods to satisfy local demand.
   If LQ = 1, Region produces just enough in industry X to satisfy local demand.
   If LQ > 1, Region is more specialized in industry X and exports goods to other regions.

—Christine Nolan, Area Educator, Purdue University Cooperative Extension Service and the Indiana Economic Development Council

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