Chapter 7
Economic Development Partnerships to Close the Gap

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Technology Everywhere
A Campus Agenda for Educating and Managing Workers in the Digital Age

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Over the past two decades, there has been unprecedented growth in the nation’s information technology (IT) industry. With the introduction of the Internet and e-commerce, the pace of this growth has dramatically increased. In 1998, William Valdez, senior policy adviser for the U.S. Office of Science and Technology, said that “the fuel for the new economy is new technology, and the fuel for the new technology is the workforce” (Help Wanted, 1998, p. 28).

Of the issues identified by the business community relative to its economic viability and market competitiveness, the most important factor considered was the current and future availability of a qualified, skilled, and educated workforce. Higher education gives the business community an opportunity to access and benefit from its advancements in research and knowledge.

Colleges and universities have emerged as important economic development incubators for intellectual capital. For example, the University System of Georgia (USG) has adopted this strategic position statement: “Intellectual capital is the business capital of the future.” The University System of Missouri clearly articulated the importance of linking higher education and economic development in its 1999 strategic plan: “Public officials will increasingly rely on universities, especially publicly supported institutions, as instruments of economic growth and development. . . . In the future,
universities will play an expanded role in enhancing economic productivity by increasing their participation in knowledge development, technology transfer, and economic policy development. The pressure on universities to foster economic development will require institutions to develop new partnerships that cut across organizations and agencies" (University of Missouri System, 1999).

Astute leaders have historically sought a strong ROI (return on investment). As we continue to migrate to a knowledge-based global economy, the new ROI may come to be viewed as a return on intellectual capital.

Partnering to Meet the Demand

The one constant feature that characterizes the information technology industry is rapid change. Hewlett-Packard, a Fortune 500 company, derives more than 75 percent of its revenues from products that are less than two years old (Farley Group, 2000). Expressed differently, Hewlett-Packard essentially replaces its entire product line every three years. What does this mean in terms of developing economic partnerships between higher education and industry?

The IT industry is concerned with obtaining knowledge regarding the current and future availability of a skilled, creative, and educated workforce; it is also concerned about the amount of time required to prepare and graduate such employees. In a period of economic expansion and low unemployment, finding available and trained workers becomes a primary business concern.

National data reveal that occupations in information technology are among the fastest growing and highest paying. A 1999 study conducted by A. T. Kearney found that in the high-technology field “56 percent of the 317,000 high-tech jobs in 2006 will require a four-year degree, while an additional 9 percent will require a two-year degree” (Kearney, 1999, p. 15).

Data such as these would lead one to conclude that there is a significant opportunity for economic development partnership
between higher education and the IT industry. Opportunity exists and should be explored if deemed appropriate, but some caution might be required. Analysis of supply and demand in the business sector does not necessarily correspond to supply and demand as defined by higher education.

In 1999, the USG commissioned a study to inventory the capabilities of its thirty-four institutions to educate students in the information technology field. In 2000, the USG had 206,000 degree-seeking students and 410,000 participants in continuing education programs. In 1999, 1,640 students graduated from system institutions with degrees in IT, ranging from the associate's to the doctorate.

If the nation’s fourth largest system of higher education is producing fewer than seventeen hundred graduates per academic year with an IT-related degree, how must higher education partner with that industry to produce a sufficient number of graduates to meet the projections identified by Kearney? The data show that when the IT industry considers economic development partnerships with higher education, it is not solely interested in the number of graduates with an IT-related education.

We are witnessing an emerging trend in the recruitment strategies of the IT industry. The Kearney study reached one conclusion that was unexpected, but significant. In a series of interviews, managers from IT-related businesses were asked to identify the skills that would be important to an employee's success on the job. Their collective response was overwhelming. They indicated they wanted adaptable, people-oriented employees with basic communication skills who had the ability to work well on a team.

Higher education produces graduates in information technology, the sciences, and engineering; it also produces graduates with effective communication skills, broad-based liberal arts backgrounds, a sense of strong cultural awareness, and the skills to work well in teams. As discussed in several previous chapters in this book, workers with skills and capabilities of this sort are also desirable to businesses today.
Attracting Digital-Age Industry to Your State

Among states that are concerned about workforce shortages and their ability to compete in a technology-based market, much attention and research is devoted to the phenomenon called “brain drain.” This refers to students who choose to leave their state of residence to attend college or take a job after college graduation. Retention of intellectual capital is a key factor in attracting IT businesses to your state. One of the most important factors that a business considers when it decides to expand or move to a new site location is the current and future availability of a qualified, skilled, and educated workforce.

Another factor in attracting such businesses is that employees within the IT industry have high standards regarding the kind of community that is acceptable as a place to live. Some examples of the quality-of-life issues that are considered by IT professionals are the availability, accessibility, and frequency of cultural activities; the amount of funding allocated for the arts; the implementation of community planning concepts such as smart growth; the cost and location of housing; and the availability of children’s day care (Goldberg, 1999). Employees do not wish to fight traffic and urban sprawl on the trip to work or the grocery store, or in taking their children to school.

Information technology companies often employ a site-selection consulting firm when contemplating a decision regarding relocation or expansion. If a state collects and maintains quantitative data regarding the educational and employment characteristics of its higher education students and alumni, the availability of such information enhances the opportunity for new business economic development partnerships. Prospective businesses are interested in information ranging from the average starting salary of a higher education graduate (by degree and program area) to the location of jobs taken by students after graduation (Ady, 1996).
Believing that intellectual capital is the business capital of the future, in 1994 the board of regents of the University System of Georgia endorsed the concept of a one-stop point of entry by the business community to its thirty-four colleges and universities. From that concept, the system’s economic development program, known as the Intellectual CApital Partnership Program (ICAPP®), was created (see www.icapp.org/about).

ICAPP: A Strategic Link

The central role of ICAPP is broker and catalyst to strategically link Georgia’s higher education system with the state’s economic development efforts. The number of organizations and entities with which ICAPP collaborates is extensive. Among these entities are the state, national, and international business communities; about 150 chambers of commerce and development authorities located throughout Georgia; the thirty-four institutions of the USG; the office of the governor; and the state departments of industry, trade and tourism, labor, revenue, and technical and adult education, as well as the office of planning and budget.

During its initial five years of existence, 1995–2000, ICAPP focused significantly on the information technology industry. Beginning in 1995, IT professionals were in high demand, yet low supply. It was decided that the USG could play an innovative role in attempting to attract and secure critical positions of this type.

The ICAPP program was conceived and implemented primarily to help the State of Georgia convince Total System Services, an information technology company located in Columbus, that it could successfully expand its operations in Georgia rather than relocating to another state. This corporation was and continues to be one of the state’s major employers.
As a result of the success of the ICAPP program in this economic development initiative, Total System Services created fifteen hundred new positions and made a capital investment of $100 million in the state over the subsequent three-year period. The Wall Street Journal concluded that one of the most significant economic development projects of 1996 was the retention and expansion of Total System Services within our state (Beall, 1997).

**ICAPP Advantage**

The centerpiece of this economic development program is ICAPP Advantage. ICAPP Advantage has four key facets: (1) accelerated academic programs, (2) the ability to customize academic degree programs to meet a company’s specific workforce needs, (3) expedited allocation of resources to system institutions to produce more college graduates in a selected discipline, and (4) the requirement that a participating company be involved with selecting students and guarantee employment to those who successfully complete the program.

ICAPP Advantage is unique in that it was the first instance of a major higher education system in the United States inviting an IT company to its campuses to assist with developing an educational curriculum for degree-seeking students. Among the companies that have participated in the ICAPP Advantage program are Total System Services, Equifax E-Banking Solutions, AFLAC, CheckFree, Nortel Networks, Internet Security Systems (ISS), ComputerLogic, Core Management, and United Parcel Service (UPS).

From 1996 to 2000, the ICAPP Advantage program received $11.7 million from state appropriations, matched by $5.8 million in corporate support. Some sixty-six hundred new jobs were created, led by the high-end IT jobs of twenty-four hundred Georgians completing their expedited education through ICAPP. In 1998, the Georgia State University Economic Forecasting Center concluded that the state was receiving an ROI greater than fifteen to one in the ICAPP Advantage program just from the resulting increased
salaries of its graduates, not even counting new capital investments (Ratajczak, 1998).

In Georgia, as elsewhere, economic development is important to businesses as it helps them succeed, and to government at all levels because it creates tax digest; it is particularly important to education because tax digest funds its programs. As the USG achieves success with these programs, it gains favor with these constituencies.

Benefits and Lessons Learned

The USG has derived many benefits from its special funding initiative through the ICAPP Advantage program. According to the final report of a consultant who performed an evaluation of client satisfaction, the program has raised the awareness among companies and academics of the gap between the classroom and industry. Continuing collaborative partnerships should permit a participating institution to remain current with emerging technologies and processes, as well as reduce the existing technology gap between the classroom and the work setting (White, 2001). ICAPP Advantage allows an institution to secure funding for faculty, equipment, and space in a much shorter time frame than in the past. This has enhanced the credibility and viability of this program among our system institutions.

By knitting companies and colleges closely together, the ICAPP Advantage program is building a successful foundation for future corporate investment. As a company’s competitive advantage is built through participation in this program, it is more responsive to requests for additional fiscal support. ICAPP Advantage has expedited the education of IT workers to meet a company’s specific workforce needs (White, 2001). As a result, it has drawn some students to colleges and universities who would not have attended otherwise. Some are beginning to call ICAPP “Georgia’s second-chance university.”

Institutions participating in the program have also learned valuable and important lessons that can benefit others who wish to emulate the model.
First, this type of program works best if the economic partnership is based on the recognition of each participant’s needs and capacities. Second, such a program is not always the appropriate solution to a company’s business requirements. For example, situations arise in which new technologies or approaches occur more quickly in the industry than institutions can integrate them into their curriculum.

Third, the program, as it is currently constituted, addresses only a company’s need for new workers; it does not address the need for retraining existing employees (White, 2001).

The ongoing challenge for ICAPP is to strategically allocate and leverage resources so that it can continue to pursue several initiatives well, without exceeding the limits of its capacity. Economic development trends and needs change quickly. This program has to continue reinventing itself and adapting to the ever-changing needs of its constituents if it is to remain successful and viable.

**Complementary Programs**

ICAPP Advantage develops knowledge workers, who are in high demand and low supply, but the need exists for businesses and graduates to communicate with each other regarding immediate and available employment opportunities. In 1999, GeorgiaHire, an online, cost-effective resource available at no charge for employers, became operational. This ICAPP Web site (www.GeorgiaHire.com) enables a business to search USG student and alumni résumés. Employers may use e-mail to directly dispatch information regarding a position opening to students. In its first twenty-eight months of operation, approximately ninety-two hundred employers searched more than eighty-six thousand résumés of students and alumni from Georgia’s public colleges and universities.

In 1999, an additional economic development initiative was introduced, called Yamacraw (see www.yamacraw.org). The objective of this program is to position Georgia as a world leader in designing high-bandwidth communications. The Yamacraw initiative is designed to grow high-technology clusters within the state that focus
on designing electronics for the communications and computer industries. Cooperating closely with business and industry, eight USG institutions are educating students, adding faculty, changing curricula, and conducting research in broadband communications, optical and wireless networks, high-speed access, and content processing.

What Others Are Doing

A number of initiatives have been established to promote partnership between higher education and the IT industry. As Aspray and Freeman point out in Chapter One, jobs within the IT field require varying skill sets and levels of knowledge. The education and training requirements that are needed by the IT industry are complex, requiring coordination among technical schools, two- and four-year higher education institutions, and graduate school programs.

A good example of a partnership that helps to meet the IT industry’s education and training needs is the Applied Information Management (AIM) Institute, established in 1992 as a nonprofit corporation in Omaha, Nebraska (see www.aiminstitute.org). AIM’s purpose is to ensure that graduates of academic programs possess the skills needed by the IT industry, that IT workers can remain up to date in their knowledge and skills, and that IT worker availability is improved (Skinner and Cartwright, 1998). AIM members include community colleges, public and private universities, local businesses and corporations, state government, and the local chamber of commerce.

The Commonwealth of Pennsylvania funds a similar project, Information Technology Workforce Development (ITWD), designed to enable higher education institutions in the state to attract, retain, and graduate information technology students with the knowledge and skills that match the needs of Pennsylvania employers. Project partners include eighty-seven businesses, fifty-four educational institutions, and nine government and nonprofit organizations. In addition, last year a new grant called I-Grad provided funding to Pennsylvania colleges and
universities that designed programs to target investment in IT disciplines, technology-influenced disciplines, and nontechnology disciplines that explore how technology is changing their field. (For information about these programs, see I2l.org/highered.html.) The USG surveyed a number of states regarding their respective economic development partnership initiatives. Included in the survey were Alabama, Arizona, California, Illinois, Kentucky, Maryland, Massachusetts, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, and South Carolina.

In interviews with representatives from these states, a number of questions were asked regarding the nature and the extent of partnership (Farley Group, 2000). Questions regarding the structure and organization of a state’s higher education system were raised. In addition, individuals were asked if there was a single designated office within their state that facilitated access by prospective businesses to its university, two-year college, and other technology resources. If there was no single designated state office, representatives were asked how the resources of their public and private higher education system would be coordinated to respond to interest on the part of an IT business in considering that state as a possible location site.

Most of the states surveyed lacked a single point of access to university resources for a business that was interested in establishing an IT economic development partnership. The Oklahoma University System recently created an Office of System Advancement and Economic Development, apparently to give businesses one-stop access to the resources of its colleges and universities.

According to our survey results, Maryland stands out for its comprehensive approach to business access to services delivered by community colleges and four-year schools. In 1998, the Maryland Applied Information Technology Institute (MAITI) built a partnership that included all four-year public institutions, along with private colleges and universities. In 2000, the MAITI partnership was extended to Maryland’s independent community colleges. Simultaneously, the state’s education department has developed a
career-oriented “clusters” program for grades nine through twelve. It is believed that MAITI’s postsecondary partnership will connect its efforts to this program within the next few years.

Ben Franklin Technology Partners is a state-funded economic development program in the Commonwealth of Pennsylvania dedicated to advancing the state’s knowledge-based economy. The program is explicitly funded for the purpose of supporting small to medium industries with a high-tech focus, and many of the partnerships are allied to universities in the state. Included in the program is the Pennsylvania Alliance of Higher Education for Research and Technology, which provides an on-line searchable database of faculty, unique equipment, and specialized facilities in colleges and universities that are available as resources for industry, research, and technology development.

The Massachusetts Institute of Technology (MIT) is a private institution with one of the best technology commercialization and entrepreneurial records in the world. Its Industrial Liaison Program is a membership, fee-based service that enables businesses to access a range of structured services. These services include sponsored research programs; one-on-one meetings with faculty to discuss emerging research projects of interest; access to MIT libraries, publications, and related data resources; corporate strategy and management assessments; and participation in courses, seminars, and conferences.

In reviewing the data from each of the states surveyed, we found certain themes and patterns. Economic development networking among institutions and organizations in higher education is becoming more common. IT economic development partnerships between institutions of higher education and corporations follow a range of strategies and approaches.

Most business outreach appears to be centered on technology transfer and the promotion of university research. Conversely, most training or education outreach on behalf of a specific business appears to begin with either a two-year institution or a state workforce development agency.
Although the IT economic development partnership strategies of some states promote workforce development, others favor technology commercialization. For those states promoting both, efforts are not always coordinated. Most of the IT economic development partnerships have been established at the institutional level, rather than statewide (Farley Group, 2000).

Trade publications such as Expansion Management (www.expansionmanagement.com) often rate and rank economic development programs of interest. Other resources of interest are Site Selection (www.siteselection.com) and the International Economic Development Council (www.iedconline.org), an organization recently formed through the merger of the Council for Urban Economic Development and the American Economic Development Council.

**Recommendations**

Colleges and universities have a unique opportunity to develop economic development partnerships with the information technology industry and thus reduce the gap between supply and demand for IT workers. There may be considerable agreement that there is a strong linkage between higher education and a community’s economic development, but making that connection occur is complex.

Economic development trends and needs change quickly. We recommend that a number of factors be considered when exploring an industry-education partnership:

- **Alliances.** Increasing attention is being focused on promoting industry alliance as an effective economic development tool. States and institutions of higher education should participate in regular business roundtables for industry clusters to identify the skill needs of the industry in that area; select common concerns and issues; and share costs for marketing, employee training, and acquisition of technology and equipment.
• One-stop access. The ability of a state to establish a one-stop point of access to the resources of its public and private institutions of higher education is attractive to a prospective business.

• Early interest. A person’s interest in a career in information technology should not begin while attending a college or university. States and institutions of higher education should work with high schools to develop curricula that are designed to prepare the student for a targeted career path. Linking K–12 with the economic development initiatives of a state is next on the horizon.

• Faculty. For an institution to produce graduates with the knowledge, skills, and creativity required by the IT industry, faculty must be knowledgeable and skilled in technological issues and applications, as well as have access to the type of equipment needed to use that knowledge.

• Curriculum. Curriculum redesign should be more responsive to the growing demand for skilled technicians.

• Public-private linkage. Opportunities to link the collective resources of public and private institutions of higher education should be considered to enhance statewide economic development, more so than regional economic development.

• Hiring versus retraining. From an IT company’s point of view, there is often little distinction between the need for new workers and retraining its existing workforce. The company wants to employ individuals to solve a constantly changing set of challenges and opportunities. Sometimes the appropriate solution is to add workers; sometimes it is to retrain and reassign existing employees. Companies are willing to pay for the cost of instruction, but they need such instruction to be delivered in ways that allow employees to continue to be productive on their present jobs, while they are trained for new jobs (White, 2001).

• E-learning. Serious consideration should be given to e-learning as a delivery mechanism for a partnership program. Web-based training is expected to increase more than 100 percent a year and possibly
reach $12 billion by 2002 (Boyett, Boyett, Henson, and Spirgi-Hebert, 2001). A number of successful “learning marketspace” partnerships have been established between higher education and industry with a Web site as their focal point (Duin, Baer, and Starke-Meyerring, 2001).

- **Long-term projects.** The most successful higher education and IT industry collaborations for expanding and improving the pool of IT workers tend to be “sustained, multiple-year programs, not short-term projects” (Skinner and Cartwright, 1998, p. 53).

- **Collaboration.** Public officials, higher education governing boards, and corporate leaders must work to remove barriers to collaboration by developing mutually beneficial business plans, rather than colleges and universities looking for grants “up-front” as a pre-condition of working together (Skinner and Cartwright, 1998).

Simply stated, considerable planning must go into an economic development partnership initiative. Issues of mapping out curriculum, securing instructors, and acquiring facilities and equipment must be considered, and lessons associated with economies of scale have to be kept in mind. The first students to complete the program are the most expensive on a per-student basis. However, each class that follows grows less expensive as faculty and staff are in place, the curriculum is established, and the requisite equipment and space are secured (White, 2001).

Economic development partnerships are extensive and diverse. Higher education is only beginning to realize the potential for partnership to bridge the gap between the supply and demand for information technology workers.

**References**


