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White Paper : Internet Economy - New Skills, New Partnerships

Maine Technical College System

Center for Career Development

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INTERNET ECONOMY

New Skills, New Partnerships

THE INTERNET IS CHANGING THE RULES of commerce at an unprecedented speed. Carlos Dominguez, vice president of service providers for Cisco Systems Inc., illustrated the pace. In 1994, the cover of Time magazine first noted the "strange new world of the Internet." Four years later, the same cover declared "kiss your mall goodbye" —

a stunning admission that what so recently had been "strange" was now re-making something as basic to the American economy and life as shopping.

Dominguez, lead presenter at the Center for Career Development's June 5, 2000 symposium, **The Internet Economy and Its Impact on the Workforce**, made a strong case that the Internet cannot be viewed as just a technological advance or even a tool. Instead, he said, the Internet is best understood as the instigator of an economic transformation, remaking the way people work and live, and obliterating prior business models in the process.

"Much like the Industrial Revolution changed everything — bringing people from farms to central cities, creating the superpowers that are here today, the have and have-nots and a whole new economy — if you look back at that and compare it to today it is very similar. In that manner, this whole Internet economy is going to do the same thing — establish who the winners and losers are for the next 20 or 30 years," Dominguez said.

One marker of this transformation is the way businesses invest in information technology (IT). In the early days of IT, when large mainframe computers were the norm, IT was viewed as a cost center, representing about 4 to 6 percent of corporate expenditures, Dominguez said. By the time the personal computer came along, IT was viewed more as a

productivity tool and spending jumped to about 24 percent of the corporate budget. Today, about 52 percent of corporate expenditures are in technology because technology is now viewed as a competitive advantage, Dominguez said.

Nations also are looking upon technology as a competitive advantage. India, for example, is spending aggressively on its technological infrastructure and developing software within a unified national public policy. Whatever one thinks of that approach philosophically, it indicates strong awareness that fundamental change is underway in the world's economy due to technology and that the stakes are high.

"The Internet changes everything — every company and country is in transition," Dominguez said, adding, "Transition is good. That's the time to make change. That's the time to have an impact. When you invest properly through a transition you can really make a difference."

"The real key to keep in mind is that all the rules we know

CARLOS DOMINGUEZ
Vice president of service providers for Cisco Systems Inc.

from a traditional business perspective have changed," Dominguez said. "You can't look at things through the same lens as before because the business models are different."

INTERNET ATTITUDES

The new Internet economy also brings with it new attitudes and issues. The so-called "digital divide" raises the concern that access to the Internet and related technology may widen the gap between rich and poor. There is strong support for equal access to computer skills and the Internet, Dominquez said.

Achieving that vision will not be as simple as connecting people, however, especially from an educational perspective, according to Dominguez. "After you get the connectivity, what do you do with it? Teacher training, making sure the web sites are there to support them, having the curriculum, empowering students to use the technology [all are important steps]," he said.

The idea of open competition also is more prominent in the Internet economy. Leadership in a particular market can be gained or lost far more quickly.

An orientation to partnership is stronger in the Internet economy, according to Dominguez. Increasing competition and business requirements can often be met more efficiently by sharing expertise and resources. Specifically, educating the workforce offers a tremendous opportunity for schools and colleges to partner with businesses, Dominguez said, because skill needs change so rapidly and corporations generally aren't equipped to deliver training.

Businesses and individuals sense the accelerating pace and constancy of change brought on by the Internet. The Internet has allowed companies to reach a mass base of consumers at an astounding rate in comparison to other technologies. Radio needed 38 years to reach a mass audience; personal computers did it in 16 years; and television in 13. The Internet, Dominguez said, did it in 4 years. The pace has created far-reaching opportunities and lifestyle changes. Internet advertising, which didn't exist in 1993, generated $12 billion in revenues in the first five months of 2000. At the same time, advertisers must contend with technologies that will enable consumers to view programming without advertising.

The Internet economy also can create new consumer expectations and lifestyle choices almost instantly. Dominguez noted the example of a day care center in San Jose, California, that installed a live video camera so parents could see their children at day care from their workplace desktop. After the first day care center made this innovation all the day care centers in the area responded. Live video on the net, scarcely known before, had become an expected standard for quality day care in a matter of weeks.

ELECTRONIC LEARNING

Electronic learning (e-learning) is an emerging initiative for Cisco Systems, Dominguez said. The company is using Internet-based coursework to quickly distribute and tailor knowledge that employees and prospective employees

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BUSINESS PRINCIPLES THAT APPLY IN THIS NEW ECONOMY

➤ The Internet can be used by business and government to **great competitive advantage**. Leaders are recognizing this and designing business products and processes to take advantage of its strengths.

➤ The Internet is making it easier to **do business worldwide** – allowing companies to use the people, materials and technology that support business in one location to support business in many locations. The customer base is no longer defined by geographic region.

➤ Businesses become even **more customer-driven**. Customers have more access to information and alternatives from a wide variety of competitors.

➤ The Internet empowers employees because it **decentralizes information**. Employees need the tools and the training to use information to serve customers and be more productive. Some companies have made the mistake of empowering customers with information that their own employees don't have or don't know how to access and use — for example, a customer may have product delivery schedule information that is not available to employees. Such situations were impossible before the Internet.

➤ **Change becomes part of the culture**, a fact companies must embrace to stay competitive. While a necessity of the new economy, it doesn't mean people will become more comfortable with it.

➤ **Internet pace is different** — Dominguez compared it to "dog years," where one year of chronological time is equivalent to seven years of activity in the Internet world.

need. It is a direction that more companies and educational institutions will adopt because electronic learning fits the more rapidly changing needs of commerce today, he said. In e-learning, the content a student studies is tailored to a specific and timely need. Certification — documentation that a student has acquired the needed knowledge and skill level — takes precedence in e-learning over traditional academic degrees.

The ability to customize learning to each individual's knowledge level is a strength of e-learning, Dominguez said. For example, a student can take a test online to determine their knowledge base before starting a course. The course content is then tailored to provide only the remaining knowledge the student needs to be certified in a particular skill. Because this testing and prescribing of content is done electronically it enables the course to be easily customized to individual students. Lesson plans, instruction and reference material, and assessments also can be developed electronically at every level to reach a large number of students.

Customization to individual need is a clear direction for the next generation of learning, Dominguez said. Another result is likely to be more certification of what each individual knows and can do, with less reliance on traditional academic degrees as measures of competency.

PARTNERING WITH EDUCATION

Business and education need each other to make e-learning work, Dominguez said. High schools and colleges don't have the time and resources to design, build and maintain the networks that support e-learning. Businesses need help in develop-

ing the curriculum, lesson plans, and assessment that support their objectives for training in new technology or processes.

Cisco's Training Academy Program is one example of how this partnering is taking place. It provides a 280-hour online learning program that teaches high school and college students to design, build, and maintain computer networks – and to move into the job market with a networking certification. Cisco has relied on educators to build the curricula and support instruction. The company provides the technology infrastructure to deliver instruction on the Web.

There are now 3,700 Cisco Training Academies operating in five languages in 71 countries worldwide as well as in the U.S., Dominguez said. The e-learning approach adapts to change and provides instant feedback. Different academy groups can compare their results across regions, states, or countries. It's also easy to diagnose when a topic is not being understood by students because comparative data is instantly available on the large pool of students worldwide showing how they are faring with specific assignments.

As regions compete for jobs in the new Internet economy, the strength of educational partnerships will be a critical determinant of success. Dominguez noted that there are currently 560,000 IT positions open in the U.S. When states look to lure high-tech growth companies, the pitch is often financial incentives, but a base of skilled workers would be a far more powerful attraction for most companies, he said.

"What I really need, as an employer, are knowledgeable workers and if I can't find them (in one place), I will go where they are," Dominguez said. ∎

The Cisco Systems Case:
Integrating the Internet into Business

Cisco has documented $850 million in savings from its own operating costs attributable to its use of Internet capabilities. The demands of growth spurred the company's creativity in using IT, Dominguez said. With business growing more than 140 percent annually, Cisco required leaps in efficiency to have its customer service and internal operations keep pace. As a result, processes relying on Internet-based IT are woven into just about every function. In addition to their e-commerce site, which does $44 million in sales each day, employee services and customer care are Internet-based.

Dominguez used Cisco System's employee travel and expense process as an example of what can be achieved in efficiency and quality. When Cisco had 6,000 employees, 24 people worked in back office jobs processing expense reports. Today, two employees handle the same function for an organization with 34,000 employees. More significantly, the service functions better and employee users are happier with the streamlined process. They file reports online — get immediate notice if they stepped outside a company guideline — and within 48 hours they are reimbursed by electronic funds transfer. By contrast, the prior system could take as long as 8 to 12 weeks to complete a reimbursement.

Purchase orders are another area where the process is not just easier for the user but enhanced in capability. All purchase orders are done electronically at Cisco with intelligence built into the system that validates the authority of the individual submitting the order to authorize the amount of the purchase. The system also can catalog orders across the company to get better pricing. The Internet capability of global networking applies just as well to other internal processes, such as training registration, benefits enrollment, internal IT help desk and internal directory information, among others.

Employer Need ▪▪▶ Training Agility

THE EXPERIENCE OF EnvisioNet is a signature of the new Internet economy. Three years ago, the Maine-based provider of Internet support services took a potential, California-based client on a tour of a soon-to-be call center. There were no desks, no computers, no phones and — most significantly — no employees. But there was a plan for acquiring all those needed elements and the agility to make it happen fast.

The prospective client — Prodigy — signed on and the young EnvisioNet invented a new category of customer service provider. Using the Maine Technical College System's Maine Quality Centers program, EnvisioNet entered a partnership with Kennebec Valley Technical College to train new customer service and technical support staff. Today, the five-year-old company has four call centers, a training center, and 1,500 employees in Maine, a number of whom have been trained through Maine Quality Centers projects.

The fact that a specific type of work — customer service for Internet business — could not exist at one moment and employ thousands of people a short time later is typical of the changes sweeping through the economy. Representatives from three Maine employers who participated in the Internet economy symposium see the new technology changing their competitive landscape, their opportunities, and their workforce skill needs — in short, just about every aspect of their businesses.

What does it all mean? David Fernald, founder and CEO of Terralink Software Systems, Inc., said the changes present incredible opportunities to businesses that learn about the Internet and effectively integrate it into their practices. "[The Internet means] thousands of new jobs in Maine — well over a 1,000 jobs to be built into the business plans of the companies represented in this room alone," he said.

In Maine, as elsewhere, the Internet economy is delivering change and demanding agility. From an individual employer perspective, the opportunities unfold more dynamically than in the past, said Kris Deveau, vice president of human resources for EnvisioNet. The traditional "career ladder" has been replaced with a career path. "The path has more side roads, switchbacks and dead-

ends" and it also rewards those who can learn, re-learn and take risks, she said.

The Internet economy often gives entry-level workers greater responsibility. Employees also may find that what they did in a prior job may be less important than their ability and willingness to learn something new. "We tell people: you start with a clean slate here. We don't really care what you used to do. We want you to be able to show us what you can do now," Deveau said.

The challenges of finding people with the proper ready-to-learn attitude are unfolding at a time of intense competitive pressure and a tight labor market. Barbara Ream, senior vice president and director of electronic services and development for Banknorth Group, said the most basic challenge is holding on to the market position a company has achieved. More strategically, the challenge is to "build more agility into the system," Ream said. That means having a more flexible technology infrastructure – capable of capturing the opportunities and customer expectations that come with the Internet economy. It also means having more agile processes to keep pace efficiently.

In banking, Ream said, it's not just new Internet competitors that are a concern but regulation changes that will increase competition among a wider range of financial services providers. The "clicks and bricks" financial service companies – those that can leverage a traditional branch network and call centers with Internet service — are doing the best, she said. But all these companies face a huge challenge in finding IT and systems talent with the specific skills needed to maintain and enhance their systems infrastructure. More traditional companies are competing for talent against the "allure" of dot.com companies that may offer financial incentives and new professional challenges.

The Internet economy can seem strange from a

PANELISTS: David Fernald of Terralink Software Systems, Inc.; Kris Deveau of EnvisioNet; and Barbara Ream of Banknorth Group

traditional business perspective, Fernald said. Companies with no earnings and business plans that are sketchy at best have sometimes enjoyed soaring valuations. It may be appropriate to be skeptical of those examples, Fernald said, but don't conclude that Internet-driven changes are overblown. The change is fundamental and smart companies will embrace it, he said. He urged symposium attendees to learn about new technology, invest in it and teach employees and partners how to use it effectively.

The employers who spoke each face different challenges in finding the workforce they need to compete. For example, EnvisioNet works in newly-invented fields of Internet customer service and technical support. Banknorth and Terralink need specific skills in systems and software development and, like EnvisioNet, must help their current workers adapt to the changes and capabilities of the Internet. Consensus was strong among these diverse companies that partnering with educational institutions was critical for

businesses to adapt their workforces.

There are examples of partnerships operating today. EnvisioNet worked with the Maine Technical College System's Maine Quality Centers program to launch its training initiative. The company also participates in the Technical Colleges' Maine Career Advantage program, an internship for high school students. At its Orono location, the company also is working with the University of Maine to create internships in technical support. More collaboration of this kind with both secondary and higher education can help Maine's workforce keep pace, panelists said.

Associations can play a key role in facilitating partnerships with education and government. Fernald, who is also vice president of the Maine Software Developers Association, said industry groups need to be active in specifying their needs for skills and knowledge. Schools, for their part, can be more active in asking people from industry to teach and provide input, he said. ∎

Skills That Work in the Internet Economy

SPECIFIC EMPLOYERS USUALLY can name the skills they need to thrive in the Internet economy. In customer service, it might be the ability to learn about new products constantly, find answers and project confidence. Those working on new information technology infrastructure often need specific network or programming skills. But the Internet economy's uncanny ability to rapidly create and recreate jobs that never existed before makes any effort to pin down its required "skills" or "knowledge" challenging. That's the nature of the phenomenon that is transforming business relationships and business models.

So how should companies train and prepare their employees for such a dynamic environment? Partnering with education and using educational programs that certify skills were ideas mentioned often by symposium participants. Businesses are not specialists in training so their best chance to keep pace is through partnerships with educators and other experts in skill development. Both businesses and educators also should benefit from the powerful new tools of electronic learning that are developing in tandem with the Internet economy. These tools — spreading and improving rapidly — will help educators and businesses deliver just-in-time learning that keeps pace with the changing economy.

The chart below provides an overview of the many attributes of work that are changing in the Internet economy. The list is from the 1999 report, *21st Century Skills for 21st Century Jobs,* by the U.S. Departments of Commerce, Education, and Labor, the National Institute of Literacy, and the Small Business Administration.

ELEMENT	OLD SYSTEM	NEW SYSTEM
Workplace Organization	Hierarchical Function/specialized Rigid	Flat Networks of multi/cross-functional teams Flexible
Job Design	Narrow Do one job Repetitive/simplified/standardized	Broad Do many jobs Multiple responsibilities
Employee Skills	Specialized	Multi/cross skilled
Workforce Management	Command/control systems	Self-management
Communications	Top down Need to know	Widely diffused Big picture
Decision-Making Responsibility	Chain of command	Decentralized
Direction	Standard/fixed operating procedures	Procedures under constant change
Worker Autonomy	Low	High
Employee Knowledge of Organization	Narrow	Broad

MAINE'S SUCCESS IN the Internet economy will rely on its current workers. The state's workforce is expected to grow at a rate of only about 0.4 percent during the next several years, according to Maine State Planning Office figures. This means the people who must fill new jobs created by the Internet economy will most often be current workers who pursue training to develop the skills they need to make the transition.

Some of that training will be on the job, but many employees will find themselves returning to school to learn new skills in networking or in the software programs that enable Internet utilization. Technical College degree programs reflect the change, teaching computer applications and workplace technologies related to the Internet that did

"A growing number of businesses, especially in the high-tech industries, are finding it difficult to get skilled workers at any price. There simply aren't enough people with these skills living in the state, and attracting them from other states and countries is extremely costly," states the Planning Office's 1999 year-end review.

This reality puts increased focus on re-training of workers as a basic ingredient for continued economic expansion. In Maine, labor force participation is already near record highs. Further, no demographic surge of younger workers is anticipated — nor is a substantial in-migration of people — to fill new jobs, so attention to upgrading the skills of current workers continually is critical.

There are many examples of training initiatives and partnerships with education that have delivered newly-

Maine's Internet Imperative: Train Current Workers

not exist only a short time ago. Initiatives such as the Regional Training Academies partnership with Cisco Systems also reflect the demand for training and the increased reach of training opportunities. (See next page for more on Regional Training Academies.)

The demands of the Internet economy have accelerated the already well-established need for greater technology skills in the workforce. The Technical College System's Quality Centers have helped more than 4,800 people qualify for jobs at companies such as Log-On America, ATX Forms, EnvisioNet and Hussey Seating. The Maine Career Advantage and Tech Prep programs assist 25,000 high school students each year in preparing for college and careers. And, the Community College Partnership — a collaborative effort of the Maine Technical College and University of Maine Systems — is expected to inspire more Mainers to pursue a college degree.

These initiatives and partnerships are unfolding now because of the increasing prominence of requirements for education and training. The Internet and other technological innovations are changing the skill profiles of jobs, not just once but many times during the course of a career. In Maine, as in other parts of the country, businesses must rely on current workers to keep pace with these demands.

emerging skills. Repeating these examples on an even larger scale will be a key to unlocking more economic opportunity for the state.

Among some recent models and successes are:

- EnvisioNet partnered with Kennebec Valley Technical College to create their program for training service providers for Internet businesses. Employment surged from 387 employees last fall to 1,500 today, assisted in part by training provided by KVTC.

- Several companies participating in the symposium use Maine Career Advantage, supporting the education of high school students in developing relevant skills and ready-to-work credentials.

- Associations like the Maine Software Developers Association are more active in engaging Maine schools and colleges about the skills their member companies need in the marketplace.

There was agreement among symposium panelists that more must be done — and faster — and there was consensus that partnerships among employers, educators and government give Maine the best chance for improving the quality and quantity of its knowledge worker base. ■

Maine Gets Boost With IT Training

FINDING TECHNOLOGY-SAVVY WORKERS in Maine will soon get easier, thanks to a partnership between Cisco Systems and two Maine Technical Colleges. Central Maine Technical College in Auburn (CMTC) and York County Technical College (YCTC) in Wells have both been selected by Cisco Systems Inc. as Regional Training Academies.

Cisco is the worldwide leader in networking for the Internet. Cisco's Training Academy Program, launched in 1997 to support the growing Internet economy by developing skilled IT workers, is now offered throughout the U.S. and in 71 countries worldwide. The Cisco Training Academy Program teaches students to design, build and maintain computer networks, using the "train the trainer" model to extend its reach.

As Cisco Regional Training Academies, CMTC and YCTC will train instructors at "Local Academies," usually high schools/secondary schools and other colleges, as well as nonprofits with educational programs. CMTC and YCTC will also offer the training program to the public, through their Business & Industry Training divisions.

Virtually every school, business and government entity has a need today for networking expertise…

Under the partnership, Cisco will provide the complete Web-based curriculum, instructor training, lab equipment, and technical support. The regional academies will develop Cisco labs, seek partnerships with local academies, and provide training and support to the local academies.

The training program consists of four training modules totaling 280 hours, with continual assessment. The training typically takes a year at a college, or two years at a high school. To receive certification as a Cisco Certified Networking Associate (CCNA), students must successfully complete the training and pass the Cisco certification exam.

Virtually every school, business and government entity has a need today for networking expertise, from providing support for e-commerce, online courses and other Web-based services, to servicing computer networks.

Cisco has headquarters in San Jose, California. It also has major operations in Research Triangle Park, North Carolina, and Chelmsford, Massachusetts; as well more than 225 sales and support offices in 75 countries. ■

FOR MORE INFORMATION

To learn more about the Maine Technical College System, visit **www.mtcs.net**

For more information on Cisco Systems e-learning initiatives, visit **www.cisco.com**
To find out more about Internet economy growth, visit **www.Internetindicators.com**

For more information on the companies participating in the Internet economy symposium panel, see:
Terralink Software Systems, Inc. at **www.terralink.com**
EnvisioNet at **www.envnet.com**
Banknorth Group, Inc. at **www.banknorth.com**

You can find the full report, "21st Century Skills for 21st Century Jobs" at
www.stw.ed.gov/Database/Subject2.cfm?RECNO=1401

To access "The Maine Economy: Year-End Review and Outlook 1999," go to
http://janus.state.me.us/spo/economic/economic.htm

WEB SITES

www.neweconomyindex.org
A project of the Progressive Policy Institute, this site describes the transformation of the economy and specific aspects such as worker education and training.

www.internetindicators.com
A great site to get a handle on the pace and direction of Internet economy expansion.

www.fortune.com/fortune/sections/onlinelearn/onlinelearn.htm
Fortune magazine report looks at how online training is changing the way education and training are delivered.

www.itaa.org/workforce/resources/articles.htm
The Information Technology Association of America publishes this page with links to school-to-work programs and recruitment and research information on the availability of skilled IT workers.

BOOKS

Building Wealth, Lester C. Thurow, HarperCollins Publishers, New York, 1999.
This is a broader view than just the Internet economy. Thurow looks at globalization and how the basic rules for creating wealth are changing for individuals, companies and nations.

Prosperity, Bob Davis and David Wessel, Times Books, New York, 1998.
Davis and Wessel make the case for new prosperity in America grounded in high-tech economy where workers are increasing their skills and raising their wages.

ARTICLES

"Getting Up To Speed," *Inside Technology Training*, Bob Oas, April 2000, pg. 46. On web at **www.ittrain.com**
Better broadband technologies are likely to give web-based training a big boost in the next few years. Article describes different broadband connection options.

"The Virtualizing of Education," *The Futurist*, Samuel L. Dunn, March-April 2000, pg. 34.
This article predicts that digital media and courseware will remake higher education, with half the nation's independent colleges closed, merged or significantly altered by 2025.

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transition. Transition is good.
That's the time to make change.
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C A R L O S   D O M I N G U E Z

The Center for Career Development is part of the
Maine Technical College System. The Center was
established in 1992 to design, implement and
administer Maine's ground-breaking, statewide
school-to-career program, Maine Career Advantage.
Since then, the Center's mandate has expanded to
include the Maine Quality Centers program,
international programs, and through the Research
& Curriculum Division, products and technical
support for other state and national customers.
*For additional information, contact Jean Mattimore,
Executive Director of the Center for Career Development.*

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CENTER FOR CAREER DEVELOPMENT

International Advisory Board of Governors

The Center for Career Development was established in
1992 as part of the Maine Technical College System.
The International Board serves as a resource to provide
overall guidance on the Center's work. Its members are:

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