

NYSHEI White Paper

The Strategic Value of Academic Libraries in Economic and Workforce Development

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THE NEW YORK STATE
Higher Education Initiative

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NYSHEI represents public and private academic and research libraries

Executive Summary

Charged by Governor Eliot Spitzer to make an analysis of the alignment of SUNY and CUNY research and degree programs with the economic development of New York and its diverse regions, the Commission chaired by Mr. Hunter Rawlings would be remiss to overlook the particular significance of academic libraries.

The opening of the Erie Canal sparked a commercial boom that spread throughout New York and opened up the entire Midwest region for economic development. It is critical to remember that the Erie Canal itself was not commerce; instead it was the infrastructure to support commerce, making it faster, more affordable and far reaching.

The infrastructure needed to spur an economic boom in the twenty-first century is one of information.

The most cost-effective way bring this economic potential to New York is to establish a virtual library that provides more research and development information tools to an ever-wider audience. The establishment of such an “information infrastructure” promises to deliver economic benefits on par with those realized by the creation of other essential infrastructure in past generations.

Academic libraries already possess remarkable research and development information resources, but need state support to fully develop their raw materials into a statewide information infrastructure.

New York needs an information infrastructure. The future of our economy hinges on information and innovation, yet New York is falling behind competing states.

Through the academic libraries of NYSHEI, and with the application of state funds, New York could quickly establish an information infrastructure that fuels a powerful wave of economic growth and job creation throughout the state. Without modern information resources opportunities for innovation and development will be lost.

A proposal for establishing this information infrastructure is described in the accompanying paper, the ARIA (Academic Research Information Access) Policy Proposal.

Background

The early twenty-first century has rightly been termed the “information age.” Scholarly information driven by new research is generated at the fastest pace in history; and it has become a major, if not the principal component of a knowledge-based economy.

A 1993 U.S. Commerce Department report notes that two-thirds of American workers are in information-related jobs, and the rest are in industries that are reliant on information.ⁱ The report states plainly that information fuels economic growth and creates jobs.

In late 1993, President Clinton formed the Information Infrastructure Task Force to explore the creation of the National Information Infrastructure (NII). The goal was simple enough, “unleash an information revolution that will change forever the way people live, work, and interact.”

In response, Congress authorized billions of dollars in expenditures for wireless technologies, computing initiatives, national labs and other means of improving the flow and availability of information.

While it fell short of many of its goals, the movers behind the NII write convincingly that “the quality of America’s information infrastructure will help determine whether companies invest here or overseas. States and regions increasingly recognize that development of their information infrastructure is key to creating jobs and attracting new businesses.”ⁱⁱ

As the core of an information infrastructure, access to academic research and development information resources is critical. Researchers confirm that access to high-end information resources leads to 87 percent more success in research activities.ⁱⁱⁱ This leads to more patents, more licenses, and thus, more jobs and economic strength.

In his 2007 State of the State address, Governor Spitzer said,

“let me now turn to... the revitalization of our economy in a rapidly changing world. We must reverse the decline of our Upstate economy; sustain the economic expansion Downstate; and develop new ways for communities which have been left behind to share in prosperity.

To meet these challenges, we must first adapt to the Innovation Economy. This is the knowledge-based economy of new businesses and new ideas that has become the driving force of job creation in the world today.”^{iv}

As we proceed in our consideration of the role of academic libraries in economic and workforce development we should keep in mind that the future of our economy depends on our states ability to access current and accurate information.

Access to Information in New York

To realize Governor Spitzer's vision of a New York Innovation Economy that fuels growth and reaches all corners of the state, information must be treated as a critical resource.

Where does information critical to the State economy reside? The great majority of this kind of information is available through university and college libraries which license access for their students and faculty. Limited information is discoverable through Google and other search engines that harvest information from the public web. However, information critical to research and applied technologies exists in databases and other electronic resources for which libraries must pay. These resources are not free; they are not on the public web.

The newly released Kearney Report understands the centrality of the information infrastructure. That report calls for a "unified statewide economic growth engine fueled by the development of a high-technology infrastructure" that includes the academic and research communities.^v This is frankly impossible without the academic libraries.

In recent years New York has made considerable investments in promoting research and innovation as a stimulus to the economy. At the fore have been forward-thinking Centers of Excellence, and the other hallmarks of the burgeoning academic-industry partnership that State policy makers have fostered.

Missing from past efforts has been broad statewide access to electronic resources essential to research and economic development. Data from the National Center for Education Statistics (NCES) demonstrates that despite its traditional ranking of first overall in access to print subscriptions, periodicals and serials, New York's academic information offering have precipitously declined. Today, New York ranks 20th among the states in offering electronic indexes and reference tools, and a lowly 35th in libraries offering full-text electronic journals and other content.^{vi}

Examining the licensing income of research universities, a hallmark of economic impact, New York University leads the nation with an impressive \$109 million in fiscal 2004. The combined SUNY system, as represented by the SUNY Research

Foundation, earned \$13 million in licensing income. The CUNY system was not mentioned in the rankings.^{vii}

According to the SUNY Research Foundation: sponsored program funding in 2007 is projected to only approach the level achieved in 2005; SUNY earned 33 patents in 2006, a decline for the fourth consecutive year; royalty income is at its lowest point in 3 years, and down about 40 percent from 2002.

A 2005 comparison of large research universities using a faculty-scholarly productivity index shows that some private institutions in New York are nationally competitive. New York University ranks 15th overall, with Cornell and Columbia ranked in the 20's, and Rensselaer Polytechnic Institute cracking the top fifty. Of the public institutions, only Stony Brook (19th) and the CUNY Graduate Center (36th) rate in the top fifty.^{viii}

It would seem clear from these snapshots that the R&D reputation of New York is being held-up by a small number of private institutions, while the public institutions struggle to gain their footing. Part of the problem is that New York has contributed only minimal funds to licensing of electronic databases and journals which will benefit faculty on every campus. Increasing this support would lift up the many faculty researchers who work in SUNY, CUNY and the smaller private universities and colleges.

Consider that the number one research university in the nation, Harvard University, is also the number one university in terms of library holdings and expenditures. NYU, Columbia and Cornell all rank in the top twenty research universities in terms of library holdings and expenditures. Comparatively, SUNY Buffalo ranks as the 63rd and SUNY Albany the 95th, among research universities in terms of library holdings and expenditures.^{ix}

Among the 123 national ARL (Academic Research Libraries) libraries, the three SUNY ARL libraries (Stony Brook, Buffalo and Albany) all rank in the bottom half, with Stony Brook and Albany teetering in the bottom fifth. Each is notably below the national median for ARL library expenditures.

The conclusion is clear. The value of a library is derived from its ability to provide access to information. The limited resources available to the State's public research universities are a serious detriment to their competitive abilities. Standing alone, without access to a statewide information infrastructure, our public research institutions will be less productive, less attractive to top faculty and students and less economically beneficial than they would otherwise be.

Regarding the New York private research institutions, it is safe to say that they currently have the ability to compete nationally and successfully. However, with other states moving rapidly to develop comprehensive statewide information infrastructure, it would seem that the competitive advantages of NYU, Columbia, Cornell and the others will be seriously undercut in the years ahead.

Other State Approaches to the Problem

It is noteworthy that the most substantive progress in establishing information infrastructure to support teaching, learning, research and innovation occurs in places other than New York.

For instance, in 1998, the New Jersey Council of College and University Library Deans, University Librarians and Directors, established VALE, the Virtual Academic Library Environment. The State legislature stepped up in 2005 with a \$6 million annual appropriation to upgrade VALE into the New Jersey Knowledge Initiative. Under its new heading, New Jersey colleges, universities and small businesses have free on-campus and remote access to high-end electronic research and development information resources. The New Jersey Knowledge Initiative, which received the 2006 Award for Best IT Collaboration among Organizations, from Government Technology magazine, was able to utilize the \$6 million state appropriation to leverage \$74.5 million worth of information resources.

With the cost of research dramatically dropping in New Jersey, three schools (New Jersey Institute of Technology, Rutgers University, Princeton University) all rank within the top fifteen of schools nationally for cost-effective production of inventions per \$1 million of research funding. It is worth noting again that the New Jersey Knowledge Initiative has been in existence only since 2005.

New Jersey is not alone. Indeed nearly half of all states have created some variety of a library-driven information infrastructure. Examples are included in Appendix A.

Limitations of Google as Information Infrastructure

Popular availability of information is greater than ever before. Google, Yahoo! and other popular electronic search engines are widely available, remarkably quick and efficient devices for research. However, these free-to-use search engines are designed to index and retrieve freely available information. Google is not designed for scholarly research. Google retrieves information from sources that are not authenticated and reflects commercial rather than intellectual interests.

Google, Yahoo!, and the others scan a massive number of sites on the web and rank them using a complex algorithm based on popularity, among other factors. Google itself has recognized that the universe is too large for a single search portal and thus has segmented the web into specialized searches for popular items like images and maps to increase the efficiency of searches.

Researchers, scholars, and entrepreneurs usually conduct more systematic and in-depth research for their companies or scholarships. These investigators are not interested in popular or general sites on a topic. Rather they are looking for scholarly studies, conference proceedings, research articles, books, reports and the like. This sort of information is not available for free on the internet.

Research and development information resources (anything from the American Journal on Roentgenology and Radium Therapy to the Transactions Of The American Institute Of Mining And Metallurgical Engineers) are available only from scholarly publishers, professional associations and research firms for a fee. The annual license for a single academic research title can range anywhere from \$1,000's to \$10,000's. The important point is that these research resources are essential for success in a fast-paced information age, and cost puts these resources far beyond the reach of the average business, person or entrepreneur.

High-level scholarly research is the piston that drives our American information economy. If New York State is to regain a competitive edge with other states, access to research resources, via an information infrastructure, must be available. Google, nor Google Scholar, provides that full-text access to research journals. New York must recognize that information is a commodity.

Comprehensive and Liberal Arts Four-Year Education

Senior Vice President at IBM, and then-newly elected Chair of the Business Council of New York State, Linda Sanford in 2005 called for an "innovation agenda." She specifically asked the State government to foster more partnerships among universities and businesses "to better leverage the vast intellectual capital residing in New York."^x

Ms. Sanford went on to say that innovation is focused "less on things, and more on ideas, collaboration and expertise." In her words, "New York should build the investment climate and the institutional infrastructure needed to ensure that its workforce, companies, and research institutions are focused on the challenge of innovation."

This focus is not limited to research universities. New York State's undergraduate institutions are a contributing partner in these efforts to develop a highly-skilled workforce and an innovation economy. In recent job postings, SUNY Geneseo demonstrates the new trend in its call for "first-rate faculty who are both excellent teachers and researchers," and expresses a particular interest in faculty candidates "whose research can involve undergraduate students... and can be sustained on campus or at libraries and laboratories in the surrounding area."

SUNY Oswego markets itself as a four-year institution that "prides itself" on "collaborative student-faculty research," among other things. In Mission Review II, Buffalo State College lists "institutional aspirations" that include "applied research." These three examples from the SUNY system are illustrative of a far-reaching trend among the comprehensive colleges.

The four-year comprehensive and liberal arts colleges provide varied educational opportunities that contribute directly to regional and state economic growth. Supporting that contribution, as always, is the library.

According to the National Center for Education Statistics, New York State is the number one destination for first-time undergraduate students, besting California, Pennsylvania and Massachusetts. If we are to continue to attract these students, the four-year colleges must have adequate educational and research resources, including competitive library collections. Already, a comparison of academic publishing from New York based faculty shows an 11 percent decline in scholarly output from 1997 to 2002.^{xi}

Today, an ever increasing portion of prospective students and their parents ask if the library is wireless and how many electronic databases are available. Likewise, new faculty, who are interested in continuing their research and publishing their work, inquire as to whether New York has the information infrastructure to support their careers. Plainly, information resources improve the ability of an institution to compete for sought-after faculty and selective students and raise the prestige and reputation of their home campuses.

Four-year colleges are engaging more and more undergraduates in research under the tutelage of faculty who are involved in long-term projects – some with local employers, some based on federal grants. The Commission for Independent Colleges and Universities, representing the States independent four-year colleges and universities, has set as one of its highest legislative priorities a State investment in science, technology, engineering and mathematics to ensure competitiveness. This emphasis is critical to the innovation economy and requires access to an information infrastructure.

Through internships with local companies, research firms and government agencies, students learn the requisite skills for professional work while contributing valuable research projects. Upon graduation, these young people tend to stay in the region thereby creating a pool of highly-skilled workers for regional business firms. These are our future business leaders, and they need access to leading research and development information tools – while enrolled and once they are full members of the workforce.

This partnership is essential, and naturally centers on the information resources available through the library, and extends well beyond individual, specialized institutions, and a satellite of training institutions. Certainly, this relationship will become ever more apparent as First Lady Silda Spitzer progresses in her “I Live New York” initiative.

Whether it is a massive initiative like bioinformatics in Buffalo, nanoscience in the Capital Region, photonics in Rochester, environmental applications in Central New York or targeted endeavors like ceramics in the Southern Tier, the impact of these innovation undertakings will be regional.

With four-year institutions the standard in higher education, these schools find themselves increasingly subject to new scrutiny, as interest in measuring the influence of higher education and economic impact continues to rise. The metrics may be embryonic, but from local business sector relationships to the national Bayh-Dole Act, the relationship is well matured.^{xiii}

An educated workforce, one populated with a large percentage of four-year degree winners, provides the backbone of a regional economy. This cohort will often fill the middle ranks of large corporations, become original entrepreneurs, and reside in the campus region upon graduation.

The four-year colleges are essential to a vibrant and growing innovation economy. Many of our future leaders in professional organizations and business firms come from these institutions. The exposure they gain to their professional field, including a proficiency in the research and information resources commonly used, will advance their interest and ability to develop new ideas. This mindset forms in the undergraduate years and carries through their professional careers. We need to provide the appropriate tools for this to occur, or, we risk losing our well-trained and able graduates to other states experiencing the economic expansion that attracts young people.

Community Colleges and Workforce Development

The importance of strong library resources extends beyond the impact on elite corporate and university research and the traditional 4-year education.

Workforce development continues to be a leading concern of employers as the tools of business, from manufacturing to the service industry, continue to become “high-tech.” As demographic trends anticipate a growth in the proportion of workers for whom English is not a first language, training and maintaining a productive workforce will become an ever more critical challenge.

This knowledge is behind Governor Spitzer’s involvement with the Innovation America Roundtable, Community Colleges as Engines of Innovation. It is also a motivator behind the Higher Education Information Technology Alliance call for substantively increased federal support for workforce development training.^{xiii}

At the June 2007 Rockefeller Institute Public Policy Forum on Community Colleges and the State Workforce Edward Reinfurt, Acting Executive Director of the New York State Foundation for Science, Technology and Innovation (previously NYSTAR), remarked on the need for his agency to improve relationships with community colleges. Doing so, he posited, would unleash the “cascade of knowledge” from the innovator to the manufacturer, thereby sparking a new era of economic growth in New York.

At the same event Dennis Golladay, Vice Chancellor for Community Colleges, State University of New York, spoke to the need for improved State support for community colleges, as these institutions were at the center of providing a capable workforce in the modern economy. Taking it one step further, Donald Katt, President of Ulster County Community College noted the collaborative relationship between community colleges and their local employers. It is this employer-specific training that ultimately keeps businesses functioning effectively, and it keeps them rooted in New York State.

Spurred by the regional leadership of high-level research, community colleges respond to the local economy like no other institution. While the flexibility afforded community college administrators in adapting to timely opportunities, such as the need for short-term certificate programs, might be improved, the academic library attached to the community college is the mainsail that administrators use to tack to the prevailing winds. The understanding of this relationship becomes clearer each day. The recent report from Jefferson Community College effectively argues that taxpayers see a “real money return of 13 percent on their annual investments” at the community college.^{xiv}

At the core of its mission, the community college library is a primary trainer in information literacy. This essential skill is much more than technical

competence. In the context of the increasingly vast stores of information available in the current day, information literacy is needed to find, evaluate, navigate, and select appropriate information and apply it efficiently. It is the defining skill of the information age.^{xv}

As community colleges have excelled in the provision of continuing education and providing access for non-traditional student populations, the library actually prepares working adults for the new world economy. Evidence of this is the dramatic enrollment trends of public community colleges.

Over the past five years enrollment at SUNY community colleges has increased by 10 percent and technical colleges have experienced a comparable rate of growth. By contrast, enrollment during the same period was 3 percent lower at university centers and nearly flat at comprehensive colleges. CUNY community colleges have witnessed an even more impressive 14 percent enrollment growth during the past five years. Today, fully half of all SUNY students are enrolled at community colleges.

The need for life-long learning has become somewhat institutionalized through partnerships between professional associations and local employers. So too has the need to maintain and upgrade community college resources become necessary.^{xvi}

Advancing information literacy implies that community college students must not only learn the fundamentals, but must be familiar with the actual and specific tools. Through internships, training and hands-on experience, the community college student is increasingly involved with information reliant economic sectors. A developed familiarity with the resources of the information age will only strengthen the value of community college graduates.

Much room for improvement remains. Libraries can and should partner with the various workforce development offices on their campuses. These workforce development offices would not only benefit by adopting some of the inter-campus collaborative models libraries have excelled at, but also fill a critical role in the information infrastructure.

The existence of a robust information infrastructure is diminished in importance if businesses and entrepreneurs are unaware of its resources, or ignorant in the means to utilize them. Working in concert, academic libraries can provide the information literacy training needed to the clients of workforce development offices. Under this model, the workforce development office provides the connection between the library resources and the off-campus business community.

Already, NYSHEI has begun discussions with the Continuing Education Association of New York. CEANY works at the promotion and support of public continuing higher education in New York State, primarily through the varied workforce development offices at SUNY and CUNY institutions.

Conclusion

Today we live in a digital world, a world that has quickly become wired, and more rapidly, wireless. While many social commentators look to the user-generated content of Web 2.0 applications and applaud it for the communications revolution it surely is, too few have paused to consider the genuine need for peer-reviewed scientific, technological and medical content to be accessible during the grand revolution.

The innovation economy, if it is to blossom in New York and take root not only in the urbanized centers but also the quiet corners of the southern tier or north country, requires academic libraries to provide the information infrastructure. Like power to run the machines of industry, or roads to speed the passage of commerce, information will cultivate the advances of innovation.

One of the primary deterrents to the economic growth in New York is the enormous cost of doing business in New York. This point has been noticed and noted ad nauseam by the Kearney Report, the Business Council of New York State, and the Empire Center for New York State Policy, most legislators and countless observers. A small State investment in information resources would significantly lower at least one cost factor, research, while simultaneously spreading the availability of that resource to reach greater audiences. In the universe of State initiatives, this one promises vast impact with minimal start-up cost and time.

NYSHEI represents an existing declaration of cooperation between public and private sectors and among research universities, comprehensive four-year colleges and community colleges. These allied academic libraries understand the importance of their role in fostering economic growth and developing a skilled workforce.

Academic libraries in other states have been successful in obtaining state government support for high-end research databases in scientific, technical, engineering, medical and financial fields of endeavor. Through State contracts, individual academic libraries have benefited from deep savings in the costs of

these databases, enabling them to invest those savings to extend their local database offerings to the growing and emerging fields of study so important to their regional economies.

Through the state-supported program for research and development information resources, college and university faculty are able to contribute advanced research to industry and government. With the State's support, academic libraries across the state can offer access to their communities. This widespread access fuels workforce development, economic expansion, new enterprises, new inventions, new industries and new jobs.

Like an irrigation system spreading life giving and life sustaining nourishment to the seeds hidden beneath the soil, so too can a robust information infrastructure spread the resources needed to give life to the state economy and sustain it into the high-tech era. The State of New York need only to recognize the potential in the academic library and make good use of it.

APPENDIX A

Competing States

The cost of research and development information resources has grown exponentially in recent years. The average cost for a scholarly periodical in the field of business and economics has increased 42 percent from 2002 to 2006. Biology, law, engineering and others have all increased by a comparably percentage. By 2006, the average price for one chemistry title is thousands of dollars per year, and academic libraries often maintain hundreds if not thousands of journal titles in the sciences alone.^{xvii}

Recognizing the limitations of budgets to excel in a go-it-alone environment, other states have taken imaginative steps toward creating their information infrastructure. While each is different, they all share collaborative efforts to leverage public and private resources for cost-effective statewide contracts. The result is an improved competitive stance, and the prospect of further achievements, and a growing economy.

Below is a short survey of initiatives in other states.

Alabama – The Alabama Virtual Library supports statewide access to electronic information for all of Alabama’s 4.5 million residents with \$3.5 million in annual state funds.

Alaska – The Alaska Statewide Learning Electronic Doorway (SLED) is a public service providing easy and equitable access to electronic information. SLED was developed by the Alaska State Library and University of Alaska Fairbanks.

Connecticut - iCONN provides all students, faculty and residents with online access to essential library and information resources. Administered by the Connecticut State Library in conjunction with the Department of Higher Education, iCONN delivers a core level of information resources including secured access to licensed databases to every citizen in Connecticut. In addition, specialized research information is available to college students and faculty.

Georgia – Georgia Library Learning Online (GaLiLeO) provides access to hundreds of electronic databases to 2000 academic and public institutions, while reducing costs and providing universal access to core information resources.

Illinois – The Consortium of Academic and Research Libraries of Illinois (CARLI) is dedicated to improving economies of scale in the provision of library services.

With the establishment of Find-It! CARLI has helped Illinois deliver library and state government resources to its citizens.

Louisiana - The Louisiana Library Network combines the resources of Louisiana's public and private academic libraries, along with a centralized support staff located on the LSU campus, to produce a dynamic library consortium with \$3.5 million annually.

Maine - MaineCat, the statewide catalog combines and links library collections across Maine. A single search scans more than 3 million unique titles and nearly 8 million items. As of mid-2006 more than 110 libraries, among them all the largest academic and public libraries. A built-in requesting and transaction management system allows patrons of libraries using a qualifying online system to make online interlibrary loan requests.

Michigan - The Michigan Electronic Library (MEL) is a statewide catalog to find and borrow books and other materials, including access to more than 40 subscription databases.

Minnesota - The Electronic Library of Minnesota (ELM) gives Minnesota residents online access to magazine, journal, and newspaper articles, eBooks, and information from other reference sources including 15 subscription research databases.

New Jersey - The New Jersey Knowledge Initiative provides entrepreneurs, small business owners, researchers and students with access to information resources through statewide electronic science, technological and medical databases. After \$12 million in state support over two years, the garden state budget situation has resulted in a decline to \$2 million for the coming year.

Ohio - OHIOLINK serves 85 public and private institutions of Ohio by offering over 45 million library items and 100 electronic research databases to state residents.

Pennsylvania - Access Pennsylvania is a coordinated effort to facilitate resource sharing among libraries throughout the Commonwealth via the World Wide Web. Nearly 3,000 libraries are members, providing access to 13.5 million titles and 61 million items to the keystone state.

South Carolina - The Partnership Among South Carolina Academic Libraries (PASCAL) is a strategic initiative launched by South Carolina's academic libraries in conjunction with their parent institutions, state agency partners and SC Independent Colleges & Universities (SCICU) to respond to the information-

access crisis facing South Carolina. It has become a series of programs built around state, institutional and grant funding

Virginia - The Virtual Library of Virginia (VIVA) and its 71 public and private academic member institutions have improved the cost of providing access to research and development information resources and estimates over \$150 million in cost savings to the state and a return on investment of \$5 for every \$1 spent.

Wyoming - The Wyoming Libraries' Database (WYLD Cat) serves all of the public and academic libraries of the state: all 23 county libraries, 43 branch libraries, four school districts, seven community colleges, a number of special libraries, and the State Library. It is managed and administered by the Wyoming State Library and shares resources through common access to the statewide database of over a million titles owned by Wyoming libraries.

This survey is not exhaustive, and regional systems and partial networks are commonplace in the library world. Additionally, a number of states, including Washington and Indiana are considering initiatives to create statewide electronic libraries.

With its superior collections and large number of researchers and experts in all fields, New York could establish a statewide information infrastructure without a rival in the nation.

About NYSHEI

The New York State Higher Education Initiative is an alliance of public and private academic and research libraries. Governed by an elected volunteer board comprised of representatives of distinct categories of institutions, NYSHEI promotes access and economic efficiency in the provision of scholarly resources.

NYSHEI has 135 member institutions including all of SUNY, CUNY, the New York State Library, New York Public Library, Columbia, Cornell, NYU, Syracuse and the majority of the State's private colleges and universities. NYSHEI holds advocacy as central to the pursuit of its objectives.

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Endnotes

- ⁱ Information Infrastructure Task Force, *National Information Infrastructure: Agenda for Action* (Washington D.C.: United States Commerce Department, 1993), 3.
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