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Intelligent Businesses: Innovative Users of Information Technology in the Hudson County Economy

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CYBERPROFILE - Intelligent Businesses: Innovative Users of
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1.0   INTRODUCTION

Most local communities have attempted to plan for the new digital economy by seeking ways to emulate the success of high-technology regions such as Silicon Valley. However, because Silicon Valley is the product of decades of evolution and hundreds of billions of dollars in capital investment, this strategy is unrealistic for most communities. Put simply, most communities cannot become the next Silicon Valley.

However, high-technology industries are not the only path to cyberdevelopment. This report approaches cyberdevelopment from another, more realistic strategy for local economic development. It examines the way in which information technologies (I.T.) are being used to transform existing firms and industries, to make them more competitive in the national and global economy. It argues that pursuing a strategy of industrial upgrading across all sectors of the local economy is far more sensible and productive over a 5 to 10 year time span than pursuing the dream of high-technology "silicon" industries.

This report begins to address the following questions:
- What is the state of the art of I.T. use nationally and globally in the industries that dominate the Hudson County economy?
- What is the state of I.T. utilization in Hudson County firms?
- What are the areas for improvement in Hudson County firms' I.T. practices?
- What can the County do to help firms and industries employ I.T. more effectively?

Specifically, it looks at the cutting-edge of I.T. use and the competitiveness of Hudson County firms in the following industries:
- Distribution and freight transportation
- Printing and publishing
- Securities and financial services
- Health care and health services
- Water transportation
- Motion picture and broadcast production
- Government and public administration

In each section, we attempt to highlight preliminary answers to the questions raised above.

2.0   DISTRIBUTION AND FREIGHT TRANSPORTATION

Distribution and freight transportation refer to a broad set of activities related to the transportation of freight by air, sea, and land (as well as inter-modal), as well as intermediate storage, warehousing, processing and breakdown/aggregation.

The State of the Art

Information technology improvements in shipping and transportation focus on two main areas – freight tracking and logistical coordination. In tracking, positioning equipment such as GPS receivers – currently in place on most long-haul planes, ships, and trucks – are increasingly supplanting barcodes and scanning checkpoints to provide real-time tracking information for freight shipments. This tracking information provides valuable information on the status and performance of industrial supply chains.

"Smart" shipping and distribution facilities such as the Port of Singapore, a containerized facility hemmed in by dense urban development, are utilizing extremely sophisticated logistics software. This software, which plans stacking schemes for containers to minimize freight movements, as well as directly controlling cranes, minimizes human operator error and improves efficiency and throughput.

Hudson County

Hudson County is currently an important freight transport corridor, and is projected to become even more important in the future. Yet the region's facilities are relatively low-tech, and rely upon union labor that has resisted past efforts to streamline operations. The North Jersey Transportation Planning Authority, Inc. and the New Jersey Institute of Technology are currently undertaking a massive study to utilize fallow brownfield sites in western Hudson County to expand the region's freight handling capacity. One result has been the proposed Portway truck route linking the Port of Newark and Elizabeth to the existing freight rail lines that terminate in the County. As a part of this effort, new Intelligent Transportation Systems architecture will be integrated into the project to create a state of the art transportation linkage.

Substantial shipping and distribution operations are sited in the Seacaucus Meadowlands, where the east coast's main North-South transport corridor comes closest to midtown Manhattan. Major facilities are operated by several distributing outsourcing companies including: Distribution Solutions, Inc., Interstate Intermodal, Kerr Norton Marine, Mega Shipping and Forwarding, Nippon Express USA, NYK Line, and Orient Consolidation Services.[1]

Areas for Improvement

The NJIT/NJTPA strategy is highly dependent upon expanding the physical capacity and land area dedicated to freight use and improving transportation linkages in the region. However, information technology-based management strategies, such as the kind that have greatly improved the ability of Singapore to handle increased traffic loads are not being actively

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[1] http://www.secaucus.org/web.html

pursued. In fact, the Phase I Executive Summary does not even contain the phrase "information technology".

Recommendations

1. Immediately push for information technology strategies to be incorporated into future freight infrastructure planning efforts, especially the NJTPA/NJIT studies.
2. Encourage investment in smart management systems for freight and distribution facilities, perhaps through tax breaks or pilot programs.

3.0   PRINTING AND PUBLISHING

The printing and publishing industry produces goods ranging from newspapers and magazines to books, labels, checks and even T-shirts. There are two dominant sectors; commercial printing (advertisements, catalogs, etc) which accounts for about one-third of all employment, and newspapers which employ a similar fraction. Publishing is one of the few industrial sectors in New Jersey that actually expanded in terms of employment during the 1990s.

The State of the Art

Lithography is the dominant method for printing, as it is ideally suited for computer composition and is economical in its use of color to achieve desired appearances. Environmental concerns have led publishers increasingly to use alcohol-free solutions, water-based inks, and recycled paper.

Print-on-demand is an emerging technology for flexible, customized manufacture of printed materials such as books and magazines. While several experiments for its deployment in large retail book chains have failed, it remains a viable option for very limited print runs by small commercial publishers. Combined with a large back catalog, print-on-demand means back titles will never go out of print. Print-on-demand also has the advantage of moving the point-of-manufacture closer to point of consumption, potential reducing distribution costs associated with book publishing. Print-on-demand, because it relies on digital data storage, naturally lends itself to remote operation via network such as the Internet.

Hudson County

The state of the printing and publishing industry in the county is starkly divided between the physical print production operations, which are rapidly shedding jobs, and the white-collar publishing functions which were one of the fastest growing sectors in the 1990s.

Hudson County is increasingly being drawn into the orbit of the Manhattan-centric book and magazine publishing industry. For example, John Wiley & Sons, a leading publisher of scientific, medical and technical books recently moved its headquarters from Manhattan to Hoboken's

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redeveloped waterfront, a net gain of over 800 jobs. The company received a business employment incentive grant from the New Jersey Economic Development Authority that will provide $7 million over the next 10 years. [2]

Areas for Improvement

The printing and publishing industry in Hudson County was traditionally driven by the exodus of printing firms from Lower Manhattan in search of lower land and labor costs. Thus, job functions tended to be lower-skilled, manual labor jobs. However, while the higher value-added functions of the publishing industry are increasingly drawn to Hudson County, this process is shaky. Much will depend upon the success of the John Wiley and Sons experiment.

Hudson County's main newspaper, the Jersey Journal, has an extremely limited circulation area. As a result the county is often overlooked in the statewide media. Some observers find this missing voice as a major factor in the county's lingering image problems. [3]

Recommendations
1. Explore further development of the technical/scientific publishing industry in Hoboken, through linkages between John Wiley & Sons and Stevens Institute of Technology
2. Introduce print-on-demand technology for local government records and documents as a demonstration of the technology.
3. Encourage the use of environmentally-friendly printing techniques

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[2] "John Wiley Leases Office in Hoboken" *New York Times¸* 8/10/2000.
[3] "Why Can't Hudson County Get Any Respect?" *New York Times.* 1/14/2001

4.0 SECURITIES AND FINANCIAL SERVICES

The securities and financial services industries are the engine of the global economy, responsible for allocating capital resources among competing opportunities for investment and development. They are also the engine of the New York metropolitan areas economy, employing hundreds of thousands directly and millions indirectly in industries that depend upon their huge wealth-generating capacity. They are also the chief financier of local government in the urban core, contributing as much as 20 percent of local tax revenues in New York City during boom periods.

The State of the Art

The financial services industry relies heavily upon telecommunications to move information and conduct transactions at a global scale. A number of technologies and technology practices support this function:

- C *Synchronous optical networks (SONET).* A technology pioneered by Bell Atlantic in the United States, SONET is a network architecture that uses meshed rings to ensure rapid recovery in the event of a network disruption. They are used extensively by the financial services industry because of their redundancy.
- C *Offsite disaster recovery facilities.* The September 11 terrorist attacks highlighted the extensive precautions taken by the financial services industry to maintain active trading operations even while Manhattan was under attack. These facilities used to be backups, but are now evolving into full-fledged twins of the Manhattan trading floors.
- C *Distributed computing.* The complexities of financial markets and the huge amount of data they produce lend themselves to analysis through distributed computing techniques, which are just beginning to be developed. This technique also leverages idle resources in other parts of the world while markets are closed at night.
- C *Voice over IP Telephony.* The largest VoIP networks in the world are used by financial companies. These networsk leverage these firm's existing investments in high capacity inter-urban IP bandwidth to cut down on international telephone service requirements from traditional carriers. Technology even exists for intercepting intracorporate mobile phone calls and routing them between employees over the corporate IP network.

Hudson County

Until the 1980s waterfront boom in Jersey City, Hudson County had a negligible presence in the financial sector. However, as an offshoot of the 50-year postwar trend for financial firms to move from lower Manhattan to Midtown, Hudson County began seeing a sizable migration of financial firms (often only single divisions) from lower Manhattan to the easily accessible Jersey City waterfront.

While initially it was back office functions, in recent years higher-level activities have also been sited in Jersey City. Firms that have moved operations to Jersey City include Chase Bank, Goldman Sacks, and Lehman Brothers.

Many of the Jersey City operations were backup trading sites. These backup locations became primary sites for workers displaced from Lower Manhattan after September 11. Hudson County's telecommunications and power infrastructure are world-class and sufficient for significant

further expansion of this sector. The trend in the securities industry is now to upgrade these backup sites to full-fledged "hot sites", signaling a sea change in the confidence of the sector in Hudson County as a location.

Areas for Improvement

Hudson County needs to address two key concerns in retaining and expanding the financial services industry:

- C   *Expanding the range of locations for finance*. Presently only the Jersey City waterfront, and to a lesser extent, the Hoboken waterfront are acceptable locations for financial services firms. Poorer building stock, inaccessibility, and image problems have prevented this activity from expanding beyond this small zone.
- C   *Retaining September 11 "Refugees"*. Many firms relocated higher-level operations to Jersey City following the Sept. 11 terrorist attacks. However, experts from NYU's Real Estate Institute have found that most of these firms have not committed to Jersey City on long-term leases.

Recommendations

- C   Explore ways to develop alternative financial services hubs such as Journal Square. Assess the needs of financial firms and ways to meet them.
- C   Actively recruit firms that located displaced workers in Jersey City to keep high-level operations in Hudson County. Key points might be the diversity of transportation, telecommunications and electric power infrastructures versus Manhattan.
- C   Continue to improve the county's technical infrastructure, while special emphasis on redundancy, reliability, and flexibility. Power and telecommunications should come first.

5.0   HEATH CARE AND HEALTH SERVICES

Health care and health services are a large, rapidly growing sector that encompasses everything from diagnostic and preventive medicine to cancer research and long-term care.

The State of the Art

Medicine and health care have been a whirlwind of innovation as advances in information technology are increasingly applied to the complexities of human biology and service delivery. However, five areas deserve special attention:

- C *Diagnostic imaging*. The array of technologies using radiation, ultrasound, and magnetic resonance for non-invasive scanning of human patients. These techniques rely heavily on sophisticated computers to process sensor data into useful imagery.
- C *Gene therapy*. Gene therapy is a novel approach to treating diseases based on modifying the expression of a person's genes toward a therapeutic goal. IT requires extensive knowledge of both human genetic mechanisms and the patient's own particular genetic makeup.
- C *Health care management.* The streamlining of the health care industry in the last two decades owes much to the use of IT systems for managing health care resources effectively.
- C *Bioterrorism and biological warfare preparedness.* Relatively unimportant before the anthrax attacks of Fall 2001, this area is now a hotbed of research and development. This includes upgrading, training, and mobilization of local bioterrorism response teams and medical assets.
- C *Telemedicine.* Using broadband data networks to remotely diagnose, treat, counsel, and even perform surgery using robotic instruments.

Hudson County

Hudson County has eight main hospitals (listed below) and dozens of outpatient clinics. While Jersey City Medical Center is a regional trauma center and is a teaching affiliate of Mount Sinai School of Medicine, the county lacks a major research institution, most of which are concentrated in the North Jersey suburbs and Manhattan. The medical center is currently building a new state of the art facility and trauma center on Grand Street in Jersey City adjacent to the proposed Liberty Harbor North development.

Of the five broad technology areas identified above, Hudson County health care institutions have not effectively leveraged these technology assets.

Hudson County has 8 hospitals:
Independent Hospitals
- C   Bayonne Medical Center (Bayonne)
- C   Christ Hospital (Jersey City)
- C   St. Mary Hospital (Hoboken)
- C   West Hudson Hospital (Kearny)

Liberty HealthCare System
- C   Greenville Hospital (Jersey City)
- C   Jersey City Medical Center (Jersey City)
- C   Meadowlands Hospital Medical Ctr. (Secaucus)

New York Presbyterian Healthcare System
- C   Palisades Medical Center (North Bergen, NJ)

Areas for Improvement

Health care has been one of the biggest sources of employment growth for New York City in the last decade. Hudson County can leverage its greater accessibility to the Jersey suburbs for highly specialized medical services that are largely captured by suburban hospitals and Manhattan research institutions. Applications of new technologies in all five areas above need to be upgraded and expanded to improve quality and consistency of health care service delivery.

In fact, the state of Hudson County's health care system is satired by the looming presence of the deserted Margaret Hague Maternity Hospital on the palisades of Jersey City.

Recommendations
- C   Utilize the present focus on bioterrorism as a means to engage the health care community in a countywide effort to assess and upgrade the health care infrastructure in a coordinated fashion.
- C   Explore ways to expand the teaching and research functions of county hospitals, and how to link these to local medical technology industry. This should be leveraged through the Liberty Heath Care System's strong links with the New York-based Mount Sinai Medical System.
- C   Explore ways to develop Hudson County into a model for bioterrorism preparedness.

6.0   WATER TRANSPORTATION

Water transportation refers to movement of passengers and freight over the county's internal and adjacent waterways by boat, ship, or air-cushion vehicle (i.e. hovercraft). Because freight shipping operations are limited in Hudson County and are covered more extensively in the section of this report on distribution and freight transportation, this section focuses on water passenger transport.

The State of the Art

Water passenger transport has been the focus of revitalized interest throughout the world's cities in the last decade, after a long period of decline. Once victim to vehicle river crossings (especially on the Hudson River crossings between New York and New Jersey), ferries are now seen as a comfortable, scenic, and reliable means of commuting. Furthermore, revitalized urban waterfronts mean pleasant port of disembarkation and jobs and housing close by to generate travel demand.

Short-haul intracoastal ferry technology has shifted from the large, slow-moving craft of the early 20th century such as the Staten Island Ferry (3000-6000 passengers) towards light, nimble, high-speed craft. (100-200 passengers) In the New York region this has resulted in a proliferation of niche routes, each servicing only a few thousand passengers daily, versus the 65,000 passengers who take the Staten Island Ferry's single route daily.

New environment-friendly ferry technologies continue to emerge. The San Francisco Bay Water Transit Authority will introduce ferries powered by hydrogen fuel cells in 2005. Fuel-cells combines hydrogen and oxygen to produce electricity, with only heat and pure water as by products.

Hudson County

Hudson County has been a world leader in revitalizing waterfronts through ferry service. In the New York region, the revitalization of ferry service was the outgrowth of real estate developer Arthur Imperatore's efforts to improve access to his waterfront development Port Imperial in Weehawken in 1986. It was the first private ferry service across the Hudson River since the late 1960s. Today, Hudson County is connected to Manhattan by no fewer than 7 major ferry routes. These ferries carry over 6 million passengers a year and an EPA study estimated they kept as many as 2,500 cars per day off Manhattan streets.

Recommendations
    C   Terminals need to be improved and better integrated into existing transit modes.
    C   Integrate ferry service with mobile alert systems. These could alert passengers to service changes, disruptions, and departure times.\
    C   Continue to develop ferries as a more distributed transportation system. Following the September 11 attacks, trans-Hudson ferries absorbed much of the commuter traffic from the destroyed PATH tubes, surging from 25,000 daily riders to over 60,000.

Ferries Around the World

	Daily (thousands)	Annual (millions)
New York City	165.0	28.0
To Staten Island	**65.0**	**19.9**
Private	100.0	8.1
Hong Kong	**143.7**	**52.5**
To Macau	13.7	**5.0**
To Mainland China	8.4	**3.1**
Kowloon to HK Island	**121.6**	44.4
Seattle	29.6	**10.8**
To Bainbridge Is	19.9	**7.3**
To Bremerton	8.8	**3.2**
To Vashon	0.9	**0.3**
San Francisco Bay	*10.4*	**3.8**

New York
    New York Metropolitan Transportation Council
Seattle
    Puget Sound Trends, No 14, 2000. [http://www.psrc.org/datapubs/pubs/trends/t4trend.pdf]. Puget
Hong Kong

San Francisco
    *ABCNews, June 22, 1999. "*Water Cure for Transport Ills High-Speed Catamarans Revolutionize
US Coast Guard (2001)
    Nationally, passenger ferry service growing at 12 percent annually.

7.0   MOTION PICTURE AND BROADCAST PRODUCTION

Motion picture and broadcast production refers to the filming, recording, editing, and final production of cinematic features, and television and radio programs. It encompasses a wide range of labor activities from makeup and costuming to scriptwriting and directing.

The State of the Art

The motion picture industry has changed dramatically since the days when the industry fled New York for the sunny and union-free climate of southern California. The lure of on-location shoots and advanced special effects have broadened the range of production locations. Los Angeles and New York City are the nation's two great hubs for motion picture and broadcast production. Television began in New York City, but quickly fled west in the postwar era. However, in the 1990s the Big Apple has reemerged as a place to produce shows, not just set them, and several large sound stages have been developed or renovated, including Chelsea Piers Studio and Kaufman-Astoira Studios in Queens.

Hudson County

Hudson County has not been a serious contender for motion picture and television production since *On the Waterfront* was shot on Hoboken's working piers in the early 1950s. More recently, however, the Bayonne Military Ocean Terminal has become an important East Coast site for television and film production. Universal Studios and HBO have leased several hundred thousand square feet of space at the facility in the last 12 months for shooting feature films and television programs. Recently, the Oscar-winning "A Beautiful Mind" was shot at MOTBY as well.[4]

Throughout the county there are only a few other nodes related to the broadcast industry. Secaucus is home to several large (yet self-contained) broadcast production facilities including MSNBC and UPN 9. Panasonic maintains an HDTV (digital) design plant in Secaucus.

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[4] "Bayonne's Terminal Catches Hollywood's Eye" *New York Times*. 2/25/2001

MSNBC's Secaucus studios.

Areas for Improvement

Hudson County offers proximity to Manhattan with far lower land and labor costs for broadcast production. Airport access through Newark International is far superior to JFK or LaGuardia, an important factor for the bicoastal motion picture and broadcasting industry. However, Hudson County lacks many of the cultural amenities that are highly valued by members of this industry. In order to develop this industry further, a clustering strategy that can concentrate enough cultural and entertainment resources in one location would be suggested.

Recommendations
- C Develop MOTBY into a media and entertainment production complex.
- C Market Hudson County as a broadcast production location, emphasizing its proximity to Manhattan and Newark International Airport
- C Identify land and buildings near existing broadcast facilities that could be redeveloped as broadcast production studios.

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8.0   GOVERNMENT AND PUBLIC ADMINISTRATION

Government and public administration includes employees of local, state, and federal government agencies including law enforcement, public transportation, and

The State of the Art

The use of I.T. in the public sector varies widely between smaller governments and larger ones, and particularly widely across geographic regions in the United States. In general, the federal government has led even the private sector in the use of I.T. to support its large and extensive bureaucracy. State governments have also widely implemented I.T. solutions to information management problems. Among local governments, it is primarily those in young, fast-growing cities of the South and West where new tools such as the World Wide Web have been most effectively used to engage citizens in more efficient, responsive government.

Hudson County

Hudson County is alarmingly far behind the curve in applying information technology in public administration. A simple survey of local government websites provides ample evidence. A review of internal I.T. assets and practices would likely uncover far more significant shortcomings that result in reduced efficiency, increased corruption, and missed opportunities for citizen involvement and interaction with government. In fact, most Hudson County municipalities do not have a website that we could locate.

- Hudson County Improvement Authority http://hcia.org/
- City of Jersey City http://www.cityofjerseycity.com/
    - Site is not working properly or is unfinished.
- Jersey City Police Department http://www.jerseycitypolice.homestead.com/JCPD.html
    - A poor, out-of-date site hosted on homestead.com (free provider).
- Jersey City Municipal Utilities Authority http://www.jcmua.com/
- Nice looking site, but information is out-of-date
- City of Hoboken http://www.ci.hoboken.nj.us/
    - The site was never completed
- City of Union City http://www.ci.union-city.nj.us/
    - Site unreachable.
- Town of Secaucus http://www.townofsecaucus.com/
    - Design dates to 1996, few useful services.

While the general state of government websites in Hudson County is poor, a handful of examples standout.
- Hudson Transportation Management Association http://hudsontma.org/
    - Effective, up-to-date, and informative.
- City of Bayonne http://www.bayonnenj.org/
    - By far the best government site in the county, offering lots of current information about government services and activities. Separate sites for residents and businesses.

Areas for Improvement

Governments are public agencies in Hudson County are far behind the cutting edge in applying information technology to streamline operations. In fact, Hudson County is very far behind.

Local government websites need to be implemented in most of Hudson County's communities. Where they already exist, they need to be dramatically upgraded and revised. Information on the sites should be kept as up-to-date as possible, and more services could be rendered directly over the Internet. These include licensing and permitting processes, payments and fines, etc.

Recommendations
- C   Conduct an assessment of IT use within Hudson County government agencies.
- C   Publish a "best government I.T. practices" document and circulate among local officials throughout the state.
- C   Initiate an "I.T. in public administration" training program for local and county officials at a local higher education institution (Stevens?)
- C   Coordinate online municipal activities throughout the county to eliminate costly redundancy and disseminate best practices.