

TARGET INDUSTRY PROFILE

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INFORMATION SERVICES

Definition

The *Information Services* industry contains four subsectors: data processing and information retrieval services; archival services for educational institutions; Internet service providers; and electronic data storage/server farms. It includes companies that provide:

- Services and products within the following fields:
 - prepackaged software in fields such as accounting, banking, communications systems, human resources, education and training, government, health services, manufacturing, office automation, technical/scientific and utility systems;
- Managerial and technical consulting and related services within the following fields:
 - data processing, computer systems analysis and software; and information retrieval services.

This target is divided into four recommended general industry subsectors for the Forward Sheridan targeting efforts, as shown in Table 1.

TABLE 1
INFORMATION SERVICES: SIC/NAICS CODES

Description	NAICS Code	SIC Code
Data processing and information retrieval services	514191, 514199	7374, 7375, 8999
Archival services for education institutions	511210, 541511, 541720	7371, 7372, 8732
Internet services providers	5182, 518111	7374, 7375, 7379
Electronic data storage/server farms	514210	7374-09

Subsector Overview

Data Processing and Information Retrieval Services (NAICS 51421, 514191, 514199). This subsector classification covers establishments primarily engaged in providing computer processing and data preparation services, and providing on-line retrieval services on a contract or fee basis.

- For data processing, the service may consist of complete processing and preparation of reports from data supplied by the customer or a specialized service such as data entry, or making data processing equipment available on an hourly or time-sharing basis
- For information retrieval services, the information generally involves a range of subjects and is taken from other primary sources.
- Establishments primarily engaged in performing activities such as credit reporting, direct-mail advertising, stock quotation services, etc., and that also create data bases, are classified according to their primary activity.
- Establishments primarily engaged in collecting databases from primary sources and reformatting or editing them for distribution through information-retrieval services are classified in Industry 51421.

Archival Services for Education Institutions (NAICS 511210, 541511, & 541720). This target activity includes firms that develop and publish software that serves the educational field. The relevant North American Industry Classification Systems (NAICS) codes for this target are: 541511 (custom computer programming services), 541720 (research and development in the social sciences and humanities, educational support services), and 511210 (software publishers).

Internet Service Providers (NAICS 5182 & 518111). Major products are Internet access, website design and hosting, and technical support services. Internet access accounts for about 60 percent of industry revenue. Internet access allows individuals or companies to connect to the Internet over ordinary and special telephone lines, cable, or wireless connections (including satellite). Website hosting allows users to have an address on the Internet by maintaining files on a specialized computer called a server, while Web design and related services involve designing and constructing websites, and consulting on various communications operations issues. Some Internet access companies provide content service, like chat rooms, message boards, and music downloads.

Electronic data storage/server farms (NAICS 514210). This refers to a collection of computer network servers. Most companies no longer purchase one large mainframe, but rather add additional servers as needed. The collection of servers that results from adding additional servers is ultimately referred to as a *server farm*, which is either an on-site or off-site building that will house the servers. Depending on the number of servers being stored, the size of the facility can range from a few thousand square feet to several thousand square feet.

Geographic Concentrations

The leading locations for information services are presented in Table 2, Table 3, and Table 4 below.

**TABLE 2
LOCATION OF INFORMATION SERVICES (NAICS 51) BY
STATE, EMPLOYMENT AND ESTABLISHMENTS (2005)**

Source: County Business Patterns

State	# of Establishments	% of all Information Services Establishments in U.S.	# of employees	% of all Information Services Employees in the U.S.
California	20,837	14.7%	509,258	15.0%
New York	11,119	7.9%	287,231	8.4%
Texas	9,486	6.7%	251,496	7.4%
Florida	8,963	6.3%	174,999	5.1%
Pennsylvania	5,315	3.8%	133,519	3.9%
Illinois	5,697	4.0%	133,241	3.9%
New Jersey	4,059	2.9%	122,177	3.6%
Georgia	4,198	3.0%	121,905	3.6%
Massachusetts	3,720	2.6%	118,772	3.5%
Virginia	4,099	2.9%	105,410	3.1%

TABLE 3
HIGHEST CONCENTRATION OF INFORMATION SERVICES (NAICS CODE 51) BY MSA (2002)

Source: County Business Patterns

MSA	# of Establishments	% of all Information Services Establishments in U.S.	# of Employees	% of all Information Services Employees in the U.S.
Los Angeles-Long Beach, CA	8,783	6.2%	174,757	5.1%
New York, NY	6,549	4.6%	193,145	5.7%
Chicago, IL	4,046	2.9%	110,250	3.2%
Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH	3,901	2.8%	121,418	3.6%
Washington, DC-MD-VA-WV	3,799	2.7%	N/A	N/A
Atlanta, GA	2,846	2.0%	114,088	3.4%
Dallas, TX	2,412	1.7%	90,505	2.7%
Philadelphia, PA-NJ	2,360	1.7%	75,000	2.2%
San Francisco, CA	1,868	1.3%	64,685	1.9%
Denver, CO	1,802	1.3%	69,679	2.0%

TABLE 4
HIGHEST PERCENT CHANGE IN ESTABLISHMENTS FOR INFORMATION SERVICES (NAICS CODE 51) BY MSA (1998-2002)

Source: County Business Patterns

MSA	Change in Number of Establishments (1998-2002)	% Change in Number of Establishments (1998-2002)	Change in Number of Employees (1998-2002)	% Change in Number of Employees (1998-2002)
Los Angeles-Long Beach, CA	996	12.8%	10,490	6.4%
New York, NY	751	13.0%	24,862	14.8%
Washington, DC-MD-VA-WV	646	20.5%	N/A	N/A
Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH	573	17.2%	8,339	7.4%
Atlanta, GA	571	25.1%	N/A	N/A
Philadelphia, PA-NJ	430	22.3%	N/A	N/A
Dallas, TX	418	21.0%	7,424	8.9%
Chicago, IL	412	11.3%	6,707	6.5%
Miami, FL	319	30.24%	3,640	16.9%
Tampa-St. Petersburg-Clearwater, FL	272	29.1%	4,187	14.4%

Trends

The Information Services sector continues to become more technologically savvy. Two groups in Information Services that contain the four subsectors within this target that are expected to continue this upward movement toward technological advancement are *InfoTech* and *E-Commerce/Internet Business*. The trends being observed in these two sectors of the industry are detailed below.

InfoTech: According to Plunkett Research, the worldwide market for information and communications technologies and services (“ICT”) was estimated at more than \$3 trillion in 2006, and will grow to about \$4 trillion in 2007. Growth in the InfoTech sector picked up considerably in 2004-2005, as the global economy rebounded from the recession of the early 2000s and organizations increased IT budgets in order to purchase new systems, software, and services. Growth slowed to about 6% in 2006, and most analysts are forecasting a 5% to 6% global growth rate in 2007. Early indications are that 2007 will see reasonable growth in revenues in the technology sector, both in the U.S. and abroad.

Today, broadband sources such as Fiber-to-the-premises, Wi-Fi, and cable modems provide high-speed access to information and media, creating an “always-on” environment for many users. The result is a widespread convergence of entertainment, telephony, and computerized information: data, voice and video, delivered to a rapidly evolving array of Internet appliances; PDAs; wireless devices (including cellular telephones); and desktop computers. This will fuel the next era of growth. Broadband access has been installed in enough U.S. households and businesses (about 60 million as 2006 ended) to create a true mass market, fueling demand for new Internet-delivered services, information, and entertainment. Over the next five to ten years, significant groundbreaking products will be introduced in areas such as high-density storage, artificial intelligence, optical switches, and networking technologies; and advances will be made in quantum computing.

E-Commerce & Internet Business: Plunkett Research reports significant, continuing growth was seen in the global Internet and E-Commerce sector in 2006. This growth will continue into 2007 and 2008, particularly in growing worldwide use of the Internet in general and growing access to the Internet via wireless devices and growing consumer purchases via websites.

During 2006, online advertising—including paid search inclusion at sites like *Google* and *Yahoo!*—has ballooned into a \$13+ billion business in the U.S. alone, threatening traditional advertising venues of all types. Projections for online advertising in America run as high as \$19 billion for 2007. Retailing online continues to be a booming business. Total online sales reached approximately \$104 billion in the U.S. during 2006, up from about \$89 billion in 2005. For 2007, growth in E-commerce sales in America will be 20% to 25%.

**TABLE 5
REPRESENTATIVE COMPANIES**

Company	Location	Total Employment
CNET Networks Inc.	San Francisco, CA	2,340
Costar Group, Inc.	Bethesda, MD	1,076
Jupitermedia Corp.	Darien, CT	639
Student Advantage LLC	Boston, MA	258
Automatic Data Processing Inc. (ADP)	Roseland, NJ	46,000
AOL LLC	Dulles, VA	19,000

**TABLE 5, CONTINUED
REPRESENTATIVE COMPANIES**

Company	Location	Total Employment
Earthlink Inc	Atlanta, GA	1,732
Verio Inc.	Englewood, CO	2,900
Digital River Inc.	Eden Prairie, MN	948
Easylink Services Corp.	Piscataway, NJ	396
J2 Global Communications Inc.	Hollywood, CA	288
Teradata	Dayton, OH	4,200
Vignette Corp.	Austin, TX	738
Administaff Inc.	Kingwood, TX	1,500
Ceridian Corp.	Minneapolis, MN	9,433
Gevity HR Inc.	Bradenton, FL	1,050
Paychex Inc.	Rochester, NY	10,900

Rationale for Selection

- Heavily populated by small businesses with low headcount demands.
- Will create professional positions offering above-average wages.
- Strong potential to partner with Sheridan College to create/modify training programs to support these operations.
- Satisfactory local availability of office and administrative-support occupations.
- Not-employed and underemployed residents are well educated, with potential for training/retraining to meet the needs of this sector.
- WDG extrapolations of household survey data indicate over 700 not-employed residents with skills in business and financial occupations. Additionally, about 470 not-employed residents and over 900 employed workers would like training in computer and mathematical occupations.
- Expanding industry sectors at national, state, and local levels supporting the target opportunity are: educational services; information; and professional, scientific, and technical services.

PROFESSIONAL, SCIENTIFIC, MANAGEMENT, AND TECHNICAL SERVICES

Definition

This target consists of professional and management services, including computer programming, data processing, and other computer-related services; engineering; product or systems design and development; research; laboratory testing; management; and related services including consulting. These targeted activities consist of firms that serve a regional, national, and global customer and client base. The table below lists the industries to be targeted, their NAICS codes, and their SIC codes.

TABLE 6
PROFESSIONAL, SCIENTIFIC, MANAGEMENT, AND TECHNICAL SERVICES: SIC/NAICS CODES

Description	NAICS Code	SIC Code
Engineering, applications research and testing laboratories	541330, 541512, 541420	8711, 7373, 7389
Engineering and environmental services – including services supporting mineral extraction, emissions testing, water treatment related to coal bed methane extraction	541330, 541370, 541360, 541620	8711, 8713, 8748
Architectural services	541310	8712
Software development, computer network support services	541512, 541519	7373, 7379
Accounting and bookkeeping services	541219	8721
Agricultural and horticultural support services	115, 11511, 115112, 115113, 115114, 115115, 115116	0711, 0721, 0722, 0723, 0761, 0762
Graphic and other design services	541430, 541490	7336, 7389
Regional medical services center, including physician-owned, such as treatment, rehab, and diagnostic facilities	621420, 621511, 621512	8093, 8071
Office, industrial, medical and commercial technical support and maintenance services	561110, 811212, 811213, 811310	8741, 7378, 7629, 7622, 7699
Real estate management	531210, 531311, 531312	6531
Legal services	5411	8111, 7389
Sales offices	See description below	
Management consulting services	54161	8742
Marketing Research and Public Opinion Polling	541910	8732

Subsector Overview

Engineering, application research, and testing laboratories (NAICS 541330, 541512, 541420). This subsector includes the following:

- Establishments primarily engaged in providing professional engineering services.
- Establishments that primarily provide and supervise their own engineering staff on temporary contract to other firms are included here.
- Establishments primarily engaged in developing or modifying computer software and packaging or bundling the software with hardware (computers and peripheral equipment) to create an integrated system for specific applications. These establishments are involved in all phases of systems development, from design through installation.
- Establishments primarily engaged in furnishing business services, not elsewhere classified.

Engineering and environmental services (NAICS 541330, 541370, 541360, 541620). This subsector includes the following:

- Establishments primarily engaged in providing professional engineering services.
- Establishments that primarily provide and supervise their own engineering staff on temporary contract to other firms are included here.
- Establishments primarily engaged in providing professional land, water, and aerial surveying services.
- Establishments primarily engaged in furnishing business consulting services, not elsewhere classified, on a contract or fee basis. Included are agricultural, economic, educational, and systems engineering consultants as well as city planners and testing services (educational or personnel).

Architectural services (NAICS 541310). This subsector includes the following:

- Establishments primarily engaged in providing professional architectural services. Landscape architectural services are classified in Industry 54169 and 54132.
- Establishments primarily engaged in providing graphic arts and related design services are classified in Industry 54143, and those providing drafting services are classified in Industry 54134.

Software development, computer network support services (NAICS 541512, 541519). This subsector includes the following:

- Establishments primarily engaged in developing or modifying computer software and packaging or bundling the software with hardware (computers and peripheral equipment) to create an integrated system for specific application. These establishments are involved in all phases of systems development, from design through installation.
- Establishments primarily engaged in providing computer-related services, not elsewhere classified, such as computer consulting, disk and diskette conversion, and tape recertification.

Accounting and bookkeeping services (NAICS 541219). This subsector includes the following:

- Establishments primarily engaged in furnishing accounting, bookkeeping, and related auditing services. These establishments may use data processing and tabulating techniques as part of providing their services. However, establishments primarily engaged in providing data processing and tabulating services are classified in Industry 54121.
- Establishments providing income tax return preparation services, without also furnishing accounting, auditing, or bookkeeping services, are classified in Industry 541213.

Agricultural and horticultural support services (NAICS 115, 11511, 115112, 115113, 115114, 115115, 115116). Industries in the support activities for agriculture and forestry subsector provide support services that are an essential part of agricultural and forestry production. These support activities may be performed by the agriculture or forestry producing establishment or conducted independently as an alternative source of inputs required for the production process for a given crop, animal, or forest industry. This subsector includes the following:

- Establishments that primarily perform these activities independent of the agriculture or forestry producing establishment.
- Establishments primarily engaged in supplying labor for agricultural production or harvesting.
- Establishments primarily engaged in providing farm management services on a contract or fee basis. These establishments always provide management, and may arrange or contract for the partial or the complete operations of the farm or ranch establishment(s) it manages.

Graphic and other design services (NAICS 541430, 541490). This subsector includes the following:

- Establishments primarily engaged in providing commercial art or graphic design services for advertising agencies, publishers, and other business and industrial users. Producers of still and slide films are classified here.
- Establishments primarily engaged in art, except commercial and medical art, are classified in Industry 71151; those engaged in medical art are classified in Industry 54143; and those providing drafting services are classified in Industry 54134.

Regional medical services centers (NAICS 621420, 621511, 621512). This subsector includes the following:

- Establishments primarily engaged in outpatient care of a specialized nature, such as alcohol and drug treatment, birth control/family planning, etc., with permanent facilities and with medical staff to provide diagnosis, treatment, or both for patients who are ambulatory but do not require inpatient care.
- Establishments primarily engaged in providing professional analytic or diagnostic services to the medical profession or to the patient as prescribed by a physician. Laboratories engaged in the manufacture of medical or pharmaceutical products are classified in Manufacturing. Laboratories engaged in commercial medical research are classified in Industry 54171, and those engaged in noncommercial medical research are classified in Industry 54172.

Office, industrial, medical, and commercial technical support and maintenance services (NAICS 561110, 811212, 811213, 811310).

This subsector includes the following:

- Establishments primarily engaged in furnishing general or specialized management services on a day-to-day basis and on a contract or fee basis. Establishments classified here do not provide operating staff. Management and operation of a business, where operating staff as well as management is provided, is classified according to the activity of the establishment managed. Construction management services are classified here.
- Establishments primarily engaged in the maintenance and repair of computers and computer peripheral equipment.
- Establishments primarily engaged in servicing and repairing electrical and electronic equipment not elsewhere classified, such as electrical household appliances (washing machines, vacuum cleaners, irons, toasters, etc.) and electrical and electronic industrial equipment.
- Establishments primarily engaged in repairing radios, televisions, phonographs, stereo equipment, and recording equipment. Also included are establishments engaged in installing and repairing television, amateur, and citizens' band antennas, and those engaged in installing and servicing similar equipment in homes, offices, boats, automobiles, or other vehicles.
- Establishments primarily engaged in specialized repair services not elsewhere classified, such as farm machinery and equipment repair; lawnmower, saw, knife, and tool sharpening and repair; bicycle repair; lock and gun repair; musical instrument repair; and the repair of typewriters. Repair services that involve primarily electrical or electronic equipment or components are classified in Industry 811211 and 811219; however, primarily mechanical repair of electrically powered equipment, such as electric sewing machine repair, is included here.

Real estate management (NAICS 531210, 531311, 531312). This subsector includes establishments primarily engaged in renting, buying, selling, managing, and appraising real estate for others.

Legal services (NAICS 5411). This group includes establishments which are headed by members of the bar and are engaged in offering legal advice or legal services. Nonprofit legal services (including legal aid societies) are classified here. Associations of lawyers formed solely for the sharing of expenses (including payroll) and not for the purpose of jointly practicing their profession are also included.

Sales Offices (NAICS – Dependent on company industry). Sales offices house a company's regional or central sales operations. Customer service personnel may also be included. Many companies have multiple sales and customer service offices at multiple locations across the country. These offices generally serve multi-state regions. These offices typically employ a relatively small number of salespeople and customer service representatives (usually less than 50) and their support staff. They are typically staffed by professional salespersons whose job requirements necessitate frequent travel within the region to maintain contact with customers and prospective customers.

Management consulting services (NAICS 54161). This industry comprises establishments primarily engaged in providing advice and assistance to businesses and other organizations on management issues, such as strategic and organizational planning; financial planning and budgeting; marketing objectives and policies; human resource policies, practices, and planning; production scheduling; and control planning. This subsector includes the following:

- Establishments primarily engaged in providing operating advice and assistance to businesses and other organizations on administrative management issues, such as financial planning and budgeting, equity and asset management, records management, office planning, strategic and organizational planning, site selection, new business startup, and business process improvement. This industry also includes establishments of general management consultants that provide a full range of administrative; human resource; marketing; process, physical distribution, and logistics; or other management consulting services to clients.
- Establishments primarily engaged in providing advice and assistance to businesses and other organizations in one or more of the following areas:
 - Human resource and personnel policies, practices, and procedures
 - Employee benefits planning, communication, and administration
 - Compensation systems planning
 - Wage and salary administration
 - Executive search and recruitment
- Establishments primarily engaged in providing operating advice and assistance to businesses and other organizations on marketing issues, such as developing and pricing, licensing, and franchise planning, and marketing planning and strategy.
- Establishments primarily engaged in providing operating advice and assistance to businesses and other organizations in areas, such as:
 - Manufacturing operations improvement
 - Productivity improvement
 - Production planning and control
 - Quality assurance and quality control
 - Inventory management
 - Distribution networks
 - Warehouse use, operations, and utilization
 - Transportation and shipment of goods and materials
 - Materials management and handling
- Establishments primarily engaged in providing management consulting services (except administrative and general management consulting; human resources consulting; marketing consulting; or process, physical distribution, and logistics consulting). Establishments providing telecommunications or utilities management consulting services are included in this industry.

Marketing Research and Public Opinion Polling (NAICS 541910). This industry comprises establishments primarily engaged in systematically gathering, recording, tabulating, and presenting marketing and public opinion data.

- Establishments primarily engaged in providing research and analysis in economics, sociology, and related fields are classified in Industry 541720, Research and Development in the Social Sciences and Humanities.
- Establishments primarily engaged in providing advice and counsel on marketing strategies are classified in Industry 541613, Marketing Consulting Services.

Geographic Concentrations

The leading locations for professional, scientific, and technical services are presented in Table 7, Table 8, and Table 9 below.

TABLE 7
LOCATION OF PROFESSIONAL, SCIENTIFIC, AND TECHNICAL SERVICES (NAICS 54)
BY STATE, EMPLOYMENT AND ESTABLISHMENTS (2005)

Source: County Business Patterns

State	# of Establishments	% of Prof, Sci, Tech Svcs Establishments in the U.S.	# of Employees	% of Prof, Sci, Tech Svcs Employees in the U.S.
California	108,411	13.1%	1,192,324	15.5%
New York	58,105	7.0%	578,103	7.5%
Texas	55,618	6.7%	519,075	6.8%
Florida	65,901	8.0%	422,953	5.5%
Virginia	25,836	3.1%	355,406	4.6%
Illinois	38,748	4.2%	350,082	4.6%
New Jersey	31,669	3.8%	304,803	4.0%
Pennsylvania	29,777	3.6%	304,291	4.0%
Michigan	22,701	2.7%	291,171	3.8%
Ohio	25,597	3.1%	244,577	3.2%

TABLE 8
HIGHEST CONCENTRATION OF PROF, SCIENTIFIC AND TECHNICAL SERVICES
(NAICS CODE 54) BY MSA (2002)

Source: County Business Patterns

MSA	# of Establishments	% of All Prof, Sci, Tech Svcs Establishments in U.S.	# of Employees	% of All Prof, Sci, Tech Svcs Employees in U.S.
New York, NY	30,019	3.6%	331,266	4.3%
Chicago, IL	29,523	3.6%	287,282	3.7%
Los Angeles-Long Beach, CA	27,275	3.3%	419,161	5.5%
Washington, DC-MD-VA-WV	25,079	3.0%	385,617	5.0%
Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH	22,072	2.7%	240,867	3.1%
Atlanta, GA	17,271	2.1%	163,736	2.1%
Philadelphia, PA-NJ	15,867	1.9%	166,558	2.2%
Houston, TX	13,575	1.6%	146,623	1.9%
Dallas, TX	12,430	1.5%	138,500	1.8%
Minneapolis-St. Paul, MN-WI	12,344	1.5%	98,351	1.3%

TABLE 9
HIGHEST PERCENT CHANGE IN ESTABLISHMENTS FOR PROF, SCIENTIFIC AND TECHNICAL SERVICES
(NAICS CODE 54) BY MSA (1998-2002)

Source: County Business Patterns

MSA	Change in Number of Establishments (1998-2002)	% Change in Number of Establishments (1998-2002)	Change in Number of Employees (1998-2002)	% Change in Number of Employees (1998-2002)
Los Angeles-Long Beach, CA	3,425	14.4%	35,790	9.3%
Washington, DC-MD-VA-WV	3,386	15.6%	52,554	15.8%
New York, NY	3,093	11.5%	18,610	6.0%
Atlanta, GA	2,595	17.7%	29,478	22.0%
Orange County, CA	2,254	23.2%	19,811	22.8%
Chicago, IL	2,211	8.1%	19,227	7.2%
San Diego, CA	2,011	25.1%	30,222	40.0%
Phoenix-Mesa, AZ	1,721	21.4%	9,975	12.9%
Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH	1,657	8.1%	38,824	19.2%
Fort Lauderdale, FL	1,632	26.0%	8,751	26.5%

Trends

R&D is a significant function within this target. Plunkett Research reports that, on a global basis, spending on R&D is increasing rapidly. In industrialized nations, R&D investment has risen from an average of about 1.5% of Gross Domestic Product (GDP) in 1980 to more than 2.2% today. Large numbers of university students around the globe are enrolled in engineering and scientific disciplines. The U.S. continues to lead the world in terms of total investment in research and development, at about \$360 billion during 2007. However, it ranks second in terms of R&D as a percent of GDP at 2.6%, behind Japan's 3.2%. Massive research outlays by the U.S. federal government play a large part; the government's total investment in R&D during 2005 was about \$110 billion. Government research dollars feed projects at universities throughout the U.S. and at many types of private corporations.

Rapidly growing sectors in U.S., Japanese, Indian, and Chinese research include alternative energy, which will receive even more emphasis due to high global demand for energy and the high costs of petroleum. The convergence of information technology, biotechnology, and nanotechnology is fueling the imaginations and the research budgets of scientists and engineers. Great research emphasis is also placed on chemicals, health care, defense, transportation, telecommunications, chips, and computer hardware and computer software.

In the U.S., due to the long-term boom in construction—including residential, commercial and government projects—building and infrastructure design and engineering have been charging and receiving high rates. Even with the recent slowdown in residential construction, commercial and government construction projects continue at a high rate.

Companies know that they must invest in R&D in order to stay competitive, but in many cases their R&D strategies are evolving. One change is the way this funding is allocated. Strategies are shifting to include more alliances and joint ventures with other companies; more subsidiary spin-offs based on established technologies; more contracts and cooperative efforts with federal labs and agencies; and higher grants and projects of greater scope at the university level.

In terms of the number of recently-graduated engineers and scientists available in the U.S. to fill job openings, statistics paint a mixed picture. For example, the number of engineering degrees awarded by U.S. universities expanded steadily from 1999 through 2004, rising about 18% to about 72,893. Meanwhile, the number of bachelor's degrees awarded in computer science rose 85% from 1998 through 2004. However, a significant percentage of these degrees are awarded to foreign students, many of whom will not be allowed to stay in the U.S. due to restrictive immigration laws. Temporary, job-related immigration status under the H1-B program has, in recent years, been limited to 65,000 per annum, plus a special additional allotment of 25,000 expressly for immigrants who hold advanced degrees from U.S. universities. Many employers are frustrated in their efforts to hire either U.S. citizens or eligible immigrants who have specific degrees and experience suitable to fill niche jobs that are vital for corporate R&D. Many employers feel that the current H1-B program is much too restrictive.

In short, some companies are driven to vast R&D efforts in order to compete in their own rapidly evolving industries, while others patiently invest in long-term R&D, hoping it will pay off through the introduction of entirely new types of products several years hence. Thanks to the beginning of the Biotech Era, investment in drug research and development is soaring—much of it fueled by investments from venture capital firms and new IPOs.

**TABLE 10
REPRESENTATIVE COMPANIES**

Company	Location	Total Employment
EG&G Inc.	Gaithersburg, MD	10,000
Englobal Corp.	Houston, TX	2,100
McDermott International Inc.	Houston, TX	27,800
Comsys IT Partners Inc.	Houston, TX	5,000
BDO Seidman LLP	Chicago, IL	30,000
Deloitte & Touche USA LLP	New York, NY	37,118
Monsanto Co.	St. Louis, MO	17,500
Bell Labs	Murray Hill, NJ	7,500
CH2M Hill Companies Ltd.	Englewood, CO	14,000
Covance Inc.	Princeton, NJ	8,100
IBM Research	Yorktown Heights, NY	3,000
National Instruments Corp.	Austin, TX	3,078
Parametric Technology Corp.	Needham, MA	4,309
Synopsys Inc.	Mountain View, CA	4,756
Alliance Imaging, Inc.	Anaheim, CA	2,092
Laboratory Corp of America Holdings	Burlington, NC	24,000
Primedex Health Systems Inc.	Los Angeles, CA	615
Horizon Health Corp.	Lewisville, TX	2,804

Rationale for Selection

- Target activities are heavily populated by small service operations with low headcount demands.
- Will create professional and technical positions offering above-average wages.
- Strong potential to partner with Sheridan College to create/modify training programs to support these operations.

- Opportunity to attract University of Wyoming graduates in professional, scientific, and technical fields.
- Satisfactory availability of architectural and engineering occupations.
- Opportunity for being the regional center for a multi-county service technical service center, including consolidation of smaller local operations within a multi-county region into Sheridan.
- Not-employed and underemployed residents are well educated, with potential for training/retraining.
- WDG extrapolations of household survey data indicate over 547 not-employed residents with skills in business and financial occupations, and over 820 with skills in management occupations. Additionally, an estimated 188 employed residents would like training in management occupations.
- WDG extrapolations of household survey data indicate about 377 not-employed residents and over 900 employed workers would like training in computer and mathematical occupations.
- Expanding industry sectors at national, state, and local levels supporting the target opportunity are: mining; professional, scientific, and technical services; administrative support, waste management, and remediation services; and educational services. The finance and insurance industry is expanding at national and state levels, despite modest local employment declines between 1999 and 2004.

SMALL SUPPORTIVE OFFICE (BACK OFFICE)

Definition

Targeted *supportive office operations* include back offices (particularly administrative service centers, call centers, customer support centers, and technical support centers) and mission-critical operations (i.e., data centers, data storage centers, and server farms). There is also some potential in the region to support professional services, consisting of companies that provide managerial and technical consulting and related services through data processing, engineering, research and testing, energy, environment, computer systems analysis, and software consulting.

Subsector Overview

Back offices typically refer to administrative service centers and inbound teleservice centers designed to provide ready access to customer support for products and services or support for company operations. This sector is diverse, but the facilities within this target share the common element of being white-collar operations with well-educated employees. The sector's workforce is typically dominated by individuals with a two- or four-year college degree and high levels of administrative, clerical, accounting, professional, or technical skills. The types of industries that use those centers include retail, financial services and insurance, manufacturing, transportation, software, utilities, and business sectors.

Administrative service centers are facilities where administrative workers engage in corporate office support operations, such as processing orders, billings, claims, accounts receivable and payable, and similar tasks. Almost all business sectors have functions that could be characterized as administrative and operation support centers. Functions with the most administrative service centers nationwide include: insurance claims processing; back-office check processing; credit card processing and servicing; mortgage servicing; retail service operations; and data processing.

Teleservice centers (call centers, customer support centers, and technical support centers) include operations where customer service representatives (CSR's) receive telephone calls (and/or e-mail inquiries) regarding consumer complaints, concerns about a product or service, and inquiries about a product's or service's specifications, availability, and pricing. They may also receive questions regarding billing, fraud, or losses (e.g., credit or debit cards). These centers typically assist callers seeking:

- User support of a product or service
- To enroll in a membership or similar service
- To discontinue a membership or similar service
- To alter the provisions of a membership or similar service
- For authorization to proceed with the provision of a service, policy, or product
- To purchase a product or service
- To acquire warranty, technical, policy, financial, or service information

Almost all industries have functions that could be described as customer service, but those with the largest customer service operations include:

- Consumer-goods manufacturers (e.g., cosmetics, health and beauty aids, computer hardware, electric and electronic gear, appliances, automotive products)
- Software firms
- Insurance companies and HMO's
- Banking and financial services
- Credit card services
- Telecommunications-related companies
- Travel and hospitality firms (including airlines, hotels, and car rental companies)
- Transportation and related companies
- Publishing firms
- Mail-order fulfillment centers
- On-line services
- Major retailers
- Express delivery companies

Trends

Administrative Service Centers

Major corporations (typically companies with \$1 billion in annual sales) in many industries continue to take steps to minimize their administrative costs. These steps include: a growing emphasis on reducing headcount through the elimination of redundant positions; process improvements to make existing office procedures more efficient; and technology improvements to increase productivity. In order to implement these strategies, companies are increasingly turning to relocation of single or multiple units that are the most cost-sensitive and the most mobile from higher-cost locations to lower-cost centers.

A relatively new trend has emerged over the past decade among the largest companies, affecting location of their administrative service centers. This trend is the advent of consolidated staff support activities (e.g., accounting, payroll, shareholder services) among a company's divisions, groups, or subsidiaries. These consolidated operations are usually called *shared services centers*. The trend toward establishing shared service center operations will accelerate in the next several years as cost reduction, efficiency, and better service continue as key operating objectives.

Another trend is the consolidation of regional or district offices. This is most prevalent in the insurance industry for claims processing. Larger carriers have been consolidating numerous field operations into one or several major operations. Again, economies of scale/cost are the

principal drivers. Companies find that relocation of single back-office units, or consolidation of multiple units into a single, stand-alone administrative service center offering shared services in a lower cost area allows them to:

- Reduce headcount by eliminating redundant positions
- Reduce direct labor costs
- Reduce fringe benefits costs
- Reduce occupancy costs
- Improve productivity through longer work weeks
- Improve productivity by implementing new office procedures and work methods
- Attract and retain high quality managers and technicians through lower living cost

With tightening labor markets nationwide, escalating salaries, rising turnover, and more costly office space, geographic redeployment of back offices will remain an important aspect of corporate re-engineering efforts.

Teleservice Centers

The underlying trend in teleservice location strategy is to place the centers in low-cost labor markets; however, the low-cost locations must also be able to support the primary operating objectives. The service center must be staffed with workers able to deliver the requisite service level to meet/exceed customer expectations, must maintain business continuity, and must be able to expand or contract in headcount and space to adjust for market conditions.

Relocated and new teleservice operations are on the upswing. Available telecommunications and computer technology allow quick and easy transfer of large quantities of information across long distances. This allows many corporate support and service operations to be separated from corporate headquarters and manufacturing facilities, and to be located as stand-alone facilities in areas with lower operating costs.

There is a growing trend in business for companies to become more responsive to their customers' needs for facilitated access and maximum convenience. It is becoming increasingly difficult to find any producer or service provider who does not have a toll-free number to take calls for product/service complaints, questions, sales, or product inquiries. Companies that do not have toll-free call center operations to answer these calls are at a disadvantage against their competitors, and are being driven to create them.

Despite rapid technological advances, inbound and outbound teleservice centers remain labor-intensive. The technology has greatly improved efficiency and responsiveness to customer inquiries. However, due to explosive growth, teleservice centers require a substantial number of agents or CSR's. Whether these are full- or part-time, or a mixture of both, depends on the company's operating philosophy and local labor market conditions.

There are numerous trends in the location of call centers in and outside the U.S. Principal trends are outlined below:

- There has been a proliferation of call centers spanning the industry spectrum (from manufacturing to retail trade).
- The advent of e-commerce has contributed to the explosion in this industry.
- The re-energizing U.S. economy will continue to fuel the need for new call center facilities.

- New facilities growth will be especially strong as the paperless economy and Internet usage become widespread.
- Payroll dominates the expense structure for call centers (generally over 65% of a facility's budget).
- A shortage of quality, entry-level labor is the biggest locational challenge facing the industry in the U.S. This applies both for basic customer service positions (e.g., requiring little independent judgment) and for higher-end technical support (e.g., software help desk).
- Tight labor market conditions in the U.S. are causing wage escalation (and high turnover), thereby reducing operating margins for call centers
- Partially in response to the labor crunch, call centers have adopted a number of measures, including:
 - Introduction of labor-saving technology (e.g., CTI, voice recognition, and database systems allowing for more scripting)
 - Reliance on the Internet both to provide customer service at a far lower cost than voice and to reduce telephone expenses
 - Downscaling call center size to open up the range of locations that can be considered for new facilities
- Companies are selecting small metropolitan or non-metropolitan areas in the U.S. that heretofore were considered “off the beaten path” for call center operations. This is especially true for non-mission-critical operations, as many small towns lack either extensive telecommunications redundancy or high bandwidth.
- There has been an increase in human resource and facility design measures to make call centers desirable places to work and to strengthen the ability to recruit/retain qualified labor.
- Web-enabled call centers are also allowing for more work at home or telecommuting, which improves a company's ability to recruit/retain labor.

Concerning U.S. call center site selection in the immediate future, several patterns should become established, including:

- More basic call center operations opting for small-town locations.
- Technical call centers locating in areas with a high concentration of basic call centers, thereby capitalizing on a trained, underemployed labor pool.
- Any call center requiring new-economy skills (e.g., web design) locating in recognized centers of the new economy – irrespective of costs (from San Francisco/San Jose to New York City).
- Canada is becoming a more popular location to serve North America, due to better labor availability and lower payroll costs, although the rising value of the Canadian dollar to the U.S. dollar has tempered this trend.
- An increasing number of companies will establish offshore call centers to serve the U.S. from low-cost locations featuring an English-speaking workforce (or possible bilingual English/Spanish for selected call centers).

Rationale for Selection

- Populated by small back office and service operations with low headcount demands.
- Office operations within this target opportunity share the common element of being professional operations with well-educated employees.
- Provides for centralization of services for a regional market that could not be supported by smaller, more localized markets.
- The target's office workforce is usually dominated by individuals with a two- or four-year college degree and a high level of administrative, clerical, accounting, professional, or technical skills.
- Strong potential to partner with Sheridan College to create/modify training programs to support operations, as well as to provide job opportunities.
- Not-employed and underemployed residents are well educated with potential for training/retraining.
- WDG extrapolations of household survey data indicate over 540 not-employed residents with skills in business and financial occupations.
- WDG extrapolations of household survey data reveal 377 not-employed residents would like training in office and administrative support occupations.
- Expanding industry sectors at national, state, and local levels supporting the target opportunity are: administrative support, waste management and remediation services, and the information industry. The finance and insurance industry is expanding at national and state levels, despite modest local employment declines between 1999 and 2004.