Prospects for low-skilled workers in the information technology (IT) sector:
Lessons for workforce development policy from Boston area IT firms and the staffing industry

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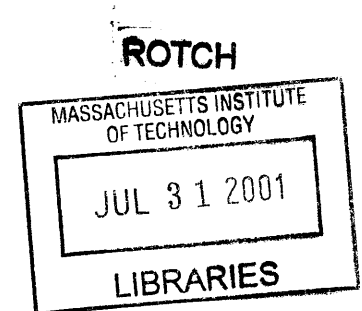
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## ABSTRACT

This thesis investigates the role of workforce development policy in creating employment opportunities
for lower skilled workers in the information technology (IT) sector and related businesses. It generally
accepted that this sector creates job opportunities with superior wages and employment benefits compared
to other sectors; this thesis explores entry-level employment in IT-related occupations as an opportunity
out of low-wage, low-skill jobs through access to higher quality entry-level work and mobility into higher
skilled position in the industry. Research on the occupational profiles along with the employment and
hiring practices of IT firms highlights employment barriers faced by lower skilled workers in the IT
sector. This investigation surveys two perspectives: the IT firms of Cambridge, Massachusetts that
employ workers, and the Boston area staffing industry that supplies a significant amount of labor to these
employers. Thus, the research presented in this thesis describes both the demand and supply sides of the
IT labor market. The ultimate goal of this investigation is to look for ways to open up high-tech
employment to workers beyond the norm of white, male, Caucasian, age 36 to 40, with a bachelor's
degree, as reported by nationwide statistics on IT workers.

Forging into the IT sector with workforce development policy requires more than short-term training to
assist lower skilled workers in accessing jobs. The stringent education and skill requirements of *core* IT
positions mandate the development of long-term training and education policies to increase the supply of
workers qualified to enter into the field. In addition to long-term training, successful employment policy
is needed to creatively assist lower skilled workers in qualifying for entry-level IT occupations, so that
they can take advantage of the growing employment opportunities created by this industry. This thesis
concludes with policy recommendations on how to provide employment and training opportunities that
initiate careers for lower skilled workers in IT-related occupations, as well as spur opportunities for
mobility out of entry-level work.

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# CHAPTER 1: INTRODUCTION

Public dialogue around the emergence of a "new economy" in the US spans from the White House to the households of most American citizens. New economy sectors are said to be largely responsible for the economic boom in the 1990's and a significant proportion of new job creation that tightened the labor market. Economists and policy researchers generally agree that the "old economy" centralized on the mass production of goods. The "new economy" hinges upon the flexible production of goods and services (Atkinson, 1998). Within the new economy the information technology (IT) sector has been largely responsible for the shift in production methods in the private market. The tools and products created by the information technology sector transformed business processes thereby impacting other facets of the U.S. economy. In particular, strong employment growth in new economy sectors is changing the type of jobs available to Americans. According to a study published by the Massachusetts Department of Employment and Training, the state will experience the fastest growth in computer software, research and testing, engineering, higher education, medicine and management consulting industries.[1] At the top of the list, *computer software and related services* has the highest projected growth rate (88.9%) compared to all other industry classifications creating an estimated total of 55,800 new jobs by 2006. The IT sector is clearly an important slice of the employment pie in Massachusetts.

The growth of employment for these types of occupations may not be good news for everyone, especially for those with limited skill and education. Therefore, the research focus of this thesis, and an important question for workforce development policy, is whether the growth of the IT sector and related occupations will generate employment opportunities accessible to workers at various skill levels. Many people believe that jobs in the IT sector are highly skilled and therefore unattainable for the average American worker. Yet it is difficult to find evidence on the proportion of job types created in the IT sector and across all industries, and the necessary mix of educational and skill requirements demanded by these jobs. Are these sectors only creating the highly skilled, technical and professional jobs that are reported in the media or discussed in line at the grocery store? Or, do they also create job types with less technical requirements? Chapters 2 and 3 of this thesis examine the job types in the IT sector based upon national research and a case study of IT firms in Cambridge, Massachusetts.

The IT sector is not the only consumer of a technically skilled labor force. Businesses that *utilize* information technology represent a formidable demand for workers with technical skills across all sectors, from manufacturing to government. A study conducted in April of 2001 by the Information Technology Association of America found that non-IT firms were the largest consumers of IT workers, consuming ten times as many IT workers as core sector IT firms. Moreover, hiring managers at non-IT firms tend not to

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[1] *The Massachusetts Job Outlook through 2006.* This publication looks at job change between 1996 and 2006.

demand "cutting edge" skills for IT-related positions. Therefore, IT-related jobs outside of the IT sector are significant not, only because of the number of jobs created, but also because a much wider array of workers have access to these jobs. Chapter 3 focuses only on firms in the IT sector, however Chapters 4 and 5 develop an understanding of the use of technical workers across all industries.

One way to better understand the IT sector is to examine the ways workers access jobs. In other words, how do workers interface with the IT job market to successfully find jobs? The most prevalent way to find a job is through word of mouth or by a personal referral from someone connected to an employer. A significant number of workers also find work via newspapers, temporary help firms, job boards or public employment agencies, or other labor market intermediaries. These methods try to replicate personal network ties to connect people to jobs. Although they are typically considered less valuable than formal and informal connections between employers and potential employees, the use of intermediaries in the labor market has grown significantly. One type of private, for-profit labor market intermediary is a temporary employment firm. A temporary employment firm hires employees to meet the fluctuating labor needs of other companies. In the US, the temporary employment services industry grew by 11 percent between 1979 and 1995, five times the rate of non-farm employment growth. During this time period, temporary employment firms transformed the industry by finding new ways to attract both "talent"[2] and business clients and keep up with the changing rules of the labor market.

The stigma of temporary employment has declined over the years as the use of these firms has increased. The industry was once thought of as employment service where only the unemployable go to get jobs. Today there is a range of temp firms that employ blue collar workers all the way up to management executives. The growing pool of temporary employees includes a contingent of highly skilled workers who do not leave the house for less than $150 an hour. Highly skilled temporary employees are particularly prevalent in the information technology sector. The IT industry has been an especially "heavy user" of temporary and contract employees. If the IT industry is truly a significant part of the future economy, workforce development professionals will need to understand why IT firms currently satisfy their human resource needs through temporary employment and contract firms.

Surprisingly, there is little research available that investigates the role and strategies of temporary employment firms themselves. Most research focuses on the business and human resource practices of firms that use temporary employment or the impact of this non-permanent work arrangement on temporary employees. As temporary employment firms have responded successfully to changes in the labor market, what contributed to their success? The strategies they use to attract talent and business clients are the key elements of their success and therefore worthy of close scrutiny. I believe this

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[2] *Talent* is the term used by many temporary employment agencies to label the workers placed in client businesses. One manager said her firm began using the term three years ago to put a positive spin on the internal and external reference to temporary employees.

information has valuable implications for workforce development policy, especially as it relates to increasing employment in the IT sector. An investigation of the human resource patterns of IT firms from an internal perspective, as well as an investigation of the strategies of temporary employment firms will describe the employment landscape of the IT sector.

The overarching goal of this thesis is to examine the labor market characteristics specific to the information technology sector. This examination looks at the demand for labor according to employers and the ways in which employment is secured within these sectors. I also examine the job types described by IT employers and temporary employment firms to look for access points to entry-level employment and the ways in which employment can be opened up to various types of workers. This examination will help to formulate a policy agenda designed to improve access to higher-skilled employment opportunities generated by the use of information technology in the market place.

## Research Questions

In an effort to determine the access points and job prospects for lower skilled workers in the IT sector and IT-related technical positions, it is necessary to address the following questions:

- *What types of jobs are created by the IT sector and what job types are created as it continues to grow?*
- *What are the skill and educational requirements needed to fill these jobs?*
- *Which job types identified by IT employers are entry-level positions that could be targeted for lower skilled workers?*
- *How have IT firms developed human resource strategies to address their labor needs?*
- *What is the role of the temporary employment industry, a labor market intermediary, in supplying labor to the IT sector?*
- *Can lower skilled workers use temporary employment agencies to access IT jobs or gain technical experience that would then provide them access to these jobs?*
- *What can workforce development policy do to increase the employment of lower skilled workers in IT sector and related job types based on what is learned from employers in the field and temporary employment agencies that work with these employers?*

The research questions outlined above are addressed through two parallel tracks of research. The first track involves the collection of information on employment in the IT sector. Chapter 2 investigates existing literature that describes job types and human resource practices of firms within the IT sector to better understand the industry and consequently its composition of occupations. The literature review defines the nuances of IT employment both inside and outside the sector. These distinctions prove to be important for the prospects of lower skilled workers in obtaining technical jobs. Chapter 3 presents survey research from a case study of IT firms located in Cambridge, Massachusetts. In-depth interviews with the human resource managers at two of IT firms supplement the survey data. The case study

describes skill and education requirements as well as salary, training and advancement opportunities for each job type reported by IT firms. Finally, Chapter 5 analyzes the survey results to identify entry-level technical and non-technical positions created by the IT sector.

The second track of research gathers information through available literature on the temporary employment industry, also known as the staffing industry, combined with eight in-depth interviews of recruiters and managers at Boston area temp firms. Chapter 4 profiles recent changes in the staffing industry to evaluate its ability to improve employment outcomes for lower skilled workers in the labor market. In addition, background information on the staffing industry adds to a discussion of labor policy issues that arise due to the increasing use of temporary employment. A comparison between the history of the staffing industry and more recent attributes highlights the changing role of temporary employment in the labor market. This information is presented to address the stigma associated with temporary employment as well as the possibility of using this industry as a way to employ lower skilled workers. More specifically, Chapter 5 reviews the activities of two types of professional temporary employment firms to examine their role in IT-related employment. Of greatest interest is the interaction between these staffing firms and IT-related employment in the Boston region.

Comparing the information gathered from IT firms and temporary employment firms draws out employment patterns, education and skill requirements for core IT and entry-level technical job types. In both the research findings on IT firms in Cambridge and interviews with the staffing industry, information on the human resource activities in terms of employee recruitment, training and promotion in this sector is highlighted. The implications drawn out in chapters three and five create a foundation for the policy recommendations in Chapter 6.

**Summary of Findings**

The results of the case study show several occupations reported by IT employers with reduced technical and educational requirements compared to core IT jobs. The key findings on entry-level jobs presented in Chapter 3 show a limited number of occupational categories. These categories include *Data Management, Technical Support* (both hardware and software), *Quality Assurance Specialists, Administrative Assistants, Associate Web Developers, Customer Service (help-desk) support, Graphic Design* and *Technical Production* jobs. These job types, although considered entry-level, still require verbal communication skills (basic command of English), some degree of industry specific experience or proven work history, the ability to think critically, and an education level ranging from high school to a bachelors degree. Interviews with IT employers and employment recruiters did unearth some encouraging evidence. For example, gaining technical experience or skill through training minimizes educational requirements. Another encouraging characteristic of entry-level positions in the IT sector is the option to advance into more skilled positions (not limited to supervisory positions). With the

exception of *Customer Service* positions, IT sector firms report additional ranks for each job type that build off of entry-level job types, allowing motivated workers to advance out of entry-level work.

As internal labor markets are supposedly shrinking within firms, labor market intermediaries become more important as a way to create advancement ladders across firms and industries (Benner, 2001). The temporary employment industry plays a prominent role in feeding a supply of labor to the internal firms across all industries and, to some degree, mimic the original internal labor markets. According to the research with recruiters at staffing firms in the Boston area, they work closely with business clients to develop strong access to hiring managers. From the perspective of a lower skilled worker, there are advantages associated with the temporary employment industry. In addition to training in basic computer skills, personal skill assessments and job placements that build work history, evidence from temporary employment recruiters presented in Chapter 5 suggests that recruiters maintain contact with temporary employees even if they after they leave the temp firm, therefore allowing workers access to new employment opportunities. Although temporary employment firms excel at job placement, they do not support other needs of lower skilled workers, like intensive training or social services. Therefore, the services of temporary employment firms are most advantageous for lower skilled workers in conjunction with institutions that specialize in education and training. Chapter 6 furthers the discussion of the policy implications related to these findings.

It is certainly disheartening to find a limited number of technical entry-level positions characterized by a challenging road into the IT sector. Despite the challenge, it is a critical road for workforce development policy. The findings presented throughout this thesis reinforce the mandate set forth by other researchers for a significant human capital investment in the US workforce (Comings, et. al., 2000; Meares and Sargent, 1999; Information Technology Association of America, 2001; Massachusetts Division of Employment and Training). If the US does not invest in lower skilled workers, a significant segment of the population will be shut out of future job growth. In any economy, jobs that offer the most benefits and wages generally require more than basic skills. In today's economy, the growing split between jobs at the high and low end of this spectrum endanger lower skilled workers no longer able to make the 'jump' up to skilled work on their own. Bringing lower-skilled workers up to speed with the demands of the labor market is a daunting task from everyone's perspective: workers, policy makers, educational institutions and employers. Nonetheless, it is arguably one of the most important and critical tasks facing the nation. The research presented in this thesis lends additional support to the voices of researchers, business leaders and policy makers who have called for a focus on long-term training and education. In addition, the discussion in Chapter 6 recommends ways to facilitate the access and mobility of lower skilled workers within the parameters of existing educational, government and employment institutions.

The US has experienced points in history when the need for workforce development policy was obvious to the nation. Episodes of rampant unemployment during the depression and during the layoffs of the 1980's left masses of people unemployed, bringing workforce development policy to the attention of the public. Today the nation is experiencing the lowest unemployment rate in recent history, holding around 4% over the last five years. Over the 1990s and into 2000 wages slowly increased even as unemployment declined. Welfare recipiency rates have declined sharply due to a combination of state and federal welfare reform laws and a high demand for workers at all levels [1]. The homeownership rate in the US has been on the rise since 1994 edging up 4 percentage points, and the rates for minority homeowners grew twice as fast as that of white homeownership rate [2]. In many ways, the booming economy of the 1990s has benefited all citizens, hence the aphorism: a rising tide raises all boats. Employment seems like the least of our worries. So why are government officials, presidents of companies[3], public education administrators and the general public discussing workforce development issues these days?

There are two interrelated issues driving the current fervor around workforce development. One issue is the diverging wage scale paid to low skilled and high skilled workers and the growth of jobs predominantly in these two categories. Industries that pay higher wages but also demand highly skilled workers fueled most of the economic growth in the last decade. At the same time there has been a surge in the number of low-wage, low-skill jobs. While the low unemployment rate over the last 10 years has meant there are less unemployed and underemployed, lagging productivity since the 1980's has meant slow wage growth for workers. Some argue that it is now more difficult to start at the bottom of the labor pool and work one's way into a higher skilled, higher wage job (Comings et. al., 2000; Atkinson and Court, 1998). This jeopardizes workers at the lower end of the economic and job ladders.

The second issue driving the commotion surrounding work force development policy is the reported lack of skilled labor needed to meet the growth of higher skilled positions. Whenever the private market transforms its need for labor, it takes considerable time for the labor force to "catch up" and match their qualifications to new demand. If a significant proportion of the labor force is unprepared to meet the labor demands of a particular industry, the US economy is less competitive in the global marketplace

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[1] The US Department of Health and Human Services reports that between 1993 and 2000 there was a decline in the number of welfare recipients by 8,334,000, a decline of 59 percent. In Massachusetts the number decreased by 72 percent from 332,044 in 1993 to 93,890 in 2000.

[2] www.hud.gov/library/bookshelf18/pressrel/pr99-69.html

[3] An example of one such discussion in MA took place on April 1st 2000 as democratic leaders invited heads of IT corporations to an event to involve corporate leaders in the political arena and help politicians understand the needs of these companies, including labor needs, (Healy, Beth).

thereby putting the nation at risk. The common factor driving both concerns is a purported change in the demand for labor in favor of highly skilled workers. One sector within the economy exemplifies the two concerns just described: the information technology sector.

A sectoral study of the IT sector is useful on several levels. First, workers reap the benefits of job growth and strong wages in this sector if they are able to gain access to jobs: a critical point given the types of jobs that are projected to grow in Massachusetts over the next decade. Second, of all the industries that fall under the new economy umbrella, information technology (IT) firms are generally expected to exhibit the strongest need for technical and professional skills. This thesis looks at the skill requirements of IT firms and is therefore a contribution to the raging debate over the increasing need for "technological" skill within the labor pool.

Since a change in labor demand can affect both opportunities for labor force participants and national economic strength, it is important to understand the demand for labor in the IT sector. The next step is to determine whether there has been a change in the jobs created by the new economy and, if so, what are the implications of these changes for the labor force. In this chapter I review literature that describes the new economy and its macro effect on the demand for labor in order to set a context for an investigation of the labor demands of IT firms in the survey results reported in Chapter 3. The following topics are addressed.

> *The influence of new economy and the IT sector on the labor market.*

> *A definition of the IT sector.*

> *The basic characteristics of IT jobs across all industries.*

Although these questions do not immediately relate to entry-level jobs or the employment of lower skilled workers in the IT sector, they inform a more comprehensive understanding of the sector. This chapter initially describes the new economy and the reasons to focus on the IT sector in workforce development policy. It then draws on national research to define the IT sector, including the distinction between core IT and technical job types across all industries. The chapter concludes with a picture of the demand for IT professionals compared to the existing supply from both a national and state perspective.

## THE NEW ECONOMY

### Is there a revolution afoot?

A wealth of information, both academic and popular, exists on the expansion of the "new" economy and the characteristics that distinguish it from the "old" economy. Almost all of these sources agree that the economy has changed. An explanation of when, why and how is still up for grabs. The Progressive Policy Institute in a report entitled *The New Economy Index: Understanding American's*

*Economic Transformation,* published a concise description of the old and new economies. The old economy, lasting between the years of 1938 to 1974, was built on manufacturing goods through standardized production methods. Firms in this economy were stable and hierarchical. They focused on increasing production and decreasing incremental costs to increase their share of the national market (Atkinson and Court, 1998).

The new economy began as firms were pressured to reorganize production processes to improve their competitive edge in providing products and services quickly, efficiently and flexibly. In his book *New Dollars and Dreams,* Frank Levy (1998) identified several trends that affected the growth and structure of occupations in the US beginning in the late 1970's. One trend includes an increase in the competitive nature of the market. Changes in production technology, communications, transportation or shipping processes broke down old economy ways between the 1970s and 1990s as firms transitioned their production methods to create new products and services.

In essence, the New Economy is as much about the reorganization of work and production as it is about the introduction of new technologies. The focus of the new economy is on structural change, innovation, and the speed at which processes take place. Firms are now competing based upon their ability to innovate new products and deliver them in less time. For example, in the auto industry, a hallmark industry of the US economy, the advent of new technology and innovation has brought the production time of a new car down from six years in 1990 to two years in 1998 (Atkinson and Court, 1998, p. 17).

The new economy is particularly important to Massachusetts and the Boston region. In 1999 the state was given the highest ranking in an evaluation conducted by the Progressive Policy Institute of each state's ability to absorb and utilize "new economy" methods. The study rated each state based on 17 different indicators grouped into five basic categories: the number of knowledge jobs; the state's response to globalization in terms of export orientation; the extent of economic dynamism and competition of state firms; the transformation to a digital economy in the workplace and public schools; and the capacity for technological innovation based on the investment in research and development, venture capital, high-tech jobs and types of workers in the labor pool. This type of economy is of great import to Massachusetts. As we have already heard in Chapter 1, Massachusetts will experience its fastest job growth in new economy sectors.

Of course, other types of jobs still exist in the labor market that are not in knowledge intensive industries. If knowledge jobs present skill barriers for certain populations of the work force, why bother with the new economy or the IT sector in the consideration of workforce development policy aimed at lower skilled workers? Why not simply confine our attention to moderately skilled, traditional jobs? One reason is the divergence in wages paid to higher-skilled and lower-skilled positions. Since the 1970's

workers with a high school degree have seen their real wages drop while college graduates have experienced increasing wage returns on education. In the 70's, a high school graduate was 3.5 times more likely to be unemployed than a college graduate, this rate increased to 4.5 during the 1980's and 1990's. (Atkinson and Court, 1998, p. 25; Levy, 1998) Wage levels for managerial and professional jobs have increased 2.5 times faster than blue-collar workers and 4.3 times faster than service jobs (Walker and Bergman, 1998, p. 26). In an effort to avoid the continued bifurcation of the haves and have-nots, larger portions of the labor force need to have access to better paying jobs.

A second reason to tap into these uncharted areas of workforce policy is to take advantage of the strong employment growth rates predicted for these sectors in the future. New economy sectors are said to be largely responsible for the most recent economic boom and a significant proportion of new job creation that tightened the labor market in the 1990's. The role of the IT sector in US economic growth accounted for more than one third of the overall growth between 1995 and 1997 (Mateyaschuk, 1999, p. 1). This is because the IT sector has played a dual role in US employment and economic growth. In one role the IT sector itself is quickly growing in economic value and employment numbers, yet it also has spurred the same type of growth in other sectors as a result of the products and services created by the IT sector. One way to conceptualize the difference is to realize that core IT sector firms are responsible for the creation and maintenance of information technology and all of its accoutrements. These products and services are largely responsible for a transformation in production processes and the "technology revolution" occurring in the private market outside of the core IT sector. The power of information technology has been its ability to influence other aspects of the economy.

This transformation is evident in the widespread use of personal and commercial computing and telecommunications. The intense increase in IT consumers has fueled innovation and scale economies helping to bring down the costs of data transmission, computer hardware and software, and basic materials needed in IT innovation (semi-conductors, microchips and telecommunication access). The Internet economy is projected to be worth $350 billion dollars at the end of 2001 compared to $15.5 billion in 1996 (Atkinson and Court, 1998, p. 5). Governments, businesses and public institutions are increasingly able to digitally deliver services and products to consumers. And business-to-business commerce over the Internet is expected to grow from $48 billion in 1998 to $1.3 trillion in 2003 (Meares, 1999, p. 5).

Clearly, the IT sector has contributed to the economy in a variety of ways. Nonetheless, there is a distinct difference between the core IT sector and businesses that have made IT applications integral to the daily operations. This difference is described in detail in the following section. It arises again in Chapter 3 as central to the interpretation of the results of employment prospects for lower skilled workers reported by IT employers.

# The IT sector – What is it?

Since the IT sector has impacted so many other areas of the private market, the difference between employment within the core IT sector and IT employment in firms outside of the core IT sector is not immediately clear, yet this is a critical distinction to make. The *core IT sector* is usually defined by firms responsible for the research, creation and production of information technology products and services. Examples include web development companies, software producers, manufacturers of electronics and hardware for personal computers, and firms that create Internet sites. Within this sector there are two technical categories, *core IT jobs* and *technical* support positions. In addition, there is a range of *non-technical job types* that require little or no technical knowledge, for example, a marketing manager or an administrative assistant.

**Figure 2.1 – Division of the IT job types in Labor Market**
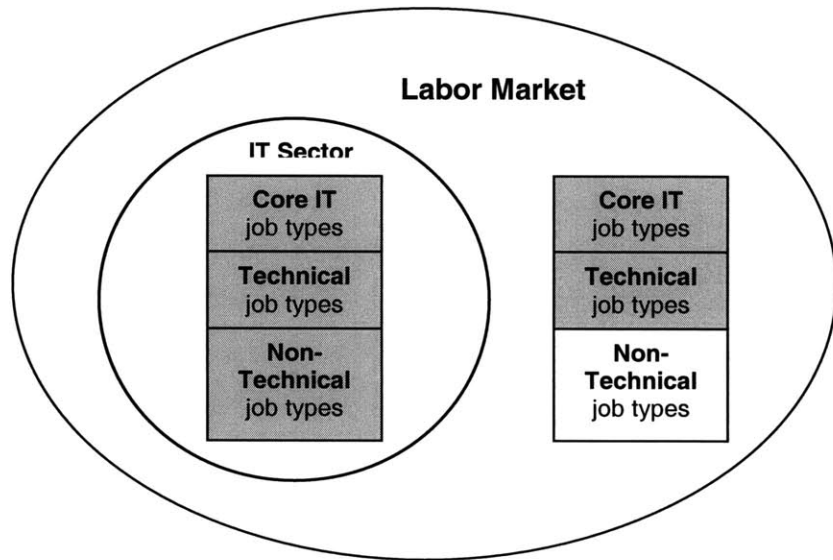


Caption: *The job structure in the overall labor market mirrors the IT sector in terms of core IT, technical and non-technical employment.*

To add to the confusion, one must also consider IT jobs that exist on the outside of the core IT sector. Much of the economic growth felt by the expansion of information technology in the private market is due to an increase in hiring of IT workers at non-IT firms. For example, a large financial company may hire a team of software engineers to create a special product line for their customers, or web development staff to create and manage a new on-line service. Alongside of core IT jobs in other areas of the private market there are technically oriented jobs that manipulate or use IT products but are not considered core IT positions. Figure 2.1 above depicts this segmentation of IT and technical jobs. In Chapter 3 focuses on a discussion of all job types found within the IT sector. Chapters 4 and 5 broaden this discussion to include job types that are core IT or technically oriented positions found outside of the IT sector. The job types of interest are shaded in the figure. The basic definitions of core IT occupations compared to technical support positions already suggest that technical positions require less skill than core IT jobs.

## Core IT jobs

The Information Technology Association of American (ITAA) and the Department of Labor Statistics organize core IT positions into four categories: computer scientists, computer engineers, systems analysts and computer programmers. These four categories are responsible for the creation and maintenance of information technology concepts and tools. Each category is comprised of a variety of job types in addition to a hierarchy for each job type based on the level of responsibility and expertise.

**Computer Scientists** design, implement and improve the theoretical concepts of computers hardware. They are the innovators and designers who function as an interface between computer science theory and tangible products.

**Computer Engineers** design and develop both the hardware and software for computer systems. They are key actors in creating the tangible product based on the computer scientist's theoretical design.

**Systems Analysts** review and evaluate hardware and software aspects of computer systems to improve performance and troubleshoot failures. They are often the interface between the technology and the user, charged with the responsibility of molding existing software and hardware to meet the needs of consumers. System analysts also design solutions for business, scientific or engineering data processes.

**Computer programmers** write and maintain code instructions for the creation and use of software programs that work with computer hardware. They often execute the prescriptions of computer engineers and systems analysts.

## Technical IT jobs

Technical positions that are geared toward the maintenance and use of IT products and services, which generally require less education or training credentials. Like core-IT positions, they exists across all industries. A variety of job titles within these firms are commonly advertised or listed on Internet job boards. Examples include: data entry/specialist, network administrator/specialist, management information systems (MIS) manager/support, software support technical, and technical support representative (help desk support). Additionally, the field of graphic design incorporates the use of computer software and creative talent so that graphic designers are generally viewed as technical

positions. Job titles in this field include graphic designers, desktop publishers, and a variety of positions at printing and publishing firms. Graphic designers often branch out into web design and software industries.

Businesses that utilize information technology represent a formidable demand for workers with technical skills across all sectors, from manufacturing to government. Firms outside of the IT sector are the largest consumers of technical workers, consuming ten times as many IT workers as core sector IT firms. IT jobs outside of the IT industry are significant not only because of the number of jobs created but also because a much wider array of workers have access to these jobs. This is because non-IT firms tend to be less stringent about the skills of applicants. Hiring managers for these positions do not demand "cutting edge" skills.

## Demand for core IT workers

It is difficult to collect data on the demand for IT workers specific to the core IT sector and other industries. According to a study published by the US Department of Commerce Technology Administration Office in 1999, future demand for core IT workers will be led by the service industry, which includes the computer and data processing services (CDPS) sector that is the largest employer of core IT workers. By 2006, the demand for computer scientists, computer engineers, and systems analysts is projected to more than double (see Table 2.1 below). By comparison, the growth rate for all occupations is expected to increase by 14% during this period. A strong demand for core IT workers is demonstrated by the unemployment rate for IT workers between March 1987 and 1998, which was 2% compared to 4.2% for all workers (Mateyaschuk, 1999, p.2).

**Table 2.1: US Occupational Projects for Core IT Jobs**

| Occupation | Employed 1996 | Projected 2006 | Growth |
|---|---|---|---|
| Computer scientists | 212,000 | 461,000 | 118% |
| Computer engineers | 216,000 | 451,000 | 109% |
| Systems analysts | 506,000 | 1,025,000 | 103% |
| Computer programmers | 568,000 | 697,000 | 23% |
| **Total** | **1,502,000** | **2,634,000** | **75%** |
| **All Occupations** | - | - | **14%** |

*Source: Mateyaschuk, 1999*
*US Department of Labor, Bureau of Labor Statistics, 1996 Industry-Occupation Employment Matrix*

## Supply of IT workers

The ability of the nation, a state or city to fulfill the demand for IT workers in both the core and non-core areas is a major concern for business, government and job seekers alike. Recent reports on the availability of IT workers do not paint an optimistic picture. One indicator that demand continues to

exceed supply of workers for these positions is the manifestation of wage pressure in high salaries and, to some extent, the use of temporary or contract workers.

The IT workforce study by the ITAA (2001) recently conducted a phone survey with business across the nation to estimate the demand for IT professionals compared to the number of positions. The survey consisted of 685 telephone interviews with a representative sample of firms over the size of 50 employees, both within and outside of the IT industry. The study found 1.4 million IT workers across the nation. Firms predicted 900,000 *new* jobs this year, of which 425,000 are predicted to remain unfilled due to an applicant pool deficient in the required technical and non-technical skills. The number of unfilled positions represents 47 percent of the total new jobs for the industry. Although the expected number of new jobs (900,000) is down from last year, it remains substantial.

The dearth of IT workers in Massachusetts mirrors trends seen on a national level. A report published by the Massachusetts Institute for a New Commonwealth (MassInc) in December of 2000 claimed that the state will experience shortfalls in human capital unlike anything seen in prior history, where one in twelve positions for skilled workers will go unfilled for certain sectors, including the information technology sector.

The MassInc report also investigates the number of Massachusetts residents that will be unable to take advantage of "new economy" jobs, including IT positions, due to skill and educational limitations. The report highlights three specific worker populations unprepared for new economy jobs. The first is a group of 195,000 immigrants with a high school diploma or more, but limited English speaking skills. The second group consists of nearly 280,000 high school dropouts. The last group includes 667,000 workers with a high school diploma or more who speak English but cannot perform at a level 3 literacy standard, which means they would have significant difficulty reading a news article to identify the topic sentence or read information needed to handle flight arrangements for a meeting (Comings et. al, 2000). The three groups in total equal 1.1 million adults of the state's 3.2 million workers. If one in three Massachusetts workers are not prepared to take even semi-skilled jobs, much work needs to be done to adequately address the demand for IT or technically skilled workers.

The existing pool of workers in the IT sector does not represent all demographic categories of workers proportionally. The profession of computer programming is an excellent illustration of the deficiency of women and minorities in IT positions. The Current Population Survey for the year 2000[4] reported that women represented 46.5 percent of the total labor force, almost double the percent of (26.5) of programmers who are female. Hispanics were the most underrepresented in the programming workforce, capturing 3.5 percent of programming jobs compared to a figure of 10.7 percent of the total

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[4] This data is available on-line at http://stats.bls.gov/pdf/cpsaat11.pdf

workforce. Black programmers, representing 8.1 percent of total programmers, came closer to representing their overall presence in the labor force with 11.3 percent.

The demand for IT workers will continue to rise and, in some ways, the labor force is slowly responding to this demand. The number of students enrolled in training or college courses specific to the IT field is on the rise. Enrollments in computer science and engineering rose 104% between 1995 and 1998 across the nation. However, the time lag between enrollment and graduation varies from 4 to 8 years depending on the degree program, posing a continued shortage of qualified professionals. IT vendors offer certification programs that have shorter time requirements and are respected in the industry, though they provide limited skill sets.

## Summary

The trends presented in this chapter suggest that demand for technically skilled IT workers is a permanent fixture in the American economy. This realization is a convincing reason to consider various ways to meet the demand for IT skills. An even more compelling issue is that certain demographic groups are being left out of IT employment. It is imperative to provide lower skilled workers with the appropriate skills needed to access new jobs created in the economy, especially ones that pay wages comparable to the cost of living. The literature review in Chapter 3 begins to outline the challenges associated with targeting IT related jobs for lower skilled workers. It also describes some of the benefits of accessing entry-level jobs that do exist within IT firms. The ultimate objective of both chapters is to find access points for lower skilled workers to IT jobs and identify the barriers to accessing these jobs.

# CHAPTER 3: IT FIRMS IN CAMBRIDGE MASSACHUSETTS

*"The company expects that all of the employees will not know 20 to 30 percent of their job and need to learn it as they go along. Therefore, we often hire employees that lack some of the expected technical skill if the person is an adept learner and is comfortable in a job that is continually in motion."*
**Interview with HR Director at IT firm in Cambridge, Massachusetts**

To better understand the nature of work in the IT sector, the next step is to investigate the types of jobs offered by employers. The national data presented in Chapter 2 provide a foothold on this subject. This chapter profiles IT firms in Cambridge, Massachusetts to gain first-hand information on employment patterns from employers. The research developed in this chapter is utilized in two ways. The employment data are analyzed to identify entry-level jobs for lower skilled workers. Entry-level jobs are considered to be access points and are therefore the key to opening up the IT sector to this population. These data are referenced again in Chapters 5 and 6, where the employment characteristics of entry-level and technical jobs are compared to the employment patterns and job placement strategies identified by temporary employment firms. Thus, a link between IT and temporary employment firms completes the supply-demand loop for entry-level technical workers.

The literature review of national research on the IT industry offers less information on the possibility of employment in IT related occupations for lower skilled workers. Therefore, employment opportunities fabricated by the IT sector need to be examined more closely to understand the gradations in job types and, most importantly, areas where lower skilled workers have the best opportunity for employment. Access to entry-level jobs within the sector is the initial step into the IT industry, however it is also important to find job types that offer mobility out of entry-level work. The survey results are reviewed with these intentions in mind to produce a concise list of job types considered to be quality jobs, yet still attainable by lower skilled workers. Quality jobs are considered to have adequate wages, lower educational and skill requirements, and opportunities for mobility through advancement or training.

In this chapter I set out to answer the following questions.

> *What job types exist in the IT sector and what types are created as the sector continues to grow?*

> *What are the skill and educational requirements needed to fill these jobs?*

> *Based on identified skill and educational requirements, which job types are considered to be entry-level positions relative to other positions in the sector?*

> *How have IT firms developed human resource strategies to address their labor needs?*

> *What are the initial implications for a workforce development policy tailored for the IT sector based upon the findings of the Cambridge case study and national research related to the IT sector employment?*

This chapter relies on a survey that collects quantitative evidence on the employment patterns of IT firms. The information collected through the survey describes the job types, both technical and non-technical, that currently exist within the Cambridge IT firms and the skill and education requirements necessary to fill these positions. A comparison of the reported job types is presented in an effort to identify both technical and non-technical entry-level positions within the sector. Interviews with the human resource managers at two IT firms in Cambridge combined with information on recruiting methods identified from the survey tool address the human resource strategies of firms in the IT sector. The literature presented in Chapter 2 provides additional research in support of the Cambridge survey results. Finally, the chapter concludes with the implications for the employment opportunities of lower skilled workers based upon the reported skill and educational requirements for entry-level job types and the human resource strategies of IT firms.

The information gathered in the case study only reflects jobs in the IT sector. The importance of technical jobs outside of the IT sector has not been forgotten. The Information Technology Association of America (ITAA) report (2001) describes the demand for technical workers in non-IT firms as ten times that of IT firms. In addition, the ITAA found that these jobs do not require the same level of "cutting edge" skills that are demand by IT firms. It would therefore make sense to survey non-IT firms, however information from the study of Cambridge IT firms was readily available. The information learned from the IT sector can be applied to jobs outside of the sector knowing that educational and skill requirements may be overestimated.

## CASE STUDY

As a case study, Cambridge qualifies as an appropriate geographical location for a sectoral study of the IT sector. The city has a concentration of IT firms resulting from spin-off companies started by MIT

and other college graduates. In addition Cambridge has a significant population of well-educated, skilled workers that is attractive for firms requiring this type of labor force. According to the 1990 census, 7.2% of the nation had a graduate degree or higher compared to 30.8% in Cambridge[1]. It is notable that employment in IT firms located in urban areas like Cambridge may be systematically different from employment in firms or branches of firms that are in suburban locations. Cambridge is located in a state that received the highest index rating for the adoption of new technology as referred to in Chapter 2. It also has a reputation as being a high tech city comparable to Silicon Valley in California.

The topics of 'workforce development' and 'skill development' became the focus of the Economic Development Committee of the Cambridge City Council in the summer of 2000. The Director of the Community Development Department of the City of Cambridge and members of the City Council charged the Economic Development Department with a detailed employment profile of "new economy" firms located in Cambridge. The Council wanted to gain a better understanding of the skill and educational requirements in these industries. The report on all new economy firms will be published by the Community Development Department in the summer of 2001. The resulting profile has broad implications for city workforce and job development policy related to new economy sectors.

## Methodology

In response to the council order, the Economic Development Division developed a research strategy. The Cambridge study centered on a survey tool for the collection of information from firms considered part of the new economy[2]. A copy of the survey instrument is in Appendix A. Questions on the survey relate to company job types, number of employees, skill and educational requirements for each job type, projected growth for each job type and the employee recruitment methods of the firm. Firms were identified based upon Standard Industry Classification (SIC) Codes indicating their primary line of business. The selected SIC codes were categorized into four new economy groups: health-related industries, science-related industries (including research & testing, and equipment development), business and professional consulting services, and information technology (IT) industries. The focus of my thesis research is on the data collected from the population of IT firms. Therefore, only a sub-set of SIC codes and the corresponding Cambridge firms representing the IT sector are discussed from this point forward.

The first step in identifying IT firms was to generate a list of the SIC codes associated with the IT sector. Firms with the five SIC codes listed below were included in the population of firms. A list of the four-digit SIC codes that make up each industry group is included in Appendix B.

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[1] Demographics on the City of Cambridge web page: http://ci.cambridge.ma.us.
[2] The sectors chosen as "new economy sectors" correspond with the projected high growth industries for Massachusetts reported by the MA Department of Labor published in *The Massachusetts Job Outlook through 2006* by the Division of Employment and Training for the State of Massachusetts.

## SIC CODES REPRESENTING IT INDUSTRY

➢ Industry Group 357: Manufacturing - Computer and Office Equipment

➢ Major Group 48: Communications - Including telephone, radio and TV

➢ Industry Group 504: Wholesale of Professional and Commercial Equipment

➢ Industry Group 737: Business Services - Computer Programming, Data Processing Services

➢ Industry Group 781: Motion Picture Production and Allied Services

The actual names and addresses of firms were extracted from a database of Cambridge businesses based on 1998 American Business Index (ABI) data. ABI is a private company that researches firms listed in the yellow pages to confirm contact and company information. ABI collects data twice per year. The data include SIC codes for each firm. In the summer of 2000, the 1998 database was updated by City staff to identify businesses related to the SIC codes listed above that were formed after 1998. As part of a mass mailing, 234 IT firms in Cambridge received surveys in December of 2000. A complete list of the number of IT firms selected from the database by SIC code is in the table in Appendix C. The mailing was sent to each firm's president and human resource director with a cover letter written by Cambridge's City Manager. Staff in the Economic Development Department and the Cambridge Chamber of Commerce made follow-up calls in January and February to larger IT firms (over 20 employees) that received a survey in an effort to improve the response rate.

Additional information was gathered through in-depth interviews with human resource staff at two IT firms (more than 25 employees each). One firm is a software design company and the other is a branch of a global web design company. The goal of the two interviews was to supplement the survey data with more information on the hiring process of each firm, types of entry-level positions, promotion opportunities, and the firm's relationships with outside training or labor sources.

## FINDINGS FROM EMPLOYMENT SURVEY OF CAMBRIDGE IT FIRMS

The survey of IT firms in Cambridge yielded 30 responses. The total response rate for the survey is 12.8%, which is within the expected range of 10 to 15 percent for a mail survey. Table 3.1 below describes the type of IT firms that returned surveys compared to the proportion of firm types (type is indicated by SIC codes) in the original population. In both the population and the sample, three quarters of the firms fall in the 737 category representing the majority of firms classified as IT. The SIC codes 357 and 483 do not have any firms represented in the sample, although they are a small percentage of the overall population of IT firms in Cambridge. On the whole, the proportion of SIC codes in the sample represent the population proportions within 3 percentage points.

The relative size of the firms in the population versus the sample is also of interest since the size of a firm may influence its the job structure. In the population 16.6 percent of firms have more than 50 employees and 83.3 percent have less than 50 employees. In the sample, the corresponding percentages are 13.3 percent and 86.7 percent respectively. This is a greater proportion of large firms than prevails nationwide. In 1998 the County Business Patterns data series reported that nationwide, 94.8 percent of firms in the 737 sector had fewer than 50 employees. The majority of IT firms (79.8%) had between one and nine employees. The overrepresentation of large firms in the Cambridge population and sample may be because of the reputation of the city as an IT hub.

**Table 3.1: SAMPLE AND POPULATION INFORMATION OF IT FIRMS IN CAMBRIDGE**

| SIC 4 DIGIT CODE | NUMBER RETURNED | PERCENT OF RETURNS | PERCENT OF POPULATION | DESCRIPTION |
|---|---|---|---|---|
| SIC 357 | 0 | 0.0 | 0.4 | SUBTOTAL COMPUTER, OFFICE EQUIPMENT - MFCT |
| SIC 481 | 1 | 3.3 | 0.4 | SUBTOTAL |
| 4813 | 1 | 3.3 | | TELEPHONE COMMUNICATIONS SERVICES |
| SIC 483 | 0 | 0.0 | 1.7 | SUBTOTAL (RADIO & TV BROADCASTING STATIONS) |
| SIC 484 | 1 | 3.3 | 0.9 | SUBTOTAL |
| 4841 | 1 | 3.3 | | TELEVISION-CABLE & CATV |
| SIC 504 | 2 | 6.7 | 6.8 | SUBTOTAL |
| 5049 | 2 | 6.7 | | LABORATORY EQUIPMENT & SUPPLIES (WHOL) |
| SIC 737 | 23 | 76.7 | 79.6 | SUBTOTAL |
| 7371 | 10 | 33.3 | | COMPUTER SOFTWARE |
| 7371 | 5 | 16.7 | | COMPUTERS-SYSTEM DESIGNERS & CONSULTANTS |
| 7373 | 2 | 6.7 | | WEB SITE DESIGN SERVICES |
| 7374 | 1 | 3.3 | | DATA PROCESSING SERVICE |
| 7374 | 1 | 3.3 | | INTERNET SERVICE |
| 7378 | 2 | 6.7 | | COMPUTERS-SERVICE & REPAIR |
| 7379 | 2 | 6.7 | | COMPUTERS-NETWORKING |
| SIC 781 | 3 | 10.0 | 10.2 | SUBTOTAL |
| 7812 | 2 | 6.7 | | MOTION PICTURE PRODUCERS & STUDIOS |
| 7812 | 1 | 3.3 | | VIDEO PRODUCTION & TAPING SERVICE |
| TOTALS | 30 | 100.00 | | |

## Job types in the IT sector

IT firms reported roughly 98 different job types that employed 631 people in total. In a few instances, answers were incomplete on a survey for specific questions. The top five reported job types by IT firms in Cambridge are *Software Engineer, Web Developer, Accountant, Administrative Assistant,* and *Senior Web Developer* positions. The five most frequently reported job types are shown in Table 3.2, along with the percent each job type represents of the total reported. Firms were also asked to project the number of new jobs created for each job type over the next five years. This information is included in Table 3.3, ranked by the number of projected new jobs. The top five job types for projected growth include more traditional IT jobs compared to the list of job types ranked by current number of employees.

**TABLE 3.2: TOP FIVE REPORTED JOB TYPES**

| JOB TYPE (JT) | COUNT OF EMPLOYEES IN JT | % OF TOTAL |
|---|---|---|
| SOFTWARE ENGINEER | 58 | 9.5% |
| WEB DEVELOPER | 40 | 6.5% |
| ACCOUNTANT | 34 | 5.6% |
| ADMINISTRATIVE ASSISTANT | 30 | 4.9% |
| WEB DEVELOPER SENIOR | 30 | 4.9% |

**TABLE 3.3: FIVE YEAR PROJECTION OF NEW JOBS**

| JOB TYPE (JT) | COUNT OF PROJECTED NEW JOBS | % OF TOTAL |
|---|---|---|
| SOFTWARE ENGINEER | 110 | 15.9% |
| SALES | 38 | 5.5% |
| SCIENTIST | 33 | 4.8% |
| SENIOR SOFTWARE ENGINEER | 25 | 3.6% |
| DATA ANALYST | 25 | 3.6% |

Firms were sporadic in reporting the *projected* number of jobs for each job type so that these counts are less meaningful than the employee counts. However, where firms reported these numbers they consistently estimated job growth for each job type in the firm. Consequently there is a reduced sample size of firms for the projected growth data presented in Tables 3.3 and 3.5. Data from the Division of Employment and Training on projected job growth for the Boston area supplement the data reported by Cambridge firms where necessary.

Analyzing over 90 different job type categories makes it difficult to see patterns in the data because some of the categories only have 2 or 3 employees each. Therefore, the 90 job types were re-categorized into 22 *aggregate job types* (see Table 3.4 for aggregate categories) to facilitate the review of reported information and surface patterns within the data. Job types with similar titles or functions were grouped together. The aggregate job type categories are mostly straightforward, but a few are very general and require a description of the types of positions included in the category. *Management* includes senior level management positions often consisting of department heads. *Administration* includes non-director positions in administration that are higher than an administrative assistant position. It encompasses office managers, personnel staff and executive assistants. *Technicians* include technical support or management positions that are not typically core IT jobs, but require related skills. The most frequently reported positions in this category include network administrators, hardware and software technicians, and data administrators. *Accountant* includes positions with financial or accounting duties at various seniority levels. The more general category of *Analyst* was created to incorporate data analysts, market analysts and systems analysts. The *Graphic* category includes art-related and graphic design positions that required technical software facility. Finally, a variety of *Production* jobs were reported, including production assistant jobs and packagers for products ranging from consulting reports to software applications.

The summary chart of aggregate job types below (Table 3.4) shows the top three reported job types to be *Web Developer, Software Engineer,* and *Management.* The switch to aggregated categories has two effects on the list of top five job types. First, it gives a category more employees by incorporating positions initially reported with distinct titles. For example, *Management* combines 56

23

employees that were scattered previously. This effect also adds *Administration* and *Management* to the list of projected job types reported by firms shown in Table 3.5. The other effect is that the number of reported employees changes due to divisions among stratified positions within one job type. For example, junior, senior or principal positions are very common for engineers, which are counted as engineers in the aggregate category. One limitation of the survey data is that a few of the job type categories (*Web Designer, Data, Graphic Designers, Marketing, Quality Assurance*) had less than five employees, so that reported results on these categories are less meaningful in this analysis.

**TABLE 3.4:**
**JOB TYPES IN CAMBRIDGE IT FIRMS**

| AGGREGATE JOB TYPES | COUNT OF EMPLOYEES IN JT | % OF TOTAL |
|---|---|---|
| *WEB DEVELOPER* | 90 | 14.3% |
| SOFTWARE ENGINEER | 76 | 12.0% |
| MANAGEMENT | 66 | 10.5% |
| ADMINISTRATION | 51 | 8.1% |
| TECHNICIAN | 43 | 6.8% |
| ACCOUNTANT | 41 | 6.5% |
| ACCOUNT EXECUTIVE | 40 | 6.3% |
| ADMIN. ASSISTANT | 31 | 4.9% |
| CONSULTANT | 28 | 4.4% |
| PROJECT MANAGER | 27 | 4.3% |
| SALES | 24 | 3.8% |
| ANALYST | 20 | 3.2% |
| CUSTOMER SERVICE | 19 | 3.0% |
| SCIENTIST | 18 | 2.9% |
| PROGRAMMER | 17 | 2.7% |
| ENGINEER | 12 | 1.9% |
| PRODUCTION | 9 | 1.4% |
| WEB DESIGNER | 5 | 0.8% |
| DATA | 4 | 0.6% |
| GRAPHIC | 4 | 0.6% |
| MARKETING | 3 | 0.5% |
| QUALITY ASSURANCE | 3 | 0.5% |
| **TOTAL** | **631** | **100.0%** |

**TABLE 3.5:**
**FIVE YEAR PROJECTION OF NEW JOBS IN CAMBRIDGE IT FIRMS**

| AGGREGATE JOB TYPES | COUNT OF PROJECTED NEW EMPLOYEES | % OF TOTAL |
|---|---|---|
| SOFTWARE ENGINEER | 148 | 21.4% |
| MANAGEMENT | 125 | 18.1% |
| ADMINISTRATION | 109 | 15.8% |
| TECHNICIAN | 52 | 7.5% |
| ANALYST | 44 | 6.4% |
| SCIENTIST | 42 | 6.1% |
| SALES | 38 | 5.5% |
| ENGINEER | 20 | 2.9% |
| CUSTOMER SERVICE | 17 | 2.5% |
| ACCOUNT EXECUTIVE | 16 | 2.3% |
| CONSULTANT | 15 | 2.2% |
| PROJECT MANAGER | 14 | 2.0% |
| GRAPHIC | 13 | 1.9% |
| ADMIN. ASSISTANT | 12 | 1.7% |
| PROGRAMMER | 10 | 1.4% |
| PRODUCTION | 6 | 0.9% |
| ACCOUNTANT | 4 | 0.6% |
| WEB DESIGNER | 4 | 0.6% |
| MARKETING | 2 | 0.3% |
| WEB DEVELOPER | 0 | 0.0% |
| DATA | 0 | 0.0% |
| QUALITY ASSURANCE | 0 | 0.0% |
| **TOTAL** | **691** | **100.0%** |

Identifying entry-level positions can be approached in two ways. One way to identify "entry-level" positions is to derive a set of IT industry descriptions of the most "junior" positions within firms, for example *Junior Programmer*. Industry reports and the Department of Labor define entry-level occupations in the IT sector as junior positions for core IT jobs. While these job types are in fact junior in skill and education requirement and salary, they do not necessarily accessible for lower skilled workers. To identify employment opportunities for lower skilled workers, a second approach is necessary. As we will see further on in this chapter, employers reported nine entry-level positions with lower education and technical skill requirements. The nine different job types are the following: *Technicians* for hardware or

software support, *Customer Service* or "help desk" support, *Graphic Design, Associate Web Developer*[3], *Data Entry, Quality Assurance* and *Web Design* occupations. *Administrative Assistant* and *Production* jobs are non-technical positions also reported in Table 3.4. This list of nine is referred to throughout the thesis as entry-level jobs.

Chart 3.1

**IT SECTOR EMPLOYEE DISTRIBUTION BY SALARY RANGE**



The job categories listed above lack a range of jobs often related to the upkeep of a building or facility like maintenance staff, security guards, cleaning staff, etc. The human resource manager of an IT firm included in the survey sample responded to a question related to the lack of these positions during a face-to-face interview. He stated that his company does not hire building maintenance staff because they lease their office space and the management company hires a contractor. It seems that this is a likely arrangement for many of the firms sampled, which would explain the lack of these types of positions in the survey data.

**Salary range**

It is well known that the salary levels of IT positions are substantial. A report from the Department of Commerce in June of 1999 confirmed that IT workers have realized faster growth in average annual wages and starting salary offers compared to workers in other sectors like accounting, financial analysis, construction, manufacturing and industrial engineering and research and development (Meares and Sargent, p. 47). The results of the Cambridge survey are reported in Chart 3.1. In Appendix D there is a table listing the frequency of salary ranges for each aggregate job type. The most frequently reported annual salary range for all job types in the sample was $40,000 to $60,000 dollars. The bar graph in Chart 3.1 shows the distribution of employees by salary for the sector, with 54.6 percent of all reported jobs falling between $40,000 and $80,000. The spread of salaries is shifted toward the higher

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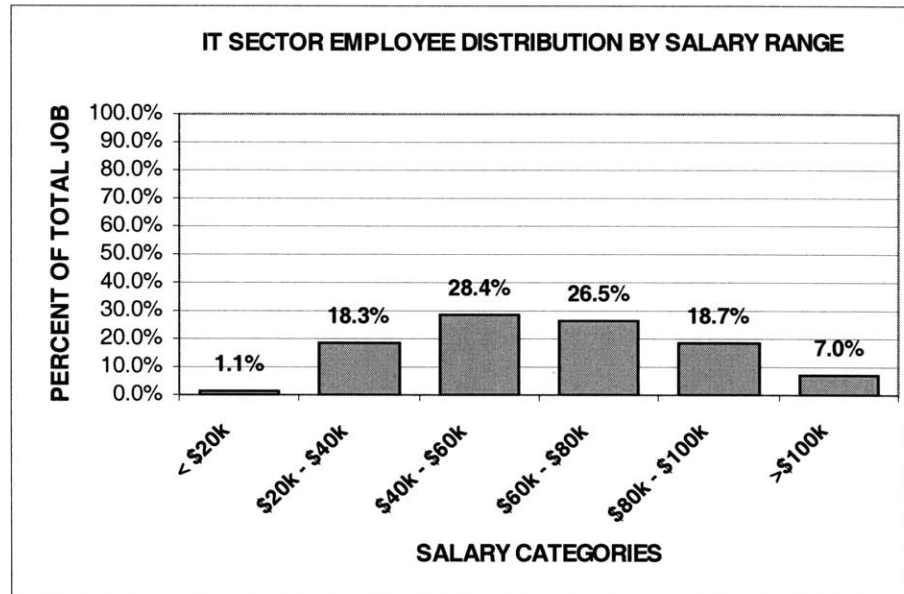
[3] The *Web Developer* job type has three levels of jobs. The lowest level has minimal barriers to entry in terms of technical expertise and therefore is extracted from the aggregate job type and listed separately as *Associate Web Developer*. This position differs from Web Designer in that it requires more knowledge of hosting web sites, not just design skills.

end of the range since more of the remaining jobs fall above the $40,000 to $60,000 range (25.7%) than below (19.3%), with 7.0% earning above $100,000. This distribution of employees at the higher end of the salary range makes the sector attractive, since most workers in the distribution earn enough to meet and support the cost of living in the Boston area. Over 80% of the employees in the distribution make over $40,000 per year compared to the Boston labor market area average annual wages of $48,318[4].

According to the Self-Sufficiency Standard for Massachusetts[5] for 1998, a single mom with two kids in the Boston area needs to earn $39,156 per year to meet the family's basic needs (Pearce,Brooks, and Henze, 1998, p. 6). In contrast, a single person with no dependents would need to earn $15,888 annually to achieve self-sufficiency, well below $40,000 per year.

The distribution of salary ranges across entry-level jobs types depicted in Chart 3.2 shows that *Technicians, Web Designer* (based upon limited number of employees) *and Web Developers* are at the higher end of the salary ranges. In addition, *Technicians* earn a wide range of salaries across employees each job types. Employees working as *Administrative Assistants, Data* related specialists and in *Production* jobs make less compared to the other entry-level jobs. These job types more frequently report salaries $40,000 and below.

**Chart 3.2: Distribution of Salaries for Entry-Level Job Types in Cambridge Firms**



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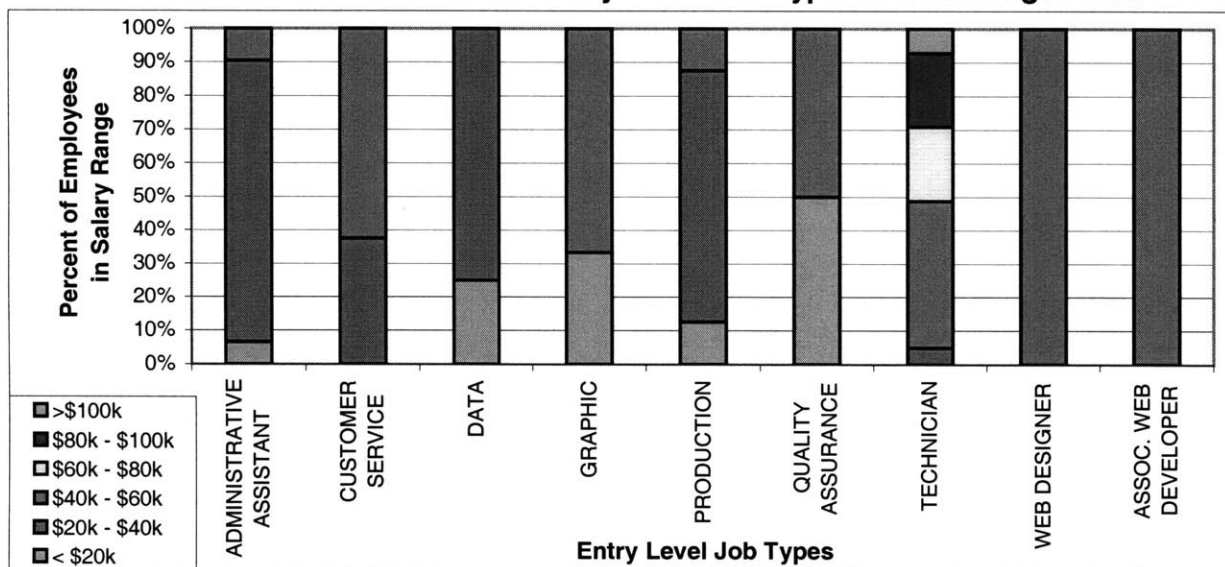
[4] Massachusetts Division of Employment and Training, www.detma.org.
[5] The Self-Sufficiency Standard is different than other poverty measurements in that it looks for a certain income level required in a specific geographic area to be able to have nutritional, housing, health care and day care necessities, or the minimum amount of money to be self-sufficient. The figure is calculated for over 70 different family types.

### Educational requirements

The most frequently reported educational requirement across all job types in Cambridge IT firms was a four-year bachelor's degree (77.3%), followed by a two-year associate's degree (6.8%) taking a distant second place.  Results for all job types in the IT sector are listed in Table 3.6 below.

**Table 3.6: Educational Requirements reported by Cambridge IT firms**

| AGGREGATE JOB TYPES | COUNT OF FIRMS | <HS | HS | ASSOC DEGREE | TECH CERT | VOCED | BACHELOR | MASTERS | DOC | ROW TOTALS |
|---|---|---|---|---|---|---|---|---|---|---|
| ACCOUNT EXECUTIVE | 6 | - | 1 | - | - | - | 39 | | - | 40 |
| | | | 2.5% | | | | 97.5% | | | 100.0% |
| ACCOUNTANT | 11 | - | 2 | - | | 1 | 36 | 1 | - | 40 |
| | | | 5.0% | | | 2.5% | 90.0% | 2.5% | | 100.0% |
| ADMINISTRATION | 16 | - | 2 | 2 | | - | 43 | 2 | - | 49 |
| | | | 4.1% | 4.1% | | | 87.8% | 4.1% | | 100.0% |
| **ADMIN. ASSISTANT** | 15 | - | 5 | 9 | | 2 | 14 | | - | 30 |
| | | | 16.7% | **30.0%** | | 6.7% | **46.7%** | | | 100.0% |
| ANALYST | 9 | - | 2 | - | | | 9 | 4 | 3 | 18 |
| | | | 11.1% | | | | 50.0% | 22.2% | 16.7% | 100.0% |
| CONSULTANT | 4 | | | | | - | 26 | 1 | - | 27 |
| | | | | | | | 96.3% | 3.7% | | 100.0% |
| **CUSTOMER SERVICE** | 10 | - | 2 | 14 | | - | 2 | | - | 18 |
| | | | 11.1% | **77.8%** | | | **11.1%** | | | 100.0% |
| **DATA** | 2 | | | 3 | - | 1 | - | | - | 4 |
| | | | | **75.0%** | | 25.0% | | | | 100.0% |
| ENGINEER | 7 | | - | - | 5 | - | 6 | | - | 11 |
| | | | | | **45.5%** | | 54.5% | | | 100.0% |
| **GRAPHIC** | 4 | | - | 1 | | - | 3 | | - | 4 |
| | | | | 25.0% | | | **75.0%** | | | 100.0% |
| MANAGEMENT | 33 | | 4 | 2 | | - | 37 | 7 | | 50 |
| | | | 8.0% | 4.0% | | | 74.0% | 14.0% | | 100.0% |
| MARKETING | 2 | | - | | | - | 2 | | - | 2 |
| | | | | | | | 100.0% | | | 100.0% |
| **PRODUCTION** | 8 | - | 2 | | | 1 | 6 | | - | 9 |
| | | | 22.2% | | | 11.1% | **66.7%** | | | 100.0% |
| PROGRAMMER | 2 | - | - | - | | - | 16 | | - | 16 |
| | | | | | | | 100.0% | | | 100.0% |
| PROJECT MANAGER | 7 | - | - | | | - | 24 | 2 | - | 26 |
| | | | | | | | 92.3% | 7.7% | | 100.0% |
| **QUALITY ASSURANCE** | 3 | - | 1 | - | | - | | | - | 1 |
| | | | **100.0%** | | | | | | | 100.0% |
| SALES | 8 | | 2 | 8 | | - | 13 | | - | 23 |
| | | | 8.7% | 34.8% | | | 56.5% | | | 100.0% |
| SCIENTIST | 6 | | | | | - | 5 | 6 | 7 | 18 |
| | | | | | | | 27.8% | 33.3% | 38.9% | 100.0% |
| SOFTWARE ENGINEER | 19 | | | - | 4 | - | 61 | 6 | 4 | 75 |
| | | | | | 5.3% | | 81.3% | 8.0% | 5.3% | 100.0% |
| **TECHNICIAN** | 29 | - | 6 | 2 | 3 | 1 | 21 | 2 | - | 35 |
| | | | 17.1% | 5.7% | 8.6% | 2.9% | **60.0%** | 5.7% | | 100.0% |
| **WEB DESIGNER** | 3 | - | 3 | - | - | - | 1 | | - | 4 |
| | | | 75% | | | | **25%** | | | 100% |
| **ASSOC. WEB DEVELOPER** | 4 | | - | - | | - | 20 | | - | 20 |
| | | | | | | | **100%** | | | 100.0% |
| WEB DEVELOPER | 1 | | - | - | | - | 80 | | - | 80 |
| | | | | | | | 100.0% | | | 100.0% |
| **COLUMN TOTALS (COUNT)** | | 0 | 32 | 41 | 12 | 6 | 464 | 31 | 14 | 600 |
| **COLUMN TOTALS (PERCENT)** | | 0.0% | 5.3% | 6.8% | 2.0% | 1.0% | **77.3%** | 5.2% | 2.3% | 100.0% |

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The Information Technology Association of America (ITAA) found that the best way to acquire the necessary skills for the IT industry was in a four-year college degree or a vendor/industry certificate program (2001). In the same report, IT firms rated technical certifications equally important to a four year degree, while non-IT firms saw certifications as less important than a four year degree.

In the survey results for this case study the job types that most frequently employ workers with less than a bachelor's degree (HS diploma, Associates or Technical Certificate) are *Customer Service, Quality Assurance, Data Management,* and *Web Design* positions. The *Administrative Assistant* category shows almost an equal number of employees split between Bachelor's and Associate's degrees. Since these positions are not considered core-IT positions it is not surprising that they are willing to hire workers with less educational credentials. The three entry-level job types show a higher concentration of bachelor's degree are *Production, Graphic* (Design) and *Technicians* positions, although similar to the salary patterns, the education requirements for *Technicians* is more broadly distributed.

## Skill requirements

To get a sense of what skills employers desire for each job type, the survey asks respondents to check off the three most important skill requirements for each job type from a list provided. The results of this question show that the three most frequently reported skill requirements across all aggregate job types in the IT sector are *critical thinking* (17.5%), *industry-specific knowledge* (15.3%) and *computer programming* (13.7%). The next two skill requirements are *verbal communication* (13.1%), closely following the top three, and *customer service* (6.6%). Interestingly *computer programming* and *industry specific knowledge* are the only "technical" type skills in the list of top five (although one could argue that *critical thinking* is a technical skill typically learned in scientific deduction at a high school level). A detailed breakdown of skill requirements for each job types is listed in Appendix E.

The highlighted columns of the table in Appendix E are designated as technically oriented skills. The last column of the table calculates a "technical index" for each job type. The technical index represents the percent of total reported skills for each job type that are classified as technical skills, thus showing the degree to which reported skill requirements for the job type are technical. The job types that have significant technical requirements for entry (a percentage over 50) are *Software Engineer, Technician, Consultant, Scientist, Programmer, Engineer,* and *Web Design* and *Graphic Design* (the *Web* and *Graphic* job type is based on a small number of reports). As a lower skilled worker, these job types would therefore require considerable technical education or skill training to be hired. However, of the six job types typically viewed as entry-level jobs by the IT sector – *Associate web Developer, Customer Service (help desk), Technician, Data, Graphic,* and *Quality Assurance* – four job types have a technical index under 50 and may have less significant barriers to entry for non-technical workers, namely, *Customer Service, Data Management, Associate Web Developer,* and *Quality Assurance.* Basic

*Production* and *Administrative Assistant* jobs also received a lower technical score. These findings underscore the notion that jobs that utilize or manage information technology products and services require less technical skill compared to core IT jobs.

Table 3.7 highlights the set nine entry-level job types and the skill requirements reported for each job type. An examination of the skill requirements for only entry-level only job types reveals the same skill requirements in terms of importance, but the top three now rank in a different order. *Verbal communication*, a soft skill, replaces computer programming as one of the top three skill requirements. Employers report *Industry specific-knowledge, verbal communication* and *critical thinking* as most important for entry-level positions. Therefore lower skilled workers wishing to access these jobs need to have the following qualifications: work experience, the ability to communicate verbally (proficiency in English at the least) and be able to think critically, which typically suggests problem solving. The absence of computer programming in the top three is an advantage for low skilled workers interested in entry-level employment in the IT sector.

These skill requirements of positions in the IT sector may be the key to unlocking access to these positions for people who do not have a four year bachelor's degree. Additionally, as explained in chapter 5, several recruiters in Boston area temporary employment firms state that a technical degree combined with industry experience is an adequate substitute for a four-year degree. Therefore, technical training and skill acquired on the job allow for an educational substitution.

The frequency of reported skills requirements like *customer service* and *verbal communication* puts emphasis on "soft skill" in the workplace. Soft skills are generally referred to as social and behavioral traits of a worker as opposed to formal technical knowledge. Philip Moss and Chris Tilly (2001) further divide soft skill into two categories pertaining to interaction or motivation skills. The degree to which soft skills are important to employers means that it might not be enough to just have the technical capacity for work. Employees must also be able to fit into the professional norms of a work environment, reflected by the way a person interacts and responds to work. Within the IT sector, human resource managers often report a tendency to hire employees who work well in a younger, dynamic environment with long work hours (Meares and Sargent, 1999). Since the assessment of soft skill is mostly subjective, the hiring manager's perception of a worker's profile vastly influences who is recruited and hired. The subjectivity of soft skills puts limitations on the type of worker hired for jobs in the IT sector.

**TABLE 3.7: Skill Requirements for entry-level job types in Cambridge IT firms (Highlighted columns equal technical skill)**

| AGGREGATE JOB TYPE | ADMINISTRATIVE | COMPUTER PROGRAMMING | CRITICAL THINKING | CUSTOMER SERVICE | DATA ANALYSIS | FINANCIAL/ACCOUNTING | GRAPHIC DESIGN | INDUSTRY-SPECIFIC KNOWLEDGE | MANAGEMENT | MARKETING/SALES | MATH | MUSICIAN | SCIENTIFIC LAB | SPREADSHEET ANALYSIS | VERBAL COMMUNICATIONS | WORD PROCESSING | WRITING | ROW TOTALS | TECHNICAL INDEX (PERCENTAGE) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TECHNICIAN | 3 | 16 | 12 | 9 | - | 2 | 4 | 23 | 2 | 4 | - | 1 | - | 2 | 11 | - | 5 | 94 | |
|  | 3.2% | 17.0% | 12.8% | 9.6% | - | 2.1% | 4.3% | 24.5% | 2.1% | 4.3% | - | 1.1% | - | 2.1% | 11.7% | - | 5.3% | 100% | 100% |
| CUSTOMER SERVICE | 1 | 1 | 1 | 13 | 4 | - | - | 10 | - | 1 | - | - | - | - | 4 | - | - | 35 | |
|  | 2.9% | 2.9% | 2.9% | 37.1% | 11.4% | - | - | 28.6% | - | 2.9% | - | - | - | - | 11.4% | - | - | 100% | 42.9% |
| ADMIN. ASSISTANT | 10 | - | 15 | 7 | - | 3 | - | 1 | - | - | - | - | - | 17 | 21 | 21 | 15 | 110 | |
|  | 9.1% | - | 13.6% | 6.4% | - | 2.7% | - | 0.9% | - | 0.0% | - | - | - | 15.5% | 19.1% | 19.1% | 13.6% | 100% | 16.4% |
| PRODUCTION | 3 | - | 1 | 2 | - | - | 1 | 7 | 2 | 1 | - | - | - | - | 5 | 2 | 1 | 25 | |
|  | 12.0% | - | 4.0% | 8.0% | - | - | 4.0% | 28.0% | 8.0% | 4.0% | - | - | - | - | 20.0% | 8.0% | 4.0% | 100% | 32.0% |
| GRAPHIC | - | 1 | 3 | - | - | - | 4 | 1 | 1 | - | - | - | - | - | - | - | - | 10 | |
|  | - | 10.0% | 30.0% | - | - | - | 40.0% | 10.0% | 10.0% | - | - | - | - | - | - | - | - | 100% | 60.0% |
| WEB DESIGNER | - | 3 | - | - | - | - | 3 | - | - | - | - | - | - | - | - | - | - | 6 | |
|  | - | 50.0% | - | - | - | - | 50.0% | - | - | - | -- | - | - | - | - | - | - | 100% | 100.0% |
| ASSOC. WEB DEVELOPER | 0 | 20 | - | - | - | - | - | 20 | - | - | - | - | - | - | 20 | - | - | 80 | |
|  | - | 25.0% | 25.0% | - | - | - | - | 25.0% | - | - | - | - | - | - | 25.0% | - | - | 100.% | 48.8% |
| DATA | 1 | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | 3 | |
|  | 33.3% | - | - | 33.3% | - | - | - | - | - | - | - | - | - | - | - | 33.3% | - | 100% | 0.0% |
| QUALITY ASSURANCE | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 | |
|  | - | - | 100% | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 100% | 0.0% |
| **TOTALS** | 18 | 41 | 53 | 32 | 4 | 5 | 12 | 62 | 5 | 6 | 0 | 1 | 0 | 19 | 61 | 24 | 21 | 364 | |
| **PERCENTS** | 4.9% | 11.3% | 14.6% | 8.8% | 1.1% | 1.4% | 3.3% | 17.0% | 1.4% | 1.6% | - | 0.3% | - | 5.2% | 16.8% | 6.6% | 5.8% | 100% | |
| Order of Importance | | 4 | 3 | 5 | | | | 1 | | | | | | | 2 | | | | |

## Employer sponsored training opportunities

Of major importance to the quality of entry-level jobs is the ability to move into higher skilled, better paying positions. Employer-sponsored training is a factor that often influences a worker's mobility out of entry-level work. Cambridge IT employers report varying patterns of employer-sponsored training for job types in the IT sector. Table 3.8 calculates the number of employees with access to employer sponsored training for each job type. Across all job types only 25.2 percent of employees had access to training in 2000. Some of the job types at the top of the list showed 60 percent or more of employees with access to training, but these percentages decline further down, in which training for the last five job types drops to zero. Entry-level job types are in bold in the table. Most entry-level jobs received training at frequencies close to or above the sample-wide average. Several entry-level job types (*Quality Assurance, Programmer, Graphic Design, Consultants*) did not have access to training. However, this percent represents only one employee whose employer filled out the section related to training and ranks them form those most likely to receive training to those least likely to be trained.

**Table 3.8:**
**Employer-sponsored Training in Cambridge IT Firms by Job Type**

| AGGREGATE JOB TYPE (JT) | TRAINING OFFERED? | | TOTAL EMPLOYEES | % EMPLOYEES WITH TRAINING |
|---|---|---|---|---|
| | N | Y | | |
| MARKETING | 1 | 2 | 3 | 66.7% |
| **CUSTOMER SERVICE** | 7 | 11 | 18 | 61.1% |
| ENGINEER | 5 | 6 | 11 | 54.5% |
| **ADMINISTRATIVE ASSISTANT** | 7 | 8 | 15 | 53.3% |
| **PRODUCTION** | 6 | 3 | 9 | 33.3% |
| SCIENTIST | 13 | 5 | 18 | 27.8% |
| SALES | 13 | 5 | 18 | 27.8% |
| ANALYST | 13 | 5 | 18 | 27.8% |
| **DATA** | 3 | 1 | 4 | 25.0% |
| **TECHNICIAN** | 23 | 7 | 30 | 23.3% |
| ACCOUNTANT | 8 | 2 | 10 | 20.0% |
| **ASSOC. WEB DEVELOPER** | 16 | 4 | 20 | 20.0% |
| ADMINISTRATION | 29 | 5 | 34 | 14.7% |
| WEB DEVELOPER | 70 | 10 | 80 | 12.5% |
| SOFTWARE ENGINEER | 67 | 8 | 75 | 10.7% |
| MANAGEMENT | 46 | 4 | 50 | 8.0% |
| PROJECT MANAGER | 25 | 1 | 26 | 3.8% |
| ACCOUNT EXECUTIVE | 39 | 1 | 40 | 2.5% |
| **WEB DESIGNER** | 4 | 0 | 4 | 0.0% |
| **QUALITY ASSURANCE** | 1 | 0 | 1 | 0.0% |
| PROGRAMMER | 16 | 0 | 16 | 0.0% |
| **GRAPHIC** | 4 | 0 | 4 | 0.0% |
| CONSULTANT | 27 | 0 | 27 | 0.0% |
| **Totals** | | 134 | 531 | 25.2% |

Training patterns differ widely across the survey sample. However, one trend is apparent in the data, showing that roughly one quarter of the employees in core IT positions have access to training, with

the exception of engineers. National research on training in the IT sector suggests there are at least two major disincentives to training workers in the IT sector, especially for "hot" skills (Meares and Sargent, 1999; ITAA, 2001; Atkinson and Randolph, 1998). First, if a firm pays for skills training it only improves a worker's ability to be mobile within the labor pool at the firm's expense thus increasing employee turnover. This trend occurs in other sectors but is more pronounced in the IT sector due to the strong demand for these types of skills and high turnover rates among employees, especially for highly skilled core IT jobs.

The second disincentive to training workers with IT skills relates to the nature of the work at IT firms, or firms that use IT in their business processes. Employers want an exact match between a job description and the skills of a worker. IT firms and businesses that use these products and services compete based upon efficiency, turn-around time and flexibility in production. They do not have the time to train employees because production tends to occur in short term project schedules. Essentially, there is no time for hand-holding. "Many companies are demanding IT people that are an exact fit with their job descriptions," says Kelly Carnes, assistant secretary designate for the Department of Commerce (Mateyaschuk, 1999, p. 2). Employers feel training domestic workers is less advantageous than importing cheaper and more qualified labor from abroad.

National trends in the IT sector related to training show that workers already possessing higher levels of education or skill are more likely to be trained (Meares and Sargent, 1999). A MassInc report on *The New Skills for a New Economy* found that the workers with the strongest skills receive occupational training (Comings et. al, 2000). However, the Cambridge survey results show no definitive pattern in training for entry-level job types compared to technically oriented jobs. For example, in Table 3.8 we see that training for *Customer Service* and A*dministrative Assistant* near the top of the list, where *Software Engineer* is near the bottom.

One of the human resource directors at a Cambridge IT firm communicated a positive attitude toward on-the-job training and promotion to new job positions. He said he almost always promotes internally before looking for outside applicants and cited an example of an administrative assistant who showed initiative in learning technical skill on her own and is now part of the web development staff. The HR director stated that this often happens with employees that come into the company without technical skill. The firm does not offer much formal training (classes on specific skills) but encourages self-tutorial training on the technical aspects of each job type that are rapidly changing. Employees that want to learn new skills are strongly encouraged to approach other staff with questions. The firm offers training opportunities to about 20% of its employees, below the sample average of 25.2%, but employees have access to a considerable amount of informal training for all positions.

This company expects that all of the employees will not know 20 to 30 percent of their job. Due to the changing nature of the web development tools, employees need to learn their job as they go along. Therefore, the HR director often hires employees that lack some of the expected technical skill if the person is an adept learner and is comfortable in a job that is continually in motion. The HR director said that if a candidate cannot tell him how s/he learns most effectively, the candidate does not get the job. Once again, the HR director's perception of an applicant is crucial. This particular director is the gatekeeper to jobs that allow for technical development and promotion within the firm.

**Entry-level positions**

From the wide range of employment in the IT sector it is possible to identify entry-level positions that present less technical and educational barriers to entry compared to core IT occupations. The entry-level jobs in earlier sections of this chapter are now summarize and compared as a group. Previously, a list of nine entry-level job types consisting of *Administrative Assistant, Customer Service, Technician, Associate Web Developer, Web Designer, Data Management, Graphic* and *Quality Assurance* positions were defined as entry-level job types according to job requirements. Issues of advancement and training enter into the following discussion of the nine entry-level job types for a more in-depth comparison of access (skill and education requirements) and job mobility for each of these job types.

The amount of technical skill required by job types in this sector is the toughest barrier to employment. Table 3.9 summarizes the technical ratings for entry-level jobs identified by the IT sector along with other characteristics about each job type.

**Table 3.9: Characteristics of Entry-level Job Types in Cambridge IT Firms**

| AGGREGATE JOB TYPE | TECHNICAL PERCENTAGE | SALARY RANGE (Highest % of jobs) | % REPORTING ABILITY TO ADVANCE | % REPORTING EMPLOYER TRAINING | PROJECTED JOB GROWTH IN CAMBRIDGE |
|---|---|---|---|---|---|
| WEB DESIGNER | 100.0% | 40-60 | 100% | 0% | 31 |
| GRAPHIC | 60.0% | 40-60 | 75% | 0% | 102 |
| ASSOC. WEB DEVELOPER | 48.8% | 60-80 | 100% | 20% | 0 |
| TECHNICIAN | 47.9% | 40-60 | 74% | 23.3% | 406 |
| CUSTOMER SERVICE | 42.9% | 40-60 | 18.0% | 61.1% | 133 |
| PRODUCTION | 32.0% | 20-40 | 33% | 33.3% | 47 |
| ADMIN. ASSISTANT | 16.4% | 20-40 | 87% | 53.3% | 94 |
| DATA MANAGEMENT | 0.0% | 20-40 | 100% | 25.0% | 0 |
| QUALITY ASSURANCE | 0.0% | 40-60 | 100% | 0% | 0 |
| | | | | TOTAL | 813 |

The most obvious pattern shown in Table 3.9[6] is that the job types that pose the least technical barriers also pay the least in the $20,000 to $40,000 dollar range, with the exception of the one reported *Quality Assurance* job. Recalling the Self-Sufficiency Standard cited earlier in the chapter, a single person could survive even at the lowest end of this income level, but the single mom with two kids requiring $39,000 in 1998 would struggle financially even after progressing to the top of the salary range. Promotion out of entry-level work is therefore necessary. One encouraging finding shown in Table 3.9 is that those positions with the least technical barriers (a technical index less than 50%) also report more access to training.

Technical skills are not the only challenge. As shown in Table 3.7, two of the top five required skill requirements across the IT sector (*customer service, verbal communication*) suggest that employers expect workers to have a basic command of English and knowledge of professional behavior with customers and coworkers. Both of the HR directors interviewed in-depth stressed the need to understand and speak English. One HR director interviewed in-depth stated that *almost* ahead of technical skill, he evaluates the ability of an applicant to fit into the work environment. When asked to describe this environment he said it is "a very fun, creative, happy and energetic" office. It is not a sweatshop of software and web development. In fact, he said the employees are bright and talented people who could easily find more money or another job if they did not enjoy their work environment. The requirement of English and the need to fit into a professional work environment reduce the chances of the least skilled workers finding employment in these types of jobs.

Employers reported an interesting pattern of training when entry-level jobs are isolated from all IT sector jobs. Job types with less than a 50 percent technical score report access to employer sponsored training while those with the highest technical index report 0 percent access to training. The position offering the highest percentage of employer-sponsored training, *Customer Service*, also shows the least opportunity for advancement. All of the job types report more than 75 percent of employees who have the opportunity for advancement except for *Customer Service* and *Production* jobs. These positions are generally thought to have more technical requirements than *Customer Service* or *Production* positions, but this does not hold true in the sample. Training for less technical positions may indicate a willingness on the part of employers to offer training for general skill but not technical. This tendency is consistent with national reports on the disincentives for employers to provide IT training. Employers state that employees who receive IT skill training are increasingly marketable and may leave once they are trained.

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[6] Projected job growth was calculated by dividing the number of new jobs reported for each job types by the response rate (.128) to determine the number of new jobs created by the firms in the population. This calculation does not take into account the births or deaths of firms.

In addition, they often need employees with a specific skill set but do not have time to wait for an existing employee to go through training.

One bright spot in the Cambridge sample is the number of entry-level positions that report advancement opportunities once workers enter the sector. Except for *Customer Service*, nearly 75 percent of all other entry-level job types reported the opportunity for advancement within the firm. Two of the IT firms interviewed in person express a willingness to promote from within if their existing employees had the proper skill sets. In-house promotions were seen as advantageous because a promoted employee already knows the culture of the firm and has established their ability to fit in with coworkers. In other words, for these two firms, internal promotions are a likely occurrence if they have the qualified staff in-house. There are additional occupation steps or opportunities for advancement if entry-level technical workers are able to advance to entry-level core IT positions. For example, if a database manager trains as a junior programmer and switch occupations a new job ladder is opened up. Nationally within the IT sector the ITAA survey (2001) found that 81 percent of firms had at least one level of advancement for the IT core positions described earlier.

Table 3.9 includes an estimate of the number of new jobs for each entry-level position for the population of Cambridge IT firms over the next five years. The estimated number of new entry-level jobs created by the IT sector in Cambridge is 813, not a large number of jobs over the next five years. The Information Technology Association of America (ITAA) reported an industry-wide slowdown in the demand for entry-level IT workers compared to five years ago or even last year. However, this does not mean that entry-level jobs will disappear or cease to grow in number. The Massachusetts Division of Employment and Training (DET) reports strong, healthy projections for three of the entry-level positions. The other job types were not specifically listed in the data available through the DET. *Technician* positions (computer support specialists) are expected to increase from 18,360 to 34,540 in the Boston PMSA between 1998 and 2008. This occupation represents a significant number of jobs for the area as well as an impressive growth rate of 88.2%. The average annual salary for computer support specialists for the area was $39,000 in 1998. *Database Administrators*, although smaller in number, are projected to grow by 43.9% to reach a total of 4,190 employees in 2008. Workers in these positions were earning an average annual salary of $48,027. Lastly, *Desktop Publishers* (part of the *Graphic* job type) made $39,624 annually and were projected to increase 55.3% over the ten-year period for a total of 970 employees.

## Staffing and recruitment methods

The survey of Cambridge IT firms polls human resource managers on their general recruitment methods for all of the job types in the firm, but does not look at recruitment methods for each job type

specifically. A question on the survey asked for the two most useful ways in which the firm recruits employees. The results listed in table 3.10 show Cambridge IT firms most frequently reported recruiting employees through personal referrals and the Internet job boards. The reliance on personal recommendations of prospective candidates highlights the importance of personal networks in finding employment in these firms. Both of these methods could pose problems for lower skilled workers who are often unconnected to the Internet for lack of a personal computer, and whose personal network most likely lacks IT employers.

**TABLE 3.10**

| REPORTED RECRUITMENT METHODS OF CAMBRIDGE IT FIRMS | | |
|---|---|---|
| METHOD MENTIONED[7] | FREQUENCY | PERCENT OF TOTAL MENTIONS |
| RECOMMENDATION | 14 | 31.8% |
| INTERNET | 14 | 31.8% |
| NEWSPAPER | 6 | 13.6% |
| TEMPORARY AGENCY | 5 | 11.4% |
| SIGN IN WINDOW | 1 | 2.3% |
| JOB FAIR | 1 | 2.3% |
| CAMBRIDGE COMMUNITY COLLEGE | 1 | 2.3% |
| CAREER SOURCE[8] | 1 | 2.3% |
| OTHER | 1 | 2.3% |
| TOTAL | 44 | 100.0% |
| Source: Survey sample of Cambridge IT Firms, 2000 | | |

Recruitment activity through temporary employment agencies was reported almost as frequently as traditional newspaper advertisements. The two in-depth interviews with IT human resource directors highlight the importance of recruitment through temporary staffing agencies. The directors both utilize temporary and contract employees for cyclical work. One firm stopped using large national agencies because the HR director feels they do not get the personal attention needed. Smaller "boutique" specialty staffing firms have typically provided employees that better fit the company's work environment and possess skill needed by the firm.

National survey data suggest an even more prominent role for staffing agencies. A national poll conducted by *Computerworld* found that 15 percent of IT managers found needed skilled labor through in house training or advancement, while 37% of new hires were made through placement firms and headhunters (Meares and Sargent, 1999). In this study, newspaper, print ads, and referrals were reported 17 percent of the time and Internet ads were reported the least at 14 percent.

Additional information on the recruiting methods of IT firms recruit will be reviewed in the following chapters on the staffing industry.

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[7] Survey respondents were asked what the two most successful recruiting methods.
[8] Career Source is a government sponsored center that receives Workforce Investment Act money for operations.

## SUMMARY AND IMPLICATIONS FOR WORKFORCE DEVELOPMENT POLICY

Before developing policy recommendations related to the IT sector set out in Chapter 6, it is necessary to review the survey results and extract implications relevant to workforce policy. The implications of greatest concern speak to the employment workers not traditionally in these types of jobs, including many women and minorities. Most of the implications introduce the challenge of breaking down significant education and skill barriers for lower skilled workers. An interpretation of the survey results and additional research previously reviewed forms the basis for the implications outlined in the sections below. This information is organized into four topic areas: entry-level job types, education, skills, and training.

### Entry-level Job Types

➤ **The core IT sector contains only a small number of entry-level jobs.** The survey results showed that *Administrative Assistant* (4.9%), *Customer Service* (4.1%), D*ata Management* (0.9%) and *Quality Assurance* (0.7%) positions are small percentages of the total number of employees in the sample. These jobs are important as entry-level positions because they have less technical requirements than other entry-level positions in the survey sample. The other categories of entry-level work that are more technical in nature do not make up a large percentage of the total work force either: T*echnicians* at 8.2%, *Production* at 2.0%, *Web Design* at 1.1%, *Web Developer* and *Graphic* at 0.9%. Additionally, national reports on entry-level IT positions show a decline in the number of jobs.

➤ ***Data management, Quality Assurance* and *Web Developers*** report the greatest opportunity for advancement and lower technical barriers to entry.

➤ **Even entry-level IT jobs with few or no technical qualifications may be inaccessible to many disadvantaged job-seekers** due to employers' preferences for basic verbal communication and soft skills.

➤ **The number of small firms in the IT sector poses additional issues for the amount of entry-level positions usually found in the internal labor markets of larger firm.** Therefore, larger firms in the IT sector most likely offer more employment options for lower skilled workers.

### Education

➤ **Core IT jobs in the survey sample most frequently reported workers that held a Bachelor's level education.** Therefore, lower skilled, high school educated workers are unlikely to obtain such

jobs without additional education or an acceptable substitute for education. The need for a Bachelor's degree was also corroborated by the national ITAA study.

➢ The **greatest percentage of employees with an associate's degree or high school diploma were in entry-level positions** of *customer service*, *data manager*, *quality assurance* and *web designer*.

**Skill**

➢ **Industry-specific experience is still one of the most important hiring requirements.** This was one of the top three requirements reported by Cambridge employers. One implication of the need for industry experience is that workers freshly trained in the latest skill set may still experience trouble finding a job without networks to employers or a work history in the field. A worker trained in graphic or web design still needs a portfolio, and a programmer needs examples of code or previous work "product."

➢ **Employers want workers with experience who can "hit the ground running" and possess an exact package of skills.** The mix of knowledge and skills varies from one IT position to another, making it difficult for employers to find, assess, and hire employees with the right mix of skills, such as Java programmers, and computer security, and E-commerce specialists (Mateyaschuk, 1999, p. 2).

➢ **Core IT positions have steeper technical skill requirements** than non-core IT positions. This is seen in the review of national research on the need for workers with "cutting edge" IT skills and in the higher technical requirement percentages for core IT jobs reported in the survey sample including *Software Engineer* (71.8% technical index), *Scientist* (75.9%), *Programmer* (66.7%), *Engineer* (78.8%) and *Web Designer* (100%).

➢ **Soft skills are as important as technical skills** for both core and non-core IT positions. The survey sample reported verbal communication and customer service in the top five skill requirements across all job types in the sector. This is especially true for entry-level job types in Cambridge IT firms. Many technical training program graduates have been the victim of this reality. While they successfully train for technical skill, graduates experience trouble finding jobs if they are perceived to lack "soft skills" that would ensure their success in the professional environment. Older technical workers also experience discrimination in hiring for core IT positions because they are perceived as unable to handle a "young" and fast-paced work environment (Meares and Sargent, 1999; interview with Boston area temp firm on 3/29/01).

**Training and Advancement**

➤ **Training in the IT sector is relatively infrequent for technical positions** as seen in the survey sample and according to other research reports. The disincentive to train workers IT skills combined with competitive timelines reduce the opportunities for employee training, especially at the lower end of the job ladder.

➤ **The colossal "jump" in skill and education requirements for core IT positions are significant barriers for lower skilled workers** and may not be addressed by workforce training policy unless it considers a K-12 education component. At the minimum, it takes eight years of additional schooling after high school to get a degree as a computer scientist or four years to obtain a Bachelor's degree in a core IT occupation (systems analyst). This type of investment is both time consuming and financial prohibitive for a typical workforce development training program or national government program.

➤ **The importance of "industry-specific knowledge" reported in the survey sample suggests that experience in a non-core IT job or in the IT sector in a non-technical job would complement technical training** for core IT positions at the entry-level.

➤ **Except for Customer Service, nearly 75 percent of all other entry-level job types reported the opportunity for advancement within the firm.** The job types that reported advancement opportunities 100 percent of the time include, *Web Designer, Associate Web Developer, Data Management* and *Quality Assurance*. Combined with internal or external training, these positions offer excellent opportunities to advance.

# CHAPTER 4: TEMPORARY EMPLOYMENT AND THE LABOR MARKET
## The Changing Role of a Labor Market Intermediary

*"If the temporary help industry's claim that 30 percent of its temporary employees get full-time jobs as a result of temporary placements is even roughly accurate, then temporary work has become a critical way-station to permanent work and a job search strategy of significance in the American labor market."*
Dorie Seavey and Richard Kazis, 1994, p. 1.

Having just heard the story of labor demand from IT employers, it is time to turn to the employee, or supply side, of the overall picture of the IT sector. In addition to the research on job types created within the IT sector reviewed in Chapter 3, a discussion of employment prospects for lower-skilled workers must acknowledge the way in which these jobs are filled. In asking the questions, how do people get jobs, or how do firms find workers, one does not *immediately* think of the temporary employment industry. There are several key reasons why further investigation of the temporary employment industry and its influence on the ebb and flow of jobs in the economy is warranted. Other researchers have already begun to document the emergence of the temporary employment firms as a labor market intermediary, in an effort to derive the "best practices" of the industry and relate them to public employment strategies (Seavey and Kazis, 1994; Bugarin, 1998; Cohany, 1998).

What is temporary employment? This type of work arrangement differs from traditional or independent contractor employment in the following ways. An independent contractor is usually a self-employed person who signs a contract with a firm to work for a certain period for a fee paid directly to the employee. Traditional employment is an arrangement in which a firm hires or fires a worker directly, on either a part-time or full-time basis, and maintains all management aspects for the employee including payroll. A temporary employee is hired by a staffing firm to work for another firm or government agency. Temporary employees are paid, hired, fired, and trained by the temp firm, but the business customer and the temp firm share management of the employee. While the length of a particular work assignment with a customer firm may be short term, a temporary employee is under contract with a staffing firm for as long as they both agree, and therefore can generally expect to work a regular set of hours per week. The important distinction of the temporary employment industry is the triangular relationship between a temp firm, a business customer and the temporary employee (Seavey, 1994). Because of this relationship, a temporary employment firm is the intermediary between worker and employer. The temporary employment industry has capitalized on its position as a selling point to both employers and customers. This is a major reason for including it in a discussion on workforce development policy.

The temporary employment industry may also be important to the workforce development puzzle with respect to the debate over whether *training* or *employment* is more effect successful in improving the employment prospects of lower-skilled workers. Some policy makers argue that work experience and quality network contacts created on the job may be more beneficial to lower skilled workers than existing training opportunities (Bugarin, 1998; Freedman, 1996). Although this debate is beyond the scope of this thesis, if in fact immediate employment is an effective catalyst toward lasting employment, temporary employment firms have cornered the market. The research presented in the next chapter speaks to the characteristics of employment opportunities throughout the industry.

This chapter begins with a discussion of general theory on how labor market intermediaries function in order to examine the increasing role of the temporary employment industry in this position. The next section is a brief description of the history of temporary employment in the US labor market; this is later compared to more recent growth patterns and trends in the industry. This context highlights the new role of the industry and the motivating factors behind its shifting role. Finally, the chapter ends with the theoretical and practical policy issues related to the increasing use of temporary employment. Chapter 5 continues the discussion of temporary employment and draws out lessons for workforce development policy related to lower skilled workers gleaned from the strategies and activities of Boston area temporary employment agencies.

## THE ROLE OF LABOR MARKET INTERMEDIARIES

Labor market intermediaries are the link between workers and employers. Intermediaries can play either an active or passive role. Active intermediaries include job counselors, career centers, temporary employment firms, head hunters, recruiters etc, in other words, there is an active agent that collects information on both workers and employers and then makes a match between the two. Passive intermediaries include newspapers, Internet job boards or job databases where the intermediary does not necessarily contain information about both the worker and the employer, nor does it actively match the two by a selection process. Labor market intermediaries are significant for workers that do not have direct contact to employment opportunities, typically lower skilled workers, because they provide that connection at various degrees of effectiveness.

The underlying notion of both active and passive intermediaries is the idea of a link or connection between jobs and employees. There is a rich body of literature that explains the importance of social networks in linking people to jobs. Workers use "weak ties," or casual social networks, to find information about and apply for jobs. For example, employers often hire for entry-level positions through referrals from current employees because it is inexpensive and because of the accountability between the employer and the current employee that helps to ensure the quality of referred applicants. This trust

decays with the length of the chain of contacts for both the potential applicant and the employer. One illustration of the self-perpetuating nature of networking is exhibited by the way it plays out among ethnic workers compared to white workers. Latinos, African Americans and other minority workers tend to hold lower paying jobs or live in segregated areas with workers of a similar status. These conditions form the basis of their social network. In comparison, white workers live near other white workers and interact with surrounding neighbors and coworkers who typically hold connections to higher quality jobs or employers. While all groups exhibit social networking behavior, there are differences in the quality resulting from the segregation of social networks and the employer contacts connected to the network (Bennett, 1998).

It follows that the effectiveness of a labor market intermediary is enhanced by its proximity to a network. In essence, the reputation of a referral agency or group is based on its positioning within social or employment networks. To function effectively this network must also cultivate the flow of information about workers and employers. Temporary employment agencies have advanced their proximity to both workers and employers by developing their reputation and expertise as an information warehouse. They collect massive amounts of information on workers and employers through screening processes, surveys, face-to-face conversations, database systems, testing tools and regular interactions with both employers and workers. As firms have realized the breadth and the potential of the data collected by temporary employment firms, the reputation of temp firms as a source of quality job matching services has increased. Temp firms are therefore better positioned to strengthen their relationships with employers (Sunoo, 1999, p. 50; Interview with temporary employment firm, 3/27/01).

## PROFILE OF TEMPORARY EMPLOYMENT

To better understand the changing role of temporary employment for both employers and workers, it is helpful to look at the evolution of this industry over the last ten years. Although temporary employment firms maintain many of the original functions dating back to the 1920s, for example providing short-term labor on demand, this industry has been a beehive of new activity.

### *History*

Just like the economy today, the booming economies of the past caused labor shortages that fueled the development of the temporary employment market. Reports of temporary employment date back to before the 1890s when work was often done on an independent contract basis. During the 1920s and 1930s, a more modern version of temporary employment emerged in the Midwest, divided into industrial, technical and clerical fields. The 40s and 50s brought labor shortages and an emphasis on temporary office work and industrial jobs. This period resulted in the creation of some larger, well-

known office temp agencies that exist today like Kelly, Olsten and Manpower Incorporated. At that time, private firms perceived temporary employees to be unstable, lower quality, less expensive workers compared to permanent employees. A bout of inflation, recession and decreasing profit margins spurred firms to systematically utilize temporary employment services to help control costs and increase production during the 1960s. This era of temporary employment kicked off the staffing industry's drive to diversify and market their services.

More recently, considerable attention has been given to the heavy use of temporary and contract employees in technical fields such as the information technology, biotechnology and engineering sectors. It is interesting to note the historical existence of temporary technical workers since the 1930s when engineers were brought into the auto industry in Chicago as temp workers. Soon thereafter, World War II increased the need for technical workers in the production of war materials so that between 1946 and 1950 four of the five largest technical temporary employment firms were established (Joray and Hulin, 1978).

### *Growth of Temporary Employment Services*

The Current Population Survey (CPS) administered by Bureau of Labor Statistics (BLS) conducted surveys on temporary employment in 1995, 1997 and 1999 to examine the total percentage of the workforce that qualified as temporary or contract employees. The growth of jobs in the temporary employment industry has increased faster than the growth of regular employment over the 1990s. According to the CPS survey, the number of workers in temporary employment arrangements increased by 10% while traditional employment grew at a rate of 2.8% between 1995 and 1997. By 1997, temporary employees numbered 1.3 million or 1% of overall workers (Cohany, 1998, p. 7). The CPS showed that in 1999 temporary employees comprised 1.5% of the total workforce, or roughly 2 million workers on any given day (Carre et al, 2001). Although the temporary employment population represents a small percentage of the overall workforce, the strong growth rate represents a sizable number of newly created jobs

There is no doubt that firms have increased their use of temporary employment arrangements since 1990. A study by the Upjohn Institute randomly sampled 550 private firms to ask about their use of temporary employees. The survey found that these firms created temporary jobs at a rate of seven or eight times that of regular employment (Houseman, 1997, p.49). The survey also reported that 78% of firms used at least one type of flexible staffing arrangement[1], while 46% of the firms had specifically hired temporary employees (p. 12). More to the point, 24.3% of firms said their use of temporary

employment had increased (p. 33). A survey conducted by the National Association of Temporary Staffing Services (NATSS) in 1999 found that approximately 90% of firms stated an increased reliance upon temp firms to fill job vacancies. The growth of temporary jobs and the frequency of use by firms suggest that this industry evolving into a major access point to the labor market.

## Reasons for Growth

Traditionally the increase in temporary employment was only seen as a having a negative impact on workers and their prospects for work. The outsourcing of certain types of employment by firms has been hotly debated and scrutinized by media headlines. Large firms are villainized for this practice. Microsoft has been the target of several lawsuit filed by temporary employees for its use of "permanent temps". Clearly the advantages of temporary employment for firms is a major factor contributing to the industry's growth. There is quite a bit of research available on the cost advantages in using non-permanent work arrangements. In general, temporary employment provides the following benefits from the firm perspective:

- ◆ **Lower costs in filling labor needs** for cyclical or part-time work. Firms do not have to pay for benefits, unemployment insurance and other costs associated with new hires.

- ◆ **The ability to screen workers** before they are permanently hired by a firm reduces potential costs associated with severance pay and increases the likelihood of the firm's satisfaction with the employee. (This will be further discussed in the next section.)

- ◆ Temporary employment supplies a **"just in time" workforce** and at the same time allows a firm to maintain a lower inventory of employees. Firms therefore have a "flexible" workforce that can respond more quickly to changes in the economy or production cycles.

- ◆ During **labor shortages** temporary employment firms are more adept at finding qualified workers.

- ◆ Managers can **avoid laying off permanent workers**, which is unpleasant for all involved.

- ◆ Firms can also **avoid severance packages** that can become very costly during large layoffs or whenever they scale back operations.

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[1] Flexible staffing arrangements are held by temporary employees, short-term hires, part-time workers, on-call workers and independent contractors.

On of the advantages for firms mentioned above is the ability to shed employees; this is both a legal and financial issue for firms. David Autor of the Sloan School at MIT has done extensive research on the temporary employment industry. In a recent paper he suggests that a series of court decisions related to labor law in the US can explain 20% of the growth in temporary help services employment. During the 1950s and through the late 1970s a common law doctrine of employment-at-will acknowledged employer rights to fire employees at anytime for any reason unless stated otherwise in a contract. However, US state court decisions between 1973 and 1999 have increasingly limited the discretion of employers to fire employees at will.

> *"By the 1990s, state courts had recognized three common law exceptions to these at-will relationships: a breach of an implied contractual right to continued employment, terminations contrary to public policy (for example, affirmative action), and violations of an implied covenant of good faith and fair dealing." (Autor, February 2000, p. 3).*

These court decisions discouraged the practices of firing employees at will by making this type of action worthy of expensive lawsuits on behalf of the employee. The use of temporary employment creates a formal employment agreement set up for termination and thereby excuses this arrangement from lawsuits. The downside is the way in which temporary employment undermines the recourse power of an employee within a firm.

In addition to legal incentives, Autor and others have suggested that a firm's economic growth can be attributed to a change in hiring behavior in hiring due to the advantages outlined above (Autor ,2000; Estevao, 1999; Osterman, 1999; Levy, 1992). Cheaper labor and flexible staffing helped firms compete during the blue-collar recession in the early 1980s and the white collar recession during the early 1990s (Levy 1992). Major corporations were laying off hundreds of thousands of fulltime workers during these periods in an effort to shed company weight, lower overhead and face up to market competition. During the economic recovery of the mid 90s, firms took a new perspective on hiring; pay overtime or stretch employees, but do not hire new fulltime workers. Firms reacted to an unstable economic situation that caused increases and decreases in production by hiring temporary workers that were less expensive and easy to let go. Not surprisingly, increased employment in the help services industry skyrocketed in the late 1980s and steadily increased every year throughout the 1990s. Massive layoffs and the increased use of temporary or contract workers, combined with the simultaneous weakening of unions during the Reagan years, changed the public's perception of job security starting in the late 1980s (Osterman, 1999). All of these events and changes in the labor market have contributed to a negative image of temporary employment.

The dominant reasons that firms' use temporary employment arrangements have expanded over the 1990s years. The Houseman study (1997) that investigated the usage of temporary employment by firms also asked about their reasons for using this method. Houseman found that firms reported using temporary employees most frequently to accommodate fluctuations in workload, lack of qualified workers or business expansion. Just under one quarter of the sample reported using temp firms to screen potential employees, making it a significant factor. Table 4.1 s displays these findings. These reasons suggest a shift in accepted human resource practices in the private market away from "lifetime"[2] employment at one firm toward the use of temp firms to fill cyclical labor needs and screening purposes. In essence the "low-cost" factor of temporary employees was trumped by the need for flexible staffing and better process for matching workers to jobs.

**Table 4.1: Reasons given by firms for using temporary employment arrangements**

| Reason | Percentage (of firms using temps) |
|---|---|
| Fluctuations in workload and absence of regular staff | 37.1% |
| Difficulty in finding qualified workers on own | 37.1% |
| Business expansion | 25.8% |
| Screen candidates for regular employment | 24.2% |
| Savings on wages and benefits | 12.0% |
| Source: Houseman, 1997 | |

The history and growth of the temporary employment industry over the 1980s and 1990s illustrate the changes in employment patterns of firms. These shifts created a new employment climate that has in turn affected the way workers have to interact with the labor market. A worker cannot expect to enter the labor market and marry one specific firm or job. Although this still occurs, the most effective way for workers to approach employers is to market themselves as a bundle of skills

*Profile of temporary employees*

The issue of temporary employment is of particular concern for lower skilled workers, traditionally employed by blue collar and low-end clerical office work. The demographics of temporary employees are therefore relevant to the evaluation of the staffing industry as a labor market intermediary. The 1985 Current Population Survey from the Bureau of Labor Statistics found that temporary help service (THS)

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[2] Frank Levy tells the story of workers in the 1950s who would turn down smaller companies to wait for positions at larger firms like the telephone company because these jobs were "a job for life."

workers were *disproportionately* young, black and female and worked in administrative and clerical positions. The most dominant characteristics for the *pool of THS workers* in 1985 are people who are from 25 to 54, female, white and have temp jobs in technical, sales and administrative support positions. Table 4.2 shows the demographic percentages of workers for all industries and the THS industry. The last column of data for each year shows the percent difference between the temporary employees in that category (race) and their percentage in the overall labor force. Between 1985 and 1997 the number of white and male temporary employees increased to better reflect their proportion of the total work force.

**Table 4.2**

| Employed Wage and Salary Workers in All Industries and in the Temporary Help Supply (THS) Industry<br>By Selected Characteristics | | | | | | |
|---|---|---|---|---|---|---|
| | **May 1985** | | | **May 1997** | | |
| **Characteristic** | **All** | **% of THS Industry** | **% Difference between THS and All** | **All** | **% of THS Industry** | **% Difference between THS and All** |
| **Age** | | | | | | |
| 16 to 24 | 20.1 | 32.7 | +12.6 | 14.8 | 22.6 | +7.8 |
| 25 to 54 | 67.4 | 57.6 | -9.8 | 73.5 | 68.0 | -5.5 |
| 55 and over | 12.5 | 9.7 | -2.8 | 11.7 | 9.5 | -2.2 |
| **Sex** | | | | | | |
| Men | 55.0 | 35.8 | -19.2 | 52.7 | 44.7 | -8.0 |
| Women | 45.0 | 64.2 | +19.2 | 47.3 | 55.3 | +8.0 |
| **Race** | | | | | | |
| White | 86.9 | 75.4 | -11.5 | 84.8 | 75.1 | -9.7 |
| Black | 10.4 | 20.2 | +9.8 | 10.9 | 21.3 | +10.4 |
| Hispanic | NA | NA | NA | 9.6 | 12.3 | +2.7 |
| | **Source: Seavey & Kazis, 1994** | | | **Source: Cohaney** | | |

One difficulty in measuring trends in the occupations held by temporary employees is finding a clear source of data that indicates the type of work they perform. One reliable source of employment data is the ES-202 data series. Unfortunately, in this data set temporary employees are classified and counted as employees of the temporary employment firms (where they are on payroll), and not by the employers that hire THS employees. Therefore the nature of work done for the business client is not captured by the ES-202 data series.

In an effort to estimate the employment patterns of these workers, a study by Marcello Estevao and Saul Lach (1999) combined several sources of data on the temporary help services industry between 1977 and 1997. The authors created an economic model to estimate the number of temporary help service

(THS) workers in each industry based upon data from the Bureau of Economic Analysis combined with the Contingent Worker Supplement of the Current Population Survey[3] to roughly estimate the evolution of temporary employment work in eight different industries. They looked at how the proportions of temporary employment in industry sectors shifted over this time span. The significant trends in their research showed that between 1982 and 1987, the service and public sectors dominated the proportion of THS employees for a combined total of 40%. Between 1987 and 1997, the use of THS employees in blue collar or manufacturing firms tripled to a rate of 30% of total temporary employment. By 1997, manufacturing and service temporary employees accounted for 75% of total THS employees. This research also showed that the use of temporary employees rose steadily in the finance, insurance, real estate, transportation, communications and utilities sectors in the 1990s. The use of temporary employment in the public sector dropped near zero by 1997.

## ROLE OF THE TEMPORARY EMPLOYMENT INDUSTRY

The function of the temporary employment industry is what qualifies it as a labor market intermediary. Specifically, the industry has built up a core competency in connecting workers to jobs. This is why it is crucial in the consideration of workforce development policy. The activities of the industry provide a working example of what many workforce development policies attempt to emulate. This parallel suggests that a thorough understanding of how the staffing industry has capitalized on its position between employee and employer would also benefit the design of workforce development policy. Understanding the role of the staffing industry as an intermediary begins with a review of how the industry functions in the labor market.
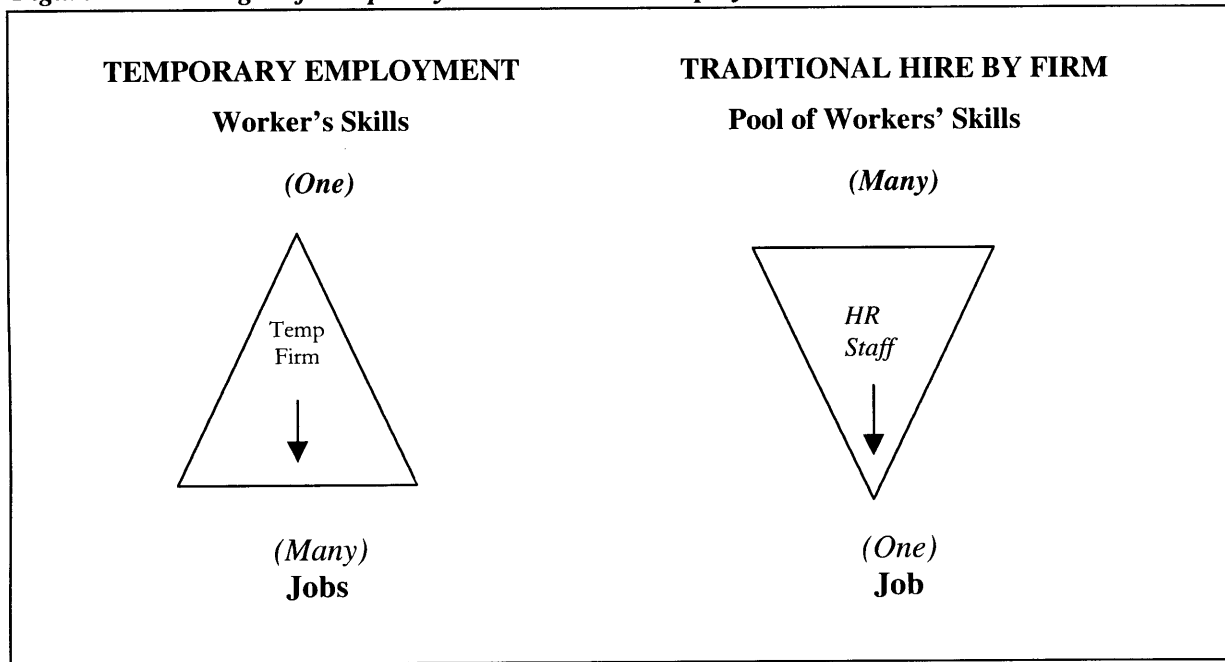
The function of a temporary employment firm is fundamentally different from the ways in which employees typically find employment; the paradigm of the matching process is almost reversed. Most people find employment through personal networks or advertisements placed by employers. Traditionally, when a firm hires an employee, they interview and screen multiple workers to find a desired skill set to fit one job. In the paradigm of the staffing industry, a recruiter reviews the multiple skills of one worker and matches them against a pool of jobs.

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[3] CPS data for 1995 and 1997 provided estimated probabilities on the likelihood that a temporary help service employee was in a particular industry. The researchers used the probabilities in their model with data from the Bureau of Economic Analysis between 1997.

The difference between the two processes is shown in Figure 4.1 (Burgarin, 1998). In a way, this is an advantage for the employee because the recruiter views their skills from a new perspective and may open up different types of work to the employee.

*Figure 4.1: Paradigm of Temporary and Traditional Employment Methods*

| TEMPORARY EMPLOYMENT | TRADITIONAL HIRE BY FIRM |
|---|---|
| Worker's Skills | Pool of Workers' Skills |
| *(One)* | *(Many)* |

Temp Firm

HR Staff

*(Many)*
**Jobs**

*(One)*
**Job**

The staffing industry is increasingly recognized for its ability to recruit and match employees to job positions. Client firms have drawn on this ability as a tool to screen potential employees as permanent hires. A report by the American Staffing Association stated that employers have turned to temporary employment as a way to screen workers to avoid significant financial loss (Lenz, 2000). The ways in which staffing firms have improved their reputation as a job matching industry are also informative for workforce development policy. These strategies are discusses in detail in Chapter 5, which presents findings from interviews with Boston area temporary employment firms.

A key reason the staffing industry has been able to build a reputation, and thereby earn the business of client firms, has been the way in which it diversified its services as an industry and then specialized its services by individual firm. Individual staffing firms have oriented their services (types of employees and types of employment arrangements) to target specific segments of the market. The most defined division in the staffing industry occurs between blue collar and white collar staffing firms. Although this division has always existed, the sub-divisions within white collar (professional) staffing firms have become more pronounced over the last eight to ten years. Professional firms tend to specialize their labor supply by concentrations of skill sets, especially around general and technical skills.

In fact, professional staffing firms can be loosely grouped into "generalist" and "technical" firms. A generalist firm specializes in providing general office skills to business clients, often including financial or management professionals. Some generalist firms blur their boundaries by creating specific technical service divisions within the firm, even though it is not their core competency. Technical firms only take job orders and recruit employees for IT, biotechnology, medical, or engineering professionals. The distinctions between technical and generalist firms will be described in greater detail in Chapter 5.

Lower skilled workers have always been part of the temporary employment pool, usually as blue collar or low-end clerical and office workers. More recently, the number of high-level professionals involved in temporary employment has increased. Temporary employment and recruitment at this end of the spectrum includes, but is not limited to, management executives, medical and IT workers, lawyers and others. Employees looking for work need to understand the distinctions between temporary employment firms to maximize their use of this employment arrangement. For example, the difference between white or blue collar firms is a strategic one for lower skilled workers. As they build up their skill base, or in order to gain new types of skills, they need to work with white collar temp firms to access different types of work.

## LIMITATIONS OF TEMPORARY EMPLOYMENT

This thesis does intend to pass judgment upon the temporary employment industry in regard to its overall impact on working conditions in the labor market. On the contrary, the goal is to examine the industry for ways to improve public policy related to employment. The limitations of temporary employment must be recognized in a discussion of the positive employment strategies offered by the industry. An important debate continues in the general public between firms, unions and workers regarding the industry's influence on the quality of employment in the US. It is argued that temporary employment plays an increasing role in changing the demand for labor in ways that undermine employees. Critics argue that employers use temporary employment to avoid the creation of permanent part-time or full-time work, which usually provides higher wages and benefits. In the absence of strong unionization or labor law to inhibit its use, the temp industry is a reality of the private market.

The outcome of temporary employment is a different experience for each facet of the private market. On a macroeconomic level, economists Katz and Krueger argue that this temp industry has helped to keep unemployment low along side of low inflation during the 1990s (Katz and Krueger, 1999). They reported in May of 1999 that the combination of temporary jobs and a highly developed staffing industry in the US changed conditions within the market so that workers were quickly matched to job openings, reducing pressure on wages during a tight labor market. Low cost labor is good for business and low unemployment and inflation is good for the average citizen. However, the greatest concern over temporary employment is the frequency of temporary employees stuck in non-permanent work

arrangements where they often lack health benefits, substantial wages or the exposure to skill training and advancement opportunities.

The experience of temporary employment varies depending on the worker's profile. The traditional temporary employee in a blue collar or clerical job sees lower wages and no benefits; most would prefer a permanent job (Kalleberg, et. al., 1997). In 2000, the staffing industry reported that about 25 percent of all temporary employees are long-term temps working for periods over 24 months at one assignment. The report also made it clear that this group of workers tends to be better educated, highly paid and have benefits as a result of their tenure with the temporary employment firm. Unlike the blue-collar worker, these workers value the flexibility and independence of temporary work because their other needs are taken care of. Even the high turnover rate in the industry can be construed positively and negatively. Most workers prefer a working situation with stable job security. However, in an industry whose reported turnover rate is 400%, temporary employment also suggests incredible movement of workers in and out of the staffing industry accessing employment in a variety of firms (Lenz, 2000, p.5). Movement within the labor market may help some people find better jobs in the long run.

Overall, temporary employment has earned a bad reputation because of the limited economic security traditionally experienced by temp workers. Despite the growth of temporary employment in the private market current labor law and regulations do not support the lives of many temporary and nonstandard employees. For example, Unemployment Insurance, National Labor Relations Act and worker's compensation are designed around workers that hold full-time, permanent positions with one employer. A few key issues highlighted below are of particular concern for temporary workers and therefore for workforce development policy that considers the use of temporary employment strategies.

## *Benefits*

One way in which firms have been able to cut costs is by hiring temporary or contract employees for which they are not required to offer a benefit package. Labor law only requires firms to offer certain full-time employees benefits packages, this does not include contracted or temporary employees on a different payroll. Temporary or nonstandard workers are least likely to have benefits upon entering temporary employment arrangements and employers are not required to offer these benefits (Houseman, 1997). In an article by Sharon Cohany (1998) published in Monthly Labor Review, she states that only 50 percent of temporary employees have health benefits at all. Therefore, one weakness of temporary employment is the number of people it places in the labor force that do not have health benefits.

This issue has been tempered to some degree as more temp firms offer benefits as a way to attract applicants. A 1998 survey by the American Staffing Association showed that 75 percent of staffing firms with over $50 million in sales offered benefits. Waiting periods range from 0 to 500 hours of work to

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qualify for benefits. However, only 15% of temporary employees avail themselves of health benefits through temporary employment firms.

## *Unemployment Insurance*

Most workers are legally covered by unemployment insurance, but temporary and non-permanent employees often fall through the eligibility cracks. In Massachusetts, workers in the following categories are not eligible to collect benefits: employees of churches and certain religious organizations; worker trainees in a program administered by a nonprofit or public institution; real estate brokers or insurance agents who work on a commission basis only; consultants working independently; elected officials and certain government officials in policy-making and advisory positions; and members of a legislative body or the judiciary. While temporary employees are not specifically stated, initial eligibility is based on an employee's earnings, number of hours worked for one employer, and the reason for separation from employment. Therefore, people working multiple part-time jobs or not enough total hours, often do not qualify for UI if they lose one of their jobs.

## *Training*

One challenge for temporary employees is the lack of consistency with one employer, decreasing their opportunity for training or skill upgrades. This is because employers do not typically train for entry-level positions and are even less likely to pay for formal training for temporary employees. Once again, this issue is slightly tempered by the staffing industry's annual increases in expenditures on training offered to temporary employees. A report published by the American Staffing Association stated, that in 1997, the staffing industry spent $866 million dollars on skills training up from $335 million in 1995 (Sunoo 1999).

## *Creaming*

Without doubt, the lack of benefits, training and unemployment insurance are negative side effects of temporary employment for workers. Nevertheless, even if these issues were miraculously solved, there is an even bigger issue that affects lower skilled workers. Temporary employment firms are motivated to hire the highest quality workers to satisfy business clients. Segments of the workforce are inevitably screened out of temporary work so that only the best potential employees are "creamed" off the top of the applicant pool. In fact, this is exactly what the industry wants to happen. The higher the quality of the temporary employee sent out on a job, the better the reputation of the temp firm and likelihood of additional job orders. The industry has developed extensive screening and testing tools to serve this purpose.

There are various points in the process of hiring temp workers where creaming takes place. An initial assessment of the potential temp worker often takes place over the phone during the initial intake and pre-screening. Successful applicants are asked to complete one or all of the following: the submission of a resume, an interview, aptitude tests, software testing including Microsoft Office software, and basic math or reading comprehension tests. At any point a recruiter or manager can discontinue the screening process with a potential applicant.

The next distinct phase of temporary employment is the assignment period. The job performance of a temporary employees perform is evaluated by the business customer and the temp firm. (At this point some temporary employment firms also have the employee evaluate the firm in which they are working.) If the evaluation of the temporary employee is unfavorable the temp firm may choose not to give them additional assignments.

While the business customers of temp firms would agree that competition provides them with higher quality temps, this practice is not desirable from the perspective of lower skilled workers. Screening methods prevent or limit the ability of this population to gain employment. However, in the last five years the shortage of labor has broadened the type of applicant hired by temp firms as it has become increasingly difficult to recruit temporary employees. As one temp firm recruiter explained, "We work with people now that we never would have looked at five years ago." Competition in the staffing industry is fierce, especially in the recruitment of high-end workers - financial analysts, commodity managers and information technology specialists (Sunoo 1999).

## CHAPTER SUMMARY

The staffing industry grows in scope and size as it continually diversifies its services and role within the labor market. The most prominent explanation for the industry's expansion lies in its ability to consistently respond to the private market's evolving demand for labor. A review of research literature on the staffing industry describes how firms now utilize temporary employment firms to essentially outsource human resource functions to this industry in order to take advantage of its expertise in screening employees and matching them to specific job requirements. Although this has improved the efficiency and lowered the costs associated with hiring and staffing at firms, the rise in temporary employment may not be good news for temporary employees, especially for those with less skill. Nonetheless, the way in which temporary employment firms have captured the trust and increased business of for-profit firms in recent years is notable. As we better understand the activities of the staffing industry and its interaction with employers, there may also be opportunities to enhance the benefits that the industry provides to temporary workers. The next chapter looks closely at the activities and daily practices of Boston area temporary employment agencies in search of these opportunities.

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# CHAPTER 5: SUPPLY OF WORKERS IN THE IT SECTOR

## Interviews with temporary employment firms in the Boston area

*"Traditionally when companies thought of using 'temps,' it meant admin/clerical/light industrial help, or technical help. In the past few years, there has been an increase in demand for professional level temporary help – from interim CEOs to management consultants. The concept of project-based staffing has gained a lot of popularity, as has the number of independent consultants or "free agents" on the market, even in today's economy. It seems as though more and more firms understand the value of project-based collaboration, as well as the benefit they see in terms of managing their full-time staff utilization rates."*

**Recruiter at a Boston Technical Staffing Firm**

The principal goal of this chapter is to learn from the successes of the staffing industry in molding itself into one of the most efficient labor market intermediaries in the private market (Katz and Krueger, 1999). The motivation behind this goal relates to the industry's ability to place various types of workers in jobs throughout private firms, an ability that is central to workforce development policy. Chapter 4 summarized the context of the staffing industry over the last ten years and described how it altered its practices to target specific markets for temporary employment. Within this period, changes in the practices and methods of the staffing industry have since grabbed the attention of researchers and are more recently reflected in available literature (Benner et. al., 2001; Autor, 2000; Burgarin, 1998; Seavey and Kazis, 1994). Researchers are also beginning to look at temporary employment as a viable way to employ lower skilled workers[1].

This chapter analyzes testimony from Boston area temporary employment firms to identify successes and best practices of the staffing industry as they apply to lower skilled workers. More specifically, this chapter looks for ways to improve the access and mobility of lower skilled workers in technical or IT jobs. Although the staffing industry itself does not cite practices that are specific to lower skilled workers, the research presented in this chapter uncover current practices of the staffing industry that offer employment access and mobility for this population in private market firms.

Staffing firms are a dynamic part of employment activity in the Boston metro area. In 1998[2] the staffing industry in Boston region ranked the sixth largest industry and accounted for 2.5 percent of total employment. In the last eight to ten years, the temporary employment industry and the IT sector have

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[1] In an interview with David Autor on November 28th 2000 he described a potential research project looking at the outcomes of welfare-to-work individuals randomly assigned to temporary employment agencies compared to traditional public job placement services.

[2] The Massachusetts Department of Employment and Training published a report *High-tech Industries in Massachusetts* based upon 1998 ES-202 data that ranked the top 25 largest industries for the Greater Boston area. The list includes in order with number of employees: hospitals (76,438), eating and drinking places (74,187), colleges and universities (59,232), computer software and related IT services (56,032), elementary schools (45,415), personnel supply agencies (35,979). The total number of workers in the Greater Boston area for 1998 was 1,431,784.

cultivated an attachment to each other that rivals the relationship between the staffing industry and general office employment. The four *generalist* temporary firms (they do not specialize in IT professionals) interviewed in for this research process reported that 35 percent of their clients are IT firms. From a national perspective, IT hiring managers report relying on staffing firms to find skilled labor 37 percent of the time, the most frequently reported way to effectively find skilled workers according to these managers. Existing IT workers are constantly approached by recruiters and headhunters to switch companies or work as a contractor. A report by *Information Week* uncovered that more than two-thirds of IT professionals were contacted by a headhunter in a one year period (Get original; Meares and Sargent, 1999, p 13). The heavy use of the staffing industry by the IT sector provides an additional reason to look for lessons in the practices and strategies of temporary employment firms related to employment in the IT sector. Thus, a second motivation in researching the success of the staffing industry as a labor market intermediary is to understand how temporary employment firms affect entry-level positions in IT and technical work.

The focus of the research presented in this Chapter stems from three questions previously stated in Chapter 1:

> ➢ *How has the temporary employment industry, a labor market intermediary, developed business strategies to secure its position within the private market as a supplier of the labor to private employers?*

> ➢ *What is the role of the temporary employment industry in supplying labor to the IT sector?*

> ➢ *How can lower skilled workers use temporary employment agencies to access IT jobs or gain technical experience that would then provide them access to these jobs?*

I seek answers to these questions through original research based on in-depth interviews with recruiters and managers at eight Boston-area staffing firms. These findings, along with additional research available in literature on temporary employment, formulate the foundation for a discussion of their implications for the employment of lower skilled workers in the technical and IT jobs presented at the conclusion of this chapter. Research on the temporary employment industry and the methods by which they operate indirectly relates to the issues of access to employment and mobility in IT related occupations. In theory, temporary employment firms are channels to better employment opportunities depending on their connection to these types of jobs and their willingness to work with lower skilled workers. In-depth interviews with recruiters and managers of these firms explore the role of two types of professional temporary employment agencies that specialize in general office and IT skills. The descriptions and data collected from these firms, combined with information for IT employers in the area,

will help inform policy prescriptions to improve the prospects of lower skilled workers in IT related occupations.

*Methodology*

A sample of IT staffing firms was generated by a search through the Boston area yellow pages (2000-2001) under the "Employment Contractors - Temporary Help" section. In order to carve out a sample of firms from the existing population of temporary staffing firms, three characteristics were applied in the sampling method: large firms (as determined by a yellow pages ad of one quarter page or larger), the availability of IT/creative services and a Boston area address. It was important to obtain a cross-section of larger staffing firms that had established operating policies and the potential to work with a large number of temporary employees and client firms. Therefore, names of firms were chosen out of the phone book if they had at least a quarter page advertisement and made a reference to IT or technical services in the ad. A total of 252 agencies are listed under this section of the yellow pages and approximately 19 had large advertisements with a reference to technical or IT staff. This list was cross-referenced with the member list on the Massachusetts Association of Personnel Services web site. As a result, six additional companies were added for a total of 25 firms.

After contacting all of the firms, 11 were determined to be inappropriate. These firms are large "generalist" agencies offering a smattering of clerical, professional office support, financial and human resource services. Within this group of firms, some have dedicated creative or IT divisions that handle employees and job contracts in graphic design or IT, and others have chosen to become highly specialized in *one* particular service area like IT or scientific research staff. Firms that only worked as office generalist and did not have an IT or creative division within the firm were deemed inappropriate for the sample. Eight of the "inappropriate" firms that advertise IT or technology employees did not actually offer these services or had discontinued them. Staff at two of the eight firms explained that this area never got off the ground or that they were not getting requests for these types of employees. The remainder of the "inappropriate" firms specialize in IT employees but only offered *contract* employees and do not match the profile of the other temporary employment services in the sample. They are highly specialized and solely dedicated to the supply of IT contractors and permanent recruitment services. It seems that the initial boom in temporary employment in the IT sector has taken a traditional market path: many firms jumped into the market originally and competition has started to shake out certain firms. The sample breakdown and response rate is listed in Table 5.1. Interviews were conducted with 8 of the 14 firms deemed appropriate for the research sample.

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**Table 5.1: Sample of Boston Area Temporary Employment Firms with IT services**

|  | Count |
|---|---|
| **Number of Employment Agencies in Boston Area** | **252** |
| Agencies with Large Ads/ IT Services | 25 |
| Completed Interviews | 8 |
| Refusals | 4 |
| Determined inappropriate after contact | 11 |
| Unable to contact | 2 |
| **Response Rate** | **57.1%** |

A questionnaire was developed to keep questions consistent in the research process (See Appendix F to view questionnaire). Each company was called and a request was made to complete the survey in person. Once contact was established with a manager or recruiter, he or she reviewed the questionnaire and then accepted or declined an interview. It was explained over the phone that in order to ensure confidentiality the name of the firm would not be used publicly. Some of the contacts agreed to complete the survey and discuss it over the phone instead of in person. Of the eight completed questionnaires, four were accompanied by face-to-face interviews and four were completed over the phone in 40 to 60 minute conversations. Follow-up questions were made through email or on the phone. Aside from the eight recruiters/managers who agreed to participate, two others were enthusiastic about the interview, but eventually decided they did not have time or were made aware of a company policy that precluded them from participating in an interview. In total, four firms refused to participate (Table 5.1).

The questionnaire addresses several main topics of interest: characteristics of temporary employees, types of IT placements, skill sets of temporary employees, strategies for recruiting employees, strategies for recruiting business clients, the response of the staffing industry to the development of the IT sector, and the changing role of the staffing industry over the last 10 years. The findings from the questionnaire are outlined in the next section.

There are always limitations to interview or survey processes. The biggest limitation of the information collected here is the small number of interviews (8) upon which to draw. It also proved difficult to extract consistent information across all interviews while working with the ability of each interviewee to answer questions as they related to their firm. For example, only two of the firms interviewed kept actual statistics on their employees. Recruiters at other firms were asked to estimate percentages where appropriate to estimate the activity at each firm. All of the recruiters and managers had between two and fifteen years of experience in the staffing industry.

The information collected from the interview process is sorted by type of firm. Four of the firms are office generalists that have a division dedicated to IT or creative placements. The estimates in their responses included all of their employees across service divisions. Interviews with the other four firms were done with IT recruiters or managers and their responses relate only to their technical employees. The split between technical and generalist firms in the sample (four and four) is similar to the breakdown of the fourteen firms in the population. Of the fourteen large temporary employment firms with an IT focus, eight are dedicated to technical placement and six are considered generalist firms with a dedicated IT division.

Responses from the questionnaire were analyzed in two ways. Demographic information reported in percentages by staffing firms was averaged across all firms. Qualitative responses were coded for key words by question. A firm received a 1 if they mentioned the key words and a 0 if they did not. The percent of firms reporting a specific response was calculated for each question. For both the quantitative and coded information three series of data were developed: rates for all firms, technical firms[3] and generalist firms. The separation of responses into technical and generalist draws out additional trends not apparent in the data in the aggregate descriptions.

## FINDINGS FROM INTERVIEWS WITH BOSTON AREA STAFFING AGENCIES

The staffing industry's ability to "give the client what it wants"[4] is perhaps the most salient characteristic of the trends that emerge from data on temporary employees and business development strategies of Boston area temp firms.

This finding has two less intuitive implications. First, as testament to this ability, the technical temporary employment firms reported statistics on technical temporary employees that exactly match the skill and education demands voiced in Cambridge by IT employers. Second, we see that temporary employment firms take this a step further and *strategize* their activities around giving the client what they want. This sets them apart from typical job training or placement programs whose activities are geared toward the client first and then on working with the firm in which they can place a client. Recruiters and managers at all of the temporary employment firms interviewed expressed the need to satisfy the business client and make the best match possible with a temporary employee.

The difference is marked in who is labeled as "client." A temp firm labels the business firm as the client, whereas a job training or placement program labels the employee as the client. One can argue that the employee should be the client; a person in need should rightfully benefit from the services of a

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[3] Reminder: technical firms are the four that had a dedicated IT recruiter and division, or if the firm specialized in the IT sector. These firms responded to questions based upon the employees that they recruit, manage and place.

job training or placement program. However, whether considering a temporary employment firm or public job training and placement agency, the ultimate goal is to place a person in a job. That job is controlled by the employer. Workforce development policy should be cognizant of the need to fit employees into what employers want or work with employers to expand their definition of what they want. Nonetheless, it is interesting to see how this theme plays out in the following findings.
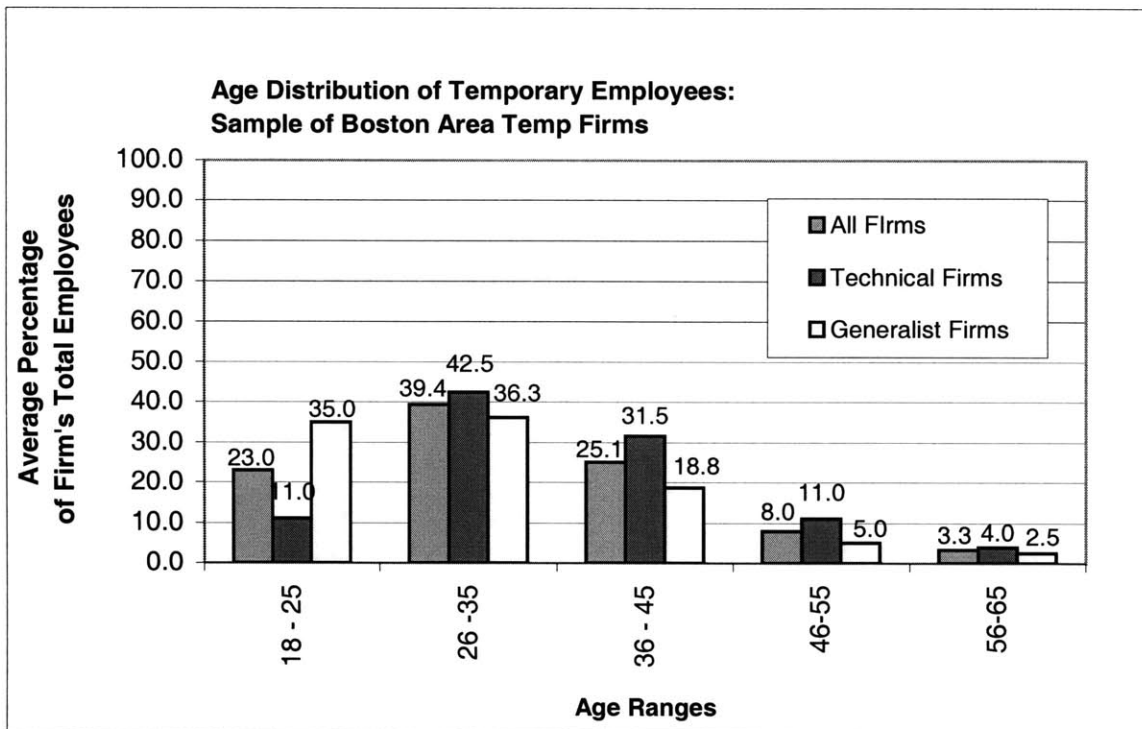
## Demographics

### Age

The interview respondent at each temporary employment firm was asked to estimate the percent of employees that fall within each age category. Each percentage was averaged across all firms and then by generalist and technical category. In Chapter 4 we learned that temporary employees are disproportionately black, young and female. Chart 5.1 shows the age distribution of temporary employees at Boston area staffing firms. The average age of temporary employees across all firms in the Boston area is also relatively young. The largest group of temporary employees across all firms (36.3%) falls in the 26 to 35 age range, which is consistent with proportions typically reported. The significant percentage of technical temps in the 26 to 35 age bracket draws the average age across all firms upwarded compared to what might be typically reported in a representative sample of all types of temporary employment firms. The average age of employees at technical firms is higher than generalist firms and the average number of employees in the 36 to 45 age bracket is almost double that of generalist firms. This may be a symptom of the high demand for industry-specific knowledge that takes time to acquire.

Generalist firms report a much younger group of temporary employees. The number of colleges and universities in the Boston area provides a constant supply of undergraduate and graduate students, typically between the ages of 18 and 25, looking for work, bringing down the age of temporary employees reported by generalist firms.

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[4] When asked about the strategy of the agency to recruit business clients the manager answers that their main philosophy is "to make the client happy, to give them what they want [in an employee]." Interview, March 30th 3001.

**Chart 5.1**



Age Distribution of Temporary Employees: Sample of Boston Area Temp Firms. Bar chart showing Average Percentage of Firm's Total Employees versus Age Ranges for All Firms, Technical Firms, and Generalist Firms.

## Race and Gender

The questionnaire asked firms to report the percentage of employees in their total work force that fall into the racial categories show on the bar graph in Chart 5.2. The percentages for each firm formed an average for all firms which was then broken down by type of firm. The racial characteristics of this sample are dominated by Caucasians, especially for technical workers. Generalist firms do a better job of employing African American workers. Two of the generalist firms keep Equal Employment Opportunity statistics on their employee population as required by certain business clients who need this information.

Another generalist firm targets a local African American newspaper and two radio stations in their marketing efforts. This firm also works with a high school located in Roxbury, Massachusetts, a predominately minority neighborhood, in their employee recruitment efforts. Upon visiting this firm, the faces in the lobby were surprisingly diverse. Of the five people sitting in the computer lab completing self-tutorials in software applications, one was White, two were Latino and two were African American. All were no older than 25 years of age. None of the other firms interviewed described marketing efforts to recruit minority employees, nor did their lobbies have as many different colored faces.

A question on the gender of temporary employees was not part of the questionnaire. However, the manager of one technical division stated that their temps are roughly 80 percent male and 20 percent

female. He also noted that females tend to work in quality control and management positions and men dominate the software and engineering placements. Although women were fewer in number, he said they were more likely to be hired as permanent employees and then promoted within their job type.

**Chart 5.2**



Distribution of Race:
Sample of Boston Area Temporary Employment Firms
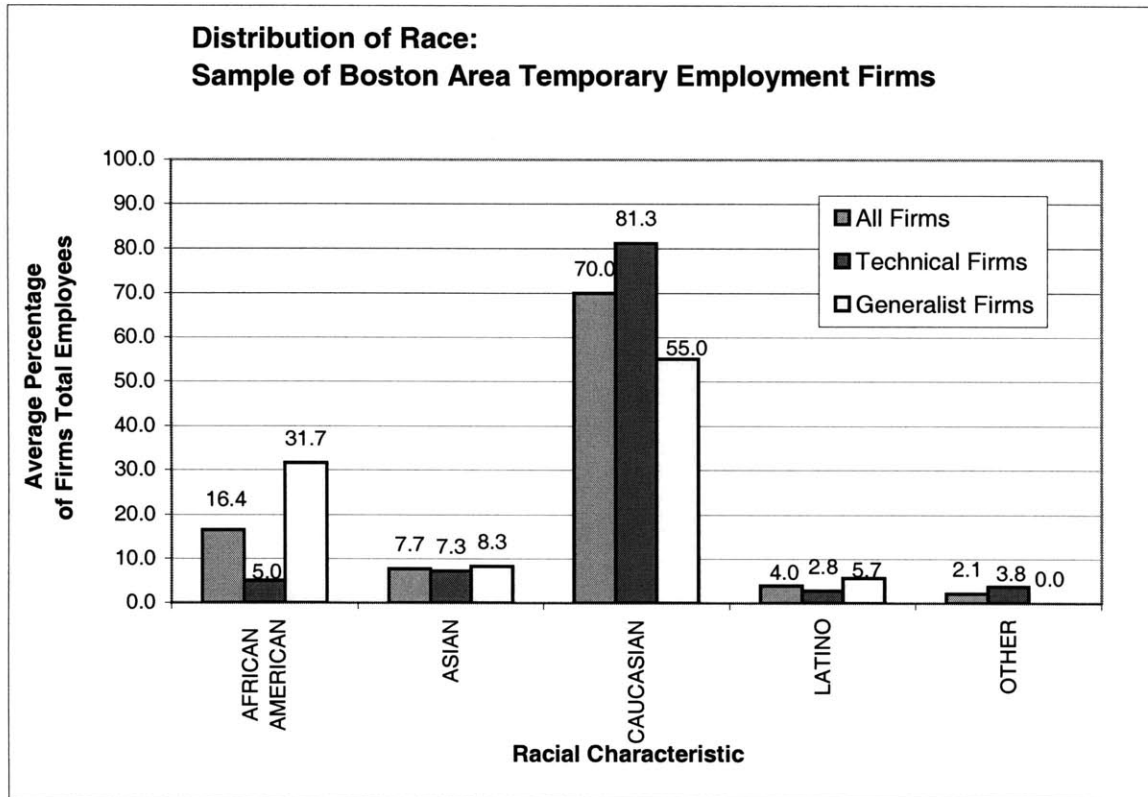
## Education Levels

Education is a key characteristic of existing temporary employees because it helps describe the types of workers accessing employment through this method and sheds light on the educational demands of employers. Chart 5.3 displays the educational characteristics of temporary employees for the sample. Similar to the educational demands of IT firms in Cambridge MA, 65.5% of the temporary employees across all staffing firms in the survey sample had a bachelor's degree. This was true for both generalist and technical firms. The employees of technical firms exhibit higher levels of education (Master's and Doctorate degrees) compared to generalist temporary employees, although small percentages of technical employees have high school, vocational, and technical certificates.

In general, the widespread perception of temporary employees as poorly educated or bottom-of-the-barrel workers does not show up in this sample of temporary employees at Boston area staffing firms.

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This is most likely a reflection of the split in the staffing industry between blue collar and professional staffing firms, the latter of which is the focus of this sample. Additionally, the concentration of college-educated workers in the sample lends support to theory that the attitude toward the temporary employment industry are changing on the part of employees, making them more likely to use them as an intermediary.

**Chart 5.3**



Distribution of Employee Education Levels: Sample of Boston Area Temporary Employment Firms
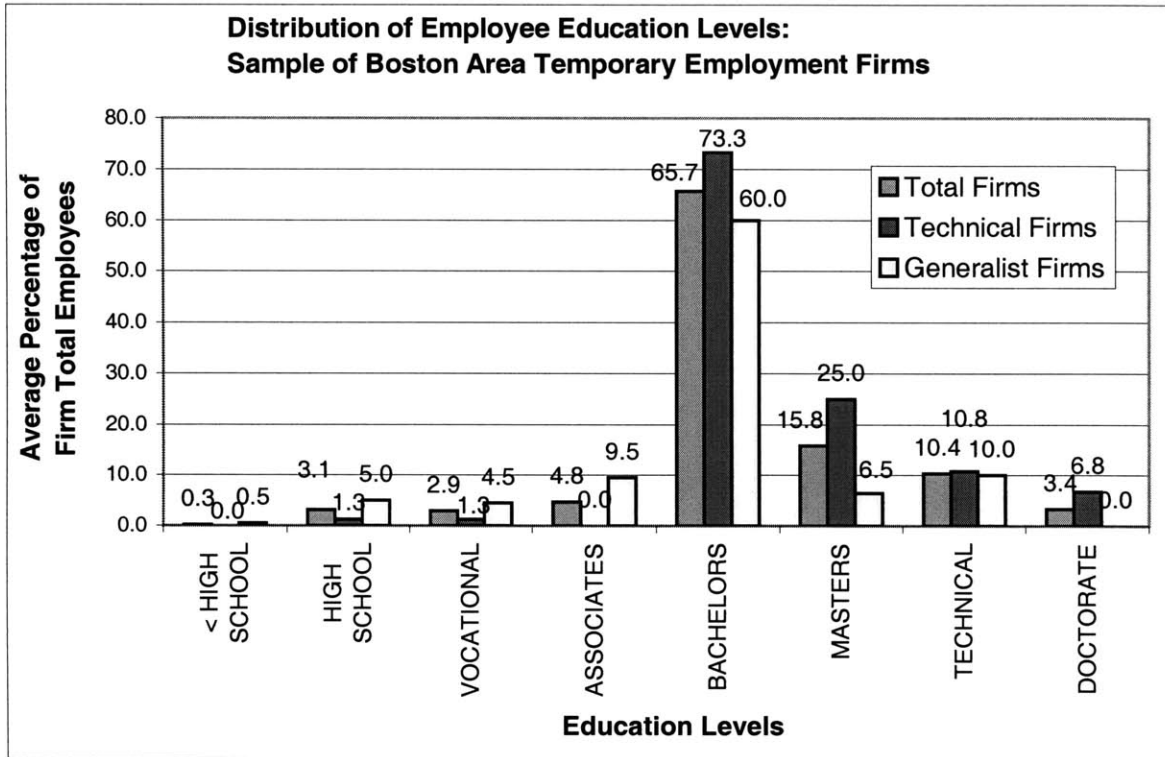
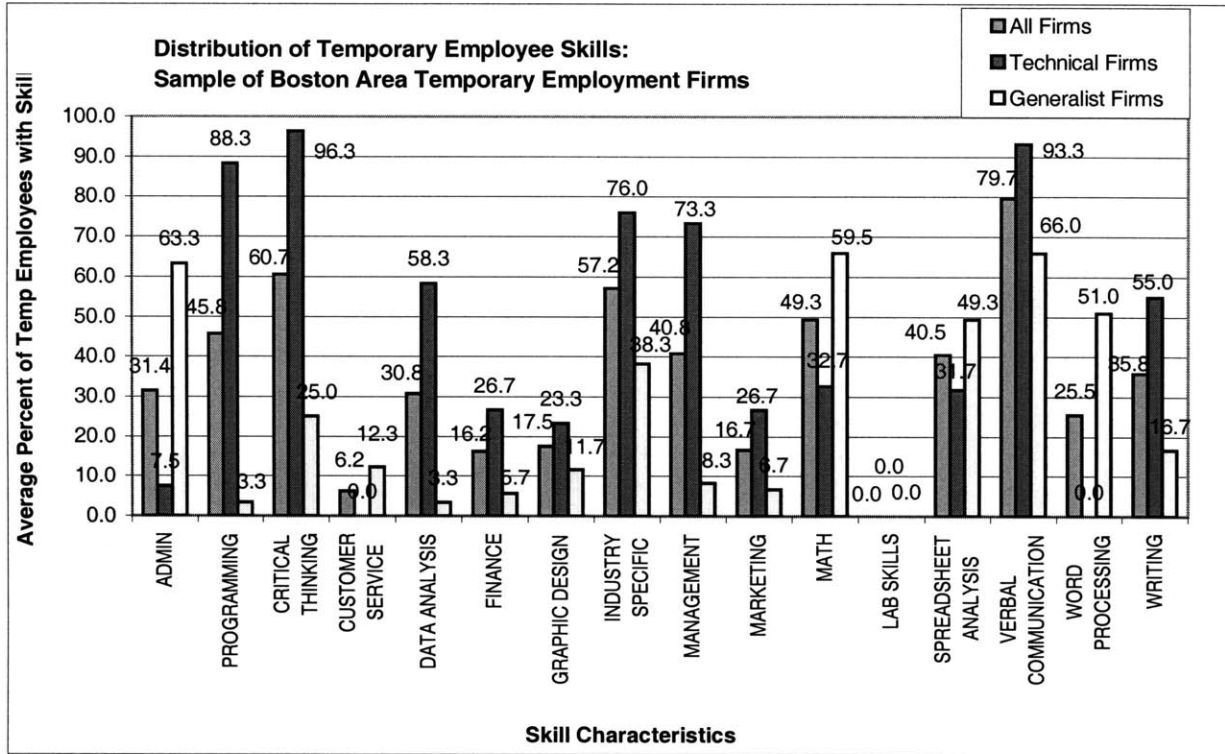### Skill levels

The list of skill requirements on the survey designed for IT firms in Cambridge was used on the questionnaire for temporary employment firms. Each temp firm in the sample estimated the percent of temporary employees possessing each skill, which was then averaged across firms. Chart 5.4 chart shows the skill sets of temporary employees as reported by temp firms.

## Chart 5.4



**Distribution of Temporary Employee Skills:
Sample of Boston Area Temporary Employment Firms**

Legend: All Firms, Technical Firms, Generalist Firms

Y-axis: Average Percent of Temp Employees with Skill

X-axis: Skill Characteristics

ADMIN, PROGRAMMING, CRITICAL THINKING, CUSTOMER SERVICE, DATA ANALYSIS, FINANCE, GRAPHIC DESIGN, INDUSTRY SPECIFIC, MANAGEMENT, MARKETING, MATH, LAB SKILLS, SPREADSHEET ANALYSIS, VERBAL COMMUNICATION, WORD PROCESSING, WRITING

Data values shown: 31.4, 7.5, 63.3, 45.8, 88.3, 3.3, 60.7, 96.3, 25.0, 6.2, 0.0, 12.3, 30.8, 58.3, 3.3, 16.2, 26.7, 5.7, 17.5, 23.3, 11.7, 57.2, 76.0, 38.3, 40.8, 73.3, 8.3, 16.7, 26.7, 6.7, 49.3, 32.7, 59.5, 0.0, 0.0, 0.0, 40.5, 49.3, 31.7, 79.7, 93.3, 66.0, 25.5, 51.0, 0.0, 35.8, 55.0, 16.7

The skills cited most often in temporary employees at technical firms are *critical thinking* (96.3%), *verbal communication* (93.3%), and *computer programming* (88.3%). Comparing the 'top three' lists of skills reported for temporary employees and by employers in Cambridge, the lists have two skills in common: *critical thinking* and *computer programming*. However, in the list for temporary employees, *verbal communication* replaced *industry specific knowledge* that was reported by IT employers. The importance of verbal communication is one skill that is probably not expected of technically oriented employees, especially those working in core IT positions. V*erbal communication* was frequently reported by IT employers for both core IT and entry-level jobs. Although not in the list of top three skills, i*ndustry-specific knowledge* was also a strong characteristic of technical employees, corroborating the report by IT employers in Cambridge that experience in the field is necessary. These descriptions reflect the skills required by IT employers and most likely the high level of technical skill required by core IT positions. Three quarters of the temporary employees at technical firms were reported to have *management* experience.

The employees of generalist firms were reported to most often possess skills in *administration* (63.3%), *verbal communication* (66.0%), and *math* (59.5%). Two of the generalist firms administer math

tests at intake and will not hire someone without basic math skills, therefore their rates approach 100 percent. The tests do not go beyond addition, subtraction, multiplication, division, and one or two basic algebra questions. Generalist firms were almost two times as likely to formally require math skills in their employees. It could be that technical firms did not place emphasis on reporting math skills because these basic skills are assumed, whereas, in generalist firms working with less technical workers, they test for basic math and made a point to report it as a skill. Generalist firms also reported that *spreadsheet skills* (49.3%) are nearly as common as *word processing* skills (51.0%). The emphasis across all firms on *verbal communication* is a significant barrier for non-English speaking workers.

Interviews with recruiters and managers at generalist firms and one of the technical firms revealed an interesting operational structure within the firms that addresses the various skill levels of incoming applicants. Divisions or departments (finance, administrative, creative, IT) within staffing firms pool their jobs, creating a web of employment that is organized and maintained by recruiters in the specialty divisions of each temp firm. Recruiters from each division consult with each other about applicants. For example, one firm has separate divisions for finance, professional office staff, creative, paralegal, and temporary-to-permanent employment[5]. Recruiters[6] from each division work together to "sift"[7] applicants by evaluating and matching them to the most appropriate department. This coordination between recruiters suggests that applicants and incumbent temporary employees have the ability to change divisions or placements with the assistance of recruiters.

An example of how this can occur is if an applicant interviews with a temp recruiter in the professional/general office division, but both the recruiter and applicant decide that the person is ready and interested in permanent placement. The applicant then immediately interviews with the permanent placement division. Or, if an applicant interviews for the creative division decides with the recruiter that they need to build graphic design skills and a portfolio, she or he may work in-house for the temp firm on projects or go through tutorials until they are ready for placement. Thus, as a worker it is easier to move around in generalist firms since they take on workers that may not immediately have a certain skill set. However, this assumes a certain level of motivation on the temporary employees' part. In purely technical firms, an applicant's technical skill are initially assessed and she or he and is hired based on that fit. The intake process at these firms is more specific to certain job types and thus, more rigid.

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[5] Temporary employment firms offer a contract arrangement to firms where an employee starts off temporary and after a certain period of time the firm has the option to buy the employee for full-time employment. The rates are lower than if they were to hire a temp and then ask for a buyout.

[6] Previously recruiters in this firm made a commission off of the placement of an employee so there was less of an incentive to "share" applicants.

[7] In Chapter 3 this process is referred to a creaming because it often eliminates certain workers from the temp pool. However, within the group of workers that are hired by the temp firm, this filtering process is more like a series of steps that a worker can climb as they build skill or change their work interests.

## Entry-level jobs

The question of skill and educational characteristics leads back to an interest in the availability of entry-level jobs at temporary employment firms. Popular perception, as the quote in the beginning of the chapter suggests, once viewed all temp jobs as entry-level. However, the profile of temporary employees described by recruiters in the Boston area described a broad range of people at both generalist and technical firms. Even the environment at each of the offices was akin to a high-powered corporate office, in which everyone standing in the room is dressed in a suit. The type of temp firm sampled for this research expects employees to be well-dressed and verbally effective with resume in hand, entry-level or not.

During interviews, recruiters and managers were asked to describe entry-level jobs types related to IT or computer functions for which they receive job orders. The number and types of job orders are different between technical and generalist firms. Generalist firms reported about eight percent of the total volume of job orders as IT jobs, but they reported roughly 25 percent of those to be entry-level. In addition to the larger volume of office support, financial and customer service positions handled by generalist firms, they receive job orders for IT customer service or help-desk positions, entry-level graphic and web designers, data entry or database managers, specialists in Powerpoint (or other types of software), and hardware or software support technicians.

Technical temporary firms have a reputation for specializing in technical employees and therefore they receive a wider variety of core IT job orders, mostly from IT firms. Technical temporary firms reported that 73.8 percent of their business clients are core IT firms and 100 percent of their job types are IT-related, therefore more of their jobs are IT than are the solicited companies. Entry-level positions at these temporary firms are sparse (recruiters estimate between 10 and 20 percent of all positions) and recruiters confirm the notion that business clients want temp employees or contractors who can "hit the ground running." Technical placements (not just entry-level) are usually generated by firms with project-based labor needs. By the time they hire additional staff, it is usually because they are behind in schedule. All recruiters at the technical temporary firms stated that the demand for entry-level technical temps has diminished over the last six months.

Technical temporary firms did report the existence of additional entry-level work in certain arrangements within the firm. For example, one technical staffing firm set up a consulting program based in-house at the temp firm called the Staff Consultant Program (SCP). The SCP program hires technical IT workers as permanent employees within the firm, but bids on temporary employment contracts. Temporary employees receive benefits and a regular paycheck from the staffing firm because they have the same status as internal staff. The staffing firm bids on project work at other private firms and then completes the project with SCP staff. The recruiter explained that entry or junior level IT employees

work as part of the SCP program. The company pays SCP staff lower wages than the regular contractors and can therefore offer bids of up to 40 percent lower than other contractors through this arrangement. Since the pay is lower, this program must accept less experienced workers who then gain hands-on-training as SCP staff. The contract agency can sell this arrangement to firms by offering "the full backing" of the rest of the company contractors in case SCP staff needs assistance. In other words, the temporary employment firm agrees to pay for an independent contractor to assist with an SCP project. This arrangement offers an opportunity for technically trained workers with little industry specific experience to enter the workforce.

## Strategies of temporary employment firms

The successful strategies of the staffing industry that attract client firms support their ability to place people in jobs. Any public job placement agency or temporary employment firm is based on its ability to work with employers. Ultimately, these strategies must enable a temporary employment firms to compete with other firms for market share. The three basic ways to compete in any type of industry are quality, service and price. The strategies of the staffing firms interviewed in the Boston area follow these principles as well, although the methods differ slightly between each firm. All of the temporary employment firms in the sample use traditional marketing efforts to recruit both temporary employees and business clients. Marketing takes the form of print ads, radio and television spots, displays in the yellow pages and local employment guides, and Internet ads or resume searches on websites like monster.com. The more creative strategies of the industry are outlined below and are organized to reflect the basic concepts of business competition.

### Recruitment of business clients

Temp firms now offer a range of employment services to their client firms outside of traditional 'fill-in' employment. The leg of the triangle described earlier between the temporary help firm and the business, is a more fluid consulting relationship with firms. Larger staffing firms offer a range of employment services to businesses including temp-to-perm placements, human resource contracting, recruiters for permanent positions, and payroll services. Some client firms go so far as to set up an on-site coordinator staffed by a temp firm, which functions as a human resource department. Businesses have started signing sole-source service contracts with temp firms, which state that they will use that particular temp firm for their temporary staffing needs. Trust in the temporary employment industry's ability to

satisfy human resource needs[8] Has been growing in firms across all sectors. In addition, temp firms have begun to develop customized training to train company workers.

*Quality*

One of the first methods of recruiting business clients cited by all temporary employment firms in the sample was a referral from a happy customer. The quality of the temporary employees placed at a firm is a key factor in the satisfaction of business clients and the resulting reputation of the firm. Over the last ten years, fueled by the new capabilities in software, the staffing industry has developed assessment tools to categorize temporary employees by an individual's skills and expertise as a worker, thus improving the quality of the matching process. The intricate tools developed by the temp industry are unsurpassed by human resource departments, and sometimes provide more information than standard interview processes.

The industry's expertise in matching employees and job orders is especially important for technical firms. All four technical firms explicitly stated they must exactly match a specific skill set requested by an employer. In chapter 2 it was explained that IT firms do not have time to bring employees up to speed with training so they look to "buy" needed skills from the staffing industry.

Temp agencies further their ability to compete on the basis of quality by offering employee "guarantees" to clients. If a client is not 100 percent satisfied, or if a temporary employee quits a job after being hired by the firm as a permanent worker, the temp firm refunds the fee paid based on a rate keyed to the amount of time a temporary employees has worked. In addition, both generalist and technical firms offer training to temporary employees as a way to improve the quality of the temporary employees they send on work assignments. The amount spent on training by the staffing industry has increased every year since 1990.

*Service*

The staffing industry sees itself as providing a human resource service to customer clients, namely private firms and government offices. This has expanded from a one-time sale of short-term employment to an on-going consulting relationship with customers. The firms in the sample all have business developers or recruiters whose sole job is to cultivate a link with human resource staff at private firms and public institutions. More and more private firms report using staffing services to preview or screen employees for permanent employment positions. Both the firm and the worker receive information about the other before a contract is signed. As a recruiter at one technical firm explained,

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[8] Recruiters or managers at all temp firms interviewed for this thesis expressed this concept. They either stated that they have developed on-going human resource consulting relationships with firms or mentioned that the industry overall has improved its reputation in the eyes of firms.

their business recruiters work closely with client firms (only a few per recruiter) to personally get to know the HR staff so that they understand what types of personalities fit in at the company. Some of the firms have been creative in differentiating based on services. One firm opens its doors on Sundays in response to the high rate of absenteeism on Monday mornings. Human resource staff can contact the firm on Sunday and have an employee there at 9AM on Monday.

*Price*

Temporary employment firms have been successful over the last decade because they create cost advantages for firms in several ways. Firms do not have to provide benefits or additional compensation packages for temporary and contract employees thereby saving on labor costs in production. Firms also see a cost advantage by allowing staffing firms to "manage their full-time utilization rates"[9] i.e. adding or subtracting staff through contract and temporary employment according to the ebb and flow business cycles so that there are never too many or too few employees on hand.

## Recruitment of temporary employees

Traditionally, the staffing industry spent little energy building up the services they offer to temporary employees. However, as competition between firms has increased, they have devised ways to attract qualified employees and improve upon the quality of the temporary employees they place in job orders.

The most important method by which staffing firms attract candidates is through referrals from other temporary employees. All of the interviewees felt this was the best way to find new recruits except for one, which preferred placing ads in the Boston *Employment Guide*. The exception is a generalist firm that actually tracks how applicants hear about the firm. The use of Internet job boards and resume sites was reported as a significant source of resumes, but generalist firms stated that print ads are more lucrative than Internet sites for recruitment.

*Quality*

The quality and experience of temporary employment greatly influences whether temporary employee refers other contacts to a specific firm. Firms have tried to improve the experience of temporary employees by offering benefits, training and a professional employment situation. One of the newest developments within the industry is the number of temporary employment firms that offer benefits as a way to attract high quality employees. All but two technical firms in the sample offer health benefits to temporary employees once they

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[9] From an interview with a technical firm on April 20, 2001, but echoed in two other interviews with technical firms.

accrue a certain number of hours work. The other two technical firms offer a "suite" of benefits including 401K plan, disability insurance, and life insurance.

Another perk offered by temporary employment firms is the variety of training options for incoming and incumbent temps. All of the firms in the sample offer software training in the form of self-paced tutorials on Microsoft software (professional office applications), Internet browsers, and Adobe software (graphic design). All but one of the technical firms offer web-based "colleges" on-line for employees that had worked a certain number of hours. These training programs relate to core IT skills including software programming, database design and management, operating platforms and network management. Two of four generalist firms offer workshops on resume and cover letter writing, business writing (memos and letters), interviewing skills, telephone etiquette, and dressing for success.

Temporary employment firms also compete for temporary employees by creating programs that address the desire for permanent work by employees. In response to hearing that a major reason employees do not sign on with a temp/contractor firm is the unstable work situation, one technical firm and one generalist firm created stabilized work arrangements within the firms. The Contract Staff Program described earlier is one example of a permanent work arrangement created to attract new types of workers. The other example is called the Guaranteed Work Program (GWP) at a generalist firm. This program allows a recruiter to hire someone into the GWP if they feel the candidate has potential and wants to take the person off the market. The individual is paid by the temp firm regardless of whether s/he is on assignment. The GWP program allows the employee to work internally for the temp firm, or if there is job order that day, they are sent to work at a non-profit (e.g. Rosie's Place, ABCD, Big Brother) at the expense of the temp firm.

The firm that sponsors the GWP program works more extensively with employees to fix "holes" in an employee's skill set. The firm offers opportunities for promising applicants to work at the temp firm and acquire additional skill. For example, if a potential applicant wants to work for the creative department but whose portfolio is not up to industry standards, the person works internally for the temp firm to build up slicks, ads etc for their portfolio. The GWP is a quasi training and industry experience boot camp with job placement services directly connected. One caveat of the program is that it is left to the recruiter to make a subjective decision about who is considered a "potential" applicant.

*Service*

Temporary employment firms also compete based upon services for temporary employees. Interview respondents at 83 percent of all of the firms interviewed stated that recruiters play a career counseling role with temporary employees. This consists of skill evaluation, job matching, follow-up once a

temporary employee is placed[10] and re-evaluation if a temporary employee is going to be replaced once a job is completed. In some situations, when a recruiter has worked with a temp for a longer period of time, they also provide a work reference for the employee, a critical factor in securing permanent employment. They manage employees through intake, assessment, training and placement processes creating a model of "continuous care" that does not exist at many other public or private agencies, or even at educational institutions. In other institutions, service from one entity usually ceases at some point along this process. A career center at a college may provide job listings and resume support, but it is not usually within their scope of services to follow-up with students once employed, or work with them again if they need another job.

Some applicants that walk through the door of a temp firm need little career coaching. Temp firms can again compete on service by offering up-to-date access to job listings with employers in their database. The ability of temporary employment firms to attract business clients improved their reputation as job brokers with the general public. This service is extremely useful in today's economy. Although the size of the contingent work force stabilized over the 1990s and the majority of Americans continue to work in full-time positions, tenure rates in full time positions have declined (Atkinson and Court, 1998). This means that more people are leaving their full-time positions more frequently. Employers look at employees more and more as a "package of skills" to be employed when needed. The staffing industry plays two important roles in this type of fluid job market. Temp firms provide a service to employees that need to connect to jobs more frequently than in the past. Another role of a temporary employment firm is to help the applicant figure out where they fit in the job market based upon the marketability of their skills. The assessment and intake diagnostic tools used by almost all temp firms, especially large firms, give feedback to the applicant while allowing the recruiter to compare the information with demand from employers.

*Price*

The ability of the staffing industry to compete based upon the wages paid to employees is a hotly debated issue. In general, blue collar and clerical office employees earn lower wages than their permanent counterparts. There are a variety of stories about wages paid to temporary employees versus permanent in technical positions. Wages paid in specialized fields like the medical industry and information technology placements are said to be higher. Some employees in these industries even opt for higher wages in temporary over a full time position with benefits. Depending on the supply of labor, temp firms often pay higher wages for skilled workers to lure them away from permanent jobs.

Lower skilled workers have a limited ability to influence wages received through temp work. The scarcity of highly skilled workers, especially in the IT industry, gives this type of temporary employee more bargaining power when negotiating with a recruiter. One thing is certain, all temporary employees are at a

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[10] The recruiter is the remaining contact between the temp firm and the employee once they are placed.

disadvantage in bargaining with temporary employment firms or the companies for which they work because it is difficult for them to organize. Temporary employees lack access to the benefits of internal labor markets within their placement firms. Typically, temporary employees do not build personal relationships with human resource or management staff at firms, therefore it is more difficult for them to negotiate. More recently, the longer duration of highly skilled temporary employees in technical or professionalized positions has begun to change this situation.

## Changing Role of Temp Employment

Over the last ten years the staffing industry has built up its expertise as an active labor market intermediary through several methods: information broker, industry stratification and improved benefits for temporary employees. Temporary employment firms have enhanced their role as warehouses of data on employees and employers. Standing alone, employees and employers lack the capacity to individually collect and manage data at the same scale as the staffing industry. This industry collects demographic statistics and market analyses on employers AND employees, a number that expands each year. This role has greatly improved the industry's credibility as a "job matcher" and has also created a product that firms are willing to pay for through temporary employment fees. Therefore, much of the growth and success of the industry is attributable to its role as a data clearinghouse. However, staffing firms go one step beyond data collection and form personal connections with temporary employees and human resource managers at client firms to solidify the matching process. This personalized link is what sets the staffing industry apart from other labor market intermediaries. They complete their intermediary role more quickly than other forms – internet, newspapers – and more efficiently than firms' internal human resource staff who lack knowledge about an applicant's true capabilities.

The business environment has also shaped the role of the staffing industry in the last ten years. The concept of project-based staffing has gained a lot of popularity, as has the number of independent consultants or "free agents" on the market. In the past few years, there has been an increase in demand for professional level temporary help – from interim CEOs to management consultants. One recruiter explained her experience working as a technical recruiter and the changing attitudes of the business community toward the industry thus far. She felt it has taken a long time for the process of this type of hiring to catch on with firms and employees/contractors. Certain employees have realized a benefit to non-permanent employment, although the general trend is a desire for regular employment. She also pointed out that even regular employment is unstable these days. She cited one example with Putnam Investments where they laid off permanent employees but left their contractors untouched. This example is contrary to the general belief that "the first to go" are temporary or contract workers.

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The tight labor market and fierce competition in the staffing industry is of paramount importance in shifting some of the temporary employment industry's focus onto the needs of temporary employees (Seavey and Kazis, 1994). Tight labor market conditions have spawned creative employee recruitment methods. One company offers a special monetary bonus for new referrals from existing employees. The shortage of young, college-educated applicants has motivated several of the generalist and technical firms to recruit from worker populations once considered atypical. For example, three temp firms talked about marketing efforts to attract candidates in the 45 to 55 range, an underutilized but attractive workforce. According to one recruiter this age range is more "seasoned" and does not require babysitting; temp firms does not need to worry about whether they will show up on time.

Every generalist firm in the sample reported that the need for more workers opened up their intake process to applicants not desired even as recently as five years ago. Fierce competition in the staffing industry has focused attention on neglected groups of workers with less skill. The staffing industry reports that it easier to recruit employees for "bottom-filling" and train them to take more skilled positions, versus directly recruiting skilled employees that may have better options elsewhere (Sunoo, 1999 p. 6). In the sample of Boston area temp firms, this was not the case at specialized temp firms. Technical staffing firms wanted workers with as much skill as possible related to a job placement. Of course, this hurts the chances of lower skilled workers in finding work with these types of employment firms. However, there is willingness substitute education for skill. One recruiter mentioned that they work with IT people that have two-year technical degrees from institutions like Clark University, when this is coupled with hands-on experience. This combination was acceptable to two other managers at technical firms. Generalist firms seem more willing to hire someone that passed basic proficiency tests but needed additional training in a specific skill.

## SUMMARY AND IMPLICATIONS FOR WORK FORCE DEVELOPMENT POLICY

If the staffing industry is so successful at placing workers in jobs, why not eliminate workforce policy and send every one who needs a job to a staffing firm? There are two critical reasons why the staffing industry fails to take the place of workforce development policy. One reason is the inherent motivation of the staffing industry to skim off the best employees from their applicant pool. Thus the most unqualified workers will never be employed by these firms. In recent years, the shortage of workers across all sectors of the economy forced staffing firms to accept a "lower grade" pool of applicants, making this less of an issue. However, when the labor market loosens up again the willingness of staffing firms to hire lower skilled workers will most likely taper off. Secondly, the issue of wage inequality and the rising premium for skilled labor is not directly addressed by the practices of the staffing industry. Although they offer some training for temporary employees they are not primarily focused on upgrading

the skill level of workers (Benner, 2001). Since the staffing industry functions within the private market it competes with competitive pricing for labor and is therefore unsuccessful at helping unskilled workers find employment with wages that cover the cost of living. Regardless of these issues, the staffing industry provides valuable lessons on how to manage two clients, the employee and the private market firms.

While there is available research on the connection between the strategies of temporary employment agencies and the role of labor market intermediaries, the research findings presented here offer a unique angle on this subject related to working within the IT sector. This research also focuses on available employment opportunities and worker qualifications for lower skilled workers at both technical temporary employment firms and generalist employment firms. This information is vital to the design of employment policy for lower skilled workers.

## Entry-level Opportunities

Research from the interviews brought out several findings on access to jobs in the IT sector as well as other technical jobs in firms not part of the IT sector. These findings provide additional information on the employment prospects for lower skilled workers in higher skilled, technical work.

➢ **The diversification of the staffing industry in the last ten years has improved a temporary employee's access to higher skilled jobs.** This structural change is evident by the specialized divisions within generalist firms. Temporary employment firms now handle clerical (filing, administrative assistant) to professional (finance, project management) to technical (medical, IT) work often within a generalist firm. In theory, a temporary employee that starts out in a less skilled position has access to more skilled positions as his or her proficiency improves.

➢ **Targeting the IT sector means providing exact skill matches for IT job types.** Therefore training and education are still keys to better quality employment opportunities and are necessary for less-skilled workers wishing to enter the IT sector. A technical degree or training certificate combined with experience in the field is often accepted by employers and staffing firms for IT positions. Temp firms are aware of which schools have acceptable training standards. Having have hands-on experience is an essential supplement to a technical certificate.

➢ **Technical temp firms offer entry-level IT jobs, but many of these jobs require specialized technical skills.** These positions include technical support for hardware and software, associate web developers, data managers, quality assurance and production assistant positions. The example of the Staff Consulting Program at one technical firm provides more entry or junior level positions with diminished skill (experience) requirements that the rest of the firm.

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➢ **Generalist firms offer the greatest number of non-technical jobs in IT firms that could be used as ladders into entry-level technical jobs.** One area in the IT supply chain to insert lower-skilled workers is through generalist temp agencies that tend to work with non-core IT firms and therefore have slightly lower skill demands. This is important for workers who have no technical skills and cannot immediately access IT training, or those who have some training but need additional industry experience in the field to cement training knowledge.

➢ **Generalist firms predominantly receive more job orders for customer service (help desk support), and data entry positions with fewer technical requirements than entry-level IT jobs at technical firms.** Workers lacking technical skills can participate in short-term training programs (less than one month) to qualify for these two job types, wheras other entry-level job types require longer term training and technical facility. Working these jobs provides industry specific experience that is necessary to apply to a technical staffing firm. Help-desk customer service positions in Chapter 3 reported having less opportunities to advance than data entry/management positions.

➢ **For a worker seeking to move from a non-technical to a technical job, there is more mobility in generalist firms with technical divisions (creative or IT)than in technical firms.** Since generalist firms offer a wider variety of employment areas, they do not initially evaluate temp applicants solely on technical skills. Therefore, the applicant may have more flexibility to be hired as a non-technical worker in an IT firm and then move to a more technical position after additional training or industry experience.

## Lessons from Temporary Employment Firms

The strategies of the temporary employment industry cluster around defining and satisfying the needs of the client, in this case, the customer firm purchasing employment. Temporary employment firms must also strategize on how to improve the quality of their product to better compete for customers. As a result, the staffing industry has predominately focused its efforts on its relationship with the customer firm or client and increased specialization of services.

## Who's the client?

➢ **One lesson from the temporary help industry is a need for a renewed focus on the employer.** Employers make the ultimate decision in the hiring process; this is a subjective decision influenced by many factors including personal biases (Moss and Tilly, 2001). The industry is just beginning to engage employers in a discussion of labor needs and to look for ways to expand their definition of the skills needed. The advantage of a tight labor market brings employers into this discussion more

willingly because they are in need of workers. One technical manager (who also has significant technical skills and background in IT) said that he prefers to work directly with IT managers instead of HR people because he could help IT managers understand how the skill set of a particular employee might fit a certain job, even though that skill set was not originally requested. He feels HR people have been less willing to entertain these possibilities because they were not as familiar with what the job entailed to begin with.

**Know the client**

➢ **The staffing industry's position in the private market, versus the public sector, means it has an economic incentive to stay on top of employer demands for education and skill level of workers.** Without this information temp firms lose profits and, for some staffing firms, directors will eventually have to answer to shareholders. Every worker placed in a job is income for the staffing firm. If quality of service (temporary employees) declines, eventually so will their profits. Publicly funded programs lack this economic regulator. Therefore, workforce development policy must consider whether it is in the best position to effectively offer job matching services.

➢ **In general the staffing industry has also improved their services in their relationship with hiring managers at client firms.** The consulting relationship that has evolved over the years between the business recruiter at the staffing firm and the hiring manager at the client firm helps make a better match with an employee because the business recruiter has a personal sense of the firm. This relationship reinforces the accountability of the recruiter in providing only quality candidates to the hiring manager because a personal relationship is at stake. This relationship works to the advantage of the recruiter at the staffing firm who is likely to be made more aware of new job openings at the firm.

**Specialization**

➢ **One of the strongest and clearest strategies of the staffing industry in recruiting both employees and business clients is a continuous mission to improve the quality of their "goods and services" by branding their name with a particular specialization.** This was seen in the organizational structure of generalist firms that offer minimal core IT and technical skill sets compared to IT temp firms that only offer IT skill sets. The specialization of employment services builds a core competency and a reputation for the firm. The need to specialize might explain why some of the generalist firms that initially offered IT or technology-type services have since dropped the focus or created separate companies under different names to house technical employment services.

➢ **The assessment tools and screening procedures developed by the staffing industry to diagnose an applicant's skill increase the transparency of information about employees for employers.** These tools are widely used in the staffing industry in order to compete with other staffing firms and, as a result, the quality of temporary employees becomes more standardized across the industry. Although an individual firm exists independently, it also exists as part of a larger industry that has set standard expectations of employee quality. It is similar to the existence of fast food chain stores like McDonald's. Even though the chain includes stores owned by many different owners, customers know what type of food to expect when they patronize a McDonalds. Standard quality across the industry builds the private market's trust in using temporary employees.

In chapter 6, the policy implications from Chapter 3 and Chapter 5 are combined into an integrated analysis used as the basis for policy recommendations for a workforce development approach to the IT sector.

# CHAPTER 6: FORGING INTO THE IT SECTOR:

WORKFORCE DEVELOPMENT POLICY FOR LOWER SKILLED WORKERS

*"Although attention to labor market preparation, access, and retention for disadvantaged workers has experienced a dramatic turnaround in the past six years for economic and policy reasons, serious challenges remain. Today's workforce development implies more than employment training in the narrow sense: It means substantial employer engagement, deep community connections, career advancement, integrative human service supports, contextual and industry-driven education and training, reformed community colleges, and connective tissue of networks."*
**Robert P. Giloth, Annie E. Casey Foundation**

The preceding chapters delve into the characteristics of employment in the IT sector as well as employment in IT-related positions in non-IT firms. This investigation comes from two perspectives: the IT firms of Cambridge Massachusetts that employ workers, and the Boston area staffing industry that supplies a significant amount of labor to these employers. IT skills continue to become more critical as the economy increasingly relies on the use of information technology in day-to-day business. The ultimate goal of this investigation is to look for ways to open up high-tech employment to workers beyond the norm of white, male, Caucasian, age 36 to 40, with a bachelor's degree, as reported by Boston area temp firms and confirmed by nationwide statistics on IT workers. The job growth and wages paid in this field are currently only enjoyed by a narrow segment of the population. Moreover, without efforts to attract and train new types of workers for these positions, employers will continue to face a shortage of qualified IT workers. More importantly, inaction will drive the wedge between skilled and unskilled workers deeper into society. Forging into the IT sector with workforce development policy requires more than short-term training to assist lower skilled workers in accessing jobs. The stringent education and skill requirements of *core IT positions* mandate the development of long-term training and education policies to increase the supply of workers qualified to enter into the field. However, a successful employment policy must be creative in findings ways to help lower skilled workers qualify for entry-level IT occupations to be able to access the growing opportunities in this industry. The primary goal of this chapter is to outline creative approaches to providing employment and training opportunities for lower skilled workers that initiate careers in IT-related occupations, as well as opportunities for mobility out of entry-level work.

The research findings presented thus far demonstrate that this is no easy task. The need to speak English and gain hands-on experience in a specific skill to qualify for entry-level IT jobs poses a challenge for the least skilled workers in the labor market. For this reason, entry-level IT positions may be most appropriate for individuals that have already cleared a few basic hurdles, including the ability to speak English and mastering basic reading and math skills. The definition of a *lower-skilled* fits several

types of workers who span a range of skill and education levels. Therefore, one purpose of identifying the characteristics of IT-related job types and employment qualifications is to also identify distinct groups of lower skilled workers with the potential to take advantage of entry-level jobs in IT-related occupations. For example, employment prospects are different for English-speaking high school graduates versus non-English-speaking high school graduates. In general, the findings and implications from the preceding research suggest two factions of lower-skilled workers that have the most potential for employment in IT entry-level work: high school graduates and current entry-level workers. Distinctions between lower skilled workers are acknowledged throughout the recommendations.

The research findings on IT employment and temporary employment firms brought to the surface larger concerns that are not focused on in detail in the following recommendations. One such issue is the need for education reform. It is increasingly apparent that reforming pubic education for youth and adult populations is a key element in providing a future workforce with the basic reading, writing, quantitative and technical skills necessary to advance into core IT occupations. Although, the recommendations do not substantively address education reform, they pinpoint specific areas where there are opportunities for education and workforce development policies to intersect and improve access to entry-level IT occupations.

Several broad policy issues related to temporary employment are acknowledged but not addressed in the recommendations (Houseman, 1999; Kalleberg et. al., 1997; Cohany, 1998; Parker, 1994). It is worth mentioning the scope of these issues since the IT sector continues to use temp firms as a source of employees. There is a strong need across all industries in the US to support workers in non-traditional employment arrangements with labor and governmental policies. More specifically, the need for portable health benefits and unemployment insurance is heightened by non-permanent work arrangements. Additionally, the transient nature of temporary employment makes it difficult to organize workers or pressure multiple employers to improve working conditions. Improvements in unionization of temporary or non-permanent workers or the passage of a temporary worker "Bill of Rights" would ultimately reduce the negative side effects of this type of work.

Several assumptions underlie the following conclusions and recommendations. It is assumed that, in all of the following recommendations, industry leaders would inform policy makers and guide forthcoming processes. The results of other researchers and the research presented in this thesis have shown the importance of first-hand knowledge from IT industry leaders. There is no compelling reason to design new policies that create additional labor market intermediaries maintained by government or non-profit entities, energy would be better focused on ways to improve upon private and public institutions that already have contact with this industry.

The next three sections of this chapter present policy recommendations intended to increase the employment and advancement of lower skilled workers in IT-related jobs. It includes additional recommendations on how labor market intermediaries can better assist with this effort. The first section is a set of recommendations that enhance access to job opportunities for lower-skilled workers in IT occupations. The second topic centralizes around the mobility of workers from entry-level work to more skilled positions. The third section highlights improved linkages between existing labor marketing intermediaries to increase the access and mobility of lower skilled workers within the IT industry. These three strategies are based on the implications of previous research as well as information collected through literature on the IT-related employment.

## ACCESS STRATEGIES

Public image surrounding the IT sector portrays an inaccessible fortress of computer science wizards, housed in yet another fortress of educational degrees and programming skills. For low and even moderately skilled workers, this is a formidable image. While the IT sector is dominated by core IT professionals, the implications of the findings in this research suggest there are a few strategic access points for entry-level workers to break through the sector's suit of armor. These access points exist in the form of entry-level jobs with lower technical and educational requirements compared to other jobs in the IT industry. Like any employment opportunity, access to technical occupations can be approached from the following angles. Workers can apply for entry-level positions from outside of a company or firm (external access), or they can move internally within a firm from jobs with less technical barriers (internal access).

### Internal Access

Accessing employment opportunities as part of the internal labor market of a firm gives an employee the advantage of established personal connections to hiring managers. If an employee is knowledgeable about the work environment and business of a firm, they are more attractive than an external candidate, all else being equal. For this reason, *non-technical* entry-level positions are important in accessing entry-level *technical jobs,* provided firms are willing to train and promote employees. Interviews with IT firms and technical recruiters suggest mixed findings on IT firms' attitudes toward training.

Cambridge IT firms described a two-tiered system of "entry-level" jobs that could provide a structure for internal mobility, again depending on the attitude of the firm. A review of the entry-level job types identified n Chapter 5 (see Table 6.1) shows two groups of entry-level positions split by salary

range and technical/educational requirements. Most of the job types that pose the fewest technical barriers (*Production, Administrative Assistant, Data Management*) also pay the least, in the $20,000 to $40,000 dollar range, while job types over $40,000 had a technical index above 40 percent. This split could be perceived as a stepping-stone to more highly skilled work.

**Table 6.1 Entry-level Job Type Characteristics**

| AGGREGATE JOB TYPE | TECHNICAL PERCENT | % BACHELOR OR MORE | SALARY RANGE (Highest % of jobs) | % REPORTING ABILITY TO ADVANCE | % REPORTING EMPLOYER TRAINING | PROJECTED 5-YEAR JOB GROWTH[1] IN CAMBRIDGE |
|---|---|---|---|---|---|---|
| WEB DESIGNER | 100.0% | 25.0% | 40-60 | 100% | 0% | 31 |
| GRAPHIC | 60.0% | 75.0% | 40-60 | 75% | 0% | 102 |
| WEB DEVELOPER | 48.8% | 100% | 60-80 | 100% | 20% | 0 |
| TECHNICIAN | 47.9% | 65.7% | 40-60 | 74% | 23% | 406 |
| CUSTOMER SERVICE | 42.9% | 11.1% | 40-60 | 18.0% | 61% | 133 |
| PRODUCTION | 32.0% | 66.7% | 20-40 | 33% | 33% | 47 |
| ADMIN. ASSISTANT | 16.4% | 46.7% | 20-40 | 87% | 53% | 94 |
| DATA MANAGEMENT | 0.0% | 0.0% | 20-40 | 100% | 25% | 0 |
| QUALITY ASSURANCE | 0.0% | 0% | 40-60 | 100% | 0% | 0 |

Less clear from the information gathered through Cambridge IT firms is whether firms actually train entry-level workers for technically skilled positions. News articles profiling the IT labor shortage cite examples of firms (IT and non-IT firms) that have resorted to training non-technical workers for IT-related positions that they can fill from the outside. For example, in an article published by *Informationweek,* firms reported that "IT departments are coping [with labor shortages] by aggressively tapping new and existing resources to fill vacancies. They are retraining IT staff and hiring non-IT people from other departments." (Mateyaschuk and Violion, 1999, p.1) Several of the firms interviewed in the article approach front office and factory floor workers with strong PC skills to train and promote them into IT-related jobs in the company. This is especially true for firms in less urban geographic areas that lack a strong IT labor pool. However, temporary employment recruiters and national reports on the IT industry suggest that most firms are less willing to train employees.

The behavior exhibited by firms that retrain non-technical entry-level employees to fill the IT needs of the company should be encouraged. Specific ways to encourage private employers to pay for IT training are discussed in the next section. This discussion highlights the advantages of training entry-level workers already employed by firms.

**Recommendation: Create incentives for private firms to train and promote entry-level workers for IT-related jobs within the firm. The federal government is considering legislation to create a tax credit for firms that pay the cost of IT training for existing employees[2].**

In addition to training incentives, another way workers in non-technical jobs can access existing technical positions is by learning on the job. The practice of internally mentoring employees at a company improves access to jobs through promotion. The human resource director at one IT firm discussed at length the process of self-learning that happens in entry-level positions at his web development company. The firm encourages informal training between employees of all levels. This mentorship process could be enhanced at other firms and even supported in a formal way in the organizational structure of firms. If newly hired employees were formally matched with senior staff, mentoring would occur more consistently. Government funding sources for workforce development often provide grant money for technical assistance in designing training programs and new human resource practices. Technical assistance grants could require firms to create formal mentoring programs in addition to specific training programs.

**Recommendation: Active partnerships or funding relationships between government and private firms that have recently emerged to tackle the IT labor shortage should help private firms analyze their internal job structures to establish mentoring programs between entry-level and technical workers.**

<u>External Access</u>

Direct access to technical entry-level work from outside of a firm depends upon many factors including an employee's qualifications and connection to hiring managers. Research with Cambridge IT firms and temporary employment recruiters uncovered a set of entry-level technical jobs in the IT sector that could be effectively targeted for lower skilled workers. A list of three includes *Data Management, Software or Hardware Technicians,* and *Customer Service.* These job types were identified as target occupations based on employer descriptions of job requirements, training and advancement opportunities, and an increasing number of job openings. *Customer Service* is included in the list because of its projected growth for the population and the relatively low technical barrier (42.9%) accompanied by employer-sponsored training for more than 60 percent of the employees. The drawback for this job type

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[1] Projected job growth was calculated by dividing the number of new jobs reported by the response rate (.128) to determine the number of new jobs created by the firms in the population. This calculation does not take into account the births or deaths of firms.

is limited advancement. Advantages for the *Data Management* and *Technician* positions include greater opportunities for advancement and moderate technical barriers for entry. In addition, stellar growth rates are predicted for both job types in the Boston region between 1998 and 2008[3], as noted in Chapter 3. Data management positions in particular start at data entry jobs and work up to database management and design. Cambridge IT firms' projections on job growth agree with the projections for technicians but not for data management occupations.

One subgroup of the lower-skilled workforce that can access these jobs more easily is high school graduates that do not intend to continue with post-secondary education. There are two obvious ways to channel high school graduates into IT-related employment. One way is to improve the enrollment and graduation rates of high school graduates from IT degree programs at community colleges or technical schools. Arrangements between high school guidance counselors and instructors at community technical colleges might include high school students that participate in community college classes while still in high school. Community colleges could institute special tuition rates for high school graduates that agreed to enroll in two-year degree program. High school graduates can also access IT-related jobs directly through employers. The shortage of IT labor has taken its toll on business owners who have started to hire high school graduates and train them in everything from web design to programming. One company that moved from San Francisco to Denver recruits high school students and successfully trains them as programmers (Violino and Mateyaschuk, 1999a). The assistance of labor market intermediaries and training programs in providing direct access to entry-level IT jobs are discussed in the sections that follow.

**Recommendation: Specialize training and job placement activities for lower-skilled workers in the following occupations: *Data Management, Software or Hardware Technicians,* and *Customer Service.***

## MOBILITY

The ability of lower-skilled workers to move out of entry-level work (technical or non-technical) is dependent upon additional skills training, the acquisition of work experience, and supportive career services. Although these three components are important to any individual during their work career, they are critical for the advancement of entry-level workers in this industry.

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[2]Source: www.itaa.org
[3] *High-Technology in Massachusetts: The Industries, The Workforce.* This publication looks at job change between 1998 and 2008.

## Short-term Training

Training is key to moving from an entry-level technical job to a more skilled position. In an ideal labor market, all workers would have access to employer-provided technical training. In reality, employers more often hire external candidates with the appropriate qualifications. One way to encourage firms to sponsor formal training for entry-level workers is to create a tax credit for private firms that pays the cost of IT-related training for entry-level employees. A tax incentive could be created at various levels of government, either based on federal income or local property taxes. Unfortunately, do to the paperwork process, tax credits tend to be more of an incentive for larger firms. Small or mid-sized firms could be encouraged to participate by streamlining the tax credit process. For example, a link on a city or Internal Revenue Service website to a database tracking system for registered employers would allow them to tally credit amounts and easily generate a report for tax filing purposes. Cities could institute property tax credits to encourage training in urban areas.

**Recommendation: Create tax incentives to encourage private firms to provide IT training for entry-level workers through the design of a federal (and possibly city) tax credit policy.**

States can also play a financial role in training by using workforce dollars to design and fund low-cost classes (for lower-skilled workers) in IT skills through partnerships with community colleges or technical schools. Community colleges and technical schools often have regular contact with industry leaders and reputations as quality training institutions. They also own training facilities. States have the funding to subsidize tuition for lower-skilled or entry-level workers wishing to take part in these classes. The design of state-funded IT training should go one step further by developing coordinate career services with temporary employment agencies. Along the same line as the "sole source" vendor contracts developed by the temporary employment industry, training programs and technical placement firms would mutually benefit from a vendor contract for the placement of students. In this scenario, the vendor contract is advantageous for both parties because temporary employment agencies are guaranteed a supply of skilled labor and community colleges are guaranteed placement services.

**Recommendation: Through a partnership between state government, community colleges (or technical schools) and temporary employment agencies, create a training curriculum administered by the schools to provide entry-level or lower-skilled workers with the opportunity to access training and career services for IT-related occupations.**

## Work Experience

Any type of skills training program, especially for people new to a specific technical field, needs to build the product portfolio or work experience for a participant. If a participant is not learning a skill that creates a product, he or she should be working in the field, gaining experience. Institutions that already excel at providing training (technical and community colleges) could enhance their services by combining training with work experience or an internship. In addition to work experience, working in the field as an intern or temporary employee builds personal links to a company and provides training participants.

To accomplish this, an established training program could create a model consulting program similar to the Consulting Staff Program (CSP) reviewed in Chapter 5. This program would be run by a technical temporary employment firm and would allow less-experienced workers to gain relevant work experience on the job, along side more experienced professionals. The regular consultants for the staffing firm using this system guarantee the quality of CSP consultants so that firms are comfortable with this arrangement. Community colleges or technical schools could set up their own version of a CSP program since they have a reputation as quality IT trainers and access to an immediate supply of labor. The community college or technical school could bid on contracts for temporary IT work at private firms. The staff in the training program would need to act as guaranteed backup in order to ensure the continued interest of company clients. Alternatively, instructors who are industry professionals could be hired to support students on the job. The salaries of the industry professionals could be paid for by workforce development funds.

**Restructure existing training programs (private and public) to connect to job placements, temporary employment or internships in the field so that a participant builds of an IT portfolio.**

## Long-term Training

Lower-skilled workers who want to pursue a career in core-IT occupations need to invest in longer-term training at technical schools and community colleges to graduate with a two-year associate's degree in Information Technology. Again, tax incentives are one way to encourage employers to pay for this type of training.

Beyond IT-related training, the IT industry requires basic education and skill levels that cannot be fixed by short-term training or even in a two-year training period. Research both on Cambridge IT firms and temporary employment agencies showed that even the least educated workers had completed high school. Literacy rates, basic math and science skills of the least skilled workers, must be improved before they can seek employment in entry-level positions within the IT sector or technical positions elsewhere.

Training and education for this population is rooted in adult basic education and K – 12 public education systems. Specific recommendations on how to achieve this goal fall outside of the scope of this proposal.

**Recommendation: The adult basic education and K-12 education systems need to improve their ability to provide a solid foundation of basic skills to build a core competency in remedial and general skill preparation. Currently the system is unable to prepare workers with the necessary skill to due the high demand for these services compared to funding levels.**

## Career Services

Workforce development policy designed to facilitate mobility within the labor market is closely linked to the issue of access to job opportunities and promotion out of entry-level work. A mechanism is needed to ensure that once an entry-level worker gains additional experience, he or she is reevaluated and matched to better job opportunities. An unattractive aspect of entry-level jobs in general, but especially those that require little or no skill, is the propensity of individuals to stay in the same jobs, even while moving from employer to employer. Temporary employment firms offer limited career services for temporary employees, as discussed in Chapter 5. Some recruiters provide career services to temp employees that range from skills assessment, training, job placement, and re-placement and references. This range is a model of "continuous care" as workers move in and out of employment. Although recruiters at temporary employment firms provide such "continuous care" for temporary employees, they are not focused on entry-level workers who have secured permanent employment.

Other institutions in the labor market could adopt a more prominent role in career services for lower skilled or newly trained individuals. One set of institutions is the massive community college industry and numerous technical schools that exist across the country. A participant in a training program at a community college would benefit from extensive career services and employer connection like those of temporary employment firms described earlier. Of course, staffing these services requires individuals who are familiar with the IT industry and have industry contacts for job placements. An additional option is for community colleges or technical schools to draw off the strengths developed by the temporary staffing industry through a partnership or contract agreement for services. In this instance, each labor market intermediary retains it core function but benefits from the expertise of the other.

**Recommendation: Workforce development policy could help design and fund continuous career services at community or technical colleges, in addition to training programs to improve the transition of entry-level workers into more skilled IT positions. In addition, community colleges and technical schools can partner with temporary staffing agencies to improve the transition between training and employment.**

## Training Standards

Another finding from the research with Cambridge IT firms and the staffing industry in the Boston area was the importance of standardization of training. This is due to the demand for exact skill matches and industry-specific experience. Since the content and quality of training is important to employers and staffing firms, they are aware of which schools have acceptable training standards. Workforce development policy can intervene in this area in the continued development and implementation of industry standards for emerging IT skill sets.

**Recommendation: Policy makers should work with community colleges to set national accreditation standards for IT degree and certificate programs. All training programs related to IT products, such as software, should be vendor-certified.**

## ENHANCE LABOR MARKET INTERMEDIARIES

Many of the preceding recommendations rely on the function of existing labor market intermediaries (LMIs) to provide access to employment or mobility out of entry-level work. The active role these institutions play in facilitating employment in IT-related positions justifies a section on how to enhance their capacities and how to build a network between them.

## Specialization

The practices of the temporary staffing industry offer much for us to learn about how effectively place workers in private sector jobs. One of the clearest lessons is the way that temporary employment firms have specialized their services around specific skill sets, thereby building a reputation for technically skilled employees. Government job placement agencies like the Employment Service or Career Centers sponsored by Workforce Investment Boards do not have a reputation for technically skilled workers. Although the absence of this reputation has many causes, in order to more effectively tap into higher skilled positions in the IT industry they must specialize their services to meet the needs of employers and to build a new reputation. These agencies should follow the example of temporary employment agencies by creating separate divisions within the agency. Or, the government agencies could set up offices dedicated to specific industries as well. The biotech industry has been notably successful at setting up reputable non-profit training programs staffed by industry professionals.

**Recommendation: Public and non-profit job placement agencies should specialize in the recruitment of job placements at firms and corresponding training efforts to build theirreputations as labor market intermediaries.**

## Links to Human Resource Staff

Recruiters with intimate knowledge of the IT industry are better able to screen applicants and match employees to employers, generally improving the quality of workers they provide and the firm's reputation as an IT specialist. The technical firms interviewed during for this research only recruit and place IT employees; they are well-schooled on the requirements of the industry. Temporary employment firms also develop personalized relationships with human resource managers at client firms. As the staffing industry has evolved, temp firms have created consulting-type relationships between business recruiters at the staffing firms and hiring managers. This relationship reinforces the accountability of recruiter in providing only quality candidates because a personalized relationship is at stake. It also works to the advantage of the recruiter at the staffing firm who is likely to be more aware of new job openings at the firm. Public and non-profit job placement agencies need to emulate the connection to human resource staff in private firms.

**Recommendation: Public and non-profit labor market intermediaries should identify target industries for job placement and training activities and then train staff with industry-specific knowledge of employers and job requirements. In addition, staff at these agencies must develop personalized relationships with human resource staff of targeted firms.**

## Coordination of Labor Market Intermediaries

The function of labor market intermediaries has become more critical to the workforce as the characteristics of the labor market has leaned toward less stable employment. Labor market intermediaries (LMIs) run by for-profit companies are of interest to workforce policy because they serve workers and are financial profitable within the private market. Several researchers - Chris Benner, Laura Dresser and Laura Leete - interested in the LMIs set out to evaluate the effectiveness of various LMIs for case studies in Silicon Valley and Milwaukee (2001). They assessed the ability of various types of intermediaries to provide workers with job mobility. The researchers measured several labor market outcomes including outreach activities, assessment of employers and workers, training, on-the-job assistance, and the availability of support services. They found that each LMI generally has one specific activity in which it excels. A brief summary of their findings is presented in Table 6.2. The strength of each type of labor market intermediary is as follows: community colleges: training and lifelong learning,

temporary employment firms: outreach, placement and assessment, non-profits: outreach to marginalized populations, and public job training or placement programs: support services and soft skill training. None of the LMIs evaluated were perceived to offer more than minimal amounts of on-the-job assistance or the capacity to build worker networks. Interestingly, the assessments show that each type of LMI has one particular strength that does not overlap or duplicate the strength of another; on the contrary, it is arguable that they complement each other's strengths.

**Table 6.2: Assessments of Labor Market Intermediaries**

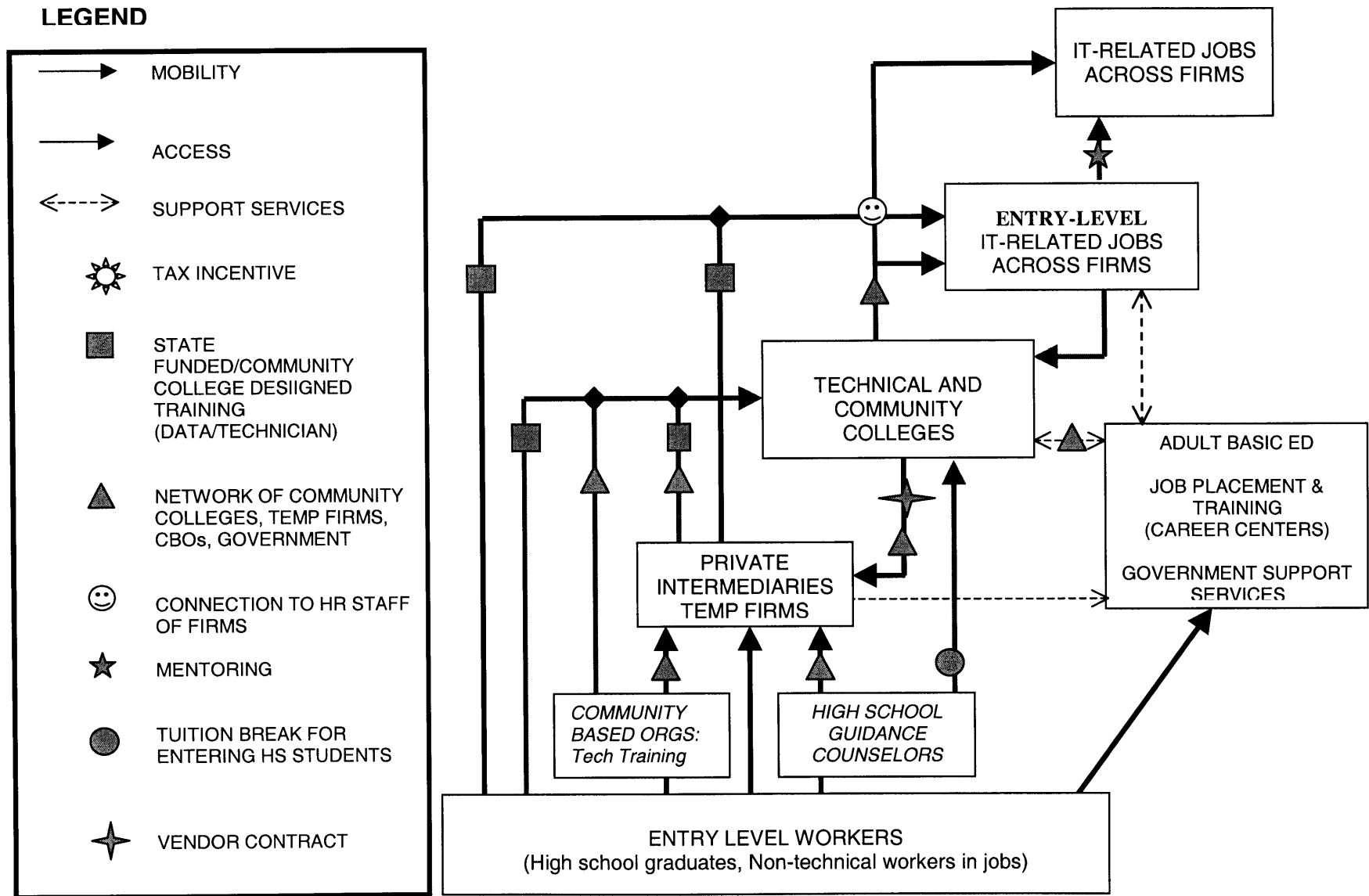| **Labor Market Intermediary** **Strong Labor Market Outcome**[4] **(Benner et. al.)** | **Labor Market Outcome** | **Evaluation of Boston Area Temporary Employment Firms** (General professional and technical employment agencies) |
|---|---|---|
| Temporary Employment Agency | Outreach with low and middle levels of labor market/placement | Outreach - Strong |
| Temporary Employment Agency | Assessment | Assessment - Strong |
| Community Colleges | Training | Training - Limited to general skills/ PC skills |
| Public Programs | Support Services | None |
| None | On-the-job assistance | On-the-job assistance – Moderate to Strong |
| None | Build worker networks | Networks – during temp contract |

The overall message of Table 6.2 suggests that existing labor market intermediaries provide needed services within the private market. Yet each service or function is controlled by a separate entity. Most likely, interfacing with multiple LMIs is confusing for a worker in need of more than one service. Therefore, a major challenge for workforce development policy is to accentuate the core competencies of each LMI and, at the same time, coordinate activities across LMIs so that they truly complement and build off each other.

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[4] This study looked at membership-based labor market intermediaries that show, several strong positive outcomes on assessment, training, industry specific knowledge, and worker networks. However, since these LMIs are not open to the general public they were not considered in the review of research on LMI outcomes.

A major recommendation flowing from the research presented in this thesis, as well as from other researchers interested in labor market intermediaries, is the need to create formal relationships or links between these institutions in order to better leverage their strengths and improve the labor market outcomes of workers. Blossoming relationships between some of LMIs have already taken hold as they seek out new ways to deal with labor shortages. There are numerous examples of community colleges linking up with training programs sponsored by non-profit community-based organizations (CBOs) to bring new students into community colleges. In Boston, this has been one outcome of basic training in PC skills. In CBO programs, participants discover an interest in technology and then enroll in classes at a community college. Additional links between LMIs would create paths between employment services to facilitate access to jobs and mobility within the labor market for lower skilled workers. Figure 6.1. depicts the position of various LMIs and the potential flows of workers through a coordinated system.

**Figure 6.1: Summary Chart of Labor Market Intermediaries with *Access* and *Mobility* of lower skilled workers in IT-related jobs**

**LEGEND**

| | |
|---|---|
| → | MOBILITY |
| → | ACCESS |
| <----> | SUPPORT SERVICES |
| ☼ | TAX INCENTIVE |
| ▓ | STATE FUNDED/COMMUNITY COLLEGE DESIIGNED TRAINING (DATA/TECHNICIAN) |
| ▲ | NETWORK OF COMMUNITY COLLEGES, TEMP FIRMS, CBOs, GOVERNMENT |
| ☺ | CONNECTION TO HR STAFF OF FIRMS |
| ★ | MENTORING |
| ● | TUITION BREAK FOR ENTERING HS STUDENTS |
| ✦ | VENDOR CONTRACT |

IT-RELATED JOBS ACROSS FIRMS

ENTRY-LEVEL IT-RELATED JOBS ACROSS FIRMS

TECHNICAL AND COMMUNITY COLLEGES

ADULT BASIC ED

JOB PLACEMENT & TRAINING (CAREER CENTERS)

GOVERNMENT SUPPORT SERVICES

PRIVATE INTERMEDIARIES TEMP FIRMS

COMMUNITY BASED ORGS: Tech Training

HIGH SCHOOL GUIDANCE COUNSELORS

ENTRY LEVEL WORKERS
(High school graduates, Non-technical workers in jobs)

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Many of the recommendations made throughout this chapter are coded and mapped on the flow chart to help the reader visualize how to meet the challenge of coordinating existing labor market intermediaries and improve their effectiveness with lower skilled workers who want employment in IT related jobs.

Creating linkages is a phrase that is widely used, and often poorly implemented because no one entity has an incentive to take the initiative. In this proposal, there are existing incentives for several of the LMIs depicted in the chart to make contact, discuss, and coordinate their efforts. For example, the proposed relationship between community colleges and temporary employment agencies would be mutually beneficial. Temporary employment firms need the labor supply of recent graduates or students completing classes in IT-related coursework. Community colleges lack career services to ensure the placement of students, which makes them more attractive to potential customers, and temporary employment firms already possess strong connections to employers. These two institutions could create an agreement or an understanding to encourage two-way referrals between staff. Although, community colleges should insist that student referrals are placed in quality jobs related to IT employment.

In the same fashion, there is an incentive for private firms to work closely with community colleges or technical schools to access a labor supply with IT-related skills, especially if firms are originally involved in the design of the coursework. There are many examples of private firms contracting with community colleges for customized training, as well as industry involvement in the design of community college curriculum. This relationship is reciprocal in that a close link between community colleges or technical schools may also improve an employer's willingness to send incumbent employees for additional IT training, thus improving the mobility of employees into technical occupations.

Once again, high school guidance counselors can be brought into the loop to help graduates with job access or recommending additional coursework that would qualify them for IT occupations. Lastly, government involvement brings in support services and funding not provided by any of the private or non-profit LMIs in the chart. This leads to the next topic of discussion on targeted funding for IT training.

**Recommendation: Key labor market intermediaries should coordinate a discussion between each entity to identify ways to collaborate and even buy services from each other to improve the opportunities for access and mobility of workers that utilized their services.**

## Targeted Funding for IT Training

The human capital investment that would be required by workforce development policy, employers, workers, or the public education system to prepare lower skilled workers for IT employment is

significant. This would be true even if attention was only focused on existing entry-level workers and high school graduates. However, this investment provides workers with technical skills that are highly valued by several types of employers. Technical skills are in high demand and are transferable across employers; a marketable trait for trained individuals across many different occupations. Since skill (plus work experience) is the predominant focus in the hiring of IT-related positions, reputable training certifications or technical degree programs increase the transparency of a worker's qualifications and therefore allow them to substitute years of education for skill. Thus, technical skills add value to an individual's package of skills and future ability to find work that pays a self-sustaining wage. This type of human capital investment improves an individual's ability to survive in a churning job market. A human capital investment of this kind also adds value to the workforce, an additional reason to pursue employment strategies tailored for IT and technical jobs for lower-skilled workers.

The need for workers with technical skills has been established at national, state and local levels by government, researchers and private firms. Workforce development policy can respond by targeting funding to programs that train or retrain lower skilled or mid-career workers for IT-related occupations.

There are existing examples of workforce funds dedicated to training workers in IT skill sets. Massachusetts has already started down the path of targeted funding. A program called the Mass High Tech Entry Ramp awarded $400,000 in state funding to four training programs that provide training related to IT skill sets. Two of the programs are run by non-profits and the other two were awarded to a professional and community college.

The Massachusetts Workforce Development Fund is another well-funded vehicle to promote retraining of existing employees. Although the fund does not specifically target IT training, it is focused on providing employer incentives to increasing training levels. This fund collects taxes from Massachusetts employers and distributes dollar-for-dollar matching grants to employers, unions, or training organizations. Last year, the fund awarded over $3 million dollars[5] and reportedly trained 6,616 workers at 52 different organizations and firms across the state. Interestingly, in the last round of funding, most of the firms receiving grant money were manufacturers. About ten firms specifically stated that the grant money would go toward training employees on technology-related skills. Grant sizes range from $2,000 to $250,000 and it is anticipated that $18 million dollars will be available next year. The Fund also offers technical assistance grants to firms that need to assess and identify their training needs. This type of training incentive is attractive to firms and could be expanded to target entry level workers in IT firms or firms that need to upgrade the IT skills of existing employees.

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[5] This information is available on-line at
http://www.detma.org/workforce/awards/Round7/rptapprovedtrainingbyregion_1.html#

# SUMMARY AND CONCLUSION

Tapping into employment opportunities for lower-skilled workers means that workers must have the opportunity to gain skills, either on the job or in a training program, and work experience to be qualified for entry-level positions in the IT industry. There are three IT-related job types that have the most potential for lower-skilled workers in terms of employment and wage benefits. These are *Data Management*, *Software* and *Hardware Technicians*, and *Customer Service* (Help Desk) positions. Some lower-skilled workers can access these positions directly, while others require additional technical training. In addition, lower-skilled workers would benefit from stronger connections among labor market intermediaries, enabling them to access a coordinated network of employment and training opportunities. This begins by contact being established between each of the existing labor market intermediaries to recognize existing incentives. This would lead to the development of more formal referral systems. In conclusion, creating prospects for lower-skilled workers in the IT sector poses a challenge for education and workforce institutions and private employers in need of skilled labor. The research findings and recommendations presented in this thesis frame the human capital investments needed to meet this challenge.

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APPENDIX A

**Company Name:** _____

**Name & Title of person completing survey:** _____ **Phone:** _____

**Annual revenue last
reporting period** (optional)   **$** _____   Additional locations[A]: **Pick One** Year established: _____

**Description of business:** _____

1. What are the types of jobs that currently exist at your company **in Cambridge**? Please estimate the salary range and number of employees in each job type. *For your convenience, you can choose job types from the list provided at* http://www.ci.cambridge.ma.us/~CDD/econdev/surv_jbs.html *or enter your own job titles below in a similar format.*

| **Please enter job title** | Salary Range *(please pick one from the pull down menu)* | | | | | | Number of employees **in Cambridge** |
|---|---|---|---|---|---|---|---|
| | <$20k | $20 - 40k | $40 - 60k | $60 - 80k | $80 - 100k | Over $100k | |
| Job Type 1:    *Press F1 for help* | Pick one of the following | | | | | | *must use number* |
| Job Type 2: | Pick one of the following | | | | | | |
| Job Type 3: | Pick one of the following | | | | | | |
| Job Type 4: | Pick one of the following | | | | | | |
| Job Type 5: | Pick one of the following | | | | | | |
| Job Type 6: | Pick one of the following | | | | | | |
| Job Type 7: | Pick one of the following | | | | | | |
| Job Type 8: | Pick one of the following | | | | | | |
| Job Type 9: | Pick one of the following | | | | | | |
| Job Type 10: | Pick one of the following | | | | | | |
| Job Type 11: | Pick one of the following | | | | | | |
| Job Type 12: | Pick one of the following | | | | | | |
| Job Type 13: | Pick one of the following | | | | | | |
| Job Type 14: | Pick one of the following | | | | | | |
| Job Type 15: | Pick one of the following | | | | | | |
| TOTAL NUMBER OF EMPLOYEES **IN CAMBRIDGE** | | | | | | | |

A. Please indicate if you have company locations outside Cambridge. **However, this survey is only asking for information on your Cambridge employment.**

2. What are the **educational requirements** for each of the job types referenced above? *Please pick from the pull down menu.*

| | Less than high school diploma | High school diploma | Vocational training related to job type | Associate's degree (2-year) | Bachelor's degree (4-year) | Master's degree | Technical Certificate and College Degree | Doctoral degree | Other |
|---|---|---|---|---|---|---|---|---|---|
| Job Type 1 | Pick One | | | | | | | | |
| Job Type 2 | Pick One | | | | | | | | |
| Job Type 3 | Pick One | | | | | | | | |
| Job Type 4 | Pick One | | | | | | | | |
| Job Type 5 | Pick One | | | | | | | | |
| Job Type 6 | Pick One | | | | | | | | |
| Job Type 7 | Pick One | | | | | | | | |
| Job Type 8 | Pick One | | | | | | | | |
| Job Type 9 | Pick One | | | | | | | | |
| Job Type 10 | Pick One | | | | | | | | |
| Job Type 11 | Pick One | | | | | | | | |
| Job Type 12 | Pick One | | | | | | | | |
| Job Type 13 | Pick One | | | | | | | | |
| Job Type 14 | Pick One | | | | | | | | |
| Job Type 15 | Pick One | | | | | | | | |

3. What are the most important **skill requirements** for the employees that fill each job type? *Please check three or fewer boxes.*

| | Administrative | Computer programming | Critical thinking | Customer service | Data analysis | Financial or accounting | Graphic design software | Industry-specific experience | Management | Marketing/Sales | Math skills | Scientific lab skills | Spreadsheet analysis | Verbal communication | Word processing | Writing | Other: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Job Type 1 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 2 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 3 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 4 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 5 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 6 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 7 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 8 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 9 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 10 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 11 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 12 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 13 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 14 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| Job Type 15 | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

2. For which job types do you offer in-house training programs for new hires who do not meet your skill or educational requirements? *Please check the number below that refers to the job type.*

   1 ☐   2 ☐   3 ☐   4 ☐   5 ☐   6 ☐   7 ☐   8 ☐   9 ☐   10 ☐   11 ☐   12 ☐   13
   ☐   14 ☐   15 ☐

3. For the job types identified in question 4, please indicate if the training you provide is technical and job-related (T), generic (G) (for example basic office skills), or both (B). *For each job type, please pick from the pull down menu.*

   1Pick  2 Pick  3 Pick  4 Pick  5 Pick  6 Pick  7 Pick  8 Pick  9 Pick  10 Pick  11 Pick  12 Pick  13 Pick  14 Pick  15 Pick

4. Which job types allow for advancement within the firm? *Please check as many as apply.*

   1 ☐   2 ☐   3 ☐   4 ☐   5 ☐   6 ☐   7 ☐   8 ☐   9 ☐   10 ☐   11 ☐   12 ☐   13 ☐   14 ☐   15 ☐

5. Which sources have been most useful in recruiting new employees? *Please check two.*

   ☐ Newspapers                               ☐ Internet job boards                    ☐ Temporary employment agencies
   ☐ Job fairs                                ☐ Cambridge Employment Program           ☐ Career Source
   ☐ Recommendations from current employees   ☐ College career centers                 ☐ Other:

6. What is your best estimate of the percent of your Cambridge-based employees that are residents of Cambridge? *Please pick one category from the pull down menu.  Pick One*

## Section 3: Growth Rate Information

7. Please estimate the number of new jobs that will be created in each job type **in Cambridge** over the next 5 years.

|  | Number of New Jobs |
| --- | --- |
| Job Type 1 | *must use whole number* |
| Job Type 2 |  |
| Job Type 3 |  |
| Job Type 4 |  |
| Job Type 5 |  |
| Job Type 6 |  |
| Job Type 7 |  |
| Job Type 8 |  |
| Job Type 9 |  |
| Job Type 10 |  |
| Job Type 11 |  |
| Job Type 12 |  |
| Job Type 13 |  |
| Job Type 14 |  |
| Job Type 15 |  |

## Thank you for your time in completing this survey!

*You may return the survey by email by attaching this document to a message to emadden@ci.cambridge.ma.us.*

*Please call Elaine Madden at 349-4618 with any questions regarding the survey or if you would prefer to complete it over the phone.*

The following is a list of suggested job types to assist you in completing the enclosed Employment Survey. Please provide your company's particular job types to the list on the survey.

| | |
|---|---|
| Account Executive | Network Administrator |
| Administrative Assistant | Office Manager |
| Bookkeeping & Accounting | Packagers, Shipping & Receiving |
| Brokers | Personnel Staff |
| Building and Maintenance Staff | Personnel Supervisor |
| Commercial Artist | Production Assistant |
| Content Manager | Project Manager |
| Computer Programmer | Public Relations Specialist |
| Customer Service Representative | Quality Assurance |
| Data Entry | Scientific Lab Assistant |
| Data Warehouse Developer | Scientific Lab Technician |
| Database Engineer | Scientific Researcher - Biology, Chemistry |
| Desktop Publisher | Software Technician |
| Drivers | Software Engineer |
| Electrical Engineer | Senior Software Engineer |
| Financial Analyst | Statistical Analyst |
| Graphic Designer | Technical Service Manager |
| Hardware Technician | Technical Writer |
| Management | Telemarketer |
| Management Consultant | Web Designer |
| Manager – General Office | |
| Marketing Analyst | |
| Mechanical Engineer | |

APPENDIX B

# SIC CODES REPRESENTING IT SECTORS

SIC Major Group 35 (Manufacturing – Industrial, Commercial Machinery & Computer Equipment)
**Industry Group 357: Computer And Office Equipment**
      3571 Electronic Computers
      3572 Computer Storage Devices
      3575 Computer Terminals
      3577 Computer Peripheral Equipment, Not Elsewhere Classified
      3578 Calculating And Accounting Machines, Except Electronic Computers
      3579 Office Machines, Not Elsewhere Classified

**Major Group 48: (Communications)**
      Industry Group 481: Telephone Communications
      Industry Group 482: Telegraph & Other Message Communications
      Industry Group 483: Radio & Television Broadcasting Stations
      Industry Group 484: Cable & Other Pay Television Services

SIC Major Group 50 (Wholesale and Trade of Durable Goods)
**Industry Group 504: Wholesale of Professional & Commercial Equipment**
      5043 Photographic Equipment & Supplies
      5044 Office Equipment
      5045 Computers & Computer Peripheral Equipment & Software
      5048 Optical Equipment
      5049 Scientific Equipment

SIC Major Group 73 (Business Services)
**Industry Group 737: Computer Programming, Data Processing Services**
      7371 Computer Programming Services
      7372 Prepackaged Software
      7373 Computer Integrated Systems Design
      7374 Computer Processing And Data Preparation And Processing Services
      7375 Information Retrieval Services
      7376 Computer Facilities Management Services
      7377 Computer Rental And Leasing
      7378 Computer Maintenance And Repair
      7379 Computer Related Services, Not Elsewhere Classified

Major Group 78: (Motion Pictures)
*(The justification for including the following categories in the survey is their need for information technology skill. The skill requirements in the fields below are changing as software, hardware and design skills become a common requirement in these fields. )*
**Industry Group 781: Motion Picture Production And Allied Services**
      7812 Motion Picture And Video Tape Production
      7819 Services Allied To Motion Picture Production

APPENDIX C

**TABLE C: POPULATION OF IT FIRMS IN CAMBRIDGE, 2000**

| SIC 4 DIGIT CODE | COUNT OF FIRMS | PERCENT OF TOTAL | DESCRIPTION |
|---|---|---|---|
| **SIC 357** | **1** | **0.43%** | **SUBTOTAL** |
| 3575 | 1 | 0.43 | COMPUTER TERMINALS (MANUFACTURERS) |
| **SIC 481** | **1** | **1.71%** | **SUBTOTAL** |
| 481 | 1 | 1.71 | COMMUNICATIONS – PHONE, RADIO & TV |
| **SIC 483** | **4** | **1.71%** | **SUBTOTAL** |
| 4832 | 4 | 1.71 | RADIO STATIONS & BROADCASTING COMPANIES |
| **SIC 484** | **2** | **0.85%** | **SUBTOTAL** |
| 4841 | 2 | 0.85 | TELEVISION-CABLE & CATV |
| **SIC 504** | **16** | **6.85%** | **SUBTOTAL** |
| 5045 | 1 | 0.43 | COMPUTERS (WHOLESALE) |
| 5045 | 1 | 0.43 | LASER PRINTERS (WHOLESALE) |
| 5047 | 1 | 0.43 | CANES (WHOLESALE) |
| 5047 | 1 | 0.43 | PHYSICIANS & SURGEONS EQUIP & SUPLS (WHOLE) |
| 5047 | 2 | 0.85 | X-RAY APPARATUS & SUPPLIES (WHOLESALE) |
| 5048 | 1 | 0.43 | OPTICAL GOODS-WHOLESALE |
| 5049 | 5 | 2.14 | LABORATORY EQUIPMENT & SUPPLIES (WHOLE) |
| 5049 | 1 | 0.43 | LASERS (WHOLESALE) |
| 5049 | 3 | 1.28 | SCIENTIFIC APPARATUS & INSTRUMENTS (WHOLE) |
| **SIC 737** | **187** | **79.91%** | **SUBTOTAL** |
| 7371 | 2 | 0.85 | COMPUTER GRAPHICS |
| 7371 | 73 | 31.62 | COMPUTER SOFTWARE |
| 7371 | 41 | 17.52 | COMPUTERS-SYSTEM DESIGNERS & CONSULTANTS |
| 7371 | 3 | 1.28 | DATA SYSTEMS CONSULTANTS & DESIGNERS |
| 7372 | 6 | 2.56 | COMPUTER SOFTWARE-MANUFACTURERS |
| 7372 | 2 | 0.85 | PREPACKAGED SOFTWARE |
| 7373 | 1 | 0.43 | CAD SYSTEMS & SERVICES |
| 7373 | 1 | 0.43 | COMPUTERS-VIRTUAL REALITY |
| 7373 | 1 | 0.43 | INTERNET SVCS-NETWORK DESIGNERS/CONSLNT |
| 7373 | 1 | 0.43 | ROBOTIC COMPONENTS |
| 7373 | 8 | 3.42 | WEB SITE DESIGN SERVICES |
| 7374 | 9 | 3.85 | DATA PROCESSING SERVICE |
| 7374 | 3 | 1.28 | INTERNET HOME PAGE DEV CONSULTING |
| 7374 | 21 | 8.97 | INTERNET SERVICE |
| 7375 | 1 | 0.43 | ONLINE SERVICES |
| 7378 | 6 | 2.56 | COMPUTERS-SERVICE & REPAIR |
| 7379 | 1 | 0.43 | COMPUTER CONSULTANTS |
| 7379 | 5 | 2.14 | COMPUTERS-NETWORKING |
| 7379 | 1 | 0.43 | COMPUTERS-SUPPORT SERVICES |
| **SIC 781** | **24** | **10.25%** | **SUBTOTAL** |
| 7812 | 3 | 1.28 | AUDIO-VISUAL PRODUCTION SERVICE |
| 7812 | 5 | 2.14 | MOTION PICTURE PRODUCERS & STUDIOS |
| 7812 | 11 | 4.70 | VIDEO PRODUCTION & TAPING SERVICE |
| 7819 | 2 | 0.85 | AUDIO-VISUAL CONSULTANTS |
| 7819 | 1 | 0.43 | CASTING DIRECTORS |
| 7819 | 2 | 0.85 | VIDEO TAPE DUPLICATION SERVICE |
| **TOTALS** | **234** | **100.0%** | |

APPENDIX D

# TABLE C: AGGREGATE REPORTED JOB TYPES BY SALARY RANGE

| AGGREGATE JOB TYPES | # OF FIRMS | < $20k | $20k - $40k | $40k - $60k | $60k - $80k | $80k - $100k | >$100k | Total Number of Employees |
|---|---|---|---|---|---|---|---|---|
| ACCOUNT EXECUTIVE | 6 | | | 37 | | 2 | 1 | 40 |
| | | 0.0% | 0.0% | 92.5% | 0.0% | 5.0% | 2.5% | 100.0% |
| ACCOUNTANT | 11 | | 2 | 37 | | 1 | 1 | 41 |
| | | 0.0% | 4.9% | 90.2% | 0.0% | 2.4% | 2.4% | 100.0% |
| ADMINISTRATION | 16 | | 33 | 8 | 8 | 2 | | 51 |
| | | 0.0% | 64.7% | 15.7% | 15.7% | 3.9% | 0.0% | 100.0% |
| ADMINISTRATIVE ASSISTANT | 15 | 2 | 26 | 3 | | | | 31 |
| | | 6.5% | 83.9% | 9.7% | 0.0% | 0.0% | 0.0% | 100.0% |
| ANALYST | 9 | | 2 | 13 | 1 | 3 | 1 | 20 |
| | | 0.0% | 10.0% | 65.0% | 5.0% | 15.0% | 5.0% | 100.0% |
| CONSULTANT | 4 | 1 | | 1 | | 26 | | 28 |
| | | 3.6% | 0.0% | 3.6% | 0.0% | 92.9% | 0.0% | 100.0% |
| CUSTOMER SERVICE | 10 | | 6 | 10 | 3 | | | 19 |
| | | 0.0% | 31.6% | 52.6% | 15.8% | 0.0% | 0.0% | 100.0% |
| DATA | 2 | 1 | 3 | | | | | 4 |
| | | 25.0% | 75.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| ENGINEER | 7 | | | 1 | 7 | 2 | 2 | 12 |
| | | 0.0% | 0.0% | 8.3% | 58.3% | 16.7% | 16.7% | 100.0% |
| GRAPHIC | 4 | 1 | | 2 | 1 | | | 4 |
| | | 25.0% | 0.0% | 50.0% | 25.0% | 0.0% | 0.0% | 100.0% |
| MANAGEMENT | 33 | | 5 | 4 | 10 | 12 | 24 | 55 |
| | | 0.0% | 9.1% | 7.3% | 18.2% | 21.8% | 43.6% | 100.0% |
| MARKETING | 2 | | | 1 | 2 | | | 3 |
| | | 0.0% | 0.0% | 33.3% | 66.7% | 0.0% | 0.0% | 100.0% |
| PRODUCTION | 8 | 1 | 6 | 1 | 1 | | | 9 |
| | | 11.1% | 66.7% | 11.1% | 11.1% | 0.0% | 0.0% | 100.0% |
| PROGRAMMER | 2 | | | | 17 | | | 17 |
| | | 0.0% | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 100.0% |
| PROJECT MANAGER | 7 | | 20 | 1 | 4 | 2 | | 27 |
| | | 0.0% | 74.1% | 3.7% | 14.8% | 7.4% | 0.0% | 100.0% |
| QUALITY ASSURANCE | 3 | 1 | | 1 | 1 | | | 3 |
| | | 33.3% | 0.0% | 33.3% | 33.3% | 0.0% | 0.0% | 100.0% |
| SALES | 8 | | 2 | 1 | 11 | 10 | | 24 |
| | | 0.0% | 8.3% | 4.2% | 45.8% | 41.7% | 0.0% | 100.0% |
| SCIENTIST | 6 | | | 10 | 3 | 4 | 1 | 18 |
| | | 0.0% | 0.0% | 55.6% | 16.7% | 22.2% | 5.6% | 100.0% |
| SOFTWARE ENGINEER | 19 | | 8 | 5 | 47 | 15 | 1 | 76 |
| | | 0.0% | 10.5% | 6.6% | 61.8% | 19.7% | 1.3% | 100.0% |
| TECHNICIAN | 29 | | 2 | 18 | 11 | 9 | 3 | 43 |
| | | 0.0% | 4.7% | 41.9% | 25.6% | 20.9% | 7.0% | 100.0% |
| WEB DESIGNER | 3 | | | 5 | | | | 5 |
| | | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| WEB DEVELOPER | 1 | | | 20 | 40 | 30 | 10 | 100 |
| | | 0.0% | 0.0% | 20.0% | 40.0% | 30.0% | 10.0% | 100.0% |
| COLUMN TOTALS (COUNT) | | 7 | 115 | 179 | 167 | 118 | 44 | 630 |
| (PERCENTS) | | 1.1% | 18.3% | 28.4% | 26.5% | 18.7% | 7.0% | 100.0% |

# APPENDIX E

**Table E: Reported Skill Requirements by Aggregate Job Types** (Highlighted columns are skills that are technical)

| AGGREGATE JOB TYPE | ADMINISTRATIVE | COMPUTER PROGRAMMING | CRITICAL THINKING | CUSTOMER SERVICE | DATA ANALYSIS | FINANCIAL/ACCOUNTING | GRAPHIC DESIGN | INDUSTRY SPECIFIC KNOWLEDGE | MANAGEMENT | MARKETING/SALES | MATH | MUSICIAN | SCIENTIFIC LAB | SPREADSHEET ANALYSIS | VERBAL COMMUNICATIONS | WORD PROCESSING | WRITING | ROW TOTALS | PERCENT TECHNICAL SKILL FOR JT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SOFTWARE ENGINEER | | 79 | 49 | | 1 | | 2 | 44 | 1 | | 1 | | | | | | | 177 | 71.8% |
| ROW % | 0.0% | 44.6% | 27.7% | 0.0% | 0.6% | 0.0% | 1.1% | 24.9% | 0.6% | 0.0% | 0.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100% | |
| MANAGEMENT | 11 | 1 | 34 | 3 | 1 | 6 | | 12 | 32 | 6 | | 1 | | 2 | 8 | 4 | 19 | 140 | 11.4% |
| | 7.9% | 0.7% | 24.3% | 2.1% | 0.7% | 4.3% | 0.0% | 8.6% | 22.9% | 4.3% | 0.0% | 0.7% | 0.0% | 1.4% | 5.7% | 2.9% | 13.6% | 100% | |
| ACCOUNT EXECUTIVE | 1 | | 1 | 33 | | | | | | 2 | | | | | 35 | 2 | 34 | 108 | 0.0% |
| | 0.9% | 0.0% | 0.9% | 30.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.9% | 0.0% | 0.0% | 0.0% | 0.0% | 32.4% | 1.9% | 31.5% | 100% | |
| ADMINISTRATION | 20 | | 28 | 15 | | 2 | | 1 | 13 | 1 | | | | 16 | 19 | 15 | 37 | 167 | 10.2% |
| | 12.0% | 0.0% | 16.8% | 9.0% | 0.0% | 1.2% | 0.0% | 0.6% | 7.8% | 0.6% | 0.0% | 0.0% | 0.0% | 9.6% | 11.4% | 9.0% | 22.2% | 100% | |
| TECHNICIAN | 3 | 16 | 12 | 9 | | 2 | 4 | 23 | 2 | 4 | | 1 | | 2 | 11 | | 5 | 94 | 47.9% |
| | 3.2% | 17.0% | 12.8% | 9.6% | 0.0% | 2.1% | 4.3% | 24.5% | 2.1% | 4.3% | 0.0% | 1.1% | 0.0% | 2.1% | 11.7% | 0.0% | 5.3% | 100% | |
| CONSULTANT | | 25 | 1 | | | | 25 | 1 | 26 | | | | | | 1 | | | 79 | 64.6% |
| | 0.0% | 31.6% | 1.3% | 0.0% | 0.0% | 0.0% | 31.6% | 1.3% | 32.9% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 1.3% | 0.0% | 0.0% | 100% | |
| PROJECT MANAGER | 21 | 2 | 5 | 20 | | | | 4 | 4 | | | | | | 21 | | | 77 | 7.8% |
| | 27.3% | 2.6% | 6.5% | 26.0% | 0.0% | 0.0% | 0.0% | 5.2% | 5.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 27.3% | 0.0% | 0.0% | 100% | |
| ANALYST | | 1 | 9 | | 3 | 2 | | 4 | 4 | 12 | 4 | | | 2 | 6 | | 2 | 49 | 28.6% |
| | 0.0% | 2.0% | 18.4% | 0.0% | 6.1% | 4.1% | 0.0% | 8.2% | 8.2% | 24.5% | 8.2% | 0.0% | 0.0% | 4.1% | 12.2% | 0.0% | 4.1% | 100% | |
| SCIENTIST | | 1 | 12 | | 17 | | | 12 | 1 | | 6 | | 5 | | | | | 54 | 75.9% |
| | 0.0% | 1.9% | 22.2% | 0.0% | 31.5% | 0.0% | 0.0% | 22.2% | 1.9% | 0.0% | 11.1% | 0.0% | 9.3% | 0.0% | 0.0% | 0.0% | 0.0% | 100% | |

| AGGREGATE JOB TYPE | ADMINISTRATIVE | COMPUTER PROGRAMMING | CRITICAL THINKING | CUSTOMER SERVICE | DATA ANALYSIS | FINANCIAL/ACCOUNTING | GRAPHIC DESIGN | INDUSTRY SPECIFIC KNOWLEDGE | MANAGEMENT | MARKETING/SALES | MATH | MUSICIAN | SCIENTIFIC LAB | SPREADSHEET ANALYSIS | VERBAL COMMUNICATIONS | WORD PROCESSING | WRITING | ROW TOTALS | PERCENT TECHNICAL SKILL FOR JT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PROGRAMMER | | 16 | 16 | | | | | 16 | | | | | | | | | | 48 | 66.7% |
| | 0.0% | 33.3% | 33.3% | 0.0% | 0.0% | 0.0% | 0.0% | 33.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100% | |
| SALES | | | 7 | 15 | | | | 13 | | 13 | | | | | 12 | 5 | 5 | 70 | 18.6% |
| | 0.0% | 0.0% | 10.0% | 21.4% | 0.0% | 0.0% | 0.0% | 18.6% | 0.0% | 18.6% | 0.0% | 0.0% | 0.0% | 0.0% | 17.1% | 7.1% | 7.1% | 100% | |
| CUSTOMER SERVICE | 1 | 1 | 1 | 13 | 4 | | | 10 | | 1 | | | | | 4 | | | 35 | 42.9% |
| | 2.9% | 2.9% | 2.9% | 37.1% | 11.4% | 0.0% | 0.0% | 28.6% | 0.0% | 2.9% | 0.0% | 0.0% | 0.0% | 0.0% | 11.4% | 0.0% | 0.0% | 100% | |
| ADMINISTRATIVE | 10 | | 15 | 7 | | 3 | | 1 | | | | | | 17 | 21 | 21 | 15 | 110 | 16.4% |
| | 9.1% | 0.0% | 13.6% | 6.4% | 0.0% | 2.7% | 0.0% | 0.9% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 15.5% | 19.1% | 19.1% | 13.6% | 100% | |
| ENGINEER | | 11 | 2 | 5 | 4 | | 4 | 7 | | | | | | | | | | 33 | 78.8% |
| | 0.0% | 33.3% | 6.1% | 15.2% | 12.1% | 0.0% | 12.1% | 21.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100% | |
| ACCOUNTANT | 6 | | 31 | | | 38 | | 30 | 2 | 1 | 3 | | | 30 | | 30 | | 171 | 36.8% |
| | 3.5% | 0.0% | 18.1% | 0.0% | 0.0% | 22.2% | 0.0% | 17.5% | 1.2% | 0.6% | 1.8% | 0.0% | 0.0% | 17.5% | 0.0% | 17.5% | 0.0% | 100% | |
| PRODUCTION | 3 | | 1 | 2 | | | 1 | 7 | 2 | 1 | | | | | 5 | 2 | 1 | 25 | 32.0% |
| | 12.0% | 0.0% | 4.0% | 8.0% | 0.0% | 0.0% | 4.0% | 28.0% | 8.0% | 4.0% | 0.0% | 0.0% | 0.0% | 0.0% | 20.0% | 8.0% | 4.0% | 100% | |
| GRAPHIC | | 1 | 3 | | | | 4 | 1 | 1 | | | | | | | | | 10 | 60.0% |
| | 0.0% | 10.0% | 30.0% | 0.0% | 0.0% | 0.0% | 40.0% | 10.0% | 10.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100% | |
| WEB DEVELOPER | | 100 | 100 | | | | | 100 | 10 | | | | | | 100 | | | 410 | 48.8% |
| | 0.0% | 24.4% | 24.4% | 0.0% | 0.0% | 0.0% | 0.0% | 24.4% | 2.4% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 24.4% | 0.0% | 0.0% | 100% | |
| WEB DESIGNER | | 3 | | | | | 3 | | | | | | | | | | | 6 | 100.0% |
| | 0.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100% | |
| MARKETING | | | | | | | | | 2 | | | | | | 2 | | 2 | 6 | 0.0% |
| | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 33.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 33.3% | 0.0% | 33.3% | 100% | |
| DATA | 1 | | | 1 | | | | | | | | | | | | 1 | | 3 | 0.0% |
| | 33.3% | 0.0% | 0.0% | 33.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 33.3% | 0.0% | 100% | |
| QUALITY ASSURANCE | | | 1 | | | | | | | | | | | | | | | 1 | 0.0% |

| AGGREGATE JOB TYPE | ADMINISTRATIVE | COMPUTER PROGRAMMING | CRITICAL THINKING | CUSTOMER SERVICE | DATA ANALYSIS | FINANCIAL/ACCOUNTING | GRAPHIC DESIGN | INDUSTRY SPECIFIC KNOWLEDGE | MANAGEMENT | MARKETING/SALES | MATH | MUSICIAN | SCIENTIFIC LAB | SPREADSHEET ANALYSIS | VERBAL COMMUNICATIONS | WORD PROCESSING | WRITING | ROW TOTALS | PERCENT TECHNICAL SKILL FOR JT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100% | |
| COLUMN TOTALS | 77 | 257 | 328 | 123 | 30 | 53 | 43 | 286 | 100 | 41 | 14 | 2 | 5 | 69 | 245 | 80 | 120 | 1873 | |
| PERCENTAGES | 4.1% | 13.7% | 17.5% | 6.6% | 1.6% | 2.8% | 2.3% | 15.3% | 5.3% | 2.2% | 0.7% | 0.1% | 0.3% | 3.7% | 13.1% | 4.3% | 6.4% | 100.0% | |

APPENDIX D

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## Survey of Temporary Employment Agencies

*Please note that IT firms or job types are those that require some degree of technical skill or knowledge related to computer software or hardware, MIS systems, machinery or telecommunications. Examples may include a programmer, graphic designer, data entry staff, a customer service representative for a software company, or PC assembly workers.

1. *Please describe the staffing services provided by this firm. Each service represents what percentage of your total staffing services?*

| **Percentage** | **Type** | **Additional Description** |
|---|---|---|
| _____ | 1 = GENERAL PROFESSIONAL | _____ |
| _____ | 2 = OFFICE/CLERICAL | _____ |
| _____ | 3 = INFORMATION TECHNOLOGY (IT)* | _____ |
| _____ | 4 = FINANCIAL | _____ |
| _____ | 5 = BLUE COLLAR/INDUSTRIAL LABOR | _____ |
| _____ | 6 = MEDICAL/SCIENTIFIC | _____ |
| _____ | 7 = HUMAN RESOURCE RECRUITMENT | _____ |
| _____ | 8 = OTHER | _____ |

2. *Please describe the type of business clients that use your staffing services:*
   The most common industry sectors (i.e. finance, IT, consulting)? _____

   What size are most of the firms? (Please check one box)

      Less than 25 employees         25 – 50 employees         Over 50 employees

3. *Please estimate the percentage of overall temporary placements that are in IT firms.* _____

4. *Please estimate the percentage of overall temporary placements that are IT jobs.* _____

5. *Do you place employees in entry-level IT jobs? If so, what are some of the job type names?* _____
   _____

6. *Please estimate the percent of total IT jobs that are consider entry-level job.* _____

7. *Please estimate the percentage of your temporary employees that fall into each of the following categories:*

**Age:**

| 18 to 25 | 26 – 35 | 36 – 45 | 45 – 55 | 56 – 65 |
|---|---|---|---|---|
| | | | | |

## Education:

| Less than high school diploma | High school diploma | Vocational training related to job type | Associate's degree (2-year) | Bachelor's degree (4-year) | Master's degree | *Technical Certificate | Doctoral degree | *Other: _____ _____ |
|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |

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\* Please fill in a description if you check-off *Other.*

## Ethnic Identity:

| African American | Asian | Caucasian | Latino | Other* |
|---|---|---|---|---|
|  |  |  |  |  |

4. *Please estimate the percent of temporary employees that possess these skills at intake:*

## Client Skills at Entry:

| Administrative | Computer programming | Critical thinking | Customer service | Data analysis | Financial or accounting | Graphic design software | Industry-specific experience | Management | Marketing/Sales | Math skills | Scientific lab skills | Spreadsheet analysis | Verbal communication | Word processing | Writing | *Other: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

5. *Which of the following **internal review or screening processes** are used by your agency in accepting clients. Choose from the following:*

____ Resume review          ____ Reference check

____ Face-to-face interview     ____ Criminal record check

____ Skill test             ____ Other: _____

____ Reading test           ____ Other: _____

8. *Do you provide training to temporary employees, free of charge? If so, what type of training is available to them?*

9. *Please estimate the percent of temporary employees that acquire as a result of your firm's training or job placement services:*

## Acquired Skills:

| TRAINING PROGRAM | Administrative | Computer programming | Critical thinking | Customer service | Data analysis | Financial or accounting | Graphic design software | Industry-specific experience | Management | Marketing/Sales | Math skills | Scientific lab | Spreadsheet analysis | Verbal communication | Word processing | Writing | *Other: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**THANK YOU FOR YOUR ASSISTANCE. PLEASE FAX TO 617 349-4658.**      2

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10. Please estimate the **average length of employment** of your temporary employees:

| 0 to 3 months | 4 to 6 months | 6 months to 1 year | Greater than 1 year |
|---|---|---|---|
|  |  |  |  |

11. What percentage of overall placements result in permanent hires?_____

12. Please describe how your firm **recruits temporary employees.**_____

_____

_____

13. Please describe how your firm **recruits businesses** in need of temporary employees.

_____

_____

_____

14. Has your firm changed its **general practices or services** to address IT skills? If so, what are some examples of change? (You now recruit from Vocational or Technical programs. Customized training programs for specific IT firms.)

15. Has your firm **tailored its services** for individual IT employers? Please describe the most recent example of this. _____

16. What is your **policy on the permanent hire** of a temporary employee by a firm?

_____

_____

17. In your opinion, how has the **role of temporary employment firms** changed over the last 5 to 10 years? For example, more firms are using temporary employment agencies or maybe different types of firms?

_____

_____

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