

Acknowledgements

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Executive Summary

As outsourcing to India has become a more prevalent part of business in the new millennium, IT workers in America have become weary of their current and future job prospects. An educated and process-oriented society in India provides U.S. businesses a way to concentrate on their core competencies, save money and improve workflow.

While there are certain changes that will be introduced to the IT economy in America as a result of outsourcing, these changes do not necessarily negatively affect American IT workers. IT workers in America will find that they are faced with new opportunities either within their own company or at a new company. Workers may be able to move into roles where they will be designing and innovating more than they would have without outsourcing. For IT workers looking for a change, there may be other opportunities within their company to learn new facets of the business. For those who wish to stay within IT, new opportunities may exist with the company that is providing outsourcing to their company. Workers that choose to find a new company will have opportunities as IT jobs continue to be created within the economy. While the baby boomer generation begins to retire and reduced enrollment in technology education begins to affect IT recruitment, IT workers in American will find that the demand for their profession will continue to grow in the next decade.

Table of Contents

Acknowledgements	ii
Executive Summary	iii
Definitions	1
Introduction	2
Literature Review	3
Background	5
Current State of IT Outsourcing to India	7
The Forces behind Outsourcing IT Work to India	7
The Negative Perceptions of Outsourcing to India	10
The Impact of Multinational Companies on the U.S. workforce	11
Resource Shifts Related to Outsourcing	12
Evidence on the Current Effects of Outsourcing	15
Job Loss and Job Gain	15
Shifts in Job Function	17
Job Movement within the U.S.	19
Improving Processes with the Move to Outsourcing	21
America as a Provider of Outsourcing	22
How Outsourcing Affects the IT Worker as a Consumer	24
Projected Long Term Affects on the American Economy for IT workers	25
Previous economic impacts of Outsourcing on the American Economy	25
Long Term Education Trends for Future IT Workers	27
The Negative Impact of Education Trends for Future IT Workers	28
Long Term Job Projections for Current IT Workers	29
Summary	33
Conclusions	35
Suggestions for Additional Work	37
References	39

Definitions

Capability Maturity Model (CMM) – A method for measuring and evaluating the maturity of the software development process. This method was developed at Carnegie Mellon University by the Software Engineering Institute. A maturity model is a collection of elements that help to describe effective processes for software development. The maturity model provides: the benefit of a community's prior experiences, a place to start from, a shared vision and common language, a method of prioritization, and a way to define improvement across an organization. A maturity model is commonly used for benchmarking to compare the quality of different organizations.

Information Technology (IT) Industry – Companies focused on information technology and related products and services ranging from software, software installation, e-commerce, consulting, hardware, to other areas of technology innovation.

IT workers – Workers employed by firms in the IT industry as well as those employed within the IT divisions of other businesses.

International Organization for Standardization (ISO) – ISO 9000 certification is concerned with quality management. Certification by ISO means that an organization is always proactively concerned with enhancing customer satisfaction by continually trying to meet customer and applicable regulatory requirements.

Offshore Outsourcing – An arrangement where a U.S. company contracts with a provider located outside of the country for services. For the purposes of this paper, the discussion of offshore outsourcing will be limited to the service of information technology being outsourced to India. Similarly, U.S. companies may operate independent divisions outside of the country for the purpose of outsourcing. This practice is often referred to as offshoring, as the work is being completed by a division of the company operating abroad. This paper will look at aspects of each as they apply to the American economy for IT workers.

Process-oriented – Describes the nature of information technology training received by students in India. A focus on process within the education system provides Indian workers with the knowledge to follow the Capability Maturity Model and ISO which enables them to help instill quality in products they develop and support.

Technology Administration – The Technology Administration is a division of the department of Commerce that works to maximize technology's contribution to America's economic growth.

Virtual employees – Employees that work offsite via telecommunications or the Internet. This type of employee has helped to enable outsourcing. It is now possible for workers in India to interact with U.S. companies in the same manner as virtual employees.

Introduction

This paper will serve to clarify some of the common misconceptions related to information technology (IT) outsourcing to India and its effects on IT workers in the American economy. The majority of media coverage of IT outsourcing over the past five years has had a negative slant, implying that an IT position moved from America to India is a job loss to America, not taking into account other economic factors.

By evaluating the current role of IT outsourcing to India and looking at some specific examples of how outsourcing is working today, a more in-depth portrayal of the situation will be provided. Examining the details of job loss and job gain for IT workers in America over the past few years as more work has moved to India will provide a better look at the potential gains and losses to the U.S. economy.

In addition to analyzing recent job statistics, a look at current educational trends and future job projections in the IT field help to provide a view of what lies ahead for American IT workers. Through objective analysis of current IT outsourcing data, the following advantages and disadvantages will be revealed:

Advantages

Cost Savings
Concentration on Core Competencies
Flexibility
Quality and Process Improvement
Job Creation
Lower Costs to Consumers

Disadvantages

Worker Displacement
Promotes Foreign Innovation
Data Security
Lowered Interest in IT Education

Careful consideration of these areas will provide a positive outlook on the future economic prospects for IT workers in America.

Literature Review

There is an overwhelming amount of literature on the subject of outsourcing. Material focusing on outsourcing of information technology (IT) to India and the economic impact it has on IT workers in America is more limited. A narrower search for writings concentrate on the effects of IT outsourcing to India on the American economy for IT workers resulted in a collection of twenty-six sources written over the past three years.

The twenty-six sources consist of ten websites, fourteen periodical publications and two books that provide differing viewpoints on the effects of outsourcing IT work to India. While less than a quarter provide a purely positive viewpoint on outsourcing, the vast majority provide an objective perspective that indicates both the positive and negative impacts of outsourcing. Additionally, some of the resources provide a political viewpoint, giving insight into a modern political viewpoint on the outsourcing of IT work to India (SifyFinance, 2004, 1), which can impact the economics of the situation. Other sources provide background on how IT workers in America will be affected by outsourcing to India (Bielski, 2005, 51). Bielski provides information concerning employees with generic positions and how their jobs may become vulnerable, while employees with a breadth of skills will become more valuable in an outsourcing environment.

The periodical sources provide both a positive look at the impact outsourcing can provide to the American economy through economic growth (Baker and others, 2004, 1) and also an objective viewpoint (Ziff, 2005), citing both positives (Mears, 2005, 13) and

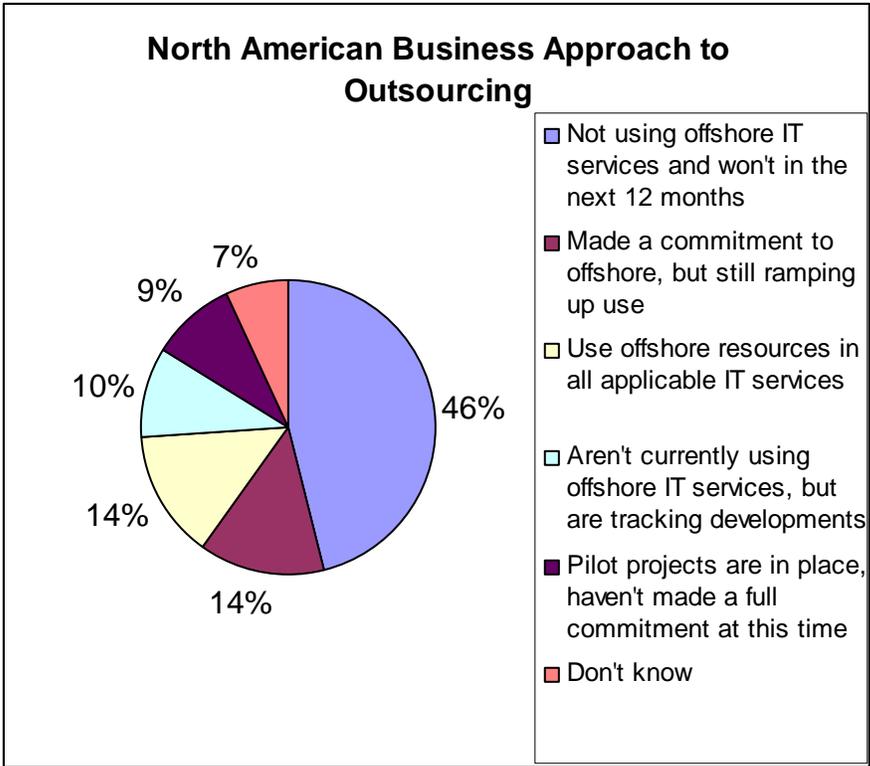
negatives (Tafti, 2005, 549-558). The resources also provide insight into job growth (Geller, 2005, 1), job loss (Schwartz, 2005, 22) and the educational impact on technical degrees (Paul, 2005, 36). Taken together this collection of resources generally provides a positive outlook for the future for American IT workers.

Background

Advancements in technology over the past decade have increased the ability of businesses to operate with virtual employees. Over this period companies have also realized the benefits of using consultants for work that can be done more efficiently by non-company resources. As an extension of these two concepts, American companies determined that consulting work and working virtually could extend beyond the borders of the United States. This has allowed US companies to expand operations to other countries and to hire consultants within those countries to provide services to them. Within the area of information technology (IT) U.S. companies have observed that India has a wealth of resources to offer.

A growing number of engineering and computer science graduates in India combined with labor costs that are much lower than in America have led to a more global information technology workforce. India offers a technology workforce option that has many advantages including a well-educated and process-oriented pool of workers. India also offers US companies a potential way to both reduce costs and increase quality. With those two factors playing a key role, several US companies have chosen to pursue outsourcing in one form or another.

Outsourcing is a growing trend in America. A poll of 113 IT decision-makers in North American firms revealed that approximately 47 percent of those businesses are currently utilizing outsourcing, piloting projects in outsourcing or are tracking developments in outsourcing (Forrester, 2005):



(Forrester, 2005, 24)

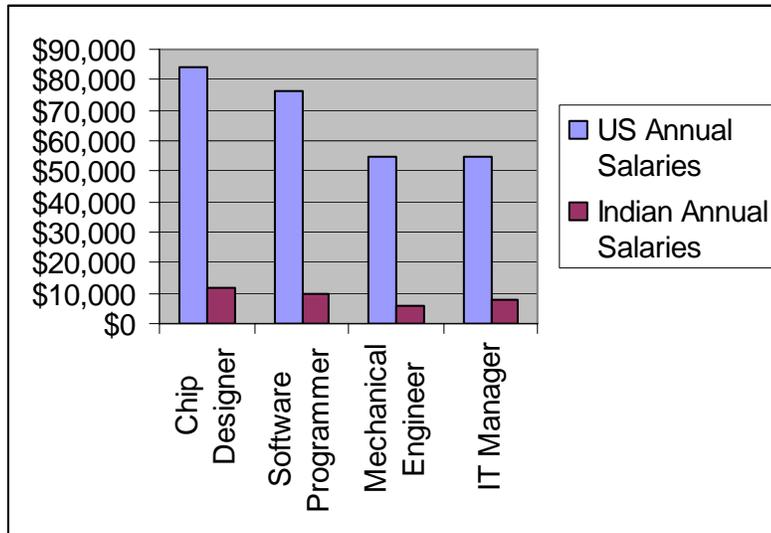
As more companies explore whether outsourcing is a viable option for their business, it is important to look at both the costs and benefits of this trend for IT workers in America.

Current State of IT Outsourcing to India

The Forces behind Outsourcing IT Work to India

There are several reasons that outsourcing of information technology (IT) work to India is on the rise. Many companies initially turn to outsourcing as a means of cost cutting. Outsourcing pioneers including Nortel, General Electric and Citibank cited cost savings as their primary reason for outsourcing (SifyFinance, 2004, 1). “Another common reason for resorting to IT outsourcing is a firm’s desire to focus its resources on those activities that are considered its strengths, often referred to as core competencies. Organizations further support their outsourcing decisions by reasoning that vendors possess economies of scale that are unavailable to an individual firm” (Tafti, 2005, 549). Flexibility and quality also play a role as IT outsourcing offers many options that may not be available to IT departments that only utilize internal resources.

The visible cost savings that draw companies towards IT outsourcing in India generally come from the difference in salaries between India and the U.S. “Cost reduction mainly comes from the difference in wages, for the same work, between developed and developing nations” (Brudenall, 2005, 102). Depending on the type of IT work outsourced savings on salaries can vary from 10 percent (Brudenall, 2005, 102) to 25 percent (Kobayashi-Hillary, 2005, 159).



(Brudenall, 2005, 103)

This salary differential is a persuasive factor in companies that decide to outsource IT to India. Additional benefits are gained as well, as outsourcing allows companies to focus on their core competencies.

The thought of focusing on core competencies was derived from corporate strategies popularized by Professor Michael E. Porter of Harvard University and Charles Handy, former professor at the London Business School. Their theories of business organization led them to believe that companies should employ core workers for managerial and essential tasks. Beyond that, work for specific projects could be contracted out to individuals with expertise in the area of the project. Additional temporary and part-time employees would be hired as needed for other work around the office (Kobayashi-Hillary, 2005, 75-76). When these ideas were being considered in the 1980's, many considered them radical. However as business begin to increase the number of virtual employees on staff, their strategies have become easier to implement in

the modern workplace. In addition to allowing companies to focus on their individual competencies, they also allow for a great deal of flexibility.

The flexibility allowed through outsourcing can be beneficial to organizations. When a company begins a new project and needs to ramp up quickly with upwards of 1,000 IT workers in a programming or customer support capacity, using an outsourcing supplier can allow work to begin quickly. Outsourcing suppliers already have a large number of trained employees, which allows a company to save on hiring and training costs in addition to the savings received by hiring in India where labor costs are lower. Any additional hiring that needs to be done will be the responsibility of the supplier, allowing the business to concentrate on its core competencies. As the project nears an end or as business declines, a company can reduce the number of consultants it needs without any worry of wasted time or employee redundancy. The outsourcing supplier is then free to apply their resources to other projects and companies (Kobayashi-Hillary, 2005, 108).

Beyond the benefits of cost savings, the ability to focus on core competencies, and flexibility, there is also the consideration of quality workmanship and IT talent when outsourcing to India. Quality is always a concern with IT products as many people experience on a daily basis while using office software and operating systems that disrupt workflows when defects are encountered. With an Indian education system and business atmosphere that stresses the importance of the capability maturity model and focuses on process improvements, many companies will experience quality gains when outsourcing IT work to India (Tafti, 2005, 550). In addition to the Indian focus on quality, there are a

great number of workers to be employed each year in this country. Over 2 million college graduates and post-graduates enter the workforce each year, giving India “a very large talent pool of low-cost English-speaking people” (Kobayashi-Hillary, 2005, 75-76). With this talent pool and a recent decline in undergraduate enrollment in IT-related fields within the US (Paul, 2005, 36), there is a natural progression towards IT outsourcing to India.

With the many reasons that companies have chosen to use outsourcing as a business strategy, cost is always the first to enter the discussion. Beyond cost, there are several other advantages which allow a company to better focus on its core competencies, run a more flexible, stable business, and improve quality. Once America has become more familiar with outsourcing and the benefits it provides, there may be a day where labeling an IT product as ‘developed in India’ has a positive connotation that encourages buyers to seek it out (Brudenall, 2005, 91).

The Negative Perceptions of Outsourcing to India

Opponents of outsourcing feel that jobs that are moved overseas from the United States will be lost forever, without jobs to replace them. As jobs moving abroad become increasingly technical in nature, it is feared that a great deal of the American middle class will lose their jobs. This fear is fueled by successful companies in America outsourcing well-paying jobs to cut labor costs. While most employers communicate that lower labor costs will translate into new jobs in America, most workers don’t believe it. Reports estimate that through 2005 less than 40 percent of IT workers who lose jobs to outsourcing will have an opportunity to work in a new position at their existing company

(Teicher, 2003, 1). With the chance that jobs are leaving the country for good; there is much opportunity for criticism.

“Critics caution that while executives are under extreme pressure to cut costs, some of them may be too quick to outsource jobs higher up on the spectrum of creativity and skill. Companies are training developing nations’ workforces to become America’s competitors” (Teicher, 2003, 2). The thought of outsourcing highly technical positions opens the door to questions about what this could lead to. Traditionally America has been a leader in technology innovation, but if outsourcing teaches other countries our strengths in these areas, there is the chance that they will become the future innovators.

In addition to the scenario of entrepreneurial talent being bred overseas instead of at home, there are additional fears surrounding outsourcing. Some believe that it leads to a loss of intellectual property rights, data security, and institutional knowledge (Kobayashi-Hillary, 2005, 276). Others fear that workers in countries outside of the US working with patented ideas and concepts may attempt to steal those patents and develop their own companies based on ideas bred in America. While some of these fears may be valid, it’s important to look at the entire picture of outsourcing to India and its economic impact in America before forming an opinion. One way to gauge the effect of outsourcing to India is to look at multinational corporations that have been doing business abroad for a number of years and the effect it has had on the IT workforce in America.

The Impact of Multinational Companies on the U.S. Workforce

By looking at the practices of multinational corporations it is possible to get an idea of the impact that outsourcing IT jobs to India will have on the economy for U.S. IT

workers. “Between 1991 and 2001, U.S.-based multinationals created close to 3 million jobs overseas. But they also created 5-1/2 million jobs in the U.S.—an increase of about 30 percent in payrolls” (Parry, 2004, 2). A 30 percent increase in jobs within U.S. multinational corporations is much higher than that of U.S. companies operating purely within the American borders. This helps to illustrate that companies’ expansion of jobs overseas does not necessarily come at the expense of domestic payroll growth—the two often rise in concert. Companies that expand their IT work overseas will generally create additional IT jobs within the U.S. to interact with overseas operations.

A good example of how this relates to global companies based in the U.S. hiring in India, while continuing to create jobs at home is Dell. Dell began operating a call center in Bangalore in 2001, since then it has expanded its Indian operations to software testing and development of internal information systems (Ribeiro, 2005). Dell has gone as far as to plan for business growth through the end of the decade, setting a goal of \$80 billion in annual revenue by 2009. While their plan includes a 55 percent growth coming from outside of the U.S., 45 percent will be within the U.S. market creating additional jobs for IT workers in America (Ribeiro, 2005). While there is no guarantee that every job moved to India will be replenished with a similar job in the U.S., multinational corporations have shown the ability to continue to generate jobs in America as other jobs move abroad.

Resource Shifts Related to Outsourcing

One major impact of outsourcing on the American economy for IT workers will be determined by how businesses decide to reallocate domestic resources when their

previous position is moved to India. David Foote of Foote Partners, LLC in New Canaan, Connecticut analyzes work and pay trends for technology workers in North America. “Foote tends to believe that jobs lost to offshoring are replenished by more interesting jobs at home and that outsourcing is adopted, then rejected, in cycles. In fact, his opinion is that ‘the miracle of the U.S. economy has always been its ability to create new positions’ and a compelling business environment” (Bielski, 2005, 50). The general trend in outsourcing is that better trained employees don’t lose jobs to outsourcing as the more duplicable positions are moved overseas (Bielski, 2005, 51). While some interpret this as a loss of middle class jobs, others see this as an opportunity for American workers to take on more responsibility, filling higher level positions as lower level positions are outsourced. U.S. IT research company Gartner estimates that “six out of 10 corporate IT professionals will assume business-facing roles by 2010” (Paul, 2005, 36). This indicates that as outsourcing becomes more prevalent in America, IT workers will begin to take on either additional business-facing responsibilities or move into business-facing roles.

Other opportunities exist when job functions are outsourced to vendors in India. “In many outsourcing deals, there is in fact the opportunity for employees to join the vendor, so change is minimized for vendor and customer” (Kobayashi-Hillary, 2005, 257). While this is clearly disruptive to the life of the American IT worker, they are still gainfully employed, working for the vendor to their previous company and helping to complete the outsourcing transition. Companies receiving negative media backlash concerning the outsourcing of IT workers have gone as far as to guarantee that permanent jobs will not be lost to outsourcing (Kobayashi-Hillary, 2005, 258). This type of guarantee helps to reinforce the idea that outsourcing is done to help a company focus on

its core competencies and improve processes, more than replacing local experienced labor with inexpensive foreign labor.

While the U.S. software company Symantec has stopped short of guaranteeing jobs to workers displaced by outsourcing, they have taken a slow growth approach to outsourcing. Symantec's IT director Dean Lane indicates that they have outsourced "over a period of time, so the total number of employees who have been impacted out of 113, is less than 10. Those people have not yet been impacted, and we're looking to place them elsewhere within the company . . . within IT. We're growing and so it may be a little bit unfair to say that that can be done all the time, but certainly if it turns out we can't find a place for these people, there will be transitory programs to help them move from Symantec to other companies" (Lourie, 2004). Lane has also realized that one of the easiest ways for outsourcing to impact the bottom line is by allowing the money saved through outsourcing to be reinvested in IT. This allows for job and technology creation in the U.S. while some IT positions move to India (Lourie, 2004).

One of the most important things for a company to consider when outsourcing is how the employees are handled whose positions are being outsourced. These employees have a great deal of knowledge and experience with the company and that may be useful to the company in other areas, whether it be in IT or in another job function. As an outsourcing plan is defined, these employees will be important to the transition, so they will need to be treated appropriately whether or not they are able to find another position within the company. When businesses aren't able to offer a worker another position within the company, several things can be done to help aid in the outsourcing transition.

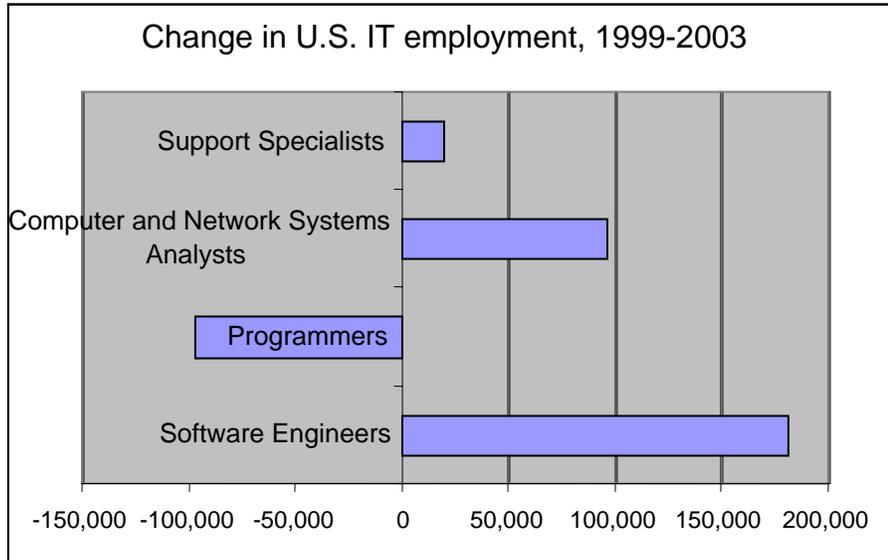
By defining a timetable and a severance package, employees will know up front how long they have to find other employment. Once this is established, human resources should be engaged to help establish contacts and leads (Kobayashi-Hillary, 2005, 231). Through the combination of options available to workers, the majority of IT workers will be able to find new positions. These positions may be in other capacities at their current company, in a similar capacity at a vendor company, or in a new capacity at a different company. Whichever the case, the IT economy will continue to provide jobs for these workers.

Evidence on the Current Effects of Outsourcing

Job Loss and Job Gain

When evaluating the economics of outsourcing, economists have looked at the jobs being generated in the U.S. vs. the jobs being moved to India to try to determine the outlook on IT jobs in America. “They found that, at most, about 274,000 software and business-process [information technology] jobs moved to India from 2000-2003, or an average of about 91,500 positions per year. ‘Although the costs were substantial for the displaced employees . . . a job shift of this size is small compared with the 2.1 million service jobs created every year during the 1990s and minor compared even with the net annual job increase of about 327,000 from 2000 to 2003’” (Eckle, 2005, 53). While the number of American jobs in programming dropped from 1999 to 2003 there were additional factors besides outsourcing that played into this. The end of the dot-com boom and a drop off in information technology hiring following Y2K played a greater role in the decline than outsourcing did (Eckle, 2005, 53). Looking at the changes in

employment over this timeframe, the higher end and lower end positions that surround programmers on the IT landscape had significant gains during this time:



(Eckle, 2005, 53)

The U.S. Department of Labor’s Bureau of Labor Statistics (BLS) supports the findings of independent economists. The BLS reports that the number of computer programmers, computer scientists, and systems analysts dropped between 2000 and 2004. The declines faced in these positions were offset by substantial gains in the employment of computer hardware engineers, computer software engineers and computer and information systems managers. These increases point towards the type of jobs that American IT workers can expect to be created as IT work moves to India. “The drop in computer programmers and rise in managers reflects the trend toward offshoring of programming jobs and the resulting need for professionals to manage outsourced projects” (Schneiderman, 2005, 25). These trends in job creation help to portray the true picture of outsourcing IT work to India. At Symantec, software jobs outsourced to India

have led to the creation of software design jobs and software architect positions in the U.S. that allow IT workers to transition from their outsourced role to a new role within IT (Lourie, 2004). While jobs will inevitably be lost, new jobs will be consistently created throughout the economy that will continue to provide opportunity to displaced IT workers.

Shifts in Job Function

As IT job processes begin to move to India, American IT workers will begin to see a shift in the function of their jobs. While this could be in the form of a complete job change, it is likely that many IT workers will remain in a similar role with a different set of tasks to complete on a daily basis. A government report by the Technology Administration has studied how daily work for IT workers would change as a result of outsourcing. The report found that most IT workers that remain in the information technology field would consider these changes to be positive because of the increases in creativity and innovation allowed through outsourcing (Technology Administration, 2004). By looking at the results of the government report and an example of a company trying to put it into practice, it's possible to see the current effect on IT workers.

The government report has concluded that several types of projects are likely to stay in America, while other tasks are likely to be outsourced. IT work that is likely to stay in America includes iterative development processes, work that will require workers to interact with end-users and clients, large scale system-integration projects, and applications with complex procedures. Other work likely to be kept in America includes work that needs a deep cultural understanding, heavy integration with U.S. operations,

and work that currently only exists in the minds of U.S. IT employees. These projects and processes all include analytical IT work that involves non-rule-based decision making. Work that is likely to be outsourced to India is less analytical work that can be explained in a specifically defined set of rules:

Projects that require a high level of creativity, insight, innovation, and thinking outside of the box are also likely to stay onshore, as are jobs requiring process design and business analysis; technology and systems integration; and fusion of industry knowledge with a high level of IT skills. For the most part, what these functions have in common is that they involve making nonroutine decisions, creating innovation, and fusion of business processes with IT. The aspects with lower value involve routine work and technology activities that are not critical to business strategy (Schwartz, 2005, 22).

Looking at this report and seeing how it applies to American business illustrates how American IT workers will be impacted by the changing economy. The research company Gartner has studied recent trends in outsourcing and recommends that clients consider outsourcing all IT functions that aren't critical to the success of the company. They don't recommend this as a way to cut costs, but as a way to allow the IT department to concentrate on the core business (Ziff, 2005). The thought behind this is that as much as three quarters of a technology budget may go towards maintaining existing software and hardware. With that much of a budget focused on maintenance, it is hard to free up IT workers for new development. "If your technology organization didn't have to worry about supporting basic activities, the thinking goes, its brainpower could be spent developing and delivering services that create a competitive advantage for your company" (Ziff, 2005).

A company that has taken this approach and applied it to their business is Ameritrade. They have chosen to outsource their non-core development and software maintenance operations. As their VP of application development Jerry Bartlett points out, “What we don’t outsource are the aspects we view as our core competencies in delivering the best possible experience to our clients” (Ziff, 2005). Their belief is that if they have highly paid, experienced IT workers, those workers should be devoted to developing and testing their next generation of products. Ameritrade has used this process to its advantage, developing and testing new web based software in less than six months. By utilizing this type of model, Ameritrade gets greater value from their IT workers and their staff gets to work on new challenging projects while the more mundane ones are being taken care of by workers in India. This is clearly a situation where the company, the workers, and the outsourcing vendor all benefit from the new business model.

Job Movement within the U.S.

An unexpected benefit within the American economy is beginning to spread across the U.S. as companies see cost benefits of outsourcing to India and apply that business model to the U.S. As high paying IT jobs on the east and west coast move to India, many businesses and smaller cities in America realized they could provide several of the same benefits that outsourcing to India provides. Consulting companies have begun to take root in smaller cities in North Dakota, Minnesota, Arkansas, and New Mexico (Geller, 2005, 1). As these companies begin to offer outsourcing services within the U.S., the benefit to American IT workers is threefold. The benefits between outsourcing to India and outsourcing within America are narrowed through lower costs;

small town America is given a chance to revive itself with IT employment opportunities, and companies can outsource within the U.S. without the risk that is created by outsourcing to India. By utilizing U.S. based employees, companies do not risk any potential client relationship issues because any outsourcing and client interaction can take place during normal business hours. There is also less concern with data security ownership of intellectual property (IP) when neither the data nor the IP are leaving the country.

For years, high paying IT jobs have been the lure of the east coast and west coast as IT workers would flock to the Silicon Valley to work in the heart of the industry. Now as outsourcing becomes more prevalent in business, IT workers from around the country are moving where the work is. CrossUSA, an IT outsourcing provider, chose to locate its IT operations in Sebeka, MN and Watford City, ND. While neither may be a thriving metropolis, workers can take positions with CrossUSA that allow them to live in an area where the cost of living is approximately one third of what it is on the coasts (Geller, 2005, 1). Workers don't make as much money as they would if they worked on either coast, but when the cost of living is that low, a pay reduction can still allow families to live with most of the amenities that they are accustomed to. For IT workers that grew up in small towns, this type of outsourcing offers them an option they never had, the chance to 'go home again' instead of moving to the big city to pursue their vocational goals.

Businesses that deal with American companies and customers on a daily basis often have a need for interaction between these customers and their IT workers. For these types of businesses, the communication gap in outsourcing can often be difficult to

overcome. Trying to have customers interact with Indian employees working in different time zones with a completely different culture is often too much to ask of a business customer. CrossUSA sells themselves by telling customers “they’ll be doing business with workers who better understand their needs, in a time zone within an hour of their own” (Geller, 2005, 1). As companies realize the benefits of outsourcing, consulting companies in America are hoping that they consider options at home along with the many options in India.

Outsourcing is a major decision for companies to undertake. As they evaluate the risks with the rewards, many companies may feel safer in keeping sensitive information and intellectual property within the U.S. borders. “A company in London or New York could save money by locating essential services in Newcastle or Omaha, yet not run the risks involved in moving offshore” (Brudenall, 2005, 256). These considerations provide many benefits to the economy for U.S. IT workers as their options within the U.S. continue to grow.

Improving Processes with the Move to Outsourcing

As companies move certain IT processes to India, those who don’t realize a cost savings may find other benefits that have a positive impact on their organization. While initial outsourcing moves to India have shown that cost savings projections don’t live up to expectations, process improvements help to make up the difference. “46 percent of offshore savings result from improved internal processes, and 45 percent come from vendor execution” (Mears, 2005, 13). These types of process improvement can benefit American IT workers as the Indian principles are applied to U.S. businesses. Companies

operating more efficiently will likely be more profitable and able to expand their business.

As American companies struggle to attain the quality needed to compete in a global marketplace, expanding their worker base to a country where process and quality is highly valued will help to improve American IT. India consulting firms focus on becoming ISO 9000 certified and being evaluated for the Software Engineering Institute's Capability Maturity Model (CMM). India has more companies ranked at the highest level of CMM than any other country in the world (Kobayashi-Hillary, 2005, 154). GE Capital moved its IT processes to India in hopes of a cost savings, but it achieved other benefits as well. "GE Capital has moved seven or eight hundred business processes to India and over ninety percent have increased in quality. Companies come to India for the cost, but stay for the quality" (Kobayashi-Hillary, 2005, 154). This type of increase in quality and decrease in cost allows for a greater spread of information technology throughout the world. With an increase in software use and other forms of IT, new jobs will be created in areas surrounding IT to design, support and integrate new software with existing software.

America as a Provider of Outsourcing

While corporations in India have been built from the ground up as providers of IT outsourcing to the U.S. and other foreign countries, American companies are new to this concept. As outsourcing begins to expand throughout corporate America, American innovation will lead to U.S. companies that provide outsourcing to other countries. American businesses that provide consulting services in the U.S. are beginning to take

advantage of the global trend toward outsourcing. A good example of this is the Computer Sciences Corporation (CSC) of El Segundo, California. CSC is a global company headquartered in California that has used its experience in the international business to provide outsourcing to other countries.

In 2003, media coverage of outsourcing generally provided a negative viewpoint of how IT jobs in America would be moving to India. Information regarding international companies winning business contracts outside of America that continue to provide IT jobs in America is often overlooked. In August of 2003 CSC signed an agreement with Maybank to provide IT outsourcing with a contract that amounted to 1.3 billion over 10 years (CSC Press Releases, 2003, 1). While CSC operates an office in Malaysia to support the IT operations in Malaysia and Singapore of Maybank, these types of outsourcing deals by American companies help to support the IT economy in America. As this project is implemented in the Asia Pacific, it will receive the IT support needed from CSC's base operations in California.

In January of 2006 CSC signed a contract with Pan-American Life Insurance Company to provide IT support to network operations to Pan-American's U.S., Central American, and South American operations (CSC Press Releases, 2006, 1). By providing IT outsourcing services within the U.S. and outside of the U.S. with the support of its 78,000 employees, CSC creates many jobs throughout the U.S. for IT workers. As companies begin to follow the lead of CSC, America will realize the benefits of being an outsourcing provider as well as an outsourcing consumer. Additionally, the outsourcing IT to India will help to grow the Indian economy to the point where it will have a greater

need for goods and services. Through the open trade created by outsourcing, the U.S. will be in a good position to provide these goods and services to India. Eventually, India will be utilizing firms like CSC to locate IT services within the U.S. while helping to grow the IT economy.

How Outsourcing Affects the IT Worker as a Consumer

An important area to examine when looking at outsourcing is how it will affect consumers in America. Even IT workers who may be negatively impacted through outsourcing by having to find another job or take on new responsibilities may be positively impacted as a consumer. “Competition sustained through outsourcing has positively affected the well-being of consumers and producers. By participating in international trade, we increase our ability to consume the goods and services we value most, and we can do so at lower cost” (Siems and Ratner, 2003, 13). These types of lower costs benefit the consumer in two ways. Lower costs on services and products used on a daily basis lead to a lower cost of living for the consumer. Lower costs on IT products enable a greater distribution of IT which will in turn create more jobs in the U.S. and abroad.

From purely a cost of living standpoint, U.S. companies that do not consider IT as one of their core competencies can look to outsource their IT staff as a means to improving processes and reducing costs. A company that recently did this was Proctor and Gamble. Proctor and Gamble decided to make this move in an attempt to “remove P&G emphasis and resources away from peripheral businesses to focus on the company’s core” (Kelly, 2005). Proctor and Gamble hired IBM as its outsourcing provider, allowing

IBM to hire many of Proctor and Gamble's IT staff to allow a mix of U.S. based and India based IT workers. This type of arrangement allows for many IT jobs to remain in America while allowing Proctor and Gamble a way to reduce costs and improve processes so as to provide lower prices to consumers.

Looking at software and web development as an example, outsourcing some aspects of software and web development to India could greatly improve quality and reduce costs associated with software products. As software and web development become more affordable to the American consumer and to consumers worldwide, many new types of software and services over the web will be created. These new products and services will offer new opportunities for IT workers in America. While this may sound good in theory, seeing examples of how this has worked in the past will help to demonstrate the positive effect of outsourcing.

Projected Long Term Affects on the American Economy for IT Workers

Previous Economic Impacts of Outsourcing on the American Economy

Over the past 25 years different parts of the American economy have been tested as different jobs have been outsourced to other countries. Dean Lane is the IT Director of Symantec Corporation and compares today's IT outsourcing to India to the outsourcing of car manufacturing in the 1980's.

I did outsourcing in the '80s, so I understand it backward and forward. Modern outsourcing is no different; it's just in a different area. Back in the '80s, it was manufacturing and now it's IT. You have to consider the results of offshoring in the '80s. Yes, some people were displaced and lost their jobs or positions, but in the long run, it created more jobs here. As the Japanese economy grew and people overseas became more affluent, they began to buy more American products. The demand

increases and, as the same thing happens in India and other places, you will see the same demand for American products go up again (Lourie, 2004, 1).

While many thought the outsourcing of car manufacturing would be the end of manufacturing jobs in America, we know today that even as American car makers struggle, Japanese auto makers continue to employ thousands within the U.S. The IT job market will continue to grow and change, but the economy for IT workers in America will remain strong.

A good example of how the IT economy can shift and remain strong is Intel. In 1985 Intel was under a great deal of pressure competing against Japanese corporations in memory chip development. “Intel Corp. exited the memory-chip business to concentrate all its resources in microprocessors. The result: Intel stands unrivaled in the business today” (Baker and Others, 2004). As American companies are forced to compete with businesses in India and businesses that outsource to India, there may be a need to shift direction, but that does not mean that there won’t be work in America in the information technology industry.

Marc Andreessen, Netscape co-founder and chairman of Opsware Inc. is a proponent of outsourcing and its benefits to the economy for IT workers. As IT resources are utilized in Bangalore, India, he “sees this reshuffling of brainpower leading to bold new applications and sparking growth in other industries, from bioengineering to energy. This could mean a wealth of good new jobs, even more than U.S. companies could fill. ‘It requires a leap of faith . . . [but] in 500 years of Western history, there has always been something new’” (Baker and Others, 2004). As the economy continues to change and

businesses continue to utilize new technology to expand workforces virtually, American innovation will continue to provide new options for IT workers.

Long Term Education Trends for Future IT Workers

Over the past five years, several factors have led to a general impression that IT jobs are on the decline and not as readily available as they were in the late 1990's. After the non-issue of the Y2K bug, the collapse of the dot coms, and more recently the negative publicity surrounding outsourcing, many students are questioning whether they should be entering IT related fields. Parents are also beginning to question whether or not their children will have jobs if they choose to pursue this career path (Fisher, 2005, 1). This type of indecision around the IT industry has led to a decline in undergraduate enrollment.

Computer science enrollment is a good indicator of the current trend. "Undergraduate enrollment in computer science programs has dropped 7 percent for each of the last two years, according to the Taulbee Survey of the Computer Research Association (CRA). Further up the pipeline, the number of students who declared their major in computer science has declined for the past four years and is now 39 percent lower than in the fall of 2000" (Paul, 2005, 36). Parents see a future in IT as unstable and are encouraging their children to pursue an education in other fields. While this is an indicator that there will be fewer IT graduates looking for jobs in the future, it also points to a job market that will remain strong as demand will increase for the limited number of graduates. Going forward, schools and businesses will be looking to encourage students to pursue IT related degrees.

At Purdue University there has been such a decline in interest in engineering from high school students that they've created "a new Department of Engineering Education to increase younger students' interest in engineering while researching ways students learn engineering concepts" (Holsapple, 2004, 1). While Purdue is the first university to create a department to study this issue, other universities have begun to study the problem. Purdue's goal with their initiative is to help establish the next generation of engineering professionals that will be needed to meet the projected future demand in this field. Companies with a future in IT also feel the need to support future IT workers. Phil Zweig is the vice president of IT for Milwaukee based Northwestern Mutual and also a vice president for the Society for Information Management. He believes "the long-term solution to an IT worker shortage is to reach out not just to university students but also high school and middle schools. 'We have to get students enthused about entering IT. This is not a dying profession'" (Paul, 2005, 36).

The Negative Impact of Education Trends for Future IT workers

Dropping enrollment rates in engineering and technology programs indicate a strong future job market for current IT workers, but it may also be an indication that students who would typically pursue information technology degrees are entering other fields at American colleges. U.S. businesses currently turn to outsourcing to focus on core competencies, save money, and improve processes, but there is a fear that the downturn in IT enrollment will lead to outsourcing in the future for additional reasons. "The simultaneous decrease of American technology workers and the increase of offshore workers poses future problems for the economy, as American companies may be

forced to consider outsourcing not only to save money, but due to lack of local talent” (Marquez, 2005).

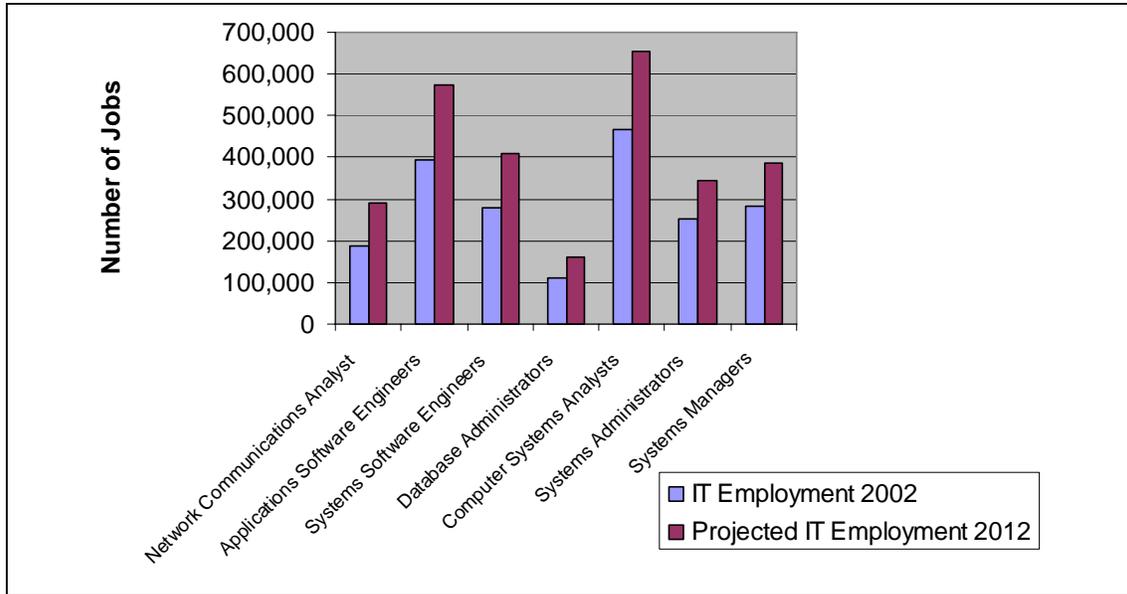
It is the current fear of outsourcing that may actually contribute to future outsourcing and create a negative cycle in U.S. IT jobs. As parents and their children make the decision on whether or not to enter an information technology education program they may be paving the way for future outsourced jobs. As Nancy Markle, a board member for the Society of Information Management points out, “Other countries are pushing for technical education . . . If we don’t do that here, companies will have no choice but to send the jobs offshore. That’s not good for the U.S.” (Paul, 2005, 36). Harris Miller, the president of the Information Technology Association of America agrees with Markle. “Everyone needs to support the next generation in seeing IT as a vibrant, growing occupation, or else the tradition of technology innovation will perish” (Paul, 2005, 36). The impact on IT education of outsourcing to India is very real, but as with all fields in America, education enrollment is very cyclical and generally follows the demand in the marketplace. While it is impossible to look into the future and predict what enrollment will be 10 years from now, if the U.S. economy in IT continues to grow and provide new jobs as it has from 1999-2003, students will realize that there will still be many opportunities available to them.

Long Term Job Projections for Current IT Workers

With current enrollment into IT and engineering courses of study in American colleges quickly declining, the long term job projections for current IT workers are very encouraging. For the past two years the “number of new high-tech jobs being created is

on the rise” (Fisher, 2005, 1). As these new jobs are being created, recruiters are receiving fewer applications per job, indicating that the demand for IT workers is growing. Phil Zweig is currently examining the “combined effects of radically dropping enrollment in IT programs at the undergraduate level and the first wave of baby boomer retirements. “Between the retirements that are coming and the reduction in computer science students, [IT management is] in a very difficult position” (Paul, 2005, 36). Analyzing these three factors indicates the probability of a favorable economy in the future for current IT workers.

The current downtrend in IT enrollment that was previously illustrated, combined with the retirement of the older generation of IT workers should create a strong economy for IT workers over the next ten years. This potentially strong economy may even lead to a shortage of workers at some point. Current IT leaders are “concerned it will be increasingly difficult to find people with skills such as project management. Without enough future IT professionals in the pipeline – and with thousands of older employees leaving the workforce – the U.S. could be left high and dry when it comes to technology innovation” (Paul, 2005, 36). While this is a strong opinion on the matter, the statistics do point towards several hundred thousand IT jobs being created by the year 2012. From the U.S. Department of Labor Bureau of Labor Statistics:



(Paul, 2005, 36).

If these IT jobs are created and enrollment in IT programs continues to decline, current IT workers will be in an ideal position as new jobs present themselves and the older generation of IT workers begins to retire. “One recent study showed that the number of high school seniors planning on careers in engineering has dropped more than 35 percent in the past 10 years. At the same time, the U.S. Bureau of Labor estimates that the number of jobs to be filled in engineering and science will grow at more than three times the rate of other professions” (Holsapple, 2004, 1). While there may be growing pains as companies begin to learn how outsourcing can best be used to benefit their organizations, the long term outlook for the economy for IT workers is very positive. As outsourcing of IT to India grows as a business option in America, the economy for IT workers will be ever changing, however, this growing trend should not negatively impact IT workers in the long term. While workers may be displaced from their jobs initially, the economy should continue to evolve as new jobs are created for

them to occupy. As the IT economy stabilizes and grows, careers in information technology in America should continue to be very prosperous.

Summary

Outsourcing information technology work to India is expanding in America because it allows U.S. businesses to reduce costs, focus on core competencies, and improve processes. While many fear that outsourcing to India will have a negative impact on the American economy for IT workers, American businesses continue to create IT jobs in America. As lower level IT work is moved to India, there are more opportunities for U.S. IT workers in areas of design and innovation.

As America adjusts to the new outsourcing trend American companies have found ways to create jobs in IT by creating consulting companies in small town America to compete with Indian firms. Other American companies have become providers of outsourcing, also utilizing the trend to benefit the economy for American IT workers. Looking toward the future, the American economy for IT will likely rebound much as other areas of the economy have in the past. As car manufacturing experienced in the 1980's, there are always growing pains with new business methods, but as the economy grows and adjusts it will continue to provide jobs for IT workers.

The future job market for IT workers should become strong as the baby boomer generation begins to retire. Currently technology enrollment in colleges is rapidly declining, while this also indicates a strong job market for future IT workers, there is fear that a lack of IT talent in the future will result in a move to outsourcing out of necessity. As Americans become more familiar with the outsourcing of IT work to India, it is important that there is education on the true impact of outsourcing. The continued influx of IT jobs in American businesses and continued demand for innovative workers should

help to ensure that future students realize the benefits that a technology education can provide.

Conclusions

As outsourcing of IT work becomes more prevalent throughout American businesses, it is important for the workers affected by this trend to look at whether or not this will affect their jobs in any way. IT workers often fear outsourcing because they feel their job may be moved to India, displacing them from their job and limiting their options for finding a new job. While outsourcing may result in an IT worker being displaced from their job, frequently that worker will have the opportunity to take on new responsibilities within their current company. Those responsibilities may expand on their previous IT work or it may be an opportunity to move elsewhere within the company and learn about other parts of the business.

While some IT workers may thrive outside of the IT department, others may not enjoy the new opportunities available to them at their company. These workers will find that opportunities for IT jobs in America are growing and should continue to grow into the next decade. Workers may find opportunities that were never available to them in the past, such as the ability to move to a small town in the middle of the country and continue to excel in an IT environment where their cost of living will be greatly reduced.

As outsourcing to India continues to grow in the coming years, workers will wonder what the ongoing impact will be to them. As the baby boomer generation begins to retire and as the current declining enrollment in technology programs begins to hit the market, current IT workers should be in demand. Society as a whole will need to work to change the perception of outsourcing and the information technology workforce of the future. Without encouragement, tomorrow's IT leaders may be reluctant to gain an

education in a field that should continue to have strong job growth in the American economy. Regardless of this education trend that needs to be reversed, the future outlook on the American economy for IT workers is very strong.

Suggestions for Additional Work

Throughout the course of writing this research paper, additional topics were encountered that would have required a great deal more investigation or could have become a topic on their own. The first such topic was the resurgence of small towns in Middle America where outsourcing companies have opened consulting firms. As many small manufacturing towns across the country have seen their populations plummet in recent years, it would be interesting to research the impact of moving new technology jobs to these areas. One would think that these towns would experience resurgence and welcome these new business and workers to the area, but further research would be required.

Another topic of interest would be to find workers directly impacted by outsourcing in the manufacturing area in the 1980's and follow their job movement over the past twenty years. While it is easy to look at numbers and references to how people and jobs move when jobs are outsourced, it would be nice to see specific examples of individuals affected and how they chose to continue their careers. This type of study wouldn't necessarily correlate to IT outsourcing to India, but it could certainly provide some insight as to how the economy has affected people in the past.

Finally, an in depth study of a specific company that is currently outsourcing or offshoring IT work. While there are many references and statistics on how jobs are moving to India and what the outcome will be to American IT workers, there aren't any good case studies citing specifics. Interviews with leadership at different companies reveal how many jobs have moved to India and where the IT workers have moved within

the companies. However, a detailed look at one company could provide more specific detail. This could include which jobs moved, the movement of the IT workers that previously held those jobs, and then the specific economic impacts to the company and the workers going forward as a result of outsourcing.

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