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Creating Offshore-ready IT Professionals: A global perspective and strong collaborative skills are needed

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Abstract

Outsourcing of IT functions has become a widespread corporate practice, which has naturally led to concerns among IT workers about how this affects their jobs. The issue is complex, and many companies are bringing their IT functions back inhouse. In light of this complexity, what skills do IT workers need to be competitive? We address this question first by reviewing the literature and then by examining two corporate case studies that have dealt with outsourcing issues. Based on this view of outsourcing, we discuss the skills that can provide a competitive advantage in the current environment.

Keywords

Business Process, Business Unit, Physical Proximity, Business Function, Group Support System

Disciplines

Management Information Systems

Comments

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Creating Offshore-Ready IT Professionals: A Global Perspective and Strong Collaborative Skills Are Needed

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Outsourcing of IT functions has become a widespread corporate practice, which has naturally led to concerns among IT workers about how this affects their jobs. The issue is complex, and many companies are bringing their IT functions back in-house. In light of this complexity, what skills do IT workers need to be competitive? We address this question first by reviewing the literature and then by examining two corporate case studies that have dealt with outsourcing issues. Based on this view of outsourcing, we discuss the skills that can provide a competitive advantage in the current environment.

I. *Introduction*

The increasing popularity of outsourcing information technology (IT) jobs has made many U.S. IT workers uneasy about their future career prospects. Many believe that IT jobs will continue to move offshore, leaving a growing number of qualified American IT professionals jobless. Furthermore, those involved in defining social and industrial policy are beginning to question how the U.S., which has repeatedly reinvented its workforce through innovation, can successfully reinvent workforce roles when the jobs moving offshore are at the heart of corporate innovation. Some have argued that innovation remains the key to U.S. competitiveness (Engardio et al., 2005; Post-gazette.com, 2005; Sparshott, 2004); however, the innovation argument becomes less persuasive as one considers the fact that many qualified, innovative, and low-cost workers are available in countries such as India and China.

IT outsourcing has grown dramatically over the last two decades. When Eastman Kodak outsourced IT functions in the late 1980s it enhanced the credibility of outsourcing and other firms began to follow suit (Apte and Mason, 1995; Dibbern et al., 2004; Lacity et al., 1995; Lee

et al., 2003; Rao, 2004; Sobol and Apte, 1995). Reasons for outsourcing vary. A primary motivating factor influencing outsourcing is the potential for substantial cost savings.¹ In particular, the goal of saving costs is the reason high profile companies such as IBM, Intel, Microsoft, and Hewlett-Packard (Ricciuti and Yamamoto, 2004) initiated outsourcing and offshoring arrangements in developing economies.

Cost savings due to outsourcing, however, are not automatic. Instead of simplifying processes, outsourcing often increases project complexity and risk, which may increase costs by requiring additional managerial oversight. According to a 2005 report by Deloitte Consulting, almost two-thirds of those companies that outsourced eventually brought some of their outsourced services back in-house because the outsourcing “advantages” failed to materialize (Deloitte Consulting, 2005). Furthermore, companies such as JP Morgan Chase are pulling outsourced functions back in-house to regain control of their technology infrastructure (Kawamoto, 2004). Nevertheless, the McKinsey Global Institute estimates that offshoring to emerging markets will grow at 30 percent annually through 2008 (Farrell et al., 2005: 18). Thus, it is difficult to accurately predict the direction that the U.S. IT employment environment will take during the next few decades. Regardless, it is likely that outsourcing and offshoring will continue as developing countries improve their ability to securely and reliably provide value-added services and products.

This cloudy picture of the future of outsourcing raises several important questions for researchers and practitioners. For example, how should U.S. IT professionals adapt to emerging technologies and business processes? What skills are needed to compete with well educated, highly skilled, and strongly motivated foreign workers? What core competencies does the labor force have that allows it to compete in an environment that has new modes of communication,

collaboration, and competitiveness? Is there hope for U.S. IT professionals if they do not react to these threats by becoming more competitive?

A sea change is underway in terms of how U.S. IT workers need to view themselves, their competitors, and their skills. Ultimately, IT workers must be better prepared to compete globally. The U.S. will not continue to be the economic envy of the world merely because it has held this position historically. After all, with lower trade barriers the proliferation of offshoring is a natural progression towards global economic equilibrium. An important question is, “Does a new type of IT worker need to evolve to meet the challenges of this dynamic environment?” We explore this matter and provide insights into this complex and important issue.

In the following section, we discuss two different frameworks summarizing outsourcing and offshoring terminology. Section III then details IT outsourcing and discusses its impact from the point-of-view of two different companies. Section IV provides a detailed description of the skills that U.S. technology workers need to remain competitive. Finally, Section V presents our conclusions and suggestions for future research.

II. *The IT Outsourcing Landscape*

IT outsourcing is well defined and researched in the literature, with the common theme of moving a business function such as IT outside of the organization by partnering with an external entity. Two recent publications by Dibbern et al. (2004) and McKinsey & Company (Farrell et al., 2005) provide excellent summaries of the contemporary state of sourcing IT labor and offer useful terminology, descriptions, and frameworks for conceptualizing and discussing the sourcing issue. Dibbern et al.’s (2004) research summarizes the current state of IT outsourcing research by categorizing the theoretical drivers, methodologies, and implications for research and practice. Moreover, it offers a useful framework for categorizing and describing IT sourcing

based on two factors: (1) the degree of outsourcing and (2) the degree of process or function ownership that is outsourced (Table 1). This framework identifies sourcing alternatives within the context of ownership and action, where ownership refers to whether the firm maintains custody of the IT functions and action refers to who is doing the work, i.e., the firm or an external entity.

Table 1
Dibbern's Labor Sourcing Framework

Degree of Outsourcing	Ownership		
	Internal	Partial	External
Total	Spin-offs	Joint Venture	Traditional Outsourcing
Selective	Spin-offs	Joint Venture	Selective Sourcing
None	Insourcing/Backsourcing	Facility Sharing	N/A

Source: Adapted from Dibbern et al. (2004).

The second relevant research project is McKinsey & Company's comprehensive examination of the state of global sourcing (Farrell et al., 2005), which focuses on the demand for labor in the global context in eight industry sectors: IT Services, Packaged Software, Banking, Insurance, Pharmaceuticals, the Automobile Industry, Health Care, and Retail. The study's findings indicate that the likelihood of outsourcing in different sectors varies due to factors such as the degree of customer interaction, barriers within firms, and industry characteristics. McKinsey & Company's outsourcing framework (Table 2) is based on two dimensions: (1) the degree of control the firm maintains over business functions and (2) the location of the business functions. The first dimension, degree of control, is similar to Dibbern et al.'s (2004) ownership concept. At one end of the spectrum are firms holding IT functions *captive*, so that the functions are totally controlled internally. At the other end are outsourced functions in which the firm maintains no direct control over the IT operations. The second dimension is location, which defines whether IT functions are carried out in the U.S. versus in

another country. This framework is useful because it illustrates two of the important dimensions in sourcing IT labor: (1) who does the work and (2) where it is done.

Table 2
McKinsey & Company's Labor Sourcing Framework

	Location	
	Internal	Partial
Control		
Outsource	Onshore / Outsourcing	Offshore / Outsourcing
Captive	Shared Services	Captive / Offshoring

Source: Adapted from Farrell et al. (2005).

Outsourcing arrangements can also be differentiated along a number of other dimensions. Categories based on the degree to which one or more business functions are sourced externally, which organization has control over the outsourced functions, and the outsourcing activity's duration have been considered when examining sourcing arrangements. For example, Lacity and Hirschheim (1993) differentiate between three different types of outsourcing: (1) Body Shop Outsourcing (use of short-term outsourcing contracts), (2) Project Management (outsourcing a specific project), and (3) Total Outsourcing (the contractor controls an entire business function for an indefinite time).

Carmel and Argarwal (2002) define four stages of offshore IT sourcing using their Sourcing of IT work Offshore (SITO) model:

- Stage 1: Offshore Bystander – No offshore sourcing; domestic sourcing only.
- Stage 2: Offshore Experimenter – Experiments with offshore sourcing on an ad hoc basis.
- Stage 3: Proactive Cost Focus – Sourcing of non-core work is encouraged at offshore centers, with the goal of cutting costs; offshore management mechanisms emerge.
- Stage 4: Proactive Strategic Focus – Core IT work is sourced to offshore centers, with the goal of achieving competitive advantage; distance management mechanisms are mature.

There are numerous examples of firms that have established long-term contracts with offshore contractors. Many times the decision to outsource is driven by the need to handle bursts in activity using short term sourcing arrangements; that is, outsourcing is more likely to be used to fill the gap. Many of these sourcing decisions fit into Carmel and Agarwal's (2002) SITO sourcing model in stages 2 (offshore experimenters) and 3 (proactive cost focus). For example, Carmel and Agarwal (2002) note that less than 10 percent of the firms they studied reached stage four. When they do, they generally do so to

...utilize offshore units to increase business innovation, spur technology innovation, develop new products, gain access to new markets, and grow globally. In short, offshore sourcing becomes embedded in the firm's culture. A key distinction between Stage 3 and Stage 4 is that the offshore partners of Stage 4 companies also routinely develop new IT products or systems, take ownership of entire IT systems or software products, and assume responsibility for end-to-end IT systems. In Stages 2 and 3, new development is rarely sent offshore. In Stage 4, it occurs regularly (Carmel and Agarwal, 2002: 71).

There are many reasons to make longer term sourcing arrangements with external contractors that are consistent with SITO's proactive strategic focus; however, these arrangements are less likely if the service or function represents a core component of a firm's competency or operations.

When facing situations where tighter control was required, firms like Citigroup, GE, Otis Elevator, and American Express established and operated wholly owned subsidiaries in India or China (Alvarez et al., 2003; Carmel and Agarwal, 2002; *CIO Magazine*, 2003). In addition to lower labor costs, this type of sourcing arrangement has other advantages over outsourcing, such as tighter control over data and greater control of business processes. Furthermore, many offshore operations support not only U.S. operations or business functions, but also have the potential to develop a local market for their services and products.

Research to date has concentrated on why firms outsource, insource, offshore, or even backsource; however, to our knowledge, there has been little, if any, research addressing how the U.S. IT labor force should position itself to remain competitive in the global economy. Consequently, there is little or no information about what organizations value in domestic IT workers that might induce insourcing rather than outsourcing. To help determine the skills desired or required in domestic IT workers, we interviewed David Kingland, President and CEO of Kingland Systems Corporation, a domestic outsourcing company that, when charged with the task of completing a large data collection project, made the strategic decision to insource instead of outsource. We also interviewed a recently retired CIO of a large Fortune 500 company who has both supervised outsourcing arrangements and retained IT functions in house. Information from these cases provide a useful starting point to enhance understanding of the skills the next generation of U.S. IT workers needs to be competitive.

Case Study 1. In 1992, Kingland Systems Corporation began providing outsourcing services to the financial and accounting industries, the U.S. government, and general businesses, and their clients have included Bank of America and Fidelity Investments. Kingland Systems specializes in Web-based software development projects for financial institutions, mission-critical data centers, disaster recovery services, business continuity services, and co-location services. The company has 100 full-time employees in four locations and plans to increase its revenue by an average of 20 percent per year over the next 10 years. The firm generally selects employees with diverse technical skills, extensive experience, and the ability to deliver solutions for complex problems.

In 2003, Kingland Systems was contracted to complete a large-scale project to collect, collate, and verify information about the business relationships existing between clients of large

accounting and management consulting firms. This labor-intensive task that Mr. Kingland likened to “flipping burgers on the Internet” required considerable coordination and management. Managers dealt with exceptions, modified processes, and adjusted the parameters of the project; furthermore, management also responded to the project’s dynamic nature, requiring *ad hoc* responses to these exceptions.

Kingland Systems needed to decide how best to source labor for this undertaking. The clients recommended that Kingland Systems establish an offshore operation to take advantage of lower labor costs. David Kingland had another idea – insource locally using a relatively low-cost yet highly educated population of students at a nearby university. The company opened a “branch” of Kingland Systems near the campus of Iowa State University and hired undergraduate and graduate students. Students worked on the project as short-term, part-time employees or as interns. Kingland said that the performance of this insourced labor was excellent and that management was able to directly interact with and supervise the entire process. For example, the close proximity of the insourced facility to the corporate headquarters meant that local managers could routinely travel to the corporate headquarters to meet directly with senior managers.

This proximity made the decision to locate this operation domestically attractive because management could monitor and control the operations at the insourced office more flexibly and effectively than if the facility was offshore. Kingland noted, “if we needed to have a meeting with personnel located in India, we could use technology to meet, but often it’s necessary to meet face to face. If we were to bring a team of managers into our office for a meeting, there would be two hours of travel-related downtime with our local facility. This would be two days of downtime for managers in a facility that’s overseas.” This project required 27 unique processes

that took two years to document; however, during the project's development the client repeatedly required changes to processes. By keeping the engineering team and managers at the "insourced" site in close proximity, Kingland System's managers were able to adapt more quickly than would have been possible if the team members were overseas. A key benefit of this arrangement was the creativity and innovation that proximity fostered in team members. Kingland Systems thrives on innovation; Kingland observed, "...you just don't have the same ability to innovate when you're at a distance. Some of the best ideas arise in the hallways or around the water cooler. You lose this when you have part of your team located halfway around the world."

Kingland identified other advantages to sourcing talent using local students. For example, language was not an issue. The project included subtleties in terminology that would be difficult for a non-native English speaker to distinguish or properly interpret. This was not a problem with the students. Furthermore, the company's rapid growth required Kingland to find ways to identify and attract quality employees willing to live in a rural Iowa town. The local facility allowed managers to screen students and identify quality candidates for career positions – a feeder network to identify and attract high-quality permanent employees.

We also asked Kingland about his use of outsourcing and his perspective on outsourcing trends. He indicated that he sourced labor externally for projects when in "burst" mode, i.e., when a project with a short-term duration and a large quantity of deliverables was underway. This, in his view, is an ideal situation for outsourcing, because arrangements can be made with a contractor and, when the project nears completion, cut back by severing the relationship. In this way, "... we can scale up or down as needed without having to lose good people in our core operations. People want to know they will have some certainty that their jobs will be there next

year, so by using outsourced labor we can offer our employees more career security and opportunities.”

Mr. Kingland firmly believes that successful outsourcing ventures require integration of Kingland’s software developers into the business problems. During installation, developers are required to be on site to ensure that the installation is smooth and to troubleshoot as necessary. He believes that when there are few touch points in a system offshore outsourcing may make sense, but when the system interfaces with many other systems or business units keeping the development near those touch points makes sense.

As the leader of a company providing outsourcing services, David Kingland is very optimistic about the future not only for his company but also for IT professionals. For example, even though the trend is toward more offshoring in some markets, there are limits that will curtail this growth for various IT professions. For example, he noted, “offshoring has its place, and it creates value for many firms. If you are only doing coding in COBOL or something similar, you will probably see your job go overseas because it makes sense to send well-documented, labor-intensive tasks to where the labor is cheapest or where the labor pool is highly skilled in a particular task.” However, firms like Kingland Systems thrive on creativity and innovation. Kingland observed that his firm and its employees succeed in securing new contracts by focusing on creativity and innovation and by being generalists who can solve various problems for diverse clients. While Kingland Systems fills one particular IT niche and some of its labor requirements are unique, most of Kingland’s insights are relevant to many IT industries and are important to consider in identifying critical personnel skills needed for success.

Case Study 2. Our second interview was with a former CIO, Mr. Tyler,² from a large privately held corporation. This firm differs significantly from Kingland Systems, with more than 100,000 employees and a physical presence in over 50 countries. Examining outsourcing in a company that is larger and older allowed us to garner information about outsourcing and offshoring from a different perspective. The company has approximately 100 business units and an IT infrastructure employing several hundred IT professionals. The objective of this interview was to ascertain how CIOs and other executives think about decisions pertaining to outsourcing, offshoring, insourcing, and the skills needed by U.S. IT professionals to be globally competitive.

Tyler described how his company positioned its IT staff. Each business unit employs its own closely integrated IT group. Interestingly, of the 100 business units, only one attempted to outsource IT to an international partner. This business unit already operated internationally, however, which meant its geographic proximity to the outsourcing partner made using the local outsourced labor cost effective. Other outsourcing arrangements were previously considered for IT functions that were not closely integrated with business units. For example, the company previously had considered outsourcing its central IT data and networking infrastructure; however, after performing a cost/benefit analysis, management concluded that “the financial payoff associated with outsourcing was not ‘interesting.’” Tyler observed that, when considering IT infrastructure, if the CIO is doing his job properly, there should be no need to outsource the function because it will already be lean. Although during Tyler’s tenure as CIO only one of the firm’s business units outsourced its IT functions, he also was cognizant of the fact that outsourcing is a requirement of doing business in a global economy and that firms were going to increasingly need to make tough decisions about sourcing labor.

These comments seem at first to be contradictory; how could a CIO who says outsourcing is inevitable also operate an IT operation where so little outsourcing occurred? Although Tyler was retired and therefore not central to the ongoing operations of the firm, he was still active in the company and was well-informed about current and ongoing corporate strategies. What this highlights is the need to understand the complexity of the factors that influence the outsourcing decision. In other words, the outsourcing decision involves understanding the interactions that exist between the organizational structure, the function being outsourced, and the firm's market. For this firm, the company was not well positioned to outsource IT because its operations were diverse; business units were complex; the units' functions were core to the strategic mission of the firm (i.e., failure was not an option); and the competitive environment was dynamic. These factors, coupled with the requirement that IT provide customized and focused services to each business unit, made outsourcing infeasible for almost all of these business units. In addition, Tyler confided that the firm did not have thorough and, perhaps more importantly, well-organized documentation of the business processes that IT was supporting.

In considering this firm and the nature of the tasks and operating conditions of its business units, we noted that an important factor influencing outsourcing decisions is the degree to which business processes are precisely defined and documented. There is a direct relationship between the likelihood of outsourcing and how straightforward and routine a business process is, how easy the process is to document, and how well the firm understands the process. However, this relationship is neither linear nor unidirectional, since firms with a poor grasp of their business processes might also be inclined to outsource functions that they view as outside their core competencies. Tyler supported this position when he noted, "...many companies will outsource their IT when they do not have a good idea of what they are doing." In Tyler's firm,

the complex nature of the environment in which the business units operated combined with the need for customized IT services meant that it fell somewhere in the middle of this spectrum. This suggests some interesting relationships between process documentation, business operations, and a firm's propensity for outsourcing IT, such that outsourcing is more likely to occur when the quality of business process documentation is very good or very poor and less likely when the quality of process documentation is only moderate.

The Broader Outsourcing Landscape. Although these two companies provide useful examples of diverse outsourcing experiences, other potential outsourcing configurations are also important. For example, ABN AMRO recently announced its entry into an outsourcing agreement with offshore partners. This agreement represents the largest financial investment to date by western firms. Partners in this agreement included IBM, Accenture, Tata Consultancy Services, Patni Computer Systems, and Infosys Technologies, and most of the project's IT labor will be sourced in India (McDougall, 2005). Given these types of outsourcing arrangements, even strong opponents of offshore outsourcing, such as Senator Christopher Dodd (D-Conn), acknowledge that "you can't stop it altogether, nor are we saying that we should stop it altogether" (Thibodeau, 2004).

In fact, there are many reasons for outsourcing IT (Willcocks and Fitzgerald, 1994). A primary driver is the lower labor rates in locations like India and Eastern Europe (Lacity and Willcocks, 2001). Additionally, when IT is viewed as an expense, outsourcing often provides a way to cut costs and reallocate expenses thereby improving the firm's short-term financial performance (Hall and Liedtka, 2005). Firms are also recognizing the importance of focusing on core competencies. According to Lacity and Willcocks (2001), the view that IT is not a core competency often arises because stakeholders do not understand the true value of IT in

supporting functions. This is illustrated when companies that have outsourced IT later bring these functions back in-house, i.e., IT is *backsourced* (Overby, 2005). Furthermore, outsourcing can be used to manage risk by spreading contracts among multiple vendors, thus diversifying exposure to firm-specific problems or catastrophes (McDougall, 2005).

Proximity and Communication. An important outsourcing requirement is that individual organizational actors interact in project teams. Regardless of whether IT functions are performed in-house or outsourced, interactions must still take place between members of project teams. With few exceptions, the nature and quality of interactions between project team members are significantly impacted by physical proximity. Kraut et al. (1990) found that the frequency, quality, and cost of collaboration were significantly influenced by the team members' physical proximity. Their findings are similar to Allen's (1977) which indicate a declining logarithmic relationship between communication frequency and distance between communicators. This holds true not only in informal interactions but also in formal and structured work environments.

Offshore collaboration affects these phenomena by replacing a static physical proximity with a dynamic collaborative structure. Since offshoring adds distance as a factor affecting collaboration, the frequency and the quality of interactions between partners are significantly affected. In most cases, the opportunity to interact is reduced, so some of the consequences of reduced interaction will occur, including lower task familiarity, lower trust, greater uncertainty, and similar problems associated with less structured collaborative relationships. Informal communication opportunities are essential for communication quality, especially in a project's initiation and planning stages. During the project's initial stages, objectives and definitions remain vague; therefore, project team members must communicate effectively so that the project

can develop and sustain momentum. Kraut et al. (1990) illustrate the importance of informal communication during initiation and planning in the following:

The intense, highly interactive meetings that characterize planning work generally take place in offices or conference rooms and typically, the only technologies involved are paper, pencils, and blackboard. Most often the participants do not prepare for these meetings in any formal sense. There is little reliance on prewritten documents or diagrams as a basis for discussion; instead, collaborators seem to value the opportunity for spontaneous, informal, and unstructured exchange of ideas (Kraut et al., 1990: 162).

While the informal, unstructured, and spontaneous interactions referenced by Kraut et al. (1990) are necessary for substantive collaboration, these same interactions are often impeded, if not precluded, in offshore outsourcing partnerships. Furthermore, Kraut et al. (1990) noted that close physical proximity reduces the cost of interactions and collaboration. Although this seems self-evident, they point out that close physical proximity allows participants to interact and share in decision-making activities for both small and large tasks. Increased participation leads to enhanced psychological involvement and personal commitment among participants.

Another consideration is the requirements of team members during various stages of decision making. Simon (1960) proposed a now classic model defining the stages of task completion which originally included four stages: intelligence, design, choice, and review. In the intelligence stage the task that needs addressing is identified, e.g., a problem is recognized as a problem, and defined. Design involves the identification and selection of alternatives to address the task. Choice involves the implementation of the selected decision-making procedure and the selection of the task solution. Lastly, review involves an assessment of past choices and their relationship to the task solution. Other researchers have expanded or modified these phases to accommodate particular circumstances or special cases (VanGundy, 1988). For example, implementation is often added as a fifth stage. Nevertheless, the model's core components have

endured and are part of several task models and decision-making procedures (Silver, 1991; Weick and Meader, 1993).

Simon's model has also been used to explain the motivation for IT outsourcing and to describe the questions (i.e., why, what, where, which, who, and how) that must be asked at various sourcing process stages (Dibbern et al., 2004). Electronic communication technologies create an *effective proximity* that enables a non-proximate team member to simulate physical proximity with colleagues and data resources. However, while effective proximity may suffice in some task phases, it does not in all phases. For example, the effective proximity created by an electronic communication technology will be less beneficial for some types of tasks during the intelligence phase because the discovery of problems or opportunities is often serendipitous. A phone call or email may trigger an idea or raise an issue requiring attention, but the lack of richness and lower levels of spontaneity offered via communication technologies are less than those in a proximate venue. Put another way, physical proximity is of greatest value in projects' early stages because of the need for rich communication and flexible interactions among team members. The importance of this requirement is evidenced when outsourcing projects are initiated. Systems requirements' determination and similar analysis tasks are most often completed by analysts or consultants who conduct data collection, interviews, and similar tasks *on site*. Electronic communication technologies may be more effective during other process stages, such as the design phase, because as a task progresses it likely becomes better defined and structured; therefore, as the project evolves many tasks can be completed without physical proximity. During implementation (i.e., the choice phase) the need for physical proximity is least pronounced since the tasks associated with completing the project have been documented and defined. Finally, the review stage requires only a moderate level of proximity since project

integration into the system requires a moderate amount of interaction between the outsourcing organization and the client. In sum, the type of proximity required, whether physical or effective, varies depending on the phase of a project.

III. *Discussion*

With the opportunities and challenges of U.S. IT professionals today, what skills are needed to compete and succeed? Based on our literature review and analysis of two case studies, we conclude that three categories of skills represent critical success factors for IT professionals: (1) communication skills, (2) business skills, and (3) technical skills.

IT professionals who are competent in each of these areas are better positioned to succeed in today's global economy, and they will be equipped to evolve to the requirements for jobs in the future. Our rationale for this conclusion is discussed below.

According to the McKinsey Group's recent study, business activities that are least likely to be moved offshore have at least one of the following characteristics: (1) the need for customer contact, (2) the need for local knowledge, and (3) complex interactions (Farrell et al., 2005: 14). Each of these factors is linked to proximity – the greater the need for physical proximity, the less likely the business function can be moved offshore. Employees involved in such activities should also have strong communication skills, a good sense of the business opportunities within the local environment (local politics, legal issues, and financial considerations), and the technical or analytical capability to successfully apply technology to business problems. An important role for IT professionals is to explain, document, and integrate business and technical concepts, thus IT professionals will increasingly be called on to develop and manage customer relationships as problem identifiers, problem solvers, and system integrators.

However, the importance of effective communication is not restricted to tasks involving customer management and interaction, for communication skills are also needed for effective teams and for the informal exchange of ideas that can lead to innovation. The importance of communication skills and effective collaboration was noted by Tyler, the CIO in Case Study 2, who indicated that "soft skills," such as those required for effective communication and teamwork, are rare in the U.S. IT workforce. Furthermore, other *soft skills*, such as being multilingual or understanding local cultures, are increasingly important because many projects involve multi-national teams or serve offshore clients.

Knowledge of specific business domains is also important for maintaining marketability and adding value to an organization. IT professionals with skills and experience in a particular industry have an advantage because their value added is more difficult to duplicate. Although no particular industry segment is immune to outsourcing, business functions that are difficult to move offshore are often those that require knowledge about a business' specific culture, its unique operations or technologies, its local regulations or political environment, or similar business- or industry-specific considerations.

By combining strong technology skills with industry-specific knowledge, IT professionals can increase their value by translating business requirements into technical solutions. Even in the absence of industry-specific knowledge, an understanding of applying technology to solve business problems is a universally valuable skill. People with general problem-solving skills add value in a number of ways, but, most importantly, they generally add the greatest value by supporting innovation and continuous improvement of business practices. Which technical skills are most important? Historically, skills in and knowledge about programming, databases, and telecommunications systems were considered critical for success.

Though knowledge and skills related to these specific technologies or functions are still important, higher level skills (e.g., analytical skills, process and data-modeling skills, etc.) that help IT professionals apply their knowledge and skills to solving problems will continue to increase in importance.

Kingland Systems has a business model that illustrates the need for both domain-specific and high-level skills. When asked about the ideal employee, David Kingland indicated that while knowledge about programming is important, the ability to communicate effectively, manage and work in teams, coordinate and manage projects, solve problems, and understand and model business processes is of much greater importance. Kingland believes that the ideal IT worker of the future will be highly focused on solving problems for clients. When combined with curiosity, self-motivation, and a strong work ethic, these skills foster an environment among his employees that supports creativity and innovation. In fact, he indicated that when hiring recent college graduates, he does not focus as much on the student's major as much as the degree to which the student possesses these higher level skills. He noted, "...we can teach a music major to program, but if he doesn't come to the job with the ability to solve problems then he will not be successful."

IBM is another corporation that has recognized the need for a "new" type of IT worker who possesses a combination of communication, business, and technical skills. IBM is championing an initiative called services sciences, management, and engineering (SSME)) in response to the increasing global importance of services. The SSME initiative involves the application of more scientific rigor to the planning and delivery of services to improve productivity and efficiency. In order to take advantage of new opportunities in the services economy, IBM recognizes that IT professionals need not only business skills and technology

skills, but also the customer-management skills traditionally associated with the service industry. The SSME initiative is based, in part, on the recognized shortage of people in the workforce with this particular combination of competencies, and IBM is working towards creating a new academic discipline that can formally train workers to satisfy this need (IBM Research, 2005).

Given these considerations, in combination with the definition of Knowledge, Skills, and Abilities offered by the U.S. Office of Personnel Management's definition (KSAs)³, we propose a pyramidal framework to summarize these concepts. The base of the KSA pyramid consists of abilities. This category is where the least distinction exists between IT professionals in the U.S. and offshore. The attributes that may be classified as abilities are requisite to all successful IT professionals and may be considered general personality traits. Examples of such characteristics include:

- Curiosity: A hunger to understand a problem without being afraid to learn.
- Good work ethic: A willingness to exceed expectations; to go the extra mile to succeed.
- Dedication: A commitment to do whatever is appropriate to successfully complete a task.
- Integrity: Honesty and reliability, which are crucial to being successful in building the firm's reputation.
- Engagement: A willingness to take the time to understand and engage in the context of the problem in order to provide a better solution.

The middle level of the pyramid pertains to specific skills that can be learned and then applied. These tend to be the characteristics most easily quantified, and as such we chose them as the basis for our initial discussion. General education and job training allows an individual to distinguish himself with respect to these and similar skills which include:

- Communication skills: The ability to effectively communicate ideas and represent ideas in ways that are meaningful to stakeholders (e.g., presentations skills, writing skills, and documentation skills).
- Business skills: Being able to understand business principles and practices.
- Technological skills: Competency with programming languages, systems, applications, etc.

The capstone of the pyramid represents the knowledge that an employee brings to a task. U.S. professionals are most often able to differentiate themselves from offshore competition with their knowledge. Knowledge implies more than simply possessing a technical skill; it is integrating technical knowledge with domain knowledge. Some attributes of the knowledge level are:

- Innovation: the ability to identify a means to accomplish tasks or develop solutions better, faster, and smarter.
- Effective management: the ability to manage projects and model processes.
- Integration: the ability to identify problem components and bring the components together into an effective solution, e.g., system and process modeling and integration.

Ultimately the integration of each of these levels of competency provides employee value. For example, while communication is an attribute in the Skills level of the pyramid, being a good communicator is necessary but not sufficient for success. Effective and meaningful communication can only occur when the communicator has acquired the appropriate knowledge about the subject matter.

IV. *Conclusion*

We have presented a framework for understanding the complexity of outsourcing through both a review of the literature and illustrative cases. We have also presented a framework that identified and categorized the types of skills needed to maintain a competitive position in the context of global sourcing.

Clearly, outsourcing and offshoring will continue to be factors affecting the IT labor force in the U.S. and elsewhere. In light of this, U.S. IT professionals need to determine how they can remain competitive relative to sources of labor elsewhere in the world. Although there is no one skill or skill set that can provide complete protection against having one's position

outsourced, a combination of the right knowledge, skills, and abilities can help IT professionals continue to add value. The KSA pyramid integrates these concepts and should be useful in helping individual IT professionals, as well as the industry as a whole, understand those value areas. Furthermore, we believe that this framework is useful in guiding those preparing to enter the job market by highlighting what they need so that they may better equip themselves while they are still in school. Lastly, we believe that educators need to move curriculum and educational programs away from a skills-only focus toward developing programs that encourage the preparation of IT professionals with capabilities at all three levels of the KSA framework.

NOTES

¹A negative aspect is that some CEOs are motivated to outsource because of the financial benefits that they personally realize through cutting costs and thereby boosting the value of their personal equity holdings in the firm (Hall and Liedtka, 2005). Although cases such as this illustrate the negative aspects of some outsourcing decisions, this is beyond the scope of our analysis.

²We did not obtain permission to disclose information about the company or its internal operations. Furthermore, we use the name “Tyler” as an alias to disguise the CIO’s identity. We did obtain consent from Tyler to report on his observations and insights about these issues. As such, these opinions and concepts should be viewed as representative of this individual’s position on these topics and not the official opinions of the undisclosed firm.

³KSAs are “the attributes required to perform a job [that] are generally demonstrated through qualifying service, education, or training” (Office of Personnel Management, 2005).

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