

Preface

Today's economic and technological environments make IT skills ever more important for both firms and individual IT professionals. On the one hand, a study done by the benchmarking firm Hackett shows that the primary causes of firms' earning shortfalls and reduced productivity include: (a) the inability to leverage technology investments, and (b) the inability to access information causing slowing and deterioration in decision-making quality (PR Newswire, 2001). As the use of IT spreads across industries and large to small firms, it is critical that skilled IT professionals deliver efficiently well-designed and functioning information systems (IS) to firms and their IS users.

On the other hand, especially after 9-11, the economic downturn forced firms to downsize their workforce. According to the AeA (formerly known as American Electronics Association) study, the high-tech industry lost 540,000 jobs in 2002 (McGee, 2003). Of 540,000 lost jobs, more than 200,000 are IT jobs (King, 2002). In addition to workforce downsizing, firms started using global outsourcing to further contain IT costs. A recent IDC study indicates that offshore delivery of IT services may increase as much as 23% by 2007 (Claburn, 2003).

While the dependency of IT use increases at firms, the number of IT professionals who deliver IT skills is dwindling—at least in the U.S. We are probably at the critical juncture to consider what IT skills really are and what they mean to firms in the short and long term.

Despite the critical nature of IT skills, their planning and management are not necessarily easy for several reasons. First, IT skills are not easy to measure. The skill of typists can be measured by the number of letters and words they type per time period and the number of errors they make in those typed words. In comparison, the IT skills of systems analysts are not as simply defined as typists' skills, let alone to measure.

Second, different people have different notions of IT skills. Some regard IT skills as how one uses a PC, others think of IT skills as some kind of broad technological knowledge. In reality, IT professionals deal with a variety of technologies, tools, and work contexts. Some IT skills pertain to the design of particular systems. A “pure” programmer realizes that he cannot do his work effectively without having good communication skills to deal with his peers, analysts, and customers. In the past, we used such terms as “hard” skills (pure technology skills) and “soft” skills (non-technology skills). With the advancement of technologies and tools, it is not clear now where to draw a line between “hard” and “soft” skills because they have become so intertwined.

Third, the substance of IT work is becoming more sophisticated and complicated. Even smaller firms use a variety of computing hardware and software. In some cases, a “VB programmer” wears a hat of systems analyst to develop a system in a short time frame, interacting heavily with an end user.

Fourth, the line between IT professionals and IT end-users is becoming obscure if not extinct. Often, we see end users developing their own reports from information they extracted.

With those reflections, it is high time that we made ourselves aware of where we stand in our understanding, and lack of understanding, on what IT skills really are, what they mean to firms, how firms can plan and manage IT skills, and how government and individual IT professionals approach IT skills.

This book provides:

- taxonomy and management tools for IT skills,
- an example of strategic skills management using IS projects and skills portfolios,
- an example of strategic skills management for e-commerce,
- the view from the individual IT professionals on IT skills,
- the view from the government on planning and developing IT skills,
- an international perspective on IT skills management, and
- the view from the HR department on planning and acquiring IT skills.

With these different scopes, this book gives a baseline for further research and builds our knowledge on the management of IT skills.

Organization of the Book

This book is divided into five sections aimed at: IT management, IT professionals, IT testing, national issues, and finally human resource issues. The first section, covering Chapters I through III, looks at the IT managerial issues surrounding IT skills.

Chapter I focuses on the concept and nature of skills—skills in general and IT skills specifically. To begin, the chapter examines a broader overview on IT skills: What are recent statistics on IT skills, and what do they indicate to firms and individual IT professionals? Then, it pins down the definition, characteristics, assessment, and classification of skills, generally drawing the findings of past studies. Although not all of us are interested in the theoretical aspects of skills, it is important to take an inventory of taxonomy on skills so that we have “vocabulary” to describe and plan IT skills strategically later. The chapter then looks into what makes IT skills different from non-IT skills based on our skills taxonomy.

Based on the foundation from Chapter I, Chapter II provides an example of strategic IT skills management using the firm-level IS projects and IT skills portfolios. First, the chapter draws three key principles for managing IT skills strategically derived from past studies. They are: people-centered organization, multi-mission capability, and work-based learning. Using these principles as the foundation, the chapter presents a framework that uses the business-goal-driven, firm-level portfolio analyses. In these portfolio analyses, the three levels of firm-level IS/IT management—(i) IS projects, (ii) key IS project deliverables, and (iii) IT skills—are prioritized by using (a) time scopes (current vs. future) and (b) a criticality assessment (e.g., how crucial to objectives, how difficult to deliver, how risky against contingencies). In the end, the framework presents four types of sourcing options based on the analysis findings.

Unlike traditional backend application systems, the development and implementation of e-commerce IT applications face a unique set of challenges. These include rapidly advancing technologies, often complex requirements for business-to-business interorganizational operations, and rather tight time constraints from analysis and design to implementation and post-implementation requirements. In Chapter III, Mirza and Chan look into how strategic IT skills management can be done in such a challenging environment. They present a framework in which the process of IT skills management (skills acquisition, skills

development, and skills maintenance) is outlined at five levels (strategy level, architecture level, systems level, project level, tools and technology level).

In Section II, covering Chapter IV, we look at the how IT skills are affecting the IT professional.

Chapter IV turns to the perspectives of individual IT professionals. Over her career as an IT professional, Lahey has seen the work environments of IT professionals shift from the employer-driven IT skill acquisition to the individual-driven IT skill acquisition without extensive, protective help from employers. Applying the Organization Man model (Whyte, 2002) and Adult Learning theory (Knowles, 1990), she portrays rich pictures of such a shift by drawing on her experience as an IT training expert at McDonald's Corporation and career challenges of three IT professionals. Lahey introduces the TechCareer Compass® (TCC) as a useful and reliable tool to assist in career decision making for individual IT professionals.

In Section III, covering Chapter V, attention turns to measuring IT skills through testing. One of the most challenging aspects of IT skills management is how to assess IT skills objectively. Leveraging his extensive experience as an IT skills assessment expert, Strauss discusses in Chapter V how to construct IT skills tests that can be readily used by managers for hiring and performance assessments. Using programming proficiency testing examples, he shows step-by-step how to present and use the testing results and their interpretations (feedback) for managing IT skills. Moreover, the chapter walks us through different IT skill assessment methods. It then informs us on which one(s) to use for a given objective. Among them, the details of adaptive testing (tests that adapt the proficiency of test-takers) are presented.

In the next section of the book, Chapters VI and VII, attention turns to the issues that IT skills present nations dealing with international competition.

A growing portion of the national economy is created and sustained by technology products. Furthermore, the days are long gone when access to computers was a privilege; now computer/computing literacy is a necessity down to frontline workers. Thus, governments are concerned about the IT skills of their constituents for maintaining and growing the nation's economic strength. A particular concern of the U.S. government is the increasing number of IT skill gaps found in the workforce. In Chapter VI, Lahey details how the U.S. government is coordinating state, national, and international projects for standardizing IT skills, as a first step.

In Chapter VII, Takeda examines the dilemma that Japan is facing with its IT skills. Japan has prided itself on using IT to meet the aims of greater efficiency.

Its firms have prided themselves on using in-house developed systems and on their IT staff's greater productivity. Unfortunately, Japanese firms find it very difficult to abandon their unique systems for the newer technologies that their international competitors have embraced enthusiastically. In response, the government has promoted policies to increase the number of engineers, develop more advanced technical expertise, and diversify the work experience. Takeda then goes on to examine how the Japanese IS vendors have responded to their clients' customization demands, further reducing the adoption of newer technologies. The chapter concludes with a number of recommendations for resolving the dilemma of introducing newer technologies while resolving their "not-made-for-us" syndrome.

In the last and fifth section of the book, covering Chapters VIII, IX, and X, we look at the human resource (HR) issues for IT skills.

In Chapter VIII, Wong-Mingji outlines a model for constructing human capital portfolios that will help firms strategically leverage their IT outsourcing. The model is based on two organizational capabilities (the rational and the connective) that provide integrating mechanisms for competencies in the HRIS (human resource information systems), the IS function, and supply chain management. While the rational organizational capabilities that deal with formulating strategies and the processes for attaining strategic goals are emphasized in many firms, the role of the connective organizational capabilities are also just as important. Thus organizational learning and improvisation, along with systems integration and relational contracting skills, play an important role in creating human capital portfolios for strategic IT outsourcing. This model assists firms in identifying and strengthening their portfolios using a multi-level and multi-disciplinary approach.

In Chapter IX, Anderson, Barrett, and Schwager present the results of their study that looked at the perceptions of HR professionals on IT certification, education, and work experience. In particular the study wanted to know how well did each substitute for another. The study found that they were imperfect substitutes for each other. HR professionals did associate certification holders with enhanced technical credibility, as well as having received valuable preparation for other positions. Also, the study looked at how well HR professionals perceive the candidate who has education, experience, and certification. The study found that such balanced candidates enjoyed a halo effect.

In Chapter X, the problem of improving the rate of successful hires by changing the hiring process is examined. Because the organization used the extreme programming method, where communication and teamwork skills are critically important, Goebel, Sheridan, and Meloche argue that the traditional hir-

ing practices were inadequate. Thus, they implemented a new hiring process where applicants can demonstrate their communication and teamwork skills as well as programming skills. The entire hiring process is discussed, including the interview process with its use of exercises and multiple interviewers.

From the expanding set of skills that the new technologies require to the issues surrounding offshore outsourcing, IT is asked to provide more and more. The aim of this book is to help IT practitioners and IT researchers address the problems involved in many aspects of managing IT skills at both the organizational and individual level.

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