Preface

The history of computing in organizations began in the early 1950s, with the first commercialization of computing technology. Over the past 50-plus years, we have witnessed amazing growth and change. Huge and very expensive mainframe computers gave way to minicomputers in the 1970s, then to personal computers in the 1980s, to networks of computers, and most recently to a world where computer chips exist inside nearly all everyday appliances, and networked devices are *de rigueur*.

In parallel with the changes in computing technology, the professionals who develop, implement, and maintain the technology in our organizations have also experienced many changes–in the tools they use, in the nature of the work they do, in expectations others have of them, and so forth. The prototypical early computer professionals were either engineers or were self-trained; they wore white lab coats and carried clipboards, and worked mainly in "machine rooms." Those were the wild west days, when it seemed that computers made anything possible. The IT professionals of the day were viewed as exceptional individuals, able to understand the inner mysteries of the "electronic brains," and to coax those complex machines into performing useful work. If they were programmers (most were), they probably wrote code in assembly language. They were often seen as a priesthood, functioning with few rules or principles of good practice; they were making it up as they went along.

During the 1960s, it started to become clear that the role of computers in organizations was becoming more and more important, and that formal training in computing was needed. This first led to the rise of computer science programmes in universities and in polytechs and colleges. Some time later, starting in the 1970s, information systems (originally called data processing or MIS), as a subject of study in business schools, also began to emerge. The emergence of

the academic fields of computer science, and information systems, began to inject a greater degree of codification and standardization into the practice of computing. Slowly but surely, this changed the nature of the IT profession, reducing the extent of independence and freedom to do things however one wished, and increasing the necessity of following "best practice," of teamwork, of following someone else's rules.

As computer science and information systems academic programmes grew and prospered in the 1960s and 1970s, research into computing *per se*, and into the application of computers in organizations burgeoned as well. Nearly all of this research was directed toward the computing artefact and its application. However beginning in the early 1970s, a few researchers began to formally study the IT profession itself. One of the first people to apply serious research to what was then referred to as "computer personnel" was professor Daniel Couger at the University of Colorado. Couger observed that many IT professionals seemed to march to a different drummer, and he was curious about what it was that motivated these individuals–what made them tick? His early studies of programmer motivation, conducted jointly with his colleague Robert Zawacki, applied the Hackman-Oldham job diagnostic survey tool, and soundly confirmed certain commonly held suspicions. They showed that the computer personnel (programmers and systems analysts) exhibited an astoundingly high levels of *need for growth*, and equally astounding low levels of *need for social interaction*. These studies achieved two important results. First, they confirmed some of the widely held stereotypes regarding "computer people" of the day–socially challenged nerds more comfortable writing programmes than interacting with other people. But more importantly, their work helped to legitimize and popularize the study of computer personnel as important and worthwhile, and interesting! Their early findings that IT professionals, as a group, were strikingly different in certain ways from other professional groups signalled the importance of developing a better understanding of all aspects of the profession. If, for example, companies had a better understanding of what motivated their programmers and analysts, they could put in place HR systems designed specifically to keep such people happy and fulfilled in their work. This would presumably lead to more productive employees, and lower turnover (high levels of job turnover among IT professionals has long been recognized as a serious problem).

More recently, the rise of the Internet has seen a new wave of changes inflicted upon the IT profession. Following the advent of the worldwide web in the early 1990s, the importance of the Web and the Internet to organizations of all types and sizes has grown remarkably. New communication channels including e-mail, instant messaging, VoIP, electronic commerce, supply chain integration, e-learning, e-government…the ways in which the Internet is impacting organizations continues to grow. From the perspective of IT professionals today, the worldwide Web has become *the* platform upon which new informa-

tion systems are developed. This requires a strong understanding of new technologies: programming for the Web is different in many ways from "old fashioned" programming. But equally important is the impact the Internet and the Web have had upon the relevance and role of IT professionals in organizations today. Once a company begins to engage in e-business, the computing stakes rise dramatically. It's one thing if an internal system fails, and quite another if a system which connects a company to its customers or suppliers fails. For example, in June 2004, the Royal Bank of Canada, Canada's largest bank, experienced a massive system failure, which impacted its ability to process payrolls–not its own payroll, but the payrolls of many of its customers, including the Ontario government! Millions of transactions, from direct pay deposits to bill payments, were affected during the outage. RBC had to deploy over 200 staff to work round-the-clock shifts over a period of days to fix the problem. For the bank's brand-new CIO, this was truly a trial by fire. A new term has been coined, only semi-facetiously, to reflect the importance of such events: MTCA, or "Mean Time to CEO Awareness." The shorter the time it takes for the problem to elbow its way onto the CEO's radar screen, the more serious it is, and the more likely that some IT professional's head is going to be on the block.

The presence of the Internet has also resulted in new non-technical demands being placed on IT professionals. Because Web-based e-business systems *become* the business—as seen by the firm's customers, suppliers or partners—the people who design, build, and implement those systems need to have a much stronger understanding of the business itself than was the case in the past. No longer can an IT professional "hide" from developing a broad and deep understanding of the nature of the business he or she works in. On top of the need for IT workers to understand their businesses better comes an ever-increasing rate of technological change. IT staff in years past revelled in the fact that change in the IT profession was rapid: they enjoyed the challenge of keeping up with new technologies in particular. However today the rate of change is even greater, to the point that even the keenest IT professional finds it impossible to stay current across the breadth of technologies that populate the leading edge. That, and the greater degree of exposure that firms have to their IT systems, mentioned earlier, has seen stress levels among IT workers skyrocket in recent years.

Another factor which is exerting a major impact on the IT profession is outsourcing, and especially offshoring (shifting some IT work to firms based in places such as India or eastern Europe). Again, the Internet has made this economically viable. While some of the early prognostications were gloomy, in fact the impacts of IT outsourcing are by no means all negative for IT professionals. Concentrating more IT development work in the service-providing firms rather than user firms results in a higher degree of professionalism and overall quality, which is good for the user firms and also good for the IT professionals. Offshoring low-level IT work such as mundane programming to a low-wage

country means that the work that remains is the more challenging, and more interesting and creative conceptual work that cannot be done offshore. Nevertheless, outsourcing and offshoring is not going away, and IT professionals in developed countries need to adapt to the new world left in its wake.

Because so many seismic shifts have occurred in the world of the IT professional during the past decade–since the rise of the Internet–we felt it was timely for a book that would, drawing upon rigorous and careful research, explore these shifts. We have organized the material in this book into three sections: gender and work-life balances, professional development of IT professional, and management of IT professionals.

Section I, *Gender and Work-Life Balance Issues*, includes three chapters, two of which address the issue of women in the IT profession, and the third the issue of work-life balance of IT professionals. In *Managing New Zealand Women in IT*, Keri Logan and Barbara Crump (Massey University, New Zealand) explore the reasons behind the low participation rate of women in IT professions. Drawing on data from two recent studies, they examine barriers such as the glass ceiling, salaries, and work-life balance issues, which affect women's participation rate and advancement opportunities in IT. In Chapter II, *Gender and the Information Technology Workforce: Issues of Theory and Practice,*" Eileen Trauth and Jeria Quesenberry (The Pennsylvania State University, USA) argue that managers would benefit from the availability of an appropriate theory as a basis for better understanding the data regarding women in the IT profession. Such a theory would provide a firmer foundation for taking appropriate action than that provided by speculation and guesswork. They present and elaborate one such theory in this chapter. Chapter III, by Helen Richardson and Darrell Bennetts (The Open Polytechnic of New Zealand), explores the issue of work-life balance within the IT profession. The chapter is divided into two sections. In the first section, the authors present a top-down examination of the sociology of a typical IT worker. In the second section the authors explore the concept of emotional intelligence, its interpretation in the case of IT professionals, and the implications for "emotional self-management" by IT workers.

Section II, *Professional Development of IT Professionals*, includes four chapters. In Chapter IV, Eugene Cash (New Zealand Food Safety Authority), Pak Yoong, and Sid Huff (Victoria University of Wellington, New Zealand) focus on the changes that have taken place in the competencies required of IT professionals, in light of the economic and organizational changes wrought by the Internet. They present a three-level cascading model involving business changes, project changes, and finally competency changes. In Chapter V, *Staffing Electronic Commerce Projects: Framework for Developing Appropriate Skill Sets*, Fred Niederman and Xiaorui Hu (Saint Louis University, USA) develop and illustrate a conceptual framework as an extension and reformulation of

several of the current "fit" theories of human resource management. Chapter VI includes a case study by Bernd Carsten Stahl and Chris Wood (De Montfort University, UK) in which they look at the challenge of teaching ethical issues in an undergraduate IT programme. Stahl and Wood describe an approach they developed in the context of their case study. The final chapter in this section, Chapter VII, by Ani Patke and Tony Hooper (Victoria University of Wellington, New Zealand), considers skills needed by IT professionals, in this case by studying the perceptions of undergraduate IT students as well as recent graduates of tertiary IT programmes.

Finally, Section III of the book, *Management of IT Professionals*, includes five chapters. Chapter VIII, by Jerry Luftman and Rajkumar Kempaiah (Stevens Institute of Technology, USA) is titled *Managing IT Professionals: Human Resource Considerations*. In it the authors draw on data from a variety of recent surveys to paint a broad picture of the current situation and future challenges within the IT profession. It particularly addresses the question of retaining IT talent, and also the issue of stress in the IT workplace. Chapter IX, by Eugene Kaluzniacky (University of Winnipeg, Canada), titled *Increasing the Effectiveness of IT Management through Psychological Awareness*," again raises the issue of stress in the IT workplace, and, drawing on them Myers-Briggs type indicator (MBTI) framework, proposes "multidimensional psychological awareness" as a way of addressing that problem. Chapter X, *The Impact of Agile Methods on Managing IT Professionals*, is contributed by Mark Tolman, Fiona Darroch, and Mustafa Ally (University of Southern Queensland, Australia). Here the authors sketch the development of "agile programming" methodology, and explore its impact on organizational culture, project management, and the management of IT professionals. Chapter XI, *Cultural Diversity Challenges: Issues for Managing Globally Distributed Knowledge Workers in Software Development*, comes from Haiyan Huang and Eileen Trauth (The Pennsylvania State University, USA). The focus of this chapter is on the cultural diversity challenges of managing globally distributed knowledge workers engaging in software development work. The ubiquity of the Internet has made global distribution of software development work commonplace. However, this has led to a number of unanticipated challenges, many of which relate to cultural differences. The authors propose a framework within which cross-cultural aspects globally distributed IT personnel may be fruitfully examined. Finally, Chapter XII is titled *The Journey to New Lands: Utilizing the Global IT Workforce through Offshore-Insourcing*, by Subrata Chakrabarty (Texas A&M University, USA). Offshore insourcing of IT work refers to the idea of a company setting up its own IT department or subsidiary in another country, and then channelling the company's IT work to it. In this chapter, the authors explore this phenomenon in the greater context of an economic analysis of IT work.