

Wanted: Information Professionals

*Do not follow where the path may lead. Go, instead,
where there is no path and leave a trail.*

—Ralph Waldo Emerson, American poet

The U.S. Department of Labor's Bureau of Labor Statistics (BLS) exists for one reason: to find out what is happening in the U.S. labor markets. The BLS spends nearly \$600 million of U.S. taxpayer dollars per year doing this, and its reports provide a more comprehensive and unbiased view of the recent, current, and future labor situation in the U.S. than any other single source. The BLS does not always get its predictions right, but it has more sources of data and a longer historical perspective than any other group that tracks labor trends. In the November 2007 Monthly Labor Review provided by BLS, the occupation projected as the fastest growing in the U.S. for the period of 2006–2016 was “Network systems and data communications analysts.” In the BLS occupational projections report from November 2009, this job was listed as the second fastest growing position in the U.S., with 53.4 percent growth expected by 2018 and wage growth projected as “very high.”

Some quick facts on this employment category include a 53 percent projected growth in the number of positions, a salary designation of “very high” (the topmost category), and a bachelor's degree as the necessary training. Yet the U.S. Department of Education reported the most popular college major as business, with 312,000

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degrees awarded in the most recently available full-year reporting period, 2004–2005 (2008 data continue to show business as the most popular major, comprising 16.4 percent of all undergraduate degrees). Business schools offer many majors, from finance and accounting to entrepreneurship, but marketing is often popular among students, particularly those who see themselves as having poor math skills (Pritchard, Potter, & Saccucci, 2004). What does the BLS say about the prospects for marketing majors? Of course, a business graduate may use the degree in a number of different positions. But if a person chose a position such as “Advertising and promotions manager,” which is a likely job for some marketing majors, the growth projected by the BLS for the decade between 2006 and 2016 is just 6.2 percent, with an average of only 1,300 new and replacement jobs opening up nationwide per year across the entire country. A recent search of a major internet job advertising site revealed 439 full-time positions across the U.S. for the title “Events/promotional marketing” as opposed to 2,518 job openings for “Systems analyst” (a title commonly used for information technology professionals in business contexts). With deep apologies to friends and colleagues who teach in marketing departments, it seems that marketing majors may have to plan on spending some serious time in the unemployment line (Brady & Davis, 1993; Kelley & Bridges, 2005; Reibstein, Day, & Wind, 2009).

There is a bit of mystery surrounding the reason some college students choose to major in fields where limited job growth opportunities seem to be the rule rather than the exception. Why major in one of these limited growth fields when most of the new high-paying jobs over the next 10 years are likely to be in information systems, health-care, and educational services (Dohm & Shniper, 2007)? While marketing is an area of study that is interesting and an essential profession to businesses, it *should* matter to students if the job growth potential in marketing is low relative to other professions. If college students are thinking carefully about their futures and their prospects for staying gainfully employed in a turbulent world, their decisions about which major to pursue does not seem to reflect this

thought process clearly. Does the country need 300,000 new undergraduate business majors per year, while enrollments in various science, technology, engineering, and math (STEM) majors continue to drop across the country? A U.S. Department of Commerce Report (Mitchell, Carnes, & Mendonsa, 1997) showed that both women and African Americans, in particular, seem to shy away from participation in the information technology workforce (as well as several other science and engineering areas). Could it be that students are choosing a major and a profession based on faulty information—about the world of work, the future of our society, job markets, their own proclivities, or all of the above? Or maybe colleges and workplaces have created situations that make women and underrepresented minority students feel unwelcome. Could it be that educators, parents, guidance counselors, or the media are somehow discouraging students' pursuit of technology education as well as other nationally important areas such as science, engineering, and math?

Here's a working hypothesis: The answer is yes to all of the above.

Let's take a closer look at some ideas that might support or refute our hypothesis. Students may have faulty information about working in the information field or other high-growth areas. Where do they get their information? Friends, parents, television, YouTube, Facebook, Wikipedia, teachers, and/or guidance counselors. Using these sources, do high school students and college freshmen get a realistic understanding of what it would be like to have a career in technology as a network systems and data communications analyst, for example? And if students have an unrealistically rosy expectation about the potential of a profession, such as criminal forensics, where did they get those ideas? Perhaps students believe that the network systems/data communications analyst job involves sitting in a dark cubicle in front of a flickering computer screen all day or inhaling fumes while soldering circuit boards or running cables through dusty basements and crawl spaces. If students think that these activities describe the jobs in the information field accurately, they may not make good decisions in choosing a major and profession.

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Let's also ask where people think the U.S. is heading economically. It would be valuable to have a better understanding of why jobs are being moved from the U.S. to various countries around the world and why certain jobs are affected more than others. When the economy is bad and many people are losing their jobs, which industries are robust against the downturn? Some skills learned in college provide a flexible foundation for lifelong learning and adaptability and allow a worker to move easily from one career to another when necessary, while other skills learned in college only work in one kind of job. What are these flexible, foundational skills?

What is happening in the economies and labor markets of countries such as India and China, and how will these changes affect workers in the U.S.? Hidden inside the details of a 2007 BLS report is the statistic that computer programming is the only job on a list of 30 professional occupations that is likely to experience an employment decline over the next 10 years in the U.S. (Dohm & Shniper, 2007). How can the outlook for the information profession be so bright overall when the job that people equate most closely with information technology—computer programmer—is likely to experience a decline? The only way to figure this out is to get a subtler understanding of the following key questions:

- What makes it possible to outsource a job?
- What happens to the previous jobholders when a job gets outsourced?
- How can people in outsourced jobs be prepared to reinvent themselves?
- What kinds of jobs are unlikely to be made obsolete by new technology or turned into low-wage positions?

We also need to look in the classroom, both in college and before college. What do students learn about the value of math, science, technology, and engineering? Perhaps the way we teach math and other “hard” topics has little relation to the way people use math in the workplace and elsewhere.

Finally, we need to talk to the students themselves. We should try to get a clear understanding of how they see their careers and what skills they have, especially in math and science, but also with respect to other areas such as psychology or sociology. Do these skills match the demands of the information professions? Given the demands of jobs such as network systems/data communications analyst, we want to know if high school seniors or college freshmen are prepared well enough to be successful—first in the major itself and later in the profession. If colleges can remediate any existing skills deficits, we want to know if we can then recruit students into information-related majors with the promise of getting them up to speed.

That's a lot of difficult questions. To lead rather than follow in the world economy, however, the answers to these questions hold critical importance for the future. Collectively, we are facing some major difficulties: climate change, financial meltdowns, declining availability and increasing cost of fossil fuels, water shortages, poverty, piracy, extremism, and epidemics. Only a few resources really matter going forward into the decades. Energy, raw materials, technology, and clean water are undeniably important, but the force that levers these resources into powerful and sustainable economic engines is people working together to solve problems. Information is the linchpin resource for solving problems. Information professionals are the experts in managing this resource, but the quality of education in science and technology provided recently has not been great. In a 2006 report produced by the nonpartisan, international Organisation for Economic Co-operation and Development (OECD), U.S. students ranked as low as 35th in science proficiency and as low as 36th in math proficiency. In both of these cases, the U.S. ranked substantially below our economic competitors such as Korea, the U.K., and Germany. One out of every four U.S. high school students failed to exceed the minimum level of proficiency in science.

We are unlikely to maintain global leadership if this situation persists. We need more individuals whose education has helped them develop sophisticated technical skills and knowledge, particularly in areas of high demand and complexity such as the information professions.

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While energy, transportation, and environmental engineering are also important, the growth of each of these sectors is accelerated by information technology and those who design and deploy it. We need innovators who can recognize a societal problem and develop a cost-effective, resource-preserving solution.

In this book, we examine why the U.S. is not producing enough of these innovative, technology-savvy professionals and what we can do about it. We focus on the information professions—including information technology, information science, computer science, telecommunications, and related areas—because these professions help to create economic and societal value across most areas of human endeavor. We focus on undergraduates because an undergraduate degree provides the best point of entry into the job markets for information professionals. Some but not all of what we say is applicable to other areas of technology and engineering, but we don't possess or claim expertise across the entire spectrum of fields and technical professions. Nonetheless, there is information here that could be valuable for students, families, and others who are concerned about choice of major and choice of career regardless of their areas of interest.

We have organized this book into three major sections. First, we take a broad look at business, government, the military, and other enterprises across the world to see how information is transforming almost every human activity. In these chapters, we examine what outsourcing really means and its effects on those nations that gain and lose jobs. This section also takes a closer look at the information industry itself and how a variety of forces have made our global information infrastructure at once more accessible to more people and more complex than ever. If you want to know how the U.S. arrived where it is right now, read this section first.

In the second section, we dispel the myths and describe the facts about what information professionals do. By providing a realistic overview of the diversity of jobs under the information umbrella, we believe that we can begin to address the questions related to the image and attractiveness of the various jobs in the information professions. In several of these chapters, we hear about the information

field from those who are studying it in college and those who are involved in it at work. At the end of this section, you will know more about the information professions. If you want to understand the everyday life of a student or worker in the information fields, read these chapters.

In the final section, we look forward to the future and try to understand how the world of education, especially higher education, can successfully educate the next generation of information professionals. While this book contains no silver bullet for fixing the country's higher education system, we offer some straightforward actions that parents, students, guidance counselors, and educators can take to get us back on the right path. We believe that local, practical improvements can add up to significant important change at the national level over time. And while we are quickly falling behind other countries, there is no time like the present to start to catch up.

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