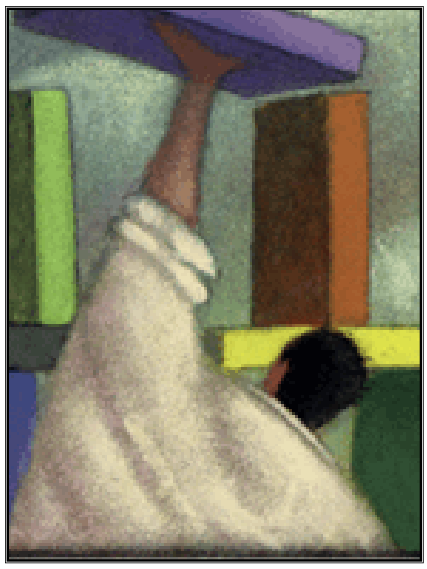

Applications of Information Technology:

Trends Assessment for 2004

BCC Bellevue Community College

NWCET National Workforce Center for Emerging Technologies

NSF

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Contents

Executive Summary

The purpose of this report is to summarize the economic, employment, industry, technology and demographic trends that relate to IT-related educational programs. The research for this work was guided by the need to identify information technologies and related applications expected to fuel economic growth and produce positive impacts on the nation's workforce over the next decade.

In this report IT is defined in the broader sense of information and knowledge management and applications, as opposed to taking a narrow focus on the technology and the IT industry. Each section includes information presented by government, research and professional organizations and when relevant, specific recommendations for educational programs.

ECONOMIC AND WORKFORCE TRENDS

This section gives an economic context at the national and state level. Growth industries, in terms of revenue and employment, are presented with projection information over the next 5 to 10 year period. Selected growth industries with special emphasis on IT-related professions are highlighted in special detail. The main findings include the following:

- Health services, business services, social services, and engineering, management, and related services will be the major contributors of additional jobs in the next decade both at the national and state level.
- Even though the Information Technology jobs are not seeing the strong growth they experienced in the 90's, IT jobs are still in demand. In Washington State, eight of the 10 fastest growing occupations are computer related.

IT WORKFORCE TRENDS

The purpose of this section is twofold. First it summarizes the current trends in IT workforce and employment qualifications. The main trends include the following:

- As IT matures and the penetration of IT products increases in a wide range of industry sectors, there is an increasing need for IT workers in "technology-enabled" organizations, companies that use or modify technologies for their specific needs. These industries will experience significant growth in the employment of IT-trained professionals. Examples of these industries include healthcare, local-state-federal government, insurance, banking, finance and e-commerce. This shift requires IT professionals to focus more on the applications of information technologies, as opposed to focusing on the technology itself, and to develop cross-disciplinary knowledge with a strong business emphasis.

- Outsourcing combined with the large number of IT workers looking for work allows employers to require significantly higher levels of IT skills and knowledge, higher educational degrees, and a higher level of industry experience than they used to require a few years ago. IT jobs that required only a 2-year degree now require a minimum of a 4-year degree.
- IT literacy and expected IT skill level are increasing in non-IT jobs, squeezing out of the market IT trained-workers with only entry-level/basic IT skills.
- The emphasis on collaborative work will continue to increase and the trend to telework—as delivered through virtual workplaces—will intensify.

The second half of this section is meant to be a guide to administrators and educators of existing IT-related programs. It presents specific recommendations for IT-related educational programs, along with identified barriers to implementation, with an emphasis on community colleges on how to respond to these trends. The detailed recommendations focus on the following areas:

- Offering advanced programs and baccalaureate degrees
- Aligning graduate expectations to actual jobs
- Moving low-level IT skills into business programs
- Emphasizing business applications in IT-related programs
- Including practical experience and internships
- Integrating soft skills with technical skills in the curriculum
- Integrating collaborative work skills and supporting tools into the curriculum

INDUSTRIES WHERE IT WORKFORCE IS EXPECTED TO INCREASE AND TRENDS IN IT TECHNOLOGY AND IT SOLUTION APPLICATIONS IMPACTING IT SKILLS

The first of these two sections focuses on industries where information technologies play an important or an increasing role. Some of these industry sectors are well established, others are emerging. The second section focuses on emerging information technologies and technology applications that impact a wide range of industries. These sections are not meant to be all inclusive, but try to highlight areas that should be assessed by educational administrators and educators as potential directions for existing programs or for the creation of new programs.

Important messages from these trends include the following:

- IT and business processes can no longer operate in isolation, requiring a new breed of professionals that cross over the IT and business application sides.
- There is a deep and rapid convergence of technologies that used to reside in separate fields of education, creating a demand for professionals with a broader knowledge of technologies and cross-trained in various technology areas.

As the IT profession is morphing into new skills and applications, the programs need to closely reassess their goals and emphasis. There are many viable strategies and directions. Each college and educational unit will make program direction choices based on the local employment and industry landscape, on their existing strengths and expertise, and on the competition presented by other educational and training organizations.

Bellevue Community College has developed and exercised a rigorous process to evaluate new program directions.

See Appendix, Table 1: Recommended Process for Program/Curriculum Development in a New Technology Area.

DEMOGRAPHIC, WORKFORCE AND TECHNOLOGY TRENDS IMPACTING EDUCATION

This section discusses a number of demographic, educational and workforce trends and explores the impact of these trends on education, with a specific focus on community college professional and technical programs. It also includes a discussion on the infusion of IT in all areas of the curriculum and more specifically, a discussion on online education.

The section includes the following issues and recommendations on how to address these issues:

- Diversity of college student population in age, ethnicity, technology-literacy and educational expectations, and in student preparedness to enter and succeed in a college environment
- Specific needs of incumbent and dislocated workers, including the need for flexible delivery alternatives, and for an assessment-based process that allows students multiple reentries into the system at various levels and times
- Technology-related challenges, including technology investment, support and training, and IT-enabled delivery in and outside of the classroom environment

- Rapid changes in professional and technical areas and the need for close collaboration with industry at the administration (advisory committees), faculty (return-to-industry) and student (internships) levels
- Systemic challenges to the educational system that call for a reevaluation of the overall structure and partnerships between educational organizations