

INFORMATION TECHNOLOGY OUTCOMES

ABOUT THE INDUSTRY

The Information Technology (IT) field has grown in importance in the state of Minnesota, now accounting for more than 88,600 jobs, according to employment estimates from DEED.

The state continues to see steady job growth in IT, with both short- and long-term gains at software publishers; data processing, hosting and related services; and other information services, which includes Internet publishing, broadcasting and Web search portals.

Combined, these three industries increased more than 10 percent and now provide more than 19,000 jobs in the state. IT occupations are projected to gain more than

8,000 net new jobs through 2022 and will also provide 13,810 replacement openings for 22,140 total openings in the next decade.

There are currently no registered apprenticeships in Minnesota; however dual-training and apprenticeship are being explored by employers and related instruction providers.

Programs that combine formal education and on-the-job training such as internships are common in this industry.



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INFORMATION TECHNOLOGY INDUSTRY COUNCIL

Sixty-five people participated in the Information Technology Industry Council meetings.

- 30 members of industry or industry associations' representatives
- 12 education representatives
- Four labor and labor/education representatives
- 19 government, legislative and other
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Council members and additional representatives are listed in Appendix K.

The first Information Industry (IT) Council meeting was conducted on Aug. 15, 2014, at the Department of Labor and Industry. The purpose of the PIPELINE Project and the vision for success were shared with the Council.

Margaret Anderson Kelliher, President and Chief Executive Officer of Minnesota High Tech Association, framed the workforce challenges that face the Minnesota Information Technology sector. Through a facilitated process the Council generated an inventory of abilities, knowledge, and skills for high demand IT occupations; the occupations discussed at this meeting were used to generate a preliminary list of “apprenticeable” occupations.

After the first Industry Council meeting, the list of high-demand occupations was cross-referenced with DEED labor-market data, MnSCU listening sessions results and Wanted Analytics data. A survey was designed to identify

the most “apprenticeable” IT occupations. Several Industry Council members reached out to PIPELINE Project staff members to discuss the uniqueness of the IT industry. Specifically, the industry is project and consultative-based and serves as both an individual industry sector and a functional business area throughout organizations. The survey and Industry Council member conversations also served to validate industry specific competencies related to personal effectiveness, academic, workplace, and industry-wide technical skills based on the PIPELINE Competency Standards Models adapted from the U.S. DOL Competency Models.

Hennepin Technical College hosted the second Information Technology Industry Council meeting on Oct. 2, 2014. Industry Council member Brendan Nolan, Director of Business Development at Eagle Creek Software Services, discussed Eagle Creek Model of Addressing the IT Talent Supply Gap. The Industry Council selected four occupations for a dual-training focus, including the development of competency standards.

The final IT Industry Council meeting was hosted by DLI on Nov. 10, 2014. Industry Council member, Bruce Lindberg, Executive Director of Advanced IT Minnesota, discussed the new Fusion program, which pairs employer-endorsed students with employer partners to students, leading to workforce-ready employees upon graduation. This program is currently available at Metro State University and soon will be offered at Mankato State

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University. Industry Council member, Mark Hurburt, President of Prime Digital Academy (formerly Chief Strategy Officer at the Nerderly), outlined the newly established Prime Digital Academy's format of working directly with employers to re-engineer software development education to prioritize the capabilities newcomers needed to make immediate contributions. Their students learn modern technologies, real world methodology and relevant behavioral skills through hands-on, experiential learning. Finally, the Industry Council identified recommendations for moving forward with occupational competency standard development and potential next steps to increase dual-training delivery in Information Technology.

Occupations identified by the Information Technology Industry Council for PIPELINE competency modeling and dual training planning are:

- **Security analyst**
- **Web developer**
- **Software developer**
- **Service desk/front line support or computer user support specialist**

Full descriptions of these occupations are available in Appendix L.

INFORMATION TECHNOLOGY RECOMMENDATIONS

Recommendations specific to the Information Technology industry are categorized by area of need:

1. Early exposure

The Information Technology instruction is offered in the secondary education system, yet varies considerably between districts and individual schools. Schools are increasingly using technology tools in the classroom, but may not provide instruction about how the technology works or how to develop tools for the technology. Parts of the IT industry maybe hidden because information technology occupations are imbedded in all industries. The proliferation of computing devises and their popularity among youth is an opportunity to engage student curiosity in how devices work and how to build programs that can add to the function of a device. The IT industry does have excellent examples of programs that are engaging youth and students, including "Coder Dojo," computing camps and technology based "meet ups." Ensuring a broader range of students has access and sufficient information to foster interest in these experiences remains a pressing need.

Industry representatives call for earlier exposure for K-12 students to the industry. They believe it is especially important to create greater awareness for students in the 8th and 9th grade. This would both develop an understanding of the occupations and career paths within information technology and inform students about the need for an academic foundation to assist in being successful in IT. Council members believe that the opportunity to use the proliferation of cell phones, computers, games, and hand-held devices to create interest and exploration in how those devices work. Parents are recognized as essential in assisting young adult early career decisions. Therefore, parents need to be educated about the great career opportunities that are available in IT.

Employers expressed interest in creating opportunities and incentives for IT professionals to work with K-20 teachers and faculty to ensure the curriculum and technology taught in schools is relevant to industry needs. Industry council members discussed the improtance of career counselors in the K-20 system. They believe these supportive service positions will be able to assist youth and adults in making more informed career decisions by working with students to develop individual career plans. IT Industry Council participants recognize the value of supporting schools and helping to strengthen IT resources as well as offer co-op education opportunities.

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2. Hiring and recruiting

IT is a broad and diverse industry that by its nature rests at the forefront of technology changes, many of which also lead to significant structural changes within the industry. While it is forecasted the current move to cloud based systems and storage will greatly diminish the need for some professions, others will undoubtedly emerge from this shift. Industry council employers indicate that there is a significant skills shortage in a wide number of occupations, including extreme shortages in some areas such as coding and software engineering. Employers also note there is little standardization for titles and hiring criteria across and between occupations. Employers often seek candidates with a four-year degree for positions that require a two-year degree. In addition, employers often require at least one-year work experience. Council members said this practice is a “hedge” against hiring under-prepared employees. Employers actively recruit students/ potential employees who have engaged in “real” work, including those with internships, work experience in college IT service offices, and hobbyists with programming or network building experience. Employers continue to want to recruit, hire and retain the best and the brightest; leading to increased competition for IT talent.

3. Skills and training

Most information technology occupations require a strong science, technology, engineering and math (STEM) foundation. Employers seek workers with broad technical knowledge, as well as specific software skills. Employees must demonstrate nimbleness and an ability to learn new and emerging technologies quickly and to transfer knowledge from one project, language or technology to the next. Process thinking and project management skills are highly sought because IT workers often build or maintain substantial infrastructure.

In addition to technology skills, employees need to have business skills, such as understanding workflow, budget and finance, and organizational theory. Employers are especially in need of employees with knowledge about how different forms of technology work together.

Council members are highly supportive of project based learning opportunities and understand classroom experiences cannot fully develop students for the industry. They encourage connecting teachers and instructors with industry through work experience. They also support creating more credit for prior learning options and occupational standards based on competency mastery. Lastly, employers acknowledge that increasing the speed and responsiveness in modifying and developing curriculum was critical to meeting the workforce needs of this industry.

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4. Recommended next steps

- Continue to develop occupational competency standards for the careers selected by the Industry Council.
- Identify an Information Technology employer to initiate a dual-training program in one of the Industry Council's selected occupations.
- Support and expand current innovative information technology training programs throughout the state.
- Assist and support employers with the processes and structure related to establishing dual-training or apprenticeship.
- Establish seed funding to assist employers and dual-trainee employees or apprentices in initiating new dual-training and/or apprenticeship programs in information technology occupations.
- Create dual-training tool kits that serve as a “turn-key resource” with templates and program design options to facilitate quick and easy implementation of new dual-training programs in information technology.
- Engage teachers, faculty and information technology experts within this sector to develop project based curriculum and on-the-job experiential opportunities.
- Lead the Minnesota effort to standardize the definition of each selected information technology occupation identified by this Industry Council.
- Provide information and training sessions for employers, educators, mentors and others.
- Catalog titles and hiring practices for occupations and determine if standardization is a reasonable goal.