Minnesota Dual-Training Pipeline
Information Technology Industry Forum
October 27, 2021
Agenda

- Welcome and Introductions
- Minnesota Dual-Training Pipeline refresher
- Pipeline Updates
- Summer Technology Work
- Labor Market Information
- Discussion on trends, strategies and successes in hiring
- Dual Training Grant update
- Next Steps and Wrap-Up
What is Minnesota Dual-Training Pipeline?

- Source of support to employers to develop their own employment-based, dual-training programs
- An innovative approach to address current and future workforce needs in the key industries of **advanced manufacturing, agriculture, health care services and information technology**
- Private Investment, Public Education, Labor and Industry Experience
Employment-Based Training

Structured on-the-job training
Taking a variety of forms

Related Instruction
with a chosen training provider

Powerful learning
Engaged employee
Benefit to all

Benefit to all
Minnesota Dual-Training Pipeline Strategies

- **Industry Forums:** *Inform* and *direct* Minnesota Dual-Training Pipeline on industry trends and needs through discussion and strategic planning aimed to expand dual training.

- **Competency Councils:** *Define* and *identify* specific occupational competencies for the four key industries.

- **Dual-Training Consulting:** *Create* and *disseminate* dual training resources for employers, employees and dual trainees: toolbox, grants, and expanding mentorship networks to set up dual training.
Diversity, Equity and Inclusion Work

- This spring and summer Pipeline offered diversity, equity and inclusion training for 37 participants from 27 different companies.

- DEI training participants participated in organizational assessments, cohort workshops, individualized team consultations and, based on this work – the companies created their own individual Diversity, Equity and Inclusion action plans.
Upcoming Training Opportunity

- Pipeline will soon be offering a train the trainer opportunity for companies doing dual training.

- The Train the Trainer project will help individuals in charge of on-the-job-training to participate in cohort workshops, get trainer resources, have a coaching session with our consultant and create action plans for improving company training practices.

- Stay tuned for more details and how to sign up for train the trainer soon....
Covid has further taught us that IT is important to all industries

Convened a group of over 25 state-wide technology professionals including employers, educators, non-profits, membership organizations

Met three times to discuss latest workforce trends in IT

Determined in-demand competencies for current and future workforce needs

Revamped and developed 13 IT competency models from this work
New or Updated Information Technology Occupations

- Application Developer
- Business Intelligence Developer/Architect
- Cloud Architect
- Computer User Support Specialist
- Data Science/AI Machine Learning Specialist
- Database Administrator
- Information Security Analyst/Specialist
- IT Project Planner/Manager
- Network Engineer
- Software Engineer/Developer
- Testing and Quality Assurance Analyst
- Web Developer – Back End
- Web Developer – Front End
Minnesota Dual-Training Pipeline
Competency Model for Information Technology
Occupation: Database Administrator - DRAFT

Employer-Specific Requirements

Monitor systems and platforms
Database system issue resolution
Administer database projects
Infrastructure support
Database performance and reliability
Database standards

*Other on-the-job training associated with a specific occupation

Occupation-Specific Competencies

Industry-Sector Technical Competencies*

Network, system configuration and management
Data backup, disaster recovery
System analysis
Network support and security
Cloud
Hardware devices, platforms
Monitoring
Database updates and collaboration

Industry-Wide Technical Competencies

Principles of information technology
Databases, applications, compliance
Networks, telecom, wireless and mobility
Software development and management
User and customer support
Digital media and visualization
Risk management, security and information assurance

Workplace Competencies

Business fundamentals
Teamwork
Innovative thinking
Hiring and organizing
Problem solving and decision making
Working with tools and technology

Academic Competencies

Reading
Writing
Mathematics
Science
Communication
Critical and analytic thinking
Fundamental IT user skills

Personal Effectiveness Competencies

Interpersonal skills and teamwork
Integrity
Professionalism
Initiative
Dependability and reliability
Adaptability and flexibility
Lifelong learning

Based on: Information Technology Competency Model Employment and Training Administration, United States Department of Labor, September 2012.

*Pipeline recommends the Industry-Sector Technical Competencies as formal training opportunities (provided through related instruction) and the Occupation-Specific Competencies as on-the-job training opportunities.
Minnesota Dual-Training Pipeline
Competency Model for Information Technology
Occupation: Data Science/Artificial Intelligence Machine Learning Specialist - DRAFT

**Employer-Specific Requirements**

**Occupation-Specific Competencies**
- Artificial intelligence systems design and implementation
- Machine learning model development
- Data management and model deployment
- Deep learning frameworks
- Technical security
- Development for infrastructure
- High-performance computing
- Intellectual property law

**Industry-Sector Technical Competencies**
- Algorithm creation
- Programming languages
- Statistical decision theory
- Deep networks
- Supervised and unsupervised machine learning algorithms

**Industry-Wide Technical Competencies**
- Principles of information technology
- Databases and applications
- Networks and languages
- Software development and management
- User and customer support
- Compliance
- Risk management, security and information assurance

**Workplace Competencies**
- Business fundamentals
- Teamwork
- Innovative thinking
- Planning and organizing
- Problem solving and decision making
- Working with tools and technology

**Academic Competencies**
- Reading
- Writing
- Mathematics
- Science
- Communication
- Critical and analytic thinking
- Fundamental IT user skills

**Personal Effectiveness Competencies**
- Interpersonal skills and teamwork
- Integrity
- Professionalism
- Initiative
- Dependability and reliability
- Adaptability and flexibility
- Lifelong learning

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**Minnesota Dual-Training Pipeline**

**Occupation: Cloud Architect - DRAFT**

### Employer-Specific Requirements

- Cloud ecosystems
- Application programming interface development
- Application functionality innovation
- Cloud native application capabilities
- Security solutions
- Cloud training and guidance
- Cloud architecture
- Technical problem solving
- New Industry trends
- Programming languages

### Industry-Sector Technical Competencies

- Cloud applications architecture
- Computer architecture and design
- Big data and cloud computing
- Applied machine learning
- Cloud implementation management
- Internet architecture
- Internet security
- Cloud computing migrations

### Industry-Wide Technical Competencies

- Principles of information technology
- Databases and applications
- Networks and languages
- User and customer support
- Compliance
- Risk management, security, and information assurance

### Workplace Competencies

- Business fundamentals
- Teamwork
- Innovative thinking
- Planning and organizing
- Problem solving and decision making
- Working with tools and technology

### Academic Competencies

- Reading
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### Personal Effectiveness Competencies

- Interpersonal skills and teamwork
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Competency Model for Information Technology Occupation: Information Security Analyst/ Specialist - DRAFT

Employer-Specific Requirements
- Firewall
- Operation systems
- Security Information Event Management (SIEM)
- Intrusion Prevention System (IPS)
- Network Security
- Security Compliance

Occupation-Specific Competencies
- Penetration Testing
- Network Access Control (NAC)
- Intrusion Detection
- Risk Assessment
- Transmission Control Protocol (TCP/IP)
- Disaster Recovery
- Security Engineering and Administration

Industry-Sector Technical Competencies
- IT Forensics
- Asset Security
- Communication, Systems, Network Security
- Identity Protection, Access Management
- Disaster Recovery, Business Continuity
- Security Engineering and Operations
- Security Assessment and Testing
- Application Security
- Data Security

Industry-Wide Technical Competencies
- Principles of Information Technology
- Databases and Applications
- Networks, Telecom, Wireless & Mobility
- Software Development and Management
- User and Customer Support
- Digital Media and Visualization
- Compliance
- Risk Mgmt., Security and Information Assurance

Workplace Competencies
- Business Fundamentals
- Teamwork
- Innovative Thinking
- Planning and Organizing
- Problem Solving and Decision Making
- Working With Tools and Technology

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- Adaptability and Flexibility
- Lifelong Learning

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Minnesota Dual-Training Pipeline
Competency Model for Information Technology
Occupation: I.T. Project Planner/Manager -DRAFT

Employer-Specific Requirements

Occupation-Specific Competencies*
- Define/implement IT strategy
- Analyze IT projects
- Coordinate projects
- Provide consultation and technical expertise
- Manage complex reporting/data analytics
- Oversees system administration

Industry-Sector Technical Competencies*
- IT business analysis
- IT program and IT project management
- Technology and business/industry trends & changes/future of IT
- Problem solving/IT business process design/automation
- Project management methodologies

Industry-Wide Technical Competencies
- Principles of information technology
- Databases, applications, Compliance
- Networks, telecom, wireless and mobility
- Software development and management
- User and customer support
- Digital media and visualization
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Minnesota Dual-Training Pipeline
Competency Model for Information Technology Occupation:
Software Engineer/Developer-DRAFT

Occupation-Specific Competencies*

- Unit and integration testing
- Coordinates software installation
- Server automation tools
- Software testing (on the job)
- Analysis and design
- Bug fixing/de-bugging
- Quality assurance
- Integrated development environment
- Monitor equipment functioning
- Continuous integration
- Translating technical docs into actionable work
- Store, retrieve and manipulate data for analysis of system capabilities and requirements
- Customer consultation re: system design and maintenance
- Design, develop and modify software systems - hands-on
- Defensive programming
- Understanding development’s role in cross-functional teams

Industry-Sector Technical Competencies*

- Bash shell scripting
- Software analysis & design
- Service oriented architectures
- Object oriented programming
- Data structures & algorithms
- Unified modeling language
- Software testing
- Knowledge of encryption
- Vertical/Cloud based development
- Waterfall & agile software dev.

Industry-Wide Technical Competencies

- Networks, Software development and management
- User and customer support
- Digital media and visualisation
- Compliance
- Risk mgmt., security and information assurance
- Networks, Telecom, wireless & mobility
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• Minnesota’s unemployment rate is currently 3.7% in September, compared to the national rate of 4.8%.

• Labor force participation is 67.9% in Minnesota, compared to the national rate of 61.6%.

• Tech job postings grew by 6% in the Twin Cities and postings were up by 42% compared with the same quarter last year, an addition of 5,245 jobs according to a CompTIA analysis of Burning Glass Technologies Labor Insights.

• DEED projects employment in computer occupations to grow 10.5% between 2018 and 2028, while the average growth of all occupations in Minnesota is 4.7%.

• In August 2021, Minnesota had 69,100 part time workers (defined as working fewer than 35 hours a week), who wanted to work full time.
Alternative Definitions of Unemployment

- U-3: Share of 16+ who were not employed in past week and who looked for work sometime in past four weeks
- U-4: + discouraged workers
- U-5: + “marginally attached” workers
- U-6: + people who are employed part-time but want full-time work
- Long-term: People who have been unemployed for more than 27 weeks.
Where are potential workers?

• In the news just last week - Minnesota’s unemployment rate just dropped to 3.7 percent as wages rise;

• September of 2021 – unemployment rate was 4.2 percent BUT

• Including discouraged workers: 4.4 percent;

• Including marginally attached workers: 5.1 percent;

• Including part-time workers who want full-time work:

  7.2 percent
## Alternative Unemployment Rates

<table>
<thead>
<tr>
<th>Measure</th>
<th>Definition</th>
<th>September 2021</th>
<th>August 2021</th>
<th>September 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-3</td>
<td>Share of 16+ who were not employed in past week and who looked for work sometime in past four weeks</td>
<td>4.2</td>
<td>4.4</td>
<td>5.5</td>
</tr>
<tr>
<td>U-4</td>
<td>+ discouraged workers</td>
<td>4.4</td>
<td>4.5</td>
<td>5.6</td>
</tr>
<tr>
<td>U-5</td>
<td>+ “marginally attached” workers</td>
<td>5.1</td>
<td>5.3</td>
<td>6.3</td>
</tr>
<tr>
<td>U-6</td>
<td>+ part-time workers who want full-time work</td>
<td>7.2</td>
<td>7.5</td>
<td>9.7</td>
</tr>
<tr>
<td>Number of Discouraged Workers</td>
<td>People who want a job but who aren’t actively searching because they think there are no jobs available that fit their qualifications. Have looked in the past year but stopped looking in the past month.</td>
<td>4,700</td>
<td>4,700</td>
<td>2,900</td>
</tr>
<tr>
<td>Number of Involuntary Part-Time Workers</td>
<td>People who work less than 35 hours/week but who want and cannot find a full-time job</td>
<td>63,000</td>
<td>69,100</td>
<td>108,700</td>
</tr>
</tbody>
</table>
And it is fair to say that Minnesota’s labor force has **86,000 fewer workers** as compared to February of 2020 – before the pandemic.
What are job seekers saying about job seeking?

• Conversations with workforce practitioners in March of 2021 revealed:
  • Fear of contracting COVID in jobs that require on-site presence;
  • Mismatch of hours or salary needed to provide for their family;
  • Lack of access to technology or be computer literate enough to create accounts, apply online or handle job interviews via Zoom;
  • Not hearing back from employers after having applied;
  • Anxiety about switching occupation or industry because they have not had to search for a job in years;
  • Uncertainty related to school schedules and availability of dependable day care;
  • Lack of adequate transportation (no car and no public transit).

_Credit: Minnesota Economic Trends, Alessia Leibert, June 2021_
What might employers do to continue to adjust?

- Increase compensation for most undesirable work shifts;
- Make the job more attractive without necessarily increasing the wage:
  - Boosting benefits packages such as parental leave, more flexible and part-time work schedules, introducing more flexibility in attendance policies and reducing mandatory overtime;
- Increasing training for new hires and encouraging incumbent workers to pursue additional training by tying compensation and internal advancement to completion of training;
- Offering college tuition reimbursement to their existing employees or new hires;
- Partnering with local colleges on curriculum design and offering internships to students in vocational programs.

_Credit: Minnesota Economic Trends, Alessia Leibert, June 2021_
Discussion on latest trends, strategies and successes in hiring

Guiding Questions:

• What’s the biggest struggle: quality or quantity of applicants?

*Notes from Forum”

Employers noted the struggles include both quality and quantity of applicants for hire
Guiding Questions:

• What new hiring strategies are working?

*Notes from Forum*

Some things that are working: Internship programs, employee referral bonuses, allowing employees to work 100% remote if they wish, increasing salaries when possible
Guiding Questions:

• What key changes have you made in hiring due to pandemic?

*Notes from Forum*

Some employers are using a three pronged interview process – the first two interviews on Zoom/Teams and the final interview in person.
Guiding Questions:

• What are the most difficult jobs to fill/ most in-demand needs for you?

*Notes from Forum”

Engineers and developers
Dual Training Grant Overview

- Up to $150,000/year per grantee
- Up to $6,000/year per dual trainee
- Pays for related instruction tuition, fees, required books/materials
- Reimbursement model for payment
- 25% match required for employers with annual revenue exceeding $25 million
Dual Training Grant Update

- MN Office of Higher Education Update/Legislative Update
- Next Grant Round opens March 2022 and closes April 2022
- Grant Writing Webinars
- Approximately $2 million in Dual Training Grant funds are available
- Any questions contact Jacquelynn.mol.Sletten@state.mn.us
Upcoming Minnesota Dual-Training Pipeline Events

- Minnesota Dual-Training Pipeline 101 Introductory Webinar
  Tuesday, December 7th from 9 to 10 a.m.

- Pipeline Speaker Series
  TBD – always looking for recommendations of speakers and topics of interest

- Next Pipeline Information Technology Industry Forum
  February 9, 2022
Thank You!

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