ITSS Summit – Day 1

Tuesday, April 23, 2024

IT SKILL STANDARDS 2020 AND BEYOND

Welcome and Introductions

IT SKILL STANDARDS 2020 AND BEYOND

Ice Breakers

Human Bingo
Marshmallow Challenge

Bingo

- Everyone will be given a Bingo Card
- You have 10 minutes to get a "Bingo" from having a person's name in squares that are filled across, vertically or horizontally.
- A person can have their name in only one square on your board.
- After you "bingo," bring the card to the facilitator while everyone else can continue to learn interesting things about their peers until they "bingo" or time is up.

The Marshmallow Challenge

- Built the Tallest Free-Standing Structure in 18 minutes
- Use only spaghetti, string, tape and a marshmallow
- The MARSHMALLOW has to be on top.
- Use the numbers on the back of your name badge to get into groups Each team has a bag with the pieces they can use for the challenge
- The exercise starts when I say GO!
- The tallest structure wins!

- Build a tower, build a team | Tom Wujec - Bing video
- For more info: Marshmallow Challenge

Break

IT SKILL STANDARDS 2020 AND BEYOND

Today's Road Map

- ITSS Products and how to use them
- Overview of the ITSS process and the BILT Model

Action Plan

What will you do when you go back to your home school?

- Three strategies, practices, or tools to use at your home school
- Need measurable outcomes

ITSS Overview

IT SKILL STANDARDS 2020 AND BEYOND

- What do workers need to know and be able to do to succeed in today's (and tomorrow's) workplace?

- How do we know when workers are performing well?

- How can colleges gain this information?

Skill standards answer three critical questions

Why Are Skill Standards Important?
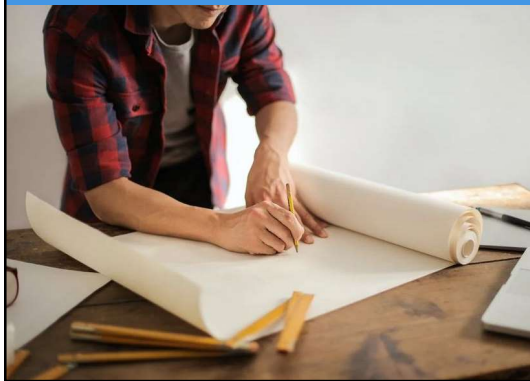
1. **Provide a blueprint** for how the technical knowledge and skills in the IT high-performance workplaces are organized and how the roles of workers contribute to the success of the enterprise.

Why Are Skill Standards Important?
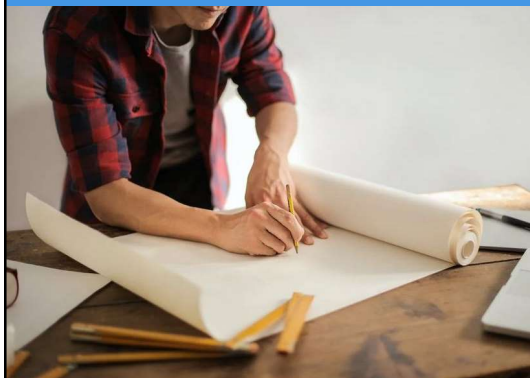
2. They **make IT careers more accessible to students and employers** because they provide transparency regarding the knowledge, skills, and abilities (KSAs) as well as the performance needed for success in the job market.

Why Are Skill Standards Important?
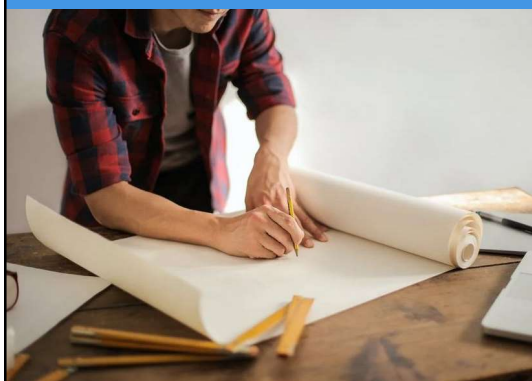
3. Business and Industry want to hire **students who can integrate products**, not just one vendor experts.

EDUCATORS

use skill standards to create curriculum that is relevant, current, and future-facing to better prepare students to meet employers' job requirements.

EMPLOYERS

use skill standards to improve communications about job openings so they hire the most qualified candidates to address their current and emerging needs, and to improve their internal training and development.

ITSS 2020's Purpose

- **WIDEN** the pipeline of qualified IT workers.

- **CREATE** a contemporary and **future-facing** set of IT Skill Standards.

- **ASSIST** both employers and educators to more easily apply the standards.

ITSS 2020's Purpose

SHARING...

1. The future-focused IT skill standard PRODUCTS

2. The PROCESS of technical skill standard development

Seven IT job clusters

Skill standards completed

1. Infrastructure Connectivity Administration and Engineering

2. Technical Support

3. Technical Project Management

4. Software Development Engineering

5. Data Management and Engineering (the IT side of Data)

6. Data Analytics and Predictive Modeling

Skill set completed

1. Cybersecurity

Four skill standard products

Created by Employer SMEs

- **Tasks + KSAs** with numerical average of prioritized votes
- **Key Performance Indicators** (KPIs) for Tasks
- Levels of Key **Employability Skills**

Created by Educator SMEs (building on Employer SME work)

- **Student Learning Outcomes** to help create/update curriculum

Task, Knowledge, Skill, and Ability

This is a snippet of a KSA and Task list.

The entire list contains a minimum of 100 items across all sections.

	Technical Support Tasks and KSAs	Avg
	Tasks — SPECIFIC THINGS an entry level person would BE EXPECTED TO PERFORM on the job WITH LITTLE SUPERVISION.	
	Install, Configure, Update, Maintain	
T-1	Install and maintain network infrastructure device operating system software (e.g., IOS, firmware).	3.0
T-2	Install and configure hardware, software, and peripheral equipment for system users in accordance with organizational standards.	3.7
T-3	Manage changes/updates for both internal and external customers when policies and procedures cha	3.4
T-4	Maintain computer hardware.	3.6
T-5	Provide technical support for software maintenance or use.	3.7
	Knowledge — Knowledge focuses on the understanding of concepts. It is theoretical. An individual may have an understanding of a topic or tool or some textbook knowledge of it but have no experience applying it. For example, someone might have read hundreds of articles on health and nutrition, many of them in scientific journals, but that doesn't make that person qualified to dispense advice on nutrition.	
K-1	Knowledge of the basic operation of computers.	3.9
K-2	Knowledge of computer networking concepts and protocols, and network security methodologies.	3.5
K-3	Knowledge of operating environments, organizational software and applications.	3.6
K-4	Knowledge of practices of internal, external, and global customers (as applicable).	3.2
K-5	Knowledge of internal organizational communication processes.	3.3
	Skills — The capabilities or proficiencies developed through training or hands-on experience. Skills are the practical application of theoretical knowledge. Someone can take a course to gain knowledge of concepts without developing the skills to apply those concepts. Development of skills requires hands-on application of the concepts.	
S-1	Skill in identifying possible causes of degradation of system performance or availability as well as skill in initiating actions needed to mitigate this degradation.	3.3
S-2	Skill in using the appropriate tools for repairing software, hardware, and peripheral equipment of a s	3.4
S-3	Skill in conducting research for troubleshooting novel client-level problems.	3.1
S-4	Skill in configuring and validating network workstations and peripherals in accordance with approved standards and/or specifications.	3.4

Task, Knowledge, Skill, and Ability

Task: Specific things an entry level person would be expected to perform on the job with little supervision.

Task, Knowledge, Skill, and Ability

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Task, Knowledge, Skill, and Ability

Abilities: Abilities have historically been used to describe the innate traits or talents that a person brings to a task or situation.

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Key Performance Indicators

Technical Support Key Performance Indicators	
For the entry-level employee, all tasks are typically done under supervision for as much as the first year and then with some independence with verification after the employee has more experience. All tasks are done according to company guidelines.	
Task	**Key Performance Indicators**
Install, Configure, Update, Maintain	
T-1	Install and maintain network infrastructure device operating system software (e.g., IOS, firmware).	Current hardware, software and system documentation are obtained and evaluated.
T-2	Install and configure hardware, software, and peripheral equipment for system users in accordance with organizational standards.	System hardware and peripherals are installed, configured and maintained according to specifications.
T-3	Manage changes/updates for both internal and external customers when policies and procedures change.	System and peripherals are tested for functionality and performance. Operating and application software are installed, configured and upgraded according to specifications.
T-4	Maintain computer hardware.	Maintenance includes appropriate follow-up action according to company policy.
T-5	Provide technical support for software maintenance or use.	Changes are documented and distributed in accordance with company policy.
Troubleshoot and Support	
T-6	Troubleshoot system hardware and software.	Users/customers are serviced in a timely manner.
T-7	Diagnose and resolve customer reported system incidents, problems, and events.	Customer input is gathered and analyzed. Relationships are managed so that users/customers are satisfied with the level of service.
T-8	Identify, test and implement solutions to computer hardware and software problems or escalate if required.	Problems are correctly identified and causes are isolated.
T-9	Test software performance in relation to troubleshooting.	Recommendations based on customer input and analysis of system data are developed and presented to key personnel.
T-10	Test computer hardware performance in relation to troubleshooting.	Solutions are thoroughly researched, using existing knowledge base.
T-11	Collaborate with others to resolve information technology issues.	Solutions are selected based on technical benefits, risks analysis and cost effectiveness.
T-12	Identify and escalate issues to improve computer or information systems.	Solutions are tested in a complete and realistic manner. Test scenarios are representative of actual use and environment.
T-13	Provide recommendations to others about computer hardware or software.	Resolutions are documented to the appropriate level of detail in accordance with company policy.
T-14	Escalate computer hardware and software problems according to organization policies.	
Monitor	
T-15	Monitor and report client-level computer system performance.	System performance is monitored and reported according to procedures.
T-16	Monitor computer system performance to ensure proper operation.	Disruptions, outages, security violations and attacks of network services are
T-17	Assess or monitor system for cyberattacks.	monitored, recognized and reported in a timely manner, in accordance with
T-18	Responds to crises/security incidents following SOPs.	company policies and procedures.
Research and Evaluation	

Employability Skills

Three possible levels

Focuses on these 11 areas
- Workplace Professionalism & Work Ethics
- Written Communication
- Oral Communication
- Teamwork
- Problem Solving & Critical Thinking
- Organization & Planning
- Adaptability & Flexibility
- Initiative
- Accuracy
- Cultural Competence
- Self Development & Career Development

Technical Support Employability Skills

Workplace Professionalism & Work Ethics	Level 1 - Employee learns expectations of workplace environment (professional behavior and ethics) and adheres to practices with some guidance. Level 2 - Employee exhibits sound professionalism, judgment, and integrity and accepts responsibility for own behavior. Employee exhibits these qualities without guidance but occasionally refers to policies as needed.
Written Communication	Level 1 - Employee understands written instructions and executes tasks with guidance and feedback from supervisor. Employee clearly communicates concepts in writing. Level 2 - Employee comprehends and executes written instructions with minimal guidance. Employee composes well-organized written documents.
Oral Communication	Level 1 - Employee understands oral instructions and executes tasks with guidance and feedback from supervisor. Employee communicates concepts orally while clarifying for meaning. Employee develops listening skills. Level 2 - Employee comprehends and executes oral instructions with minimal guidance and exhibits good listening skills. Employee clarifies for meaning without needing prompting from supervisor.
Teamwork	Level 1 - With guidance and feedback from supervisor, employee obeys team rules and understands team member roles. Employee actively participates in team activities, volunteers for special tasks, and establishes rapport with co-workers. Level 2 - Employee demonstrates commitment, enthusiasm and supports team members. Employee follows up on assigned tasks and leads by example.

Student Learning Outcomes

Technical Support Student Learning Outcomes table

When and How to Use
IT Skill Standards

	EXISTING program	NEW program
Compare the KSAs, Tasks and SLOs created by ITSS	✓	
Use comparison to fuel discussion at faculty meeting	✓	
Use comparison to fuel discussion at Business Advisory Council (BILT) meeting	✓	
Validate/clarify the KSAs and Task		✓
Use SLOs to create new curriculum		✓
Consider labor market demand		✓

IT Skill Standards Process and the BILT Model

IT SKILL STANDARDS 2020 AND BEYOND

Major Goals for Institutions of Higher Ed and US Employers

STUDENTS complete certificates and degrees and are well-qualified for ready employment or transfer

EMPLOYERS are highly engaged and want to hire students

Implementing Business & Industry Leadership Team (BILT) Model proven effective to meet BOTH GOALS

What is a BILT?

- A Business Advisory Council "on steroids"

- A structured, repeatable process that can be used for any technical program

- A model that puts employers in a co-leadership role that greatly increases their engagement with your program

BILT Essential Element
Co-Leadership

Employers report they are more likely to hire graduates from programs for which they have **curricular leadership** responsibility

Employers report they will assume this role (and more) if:
- Their time is respected
- There is a method for ensuring their input is consistently and seriously considered by faculty members
- They consistently receive feedback on their recommendations

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- **National Science Foundation** (NSF) Center of Excellence in Convergence Technology
Based at Collin College (TX) [2012-2023] with Regional Center prior to the national
- Established BILT model through work with business leaders from across the nation to determine the **Knowledge, Skills, and Abilities** that "workforce ready" graduates will need
- Model implemented at more than **100 colleges and projects in multiple disciplines.**
- **US DOL and ED recognize BILT as leading model** for strategic employer engagement
- Pathways to Innovation NSF project was launched **BILT Academy** to scale the model

BILT Roots

BILT Meeting Cycle

- Building and maintaining a thriving BILT is a **high-touch** activity with frequent two-way communication.

- Know your BILT members' "WIIFM" – what's it in for me?

- Emphasis on growing a pipeline of right-skilled job candidates.

BILT Meeting Cycle

- Annual KSA analysis meetings (initial and annually, single 2-2½ hour meeting).

- Industry Trends/Feedback meetings are held 2-3 times per year via web-meeting software to get ahead on the updates.

BILT and ITSS Working Together

	BILT model narrow scope (local region or single program)	ITSS process broad scope (large region or state) think of it as "BILT plus"
THOUGHT LEADER		THOUGHT LEADERS IDENTIFY CLUSTERS
SME	SME VOTE AND DISCUSS CLUSTER KSAS	SME VOTE AND DISCUSS CLUSTER KSAS
SME		SME VOTE AND DISCUSS CLUSTER KPIS, TASKS, AND EMPLOYABILITY SKILLS
FACULTY		FACULTY DEVELOP SLOS BASED ON KSAS
FACULTY	FACULTY UPDATE CURRICULUM TO ALIGN WITH SME FEEDBACK	

Thought Leaders

Approximately 100 "Thought Leaders" identified the first set of project Job Clusters

- Thought Leaders were typically CTOs, CIOs, CISOs or other individuals responsible for "seeing the future" to keep their companies in business.
- Purpose was to identify **8-10** of the most critical and difficult to fill job clusters for the future
- Thought Leaders were reconvened to identify remaining 2 to 3 clusters
- ITSS project team synthesized the results

Never start with a blank wall

Network Engineering

	COMMON JOB TITLES
Designs and builds computer network systems, including software and hardware. Runs program and system tests, solves technical problems and maintains the network system. Designs and analyzes computer network models.	Network Engineer Senior Network Engineer Solutions Architect Automation Engineer Infrastructure Engineer

BG OCCUPATION	POSTINGS LAST 6 MONTHS	UNFILLED JOBS LAST 6 MONTHS	+/- THROUGH 2026
Network Engineer/Architect	76,707	>40%	6.5%

Data from Labor Insights tool from Burning Glass Technologies

Both Skill Standards Process and BILT Model use the BILT voting process.

Employer SMEs

- ITSS project team compiled pro forma KSAs and Tasks.

- Employer SMEs voted on the pro forma KSAs and Tasks they wanted workforce ready grads to do/have in the future using the structured, repeatable (electronic) process from the BILT, followed by discussion

- Employer SMEs could add, change, and delete items during the 2-3 meetings per job cluster that were held

Employer SMEs

- Employers identified the appropriate level of Employability Skills needed per job cluster

- ITSS worked with ~250 different business SMEs over first 6 job clusters

After the meetings

Project team synthesized data across meetings (votes + discussion)

Employer SMEs at follow-up meeting...
- **Verified** the synthesis done by the team and changed anything they did not approve
- **Voted** on Key Performance Indicators (KPIs) for Tasks

Employer SMEs additionally...
- Assisted with dissemination
- Provided ideas to sustain updates

Break

IT SKILL STANDARDS 2020 AND BEYOND

Activity
Your Business
Advisory Council

IT SKILL STANDARDS 2020 AND BEYOND

Business Advisory Council
May meet once or twice a year
May "rubber stamp" existing program
Faculty may drive meeting agenda
May only give advice and suggestions
Job skills recommendations delivered through discussions
May not be highly invested in success of the program
May not be kept in the loop on how suggestions implemented

Business Advisory Council	BILT
May meet once or twice a year	Meets quarterly
May "rubber stamp" existing program	Actively helps faculty improve the program
Faculty may drive meeting agenda	Employers help develop agenda – especially sharing trends
May only give advice and suggestions	Co-leads
Job skills recommendations delivered through discussions	Job skills recommendations created through voting process
May not be highly invested in success of the program	Feels an ownership in the program and its students
May not be kept in the loop on how suggestions implemented	Regularly informed on how suggestions implemented

Business Advisory Council	BILT	ITSS Process
May meet once or twice a year	Meets quarterly	Meets as needed
May "rubber stamp" existing program	Actively helps faculty improve the program	Actively helps faculty improve the program
Faculty may drive meeting agenda	Employers help develop agenda – especially sharing trends	
May only give advice and suggestions	Co-leads	Co-leads
Job skills recommendations delivered through discussions	Job skills recommendations created through voting process	Job skills recommendations created through voting process
May not be highly invested in success of the program	Feels an ownership in the program and its students	Feels an ownership in the program and its students
May not be kept in the loop on how suggestions implemented	Regularly informed on how suggestions implemented	

PLUS

ITSS Process
Develops addition materials – KPIs, employability, SLOs
ITSS content feeds back into the BILT

Today's Road Map

- ITSS Products and how to use them
- Overview of the ITSS process and the BILT Model

Tomorrow's Road Map

- Seven essentials of the BILT model
- Recruiting employers
- Preparing for the KSA meeting
- Conducting the KSA Meeting
- Behind the Google Sheet
- Employability Skills
- After the KSA Meeting
- Key Performance Indicators
- Student Learning Outcomes
- Cross Reference

IT SKILL STANDARDS BEYOND 2020 SUMMIT

ACTION PLAN

Using the table below, please write down three strategies, best practices, and/or tools that you want to implement at your home school.

These three items must have measurable outcomes. That is, what data will tell you that the strategies, best practices, and/or tools made a positive impact in the classroom?

	Action item	Who will be involved	How success/impact will be measured
1.	Meet with people at your college to provide BILT overview and process for implementation.	The team that attended the ITSS Summit, the college administration, and other college faculty	The college administration and other faculty buy into the idea of the BILT.
2.	Recruit employers for cyber program - host orientation meeting.	Faculty and administrator responsible for cyber program.	About 20 employers were recruited, and an orientation meeting was held.
3.	Host a BILT KSA meeting for cyber program.	Faculty and administrator responsible for cyber program.	KSA meeting held (at least 10 employers attend) with vote and discussion on pro-forma KSA list.

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COLLIN COLLEGE