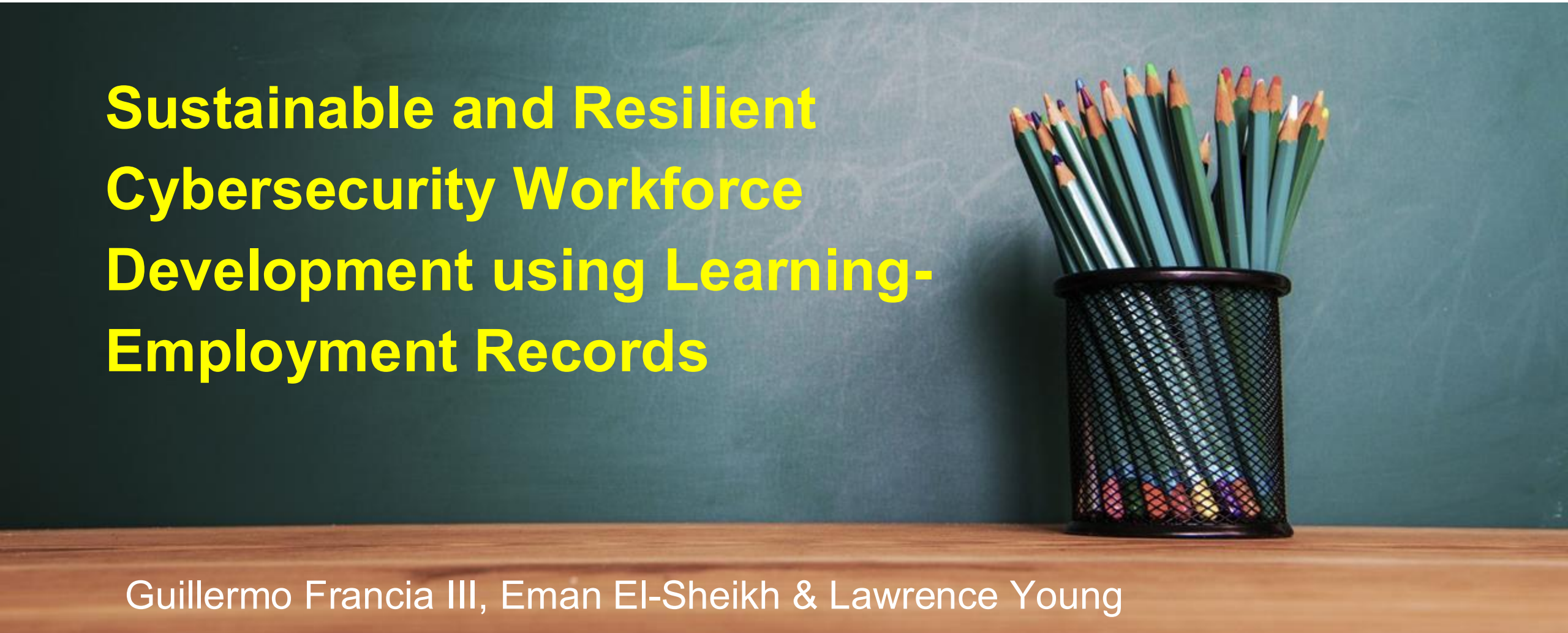
NICE Conference & Expo

Sustainable and Resilient Cybersecurity Workforce Development using Learning-Employment Records

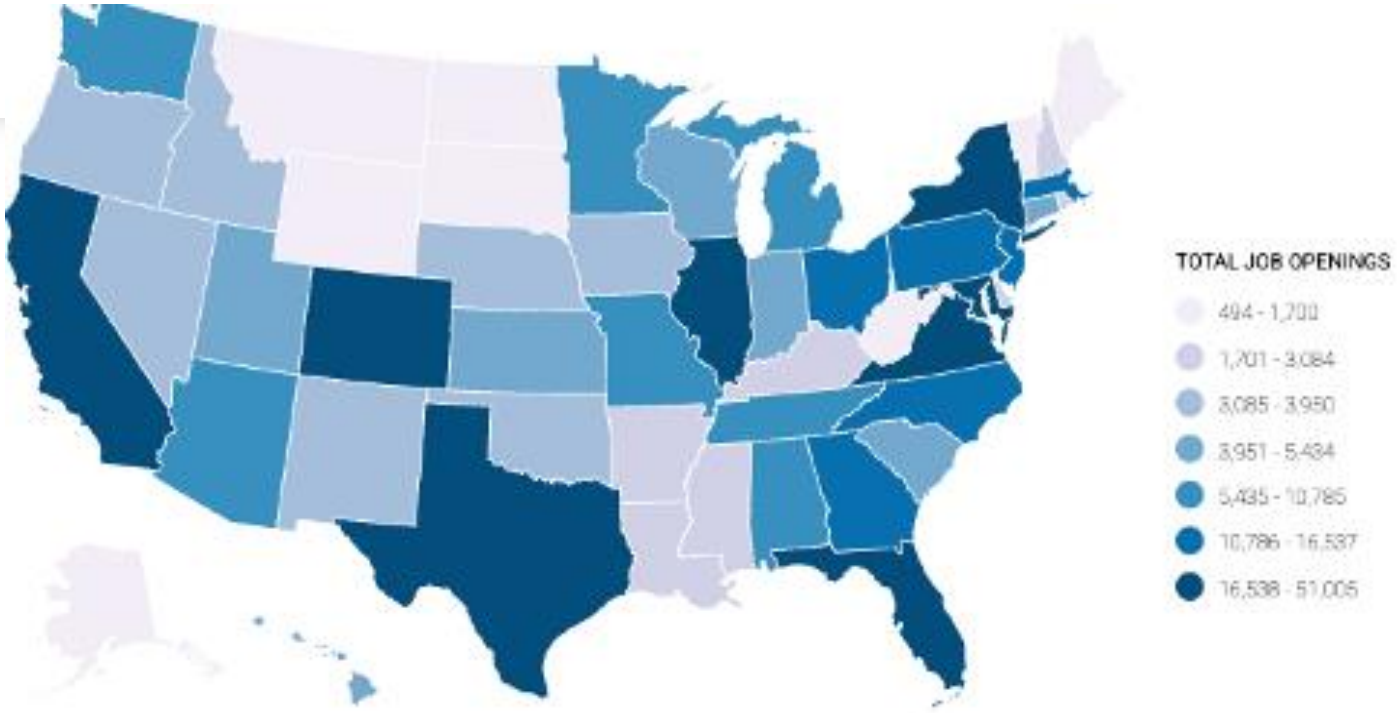


Guillermo Francia III, Eman El-Sheikh & Lawrence Young

OUTLINE

- Cybersecurity Workforce Gap
- Cyber Workforce Development Initiatives
- Learning Employment Records
- LER Structure and Benefits
- LER Platforms and Alternatives
- LERs vs Digital Credentials
- LER Best Practices: Talent Supply Chain
- Pilot Implementation
- Open Discussions

US Cybersecurity Workforce Gap

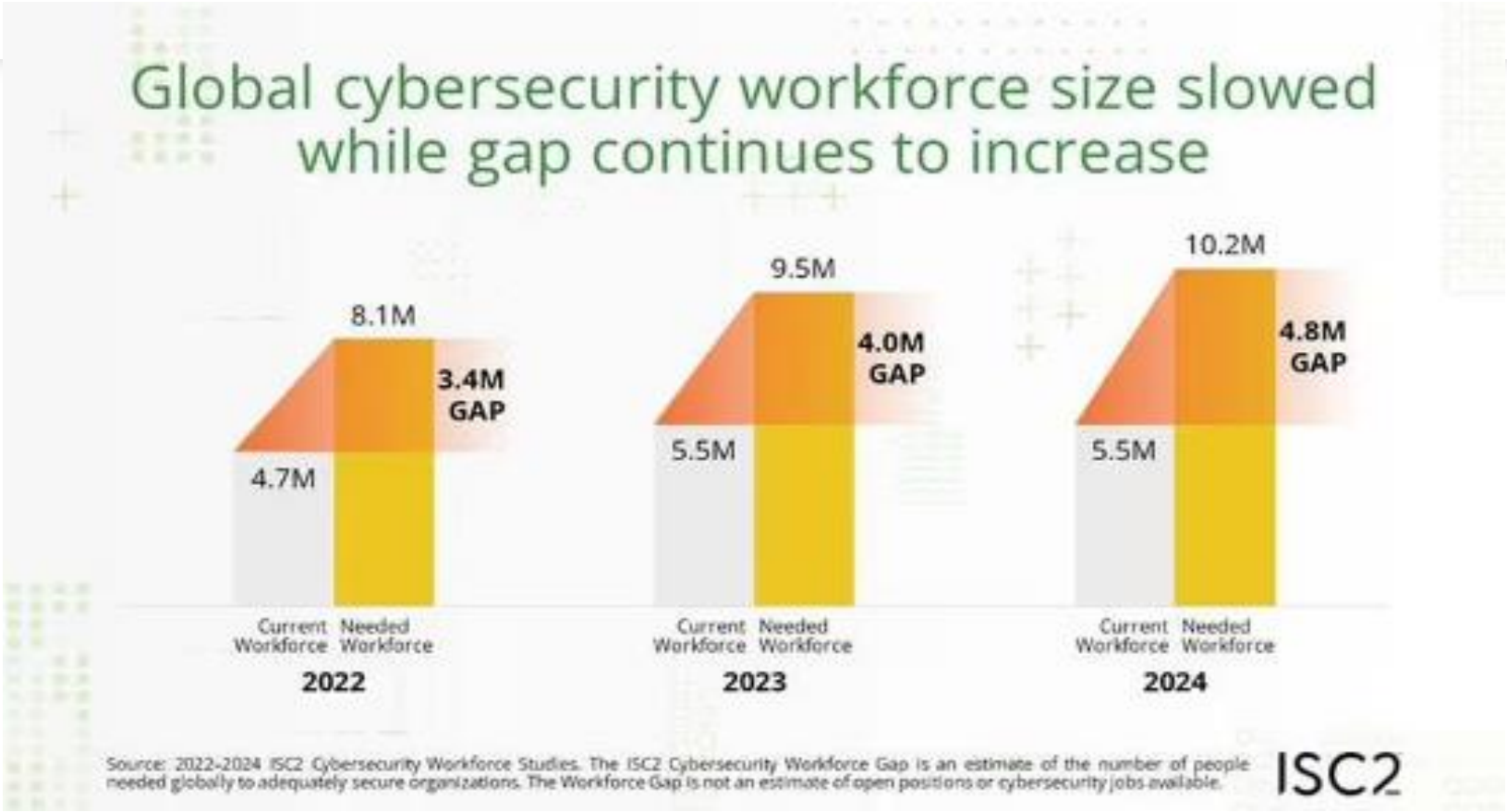


Employed: 1,337,400

Job Openings: 514,359

Source: Cyberseek.org

Global Cybersecurity Workforce Gap



Source: ISC2 Cybersecurity Workforce Studies https://abnormalsecurity.com/blog/isc2-cybersecurity-workforce-study

National Cybersecurity Workforce Development Program - CyberSkills2Work

- Free training, industry certification prep and career development support
- 85 flexible training pathways and 17+ industry certifications offered
- Over 3,500 trained cybersecurity professionals
- Hundreds of free cybersecurity teaching modules available to educators shared via CLARK
- National Employers Network Portal connects employers to program graduates
- Highlighted in the White House Office of the National Cyber Director (ONCD) National Cyber Workforce and Education Strategy as an *exemplar* for training veterans and public-private partnerships

National Employers Network

The National Employers Network connects employers with program learners and graduates nationwide. Employers can post job and internship opportunities. CyberSkills2Work learners and alumni can showcase their resumes, credentials, and certifications to potential employers.

CyberSkills2Work Work Roles & Industry Certifications

15 NICE FRAMEWORK

- Cyber Professional
- Cyber Threat Intelligence
- Cybersecurity Architecture
- Defensive Cybersecurity
- Digital Forensics
- Exploitation Analysis
- Incident Response
- Infrastructure Support
- Network Operations
- OSINT/Threat Analysis
- Program Management
- Systems Administration
- Systems Security Analysis
- Technical Support
- Vulnerability Analysis

15 DOD CYBER WORKFORCE FRAMEWORK WORK ROLES

- AI/ML Specialist (Data/AI)
- All-Source Analyst (Intelligence Cyberspace)
- Cyber Defense Analyst (Cybersecurity)
- Cyber Defense Forensics Analyst (Cybersecurity)
- Cyber Defense Incident Responder (Cybersecurity)
- Cyber Defense Infrastructure Support Specialist (Cybersecurity)
- Data Analyst (Data/AI)
- Data Scientist (Data/AI)
- Data Steward (Data/AI)
- Information Systems Security Manager (Cybersecurity)
- Network Analyst (Cyberspace Effects)
- Security Architect (Cybersecurity)
- System Administrator (IT Cyberspace)
- Technical Support Specialist (IT Cyberspace)
- Vulnerability Assessment Analyst (Cybersecurity)

17+ INDUSTRY CERTIFICATIONS

- AWS Certified Cloud Practitioner
- CompTIA A+
- CompTIA Cloud+
- CompTIA Cybersecurity Analyst (CySA+)
- CompTIA IT Fundamentals ITF+
- CompTIA Linux+
- CompTIA Network+
- CompTIA PenTest+
- CompTIA Security+
- CompTIA SecurityX
- EC-Council Certified Ethical Hacker (CEH)
- EC-Council Certified Incident Handler (ECIH)
- EC-Council Certified SOC Analyst (CSA)
- EC-Council Disaster Recovery Professional (EDRP)
- eLearnSecurity Junior Penetration Tester
- ISACA Certified Information Security Manager (CISM)
- MITRE ATT&CK Micro-Certification
- Splunk Micro-Certification

Learning and Employment Records (LERs)

A **digital, verifiable document** that captures a person's **skills, credentials, educational achievements, and work experiences** in a portable and standardized format. It's designed to help individuals **own, share, and use** their learning and employment history more effectively across schools, employers, and career platforms.

Properties of an LER

PORTABLE

VERIFIABLE

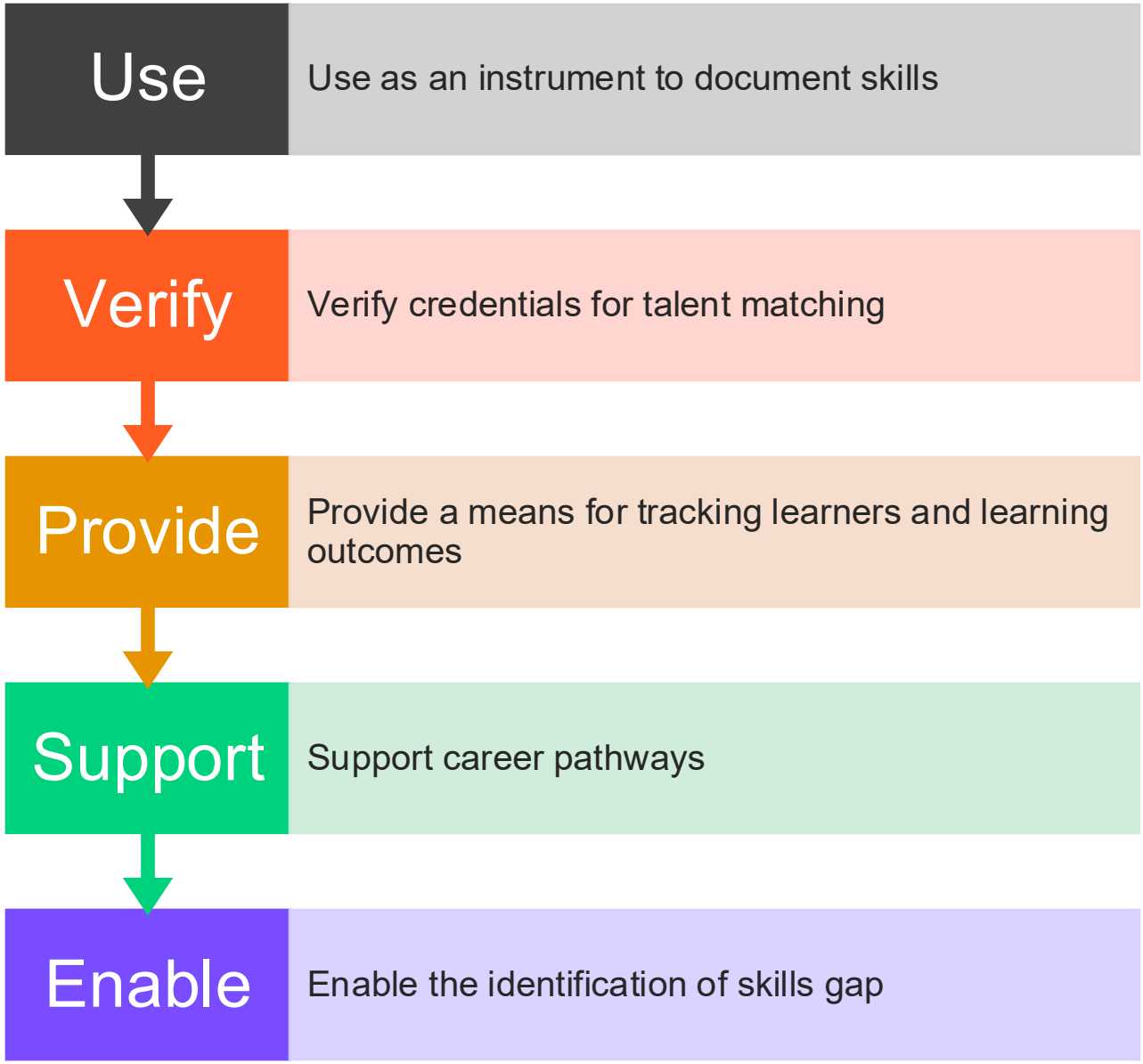
SKILLS-FOCUSED

INTEROPERABLE

ACCESS CONTROL

LER Structure

Benefits of LERs



LER Platforms and Alternatives

Digital Credentialing Platforms

Credly
Sertifier
Accredible
Certifier
CertifyMe
Certopus
Modio Health
eNetBadges
Badgecert
Hyperstack
Virtualbadge
NetCredemtial
Badgr
Openbadges.me
Open Badge Factory
Canvas Credentials

Learning Employment Records

iQ4 Wallet
Learning Records Store
Xyleme
Sponge
Learning Locker
LinkedIn Learning
Coursera
Udemy Business

LERs vs Digital Credentials

Traditional Model
Text & Document-Based

Academic/
Military
Transcripts

Job
Descriptions

Tasks
Lab Tests
Reviews

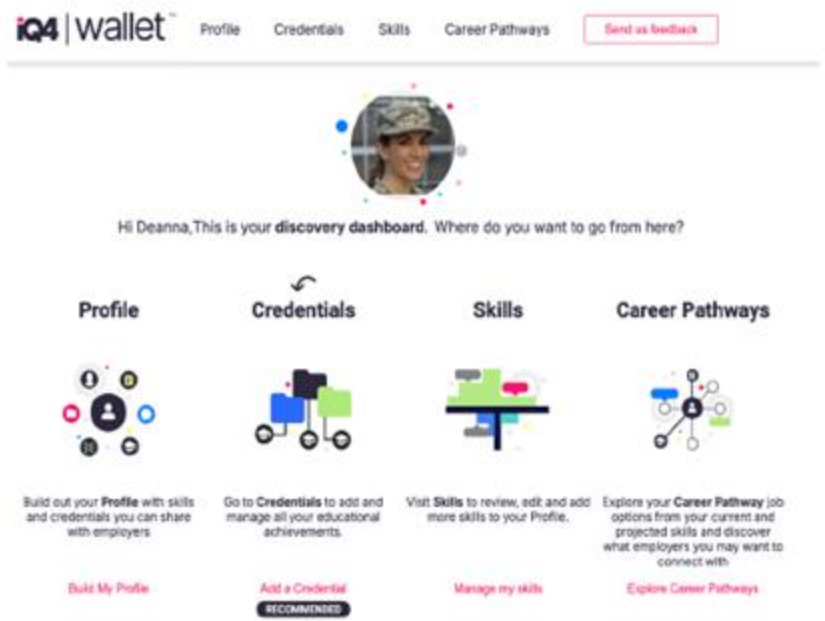
Certificates

Badges

Standardized Four Tier Taxonomy

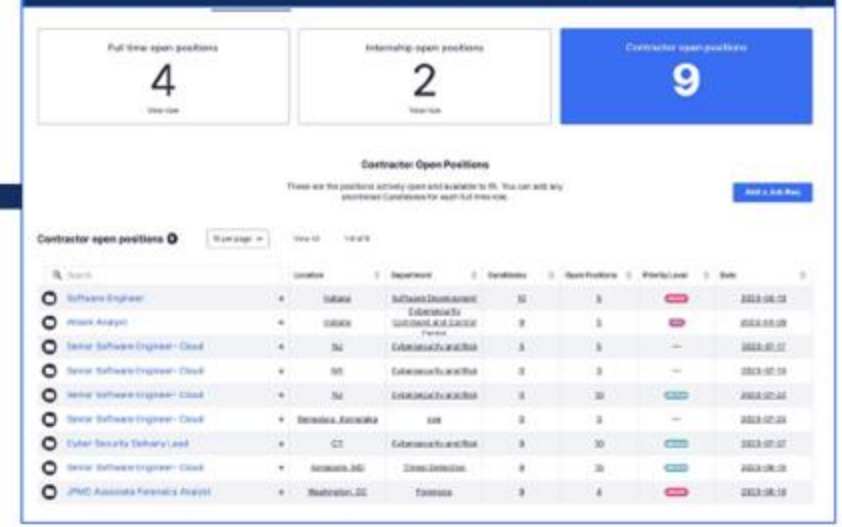
Tier	Fits Country, Sector, or Organization
1	Job Family (for Sector to employer)
2	Job Role Profile (Description/tasks)
3	Skill Category (Professional, IT/Tech, Soft)
4	Knowledge Skills Abilities

Connecting Wallet Holders to Employers With Job Role Vacancies



Thousands of Wallets in iQ4 Skills Talent Pipeline App [SKILLEDJOBS] Digital Talent Pool

SKILLEDJOBS For EMPLOYERS Job Requisitions



The accelerating adoption of Learning and Employment Records (LERs)/Wallets adds thousands of Wallet Holders to the Skills Talent Pipeline,

Job requisitions are translated into the same skills taxonomy used to describe the candidates. Matching is via the SKILLEDJOBS application.

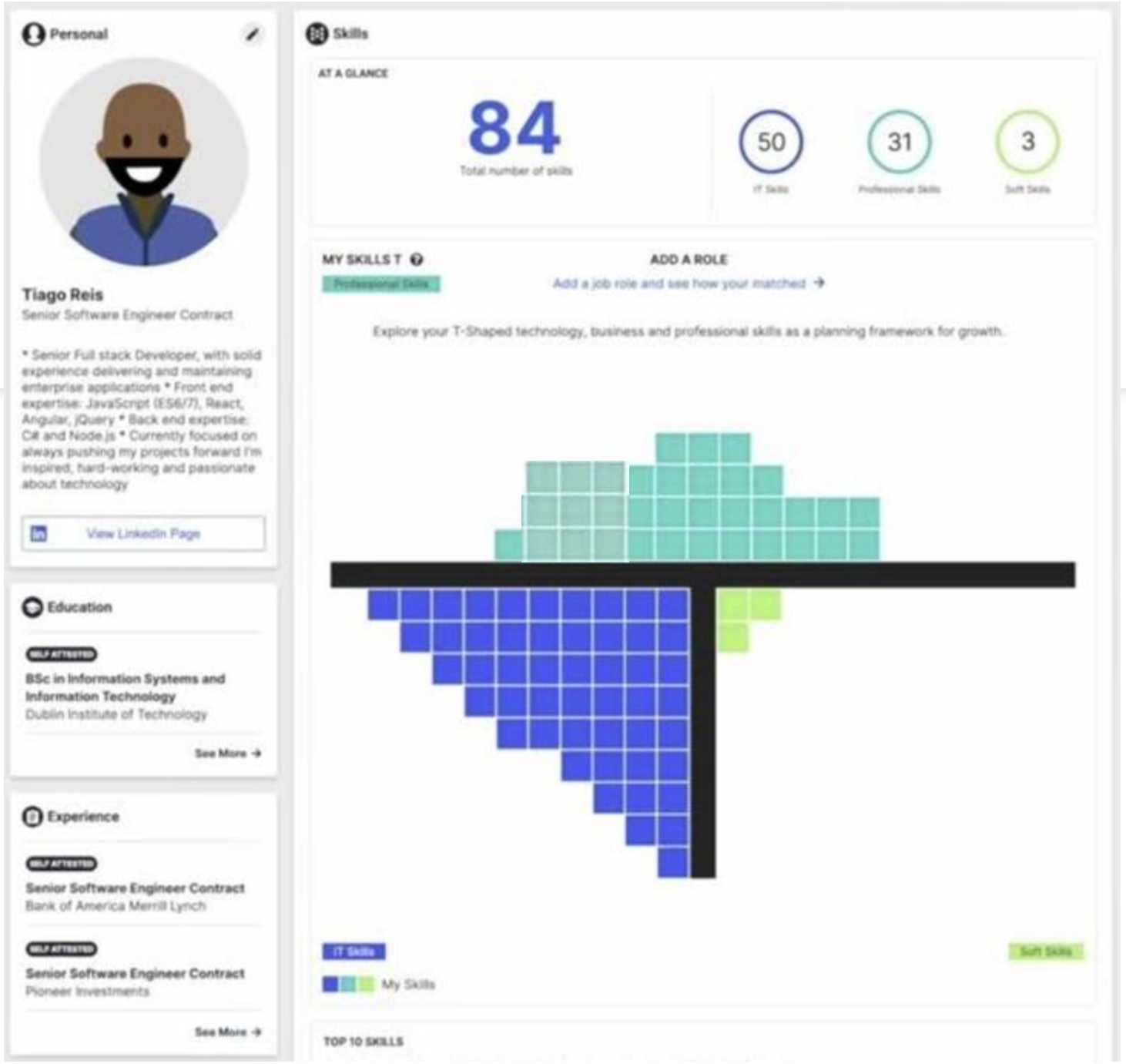
Wallet Features:

*Converts transcripts and experience into discrete skills objects (note squares)

*Reports 3 areas: (Professional skills, Technical Skills, and Soft skills)

*Maps to existing jobs as described by employers

*Gap analysis and remedial training suggestion



LER Best Practices: Talent Supply Chain

- Use as a feedback loop to augment/update training and education
- Requires employer engagement for maximum benefit
- Scaleable: across thousands of graduates and thousands of employers
- Security: Personal Identifiable Information across platforms is critical
- Compatible with credentialing, badging, workforce, range, etc. organizations
- Dashboard reporting to Employer and supporting agency (University, etc.)
- Proper onboarding of student and employer data
- Customizable KPI reporting
- Post-employment career advancement tracking, job changing tracking

LER Pilot Implementation

- An LER pilot will start in Summer 2025 as part of the National Taskforce for Cybersecurity Workforce Development
- 50 Geographically diverse participants from the CAE community
- Participants will receive:
  - a 45-minute onboarding workshop
  - a digital wallet as a repository of training, academic and professional credentials
  - tools to explore job roles and career pathways
  - access to a portal of live job postings where application can be initiated
  - help in identifying skills gap

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