Cybersecurity Workforce Alliance

“Tackling Tech RISK Skills Shortages”

Aligning Industry With Education

Using Standards

Federal Information Systems Security Educators' Association

AWARENESS • TRAINING • EDUCATION
"We Have A Failure To Communicate"

- Students rate themselves as well prepared to start work
- Employers disagree

2.5mm CS jobs – US xmm Global
(NIST not implemented yet)
Cybersecurity Workforce Development Platform

Business Framework

Academic Framework

Virtual Projects

Operation Functions

Real-World Education Applied Learning

Academic Learning

STUDENTS WORKFORCE READY
Talent – The Next Supply Chain
Workforce Skills Development

1. Map future talent needs
   Improve forecasting and planning to better understand talent needs.

2. Build talent pipeline
   Companies must work with community colleges to develop curricula that build the skills and experience they require.

3. Develop talent pool relationships
   Businesses must work with a vast network of partners to establish themselves as “employers of choice.”

4. Reinvigorate talent development
   Train entry-level and new employees. Offer internships and apprenticeships, then hire strong performers.

Source: Accenture survey of more than 800 human resources executives from U.S. companies, half of which had revenues exceeding $1 billion.
CUNY Vice Chancellor Student Affairs & CISO's Risk & Cybersecurity
Aligning Education With Industry’s Context and Needs

- NYU
- Federal Reserve
- Morgan Stanley
- Goldman Sachs
- Bank NY Mellon
- Fidelity Investments
- Express Scripts
- RANE Network
- Perkins Coie
- Capgemini
- NASA
- National Student Clearinghouse

Digital Skills “Passport” And Workforce Development Platform
To Make It Work ... Ingredients!

1. **Hands-on** membership committed to project success (process, industry frameworks, programs, resources, outcomes)

2. **Strategic**, a partnership intent to work in the spirit of co-development

3. **Scalable**, create a program that will scale as a “plug and play”
CWA – Addressing Industry Issues

• **Federal Reserve** – “Near systemic risk in Financial Services”
  – “Skills shortage – all sectors and getting worse”
  – “Takes 12-18 months to train students after graduation”
  – “Hired at $60K – leave 9-months later at $120K”

• “Students need to understanding business risk & industry knowledge”

• “Cybersecurity is a multidisciplinary problem”

• “The war for talent creates a Poverty Line!”
Improve the cyber security skills and scale the college student workforce, so they are more attractive to hire and can provide almost immediate value to the public & private sector by improving a company’s Cyber Security capabilities.

Purpose

Focus

Reduce the amount of initial training required by employers for college hires.

Create the “perfect candidate profile” for a College Hire in Cyber Security

Create and run the "the Epic Challenge"

Increase understanding of and interest in a career in Cyber security

Align & Enhance curricula to develop the skills needed for a career in Cyber Security
## Who Does What - Effort Required

<table>
<thead>
<tr>
<th>Participant</th>
<th>Effort</th>
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<tbody>
<tr>
<td>CWA</td>
<td>Workstreams for Profiles, Taxonomy, Epic Challenges, Promotion for curriculum, certificates, digital badge, timing, promotion</td>
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<tr>
<td>CUNY</td>
<td>• Align academics/schools for multi-discipline participation  &lt;br&gt; • Issue digital badges/certificates  &lt;br&gt; • Outcomes to drive industry alignment</td>
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<tr>
<td>Industry</td>
<td>• Resource challenges, SME’s, Alumni (e.g. 2-4 days over 6-weeks)  &lt;br&gt; • Mentors and assessors – launch “projects”, discussions, lessons, assignments and content, (10-20 minutes a day)</td>
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<tr>
<td>Students</td>
<td>Sign up, complete Skills Profiles, upload content</td>
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<tr>
<td>iQ4</td>
<td>Manage CWA activities and provide technology as part of Alliance subscription</td>
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</table>
> $100\text{mill ROI} \\
\ldots \text{Reduce Training by 25\%} \ldots \text{Accelerate Productivity}

\textit{Find the Best Talent – Align with Real-World Challenges} \\
\textit{Assess / Track KSAs Proficiency – Reward – Hire!}

\textit{Cast a Wide Net} – reach every school every student \\
\textit{Awareness} - Promote industry opportunity / needs \\
\textit{Extend Brand} - showcase “Perfect Candidate” career pathways \\
\textit{Matching} – based on competencies, credentials and KSA’s \\
\textit{Accelerate Employer Education} – while students are still in school \\
\textit{Retention} – better alignment … better results
NIST/NICE Workforce Framework

“Know [PROFILE} your talent, identify and fill the skills gaps and develop unrivaled Cyber workforce”

Any company doing business with USA will be examined as to their effectiveness with NIST-CA and NICE for Cyber Risk and Assurance
Tier 6-8 Sector/Occupation Specific Skills - Financial Services Example

Tier 5 [Specific] Industry Wide Technical Competencies
- Retail Banking
- Wealth Mgt
- Mortgage
- Cr/Dr Card
- Back Office

Tier 4 (NICE) Industry Wide Technical Competencies
- Retail Systems
- Wealth Systems
- Data Center
- Architecture/Infrastructure
- Networks & Telecoms
- Governance & Compliance
- etc

Tier 3 Workplace Competencies
- Business Fundamentals
- Teamwork
- Following Directions
- Planning, Organizing, Scheduling
- Problem Solving
- Decision Making
- Employability & Entrepreneurship Skills
- Working With Computer Tech
- etc

Tier 2 Academic Competencies (SKILLS)
- Mathematics
- Locating, reading & using info.
- Writing
- Listening
- Speaking
- Information Technology
- Critical Analytical Thinking
- Science
- Engineering & Technology

Tier 1 Personal Effectiveness – i.e. Essential Soft Skills - Including
- Interpersonal Skills
- Integrity
- Professionalism
- Reputation
- Motivation
- Dependability & Reliability
- Self Development
- Flexibility & Adaptability
- Ability to Learn

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“Passport” = Core Data Model

SKILLS HAVE A CAREER LIFE CYCLE AND CONTINUUM

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“Perfect Candidate” Student Profile

Seven Roles
- SOC, GRC, IT Risk Specialist / Analyst / Manager, Forensic Investigator, Business Risk Modeling

SOC- Security Operations Center
- Category: Protect & Defend
- Specialty Area: Computer Network Defense Analysis
- KSA Competencies: 3, 4, 49, 59, 61, 66, 81, 87,
- KSA Statement: Uses defensive measures and information collected from a variety of sources to identify, analyze, and report events that occur or might occur within the network in order to protect information, information systems, and networks from threats.

GRC- Governance Risk and Compliance
- Category: Securely Provision
- Specialty Area: Test and Evaluation
- KSA Competencies: 22, 38, 40, 53, 63, 81, 83, 127, 144, 169, 176, 182, 239
- KSA Statement: Develops and conducts tests of systems to evaluate compliance with specifications and requirements by applying principles and methods for cost-effective planning, evaluating, verifying, and validating of technical, functional, and performance characteristics (including interoperability) of systems or elements of systems incorporating information technology (IT).
Applying the NICE Framework

**DHS SPECIFIC CYBER ROLE**

Cybersecurity Tester: The Cybersecurity Tester provides compliance-based security testing leveraging automated tools. The Cybersecurity Tester assists in the preparation, development, modification, and management of security products in support of the C&A process. The Cybersecurity Tester provides technical analysis and automated scans to assess their completeness and identify system vulnerabilities and weaknesses.

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<tr>
<th>SPECIALTY AREAS</th>
<th>BEHAVIORAL INDICATORS</th>
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<td>Systems Requirements Planning</td>
<td>Threat Assessment: Identifies the impact of circumstances or events with the potential to harm the enterprise. Verification and validation, and supportability and effectiveness analyses for total systems.</td>
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<td>Test and Evaluation</td>
<td>Vulnerability Assessment: Uses knowledge of the types and techniques of Cyber exploitation and attack. (e.g., APT, V&amp;V, IoS).</td>
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<td>Investigation</td>
<td>Cybersecurity Testing: Ensures security testing is effective, identifies vulnerabilities, and ensures compliance with industry standards and protocols.</td>
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<td>Computer Network</td>
<td>CYBER SKILL &amp; PROFICIENCY STANDARDS PERFORMANCE LEVEL CAPEX</td>
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Selected by Component SMEs from NICE Framework Specialty Areas

Built by SMEs with alignment to respective NICE Framework KSAs

- Performs technical planning, system integration, verification and validation, and supportability and effectiveness analyses for total systems.
- Analyzes all levels of total system products to include: acquisition, concept, design, test, installation, operation, maintenance, and disposal.
- Translates operational requirements into technical requirements.
- Performs gap analyses between requirements and proposed architecture to identify security performance and other weaknesses in the system.
- Verifies security requirements through collaboration with DAA/IA/Engineering & Systems Administration.
- Conducts vulnerability & risk assessment analyses.

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NICE
NATIONAL INITIATIVE FOR CYBERSECURITY EDUCATION
Maturity Assessment Process
for IT Risk and NICE Framework

• Risk Components
  – Examples, does the student understand?

• Risk Assessment
  – Values and Risk Statement, how they apply

• Risk Mitigation
  – Explain how they apply to a given situation

• Applied Learning
  – Use cases (eg. Retail Payment mobile app) how to do it and what are the risk exposures
Competencies - Assessments / Proficiencies

**YOU HAVE 6 COMPETENCIES in this course**

**COMPETENCY – 1**
Examine the basic business models for e-business. **MORE >>**
- 2 of 2 Criteria
- BASIC

**COMPETENCY – 2**
Relate the importance of e-business infrastructure to the economic impact of a business. **MORE >>**
- 6 of 6 Criteria
- BASIC

**COMPETENCY – 3**
Examine the relationship of basic e-business strategies to business success. **MORE >>**
- 2 of 2 Criteria
- PROFICIENT

**COMPETENCY – 4**
Apply effective e-business planning and implementation. **MORE >>**
- 4 of 4 Criteria
- DISTINGUISHED

**COMPETENCY – 5**
Develop a technology and management e-business plan. **MORE >>**
- 14 of 14 Criteria
- DISTINGUISHED

**COMPETENCY – 6**
Evaluate the management implications of e-business. **MORE >>**
- 4 of 4 Criteria
- NON-PERFORMANCE
NICE Extension Requirements

- Need to expand Competencies and KSA’s for Collect and Operate, Analyze

- Add Assessment Criteria & Proficiency
  Credentialed Digital Badge

- Add Personal Qualities to Competency and KSA
  Oversight group for WF Framework extensions
Epic Challenge
Mobile App Payment

Enterprise Passports & Matching

Epic Challenges Engagements

Skills Match, Developed, Assessed, Validated
Certificate of Participation

This Certificate is Presented To:

SAM CICIO

In recognition for your collaborative contributions in the design of an autonomous vehicle to explore lava tubes on Mars. This certificate verifies the completion of the S.T.E.M. summer program held at Stevens Institute of Technology Summer 2011

Charles J. Camarda 10/14/11

Dr. Charles Camarda, Astronaut STS-114 Mission Specialist
NASA Senior Advisor for Innovation Office Of The Chief Engineer

STEVENS INSTITUTE OF TECHNOLOGY
THE INNOVATION UNIVERSITY

NASA
DQP Student “Enterprise Passport”

DQP based Cybersecurity Certificates issued by CWA
Student "Enterprise Passport"

Kyle Hamilton
Cooper Union

Skills
Computer Architecture, Software Engineering, Algorithms and Theory, Web Engineering, Computer Science... more

Personal Highlights
Phi Theta Kappa

All Skills
Computer Architecture
Computer Engineering
Web Engineering
Computer Science

Experience
Software Engineering
Computer Engineering
10 yrs
Computer Science and Mathematics Arts & Science

Certificates
Algorithms and Theory
Computer Science
10 yrs
Accounting Business
15 yrs
Next Generation Digital Resume

“Competency” Profiling
“What Students Know and Can Do”

Skills Continuum
Transcripts, Degrees, Enrollment, Certifications

Progression Mapping
Time Windows: Challenges, Innovation, Accomplishments

Pathways Roadmap
Stackable Credentials: Career Opportunities

“Trusted Data – Validated Credentials”
Framework Provided Basis for all Human Capital Actions

- Workforce Baseline Studies – Understand Capabilities (strengths and gaps)
- Position Descriptions
- Hiring Actions (vacancy notices, interviews, assessments, etc.)
- Organizing Training Inventories/Catalogs
- Identify Training Gaps and Needs
- Curriculum and Certification Program Development
- Professional Development Roadmaps
- Professional Standards
- Succession Management
Closing The Skills Gap – USA & UK

CUNY Workforce Alliance
Cybersecurity Initiative

- NYU
- Federal Reserve
- Morgan Stanley
- Goldman Sachs
- Bank NY Mellon
- Fidelity Investments
- Express Scripts
- RANE Network
- Perkins Coie
- Capgemini
- NASA
- National Student Clearinghouse

Mirror - UK Initiatives

Cyber Workforce Dev’t
MoD
GCHQ
Business Innovation & Skills (BIS)
Laszlo Bock, the senior vice president of people operations for Google — i.e., the guy in charge of hiring for one of the world’s most successful companies — noted that Google had determined that “G.P.A.’s are worthless as a criteria for hiring, and test scores are worthless. ... We found that they don’t predict anything.”

Bock is saying something important to them, too: Beware. Your degree is not a proxy for your ability to do any job. The world only cares about — and pays off on — what you can do with what you know (and it doesn’t care how you learned it). And in an age when innovation is increasingly a group endeavor, it also cares about a lot of soft skills — leadership, humility, collaboration, adaptability and loving to learn and re-learn. This will be true no matter where you go to work.