

NICE Webinar Series

NATIONAL INITIATIVE FOR **CYBERSECURITY** EDUCATION



NICE Cybersecurity Workforce Framework Use Cases and Success Stories

March 18, 2020

Improves communication about how to identify, recruit, develop, and retain cybersecurity talent.

Categorizes, organizes, and describes cybersecurity work.

Can be used by:

- Public and Private Sector Employers
 - Education Providers
 - Technology Developers
 - Current and Future Cybersecurity Workers
 - Training and Certification Providers
 - Policymakers
-



NICE FRAMEWORK

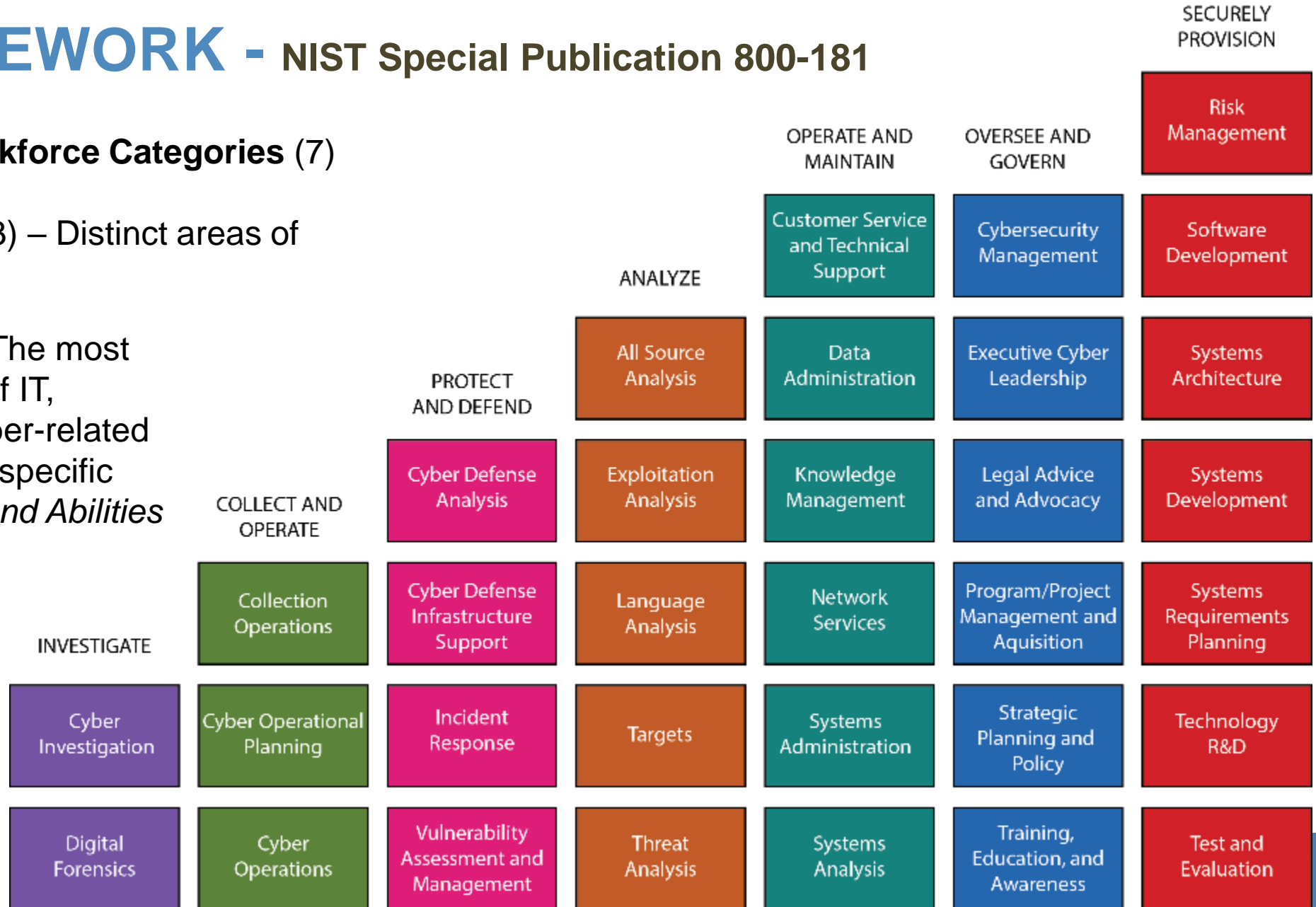
NIST Special Publication 800-181

NICE FRAMEWORK - NIST Special Publication 800-181

Cybersecurity Workforce Categories (7)

Specialty Areas (33) – Distinct areas of cybersecurity work

Work Roles (52) – The most detailed groupings of IT, cybersecurity, or cyber-related work, which include specific *Knowledge, Skills, and Abilities (KSA's)* required to perform a set of *Tasks*.



NICE FRAMEWORK USE CASES

Use Cases describe specific situation in which the NICE Framework can be used.



Development of Position Descriptions



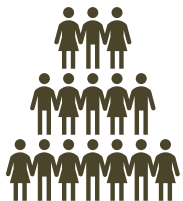
Creation of Learning Outcomes for Courses



Performing Workforce Assessments



Validation of Knowledge, Skills, and Abilities for Awarding Credentials



Talent Management



Career Pathway for Learners and Job Seekers

NICE FRAMEWORK RESOURCE CENTER



101 Resources

- Search the NICE Framework
- One Pager
- Video Tutorial



Employer Resources

- DoD Cyber Workforce Position Description Tool
- Capability Indicators



Education/Training Provider Resources

- Course/Curriculum Mappings
- Certification Mappings
- Training Catalog



Learner Resources

- Pathways
- Career Profiles
- Hands-on Activities

iQ4

Transforming the
learning economy.



iQ4 Mission

iQ4 Corp is creating a supply demand skills marketplace

Finding and Fueling Growth ... Transforming the Learning Economy

- optimizing investment in finding, developing and retaining talent.
- disrupting the status quo of buying a talent pipeline ... by building one at scale, using our tooling, models and content
- fulfilling potential of our enterprise, academic and student engagements.
- fixing the skills gap that exists internally within the enterprise, public sector and schools is at the core of our company and social markets ...

Cumulatively, firms spend billions of dollars every year on technology devoted to digital transformation, but executives admit to confusion and uncertainty about the impact. A recent Accenture survey of 1,200 executives found that, while nearly half say skill shortages are a major concern for the future of their firm, only 3% said they will significantly increase their training budgets over the next three years. In a separate survey conducted in 2017 by consultancy McKinsey & Co., 35% of U.S. executives said they believe they will realize their digital goals mainly or only by hiring new talent.

That "buy, not build" talent strategy is getting more difficult—and expensive—to pull off, especially in a market where the supply of skills like cloud computing and cybersecurity can't satisfy the immense demand for them, said Paul Daugherty, chief technology and innovation officer at Accenture PLC.

THE WALL STREET JOURNAL.



April 22, 2019

MANAGEMENT & CAREERS

Why Companies Are Failing at Reskilling

"It's one thing to invest in machine learning; it's another to reinvent an organization or a business model," he said. "Human capital is quantitatively a much bigger share of the capital in the economy than physical assets like plants, technology and equipment, and we understand it less well."

JPMorgan, which has 250,000 employees, is rolling out a platform called "skills passport." The project so far has been deployed in the bank's IT department, and it will soon be tested with employees in operations roles. Workers use it to take assessments to measure their current skills, and view career options and a curated list of activities and training they can take, said Jennie Sparandara, head of workforce initiatives.

Transforming the Learning Economy

Role/KSA profiling via standards & 4-tier taxonomies

Reskilling/upskilling via pathways, course recommendations and work-based applied learning

Skills optimization for Agile & Gig economies, talent pipelining, internal and external, My T

▶ Establish three beachheads

- **Industry/Education** – Virtual Apprentices Challenge
- **Enterprise** – JPM Chase
- **Students** – National Student Clearinghouse

iQ4 Skills Marketplace

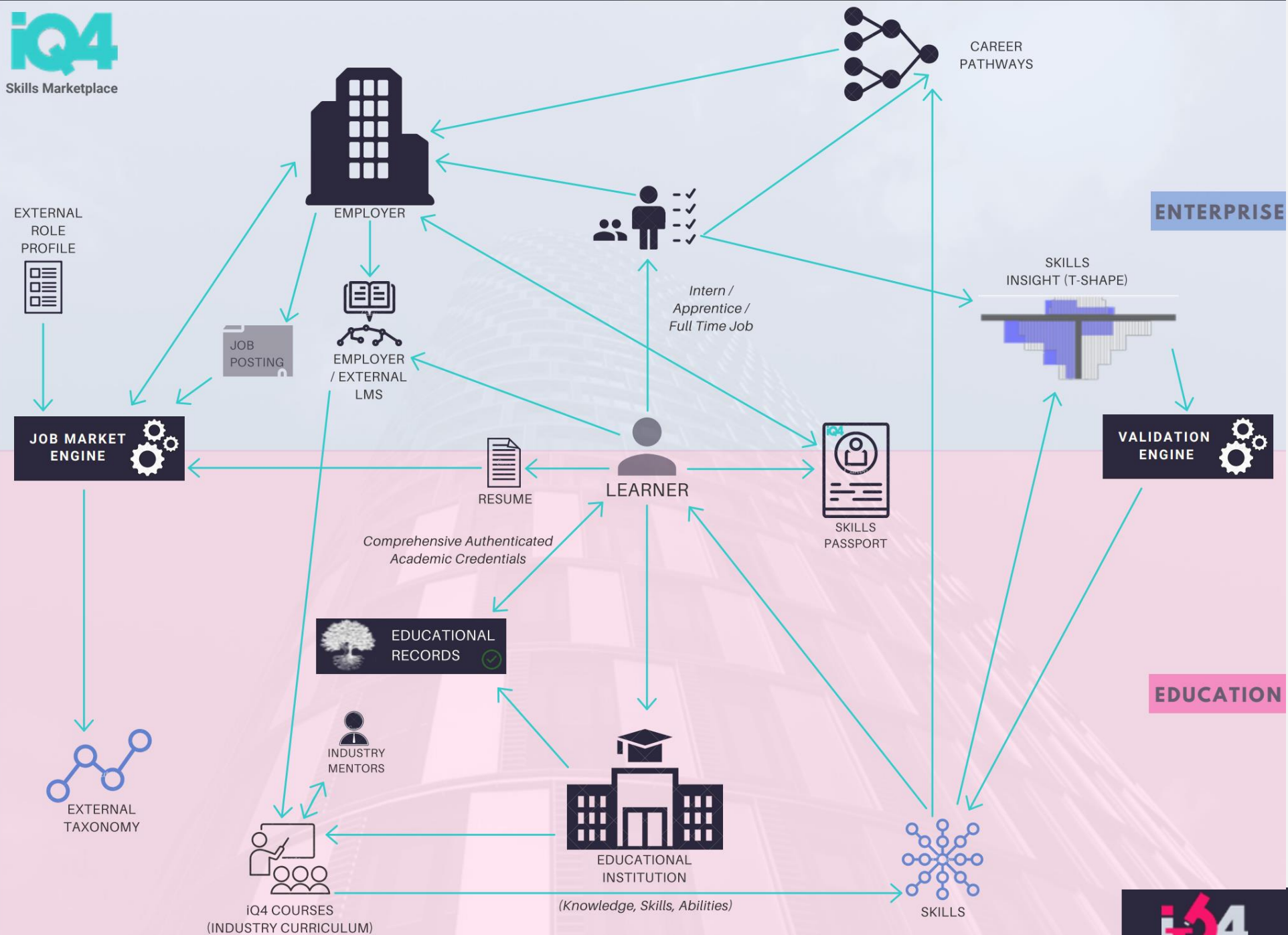


Figure 1 | Interoperable Learning Record Ecosystem

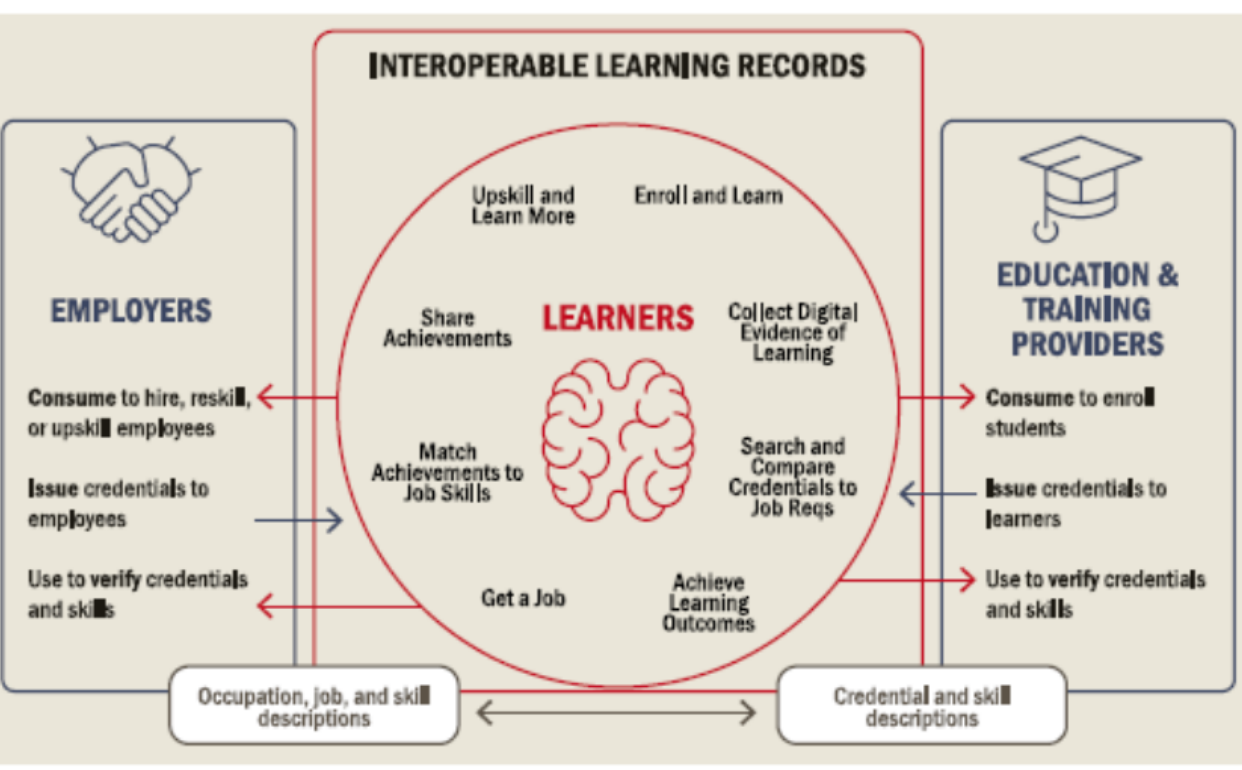
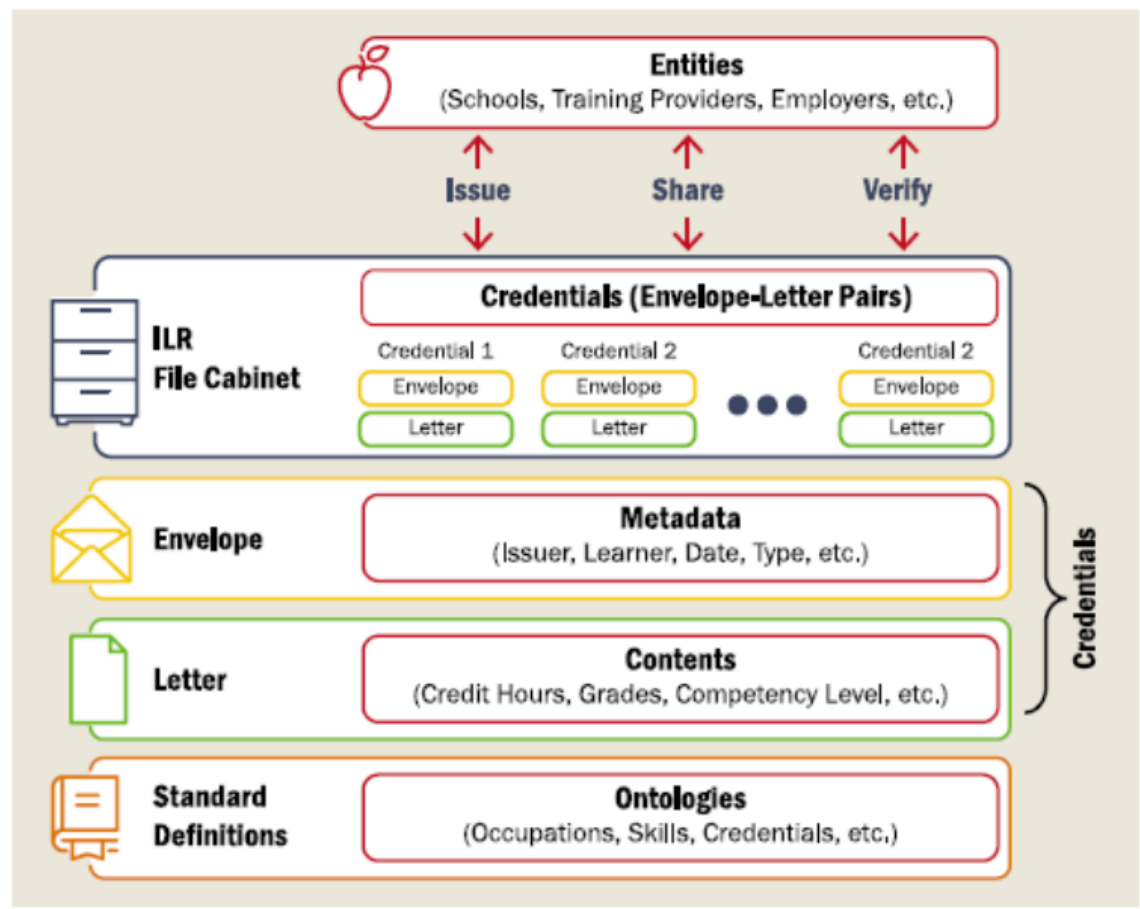
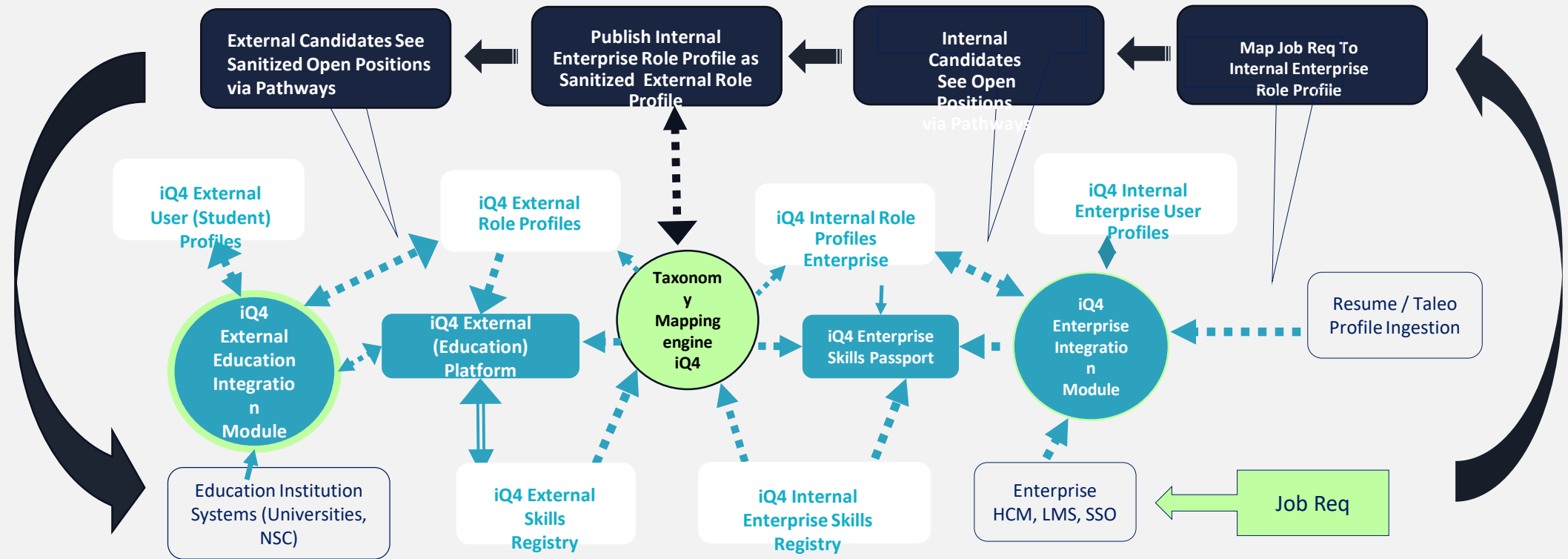


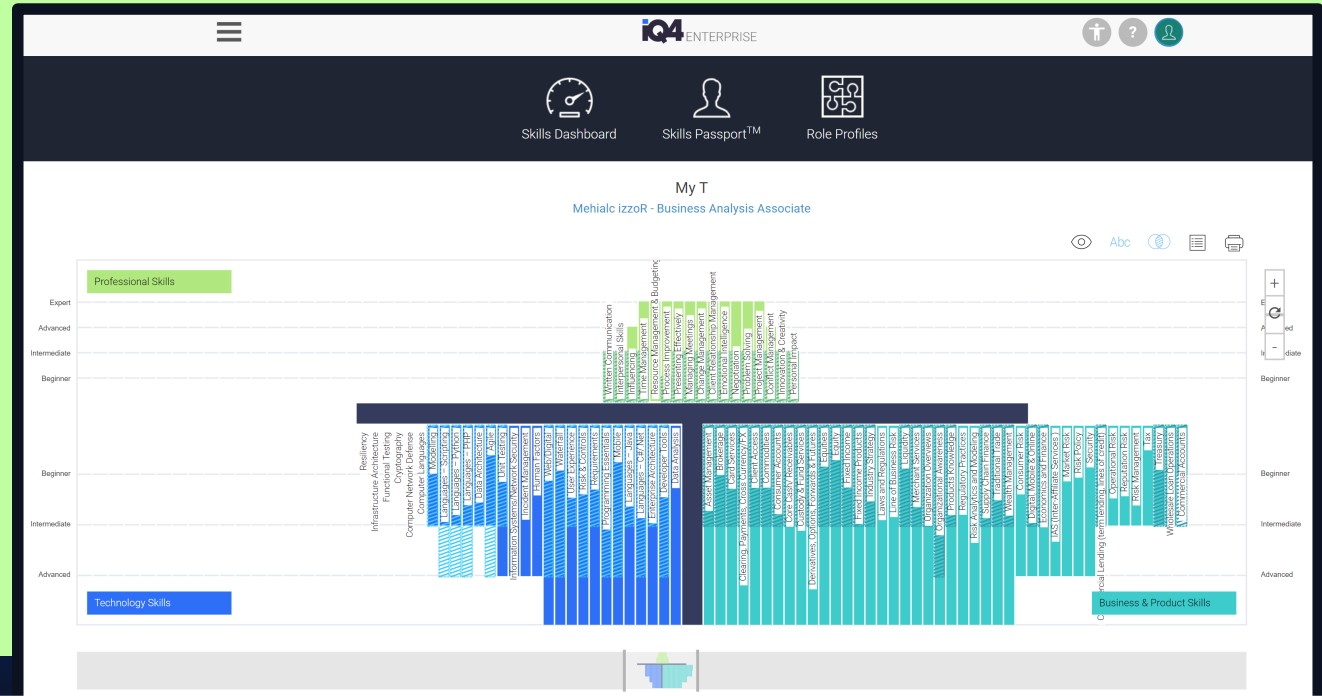
Figure 3 | Four-layer approach to the interoperable learning record protocol



Transforming the talent economy



The GREAT SHAPE





Skills Dashboard



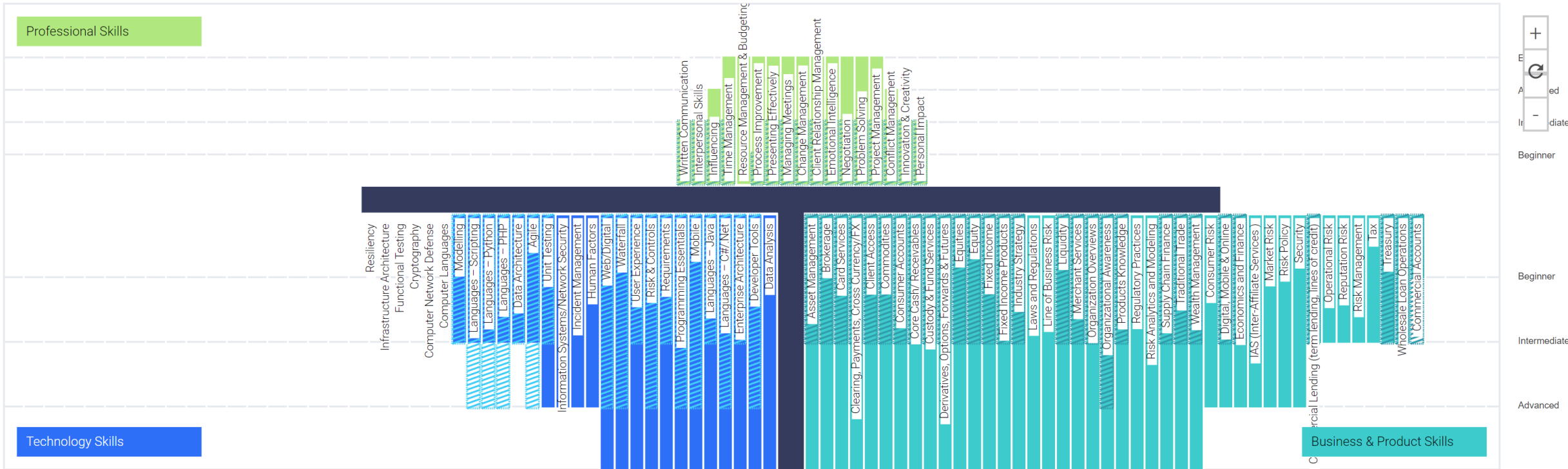
Skills Passport™



Role Profiles

“My T”

My T
MehializzoR - Business Analysis Associate



iQ4 Learner Passport

Multi – Source Assessment

iQ4 all rights reserved

15

The screenshot displays the iQ4 Learner Passport interface. At the top, there are four main sections: RISK & COMPLIANCE (Assessed 5/7 Skills), SKILLS (4 icons), ASSESSMENTS (5 icons), and RECOMMENDED COURSES (5 icons). Below this, the TECHNOLOGY section shows 21/29 skills assessed. A modal window titled 'Assessment Details' is open, showing two assessments: 'Monitoring Network Traffic Capstone' by ComTech and '2019 CTC Live: Hacker Challenge Event Module 1 PCAP' by Simspace. The modal lists specific skills for each, such as 'Knowledge of packet-level analysis' and 'Skill in performing packet-level analysis using appropriate tools (e.g., Wireshark, tcpdump)'. At the bottom of the interface, there are four informational sections: Skill, Context, Proficiency, and Recommended Courses.

RISK & COMPLIANCE
Assessed 5/7 Skills

TECHNOLOGY
Assessed 21/29 Skills

Role Skills

- Configuration Management
- Identity Management
- Cybersecurity
 - Vulnerabilities Assessment
 - Knowledge of packet-level analysis
 - Skill in performing packet-level analysis using appropriate tools (e.g., Wireshark, tcpdump)
 - Skill in using network analysis tools to identify vulnerabilities

Skill

Recommended skills for your job family and role. Assess your skills on this page. You can add and assess any additional skills you may have on the next page.

Context

Specify particular applications, tools and techniques associated with each skill to enrich your profile.

Proficiency

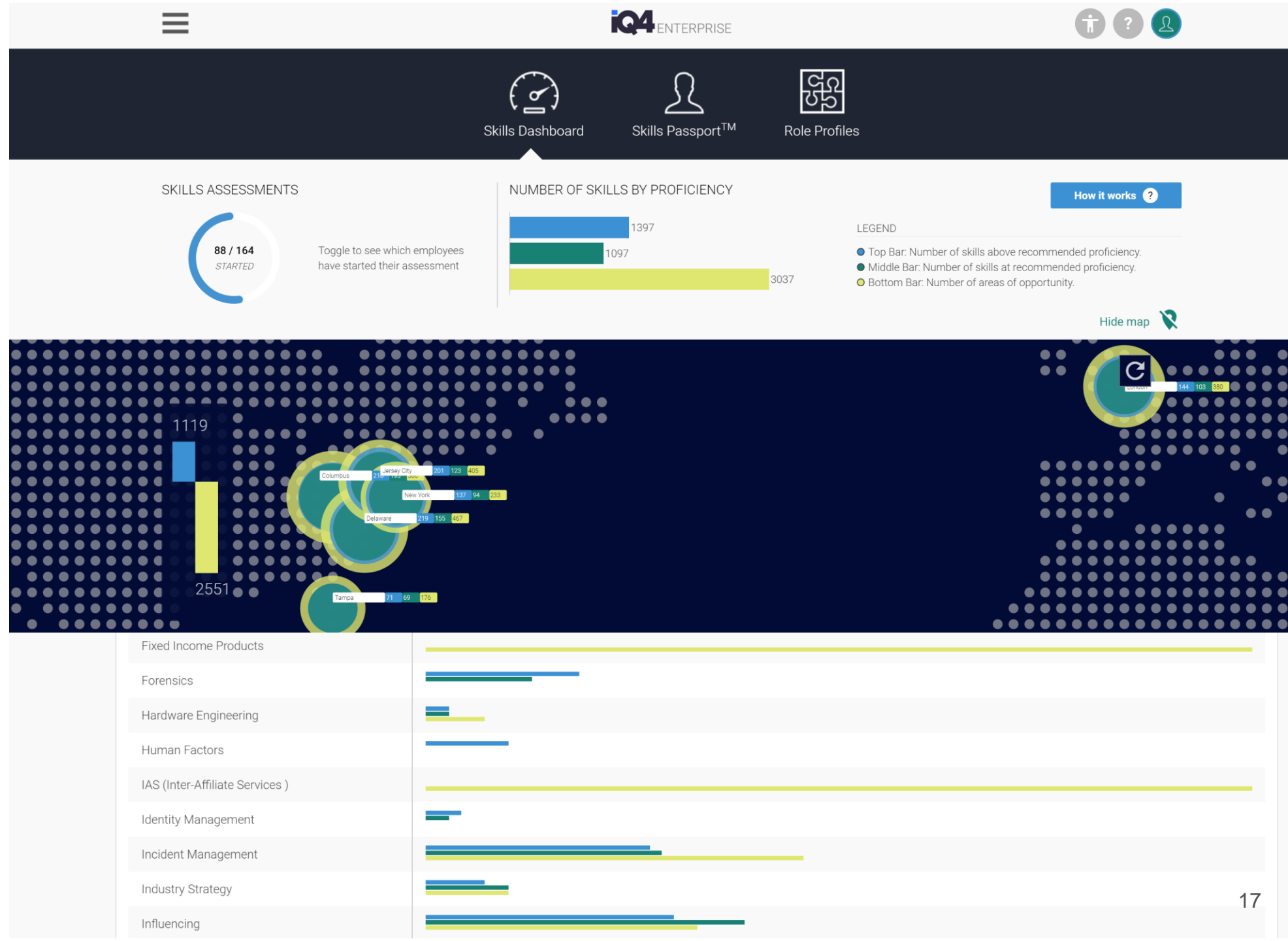
Select a proficiency from four options: Beginner, Intermediate, Advanced & Expert. Click on the information symbol to learn more.

Recommended Courses

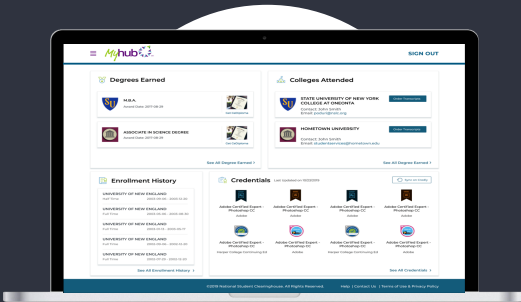
Click on the links below to go to relevant courses in learning@pmc.



Skills Analytics



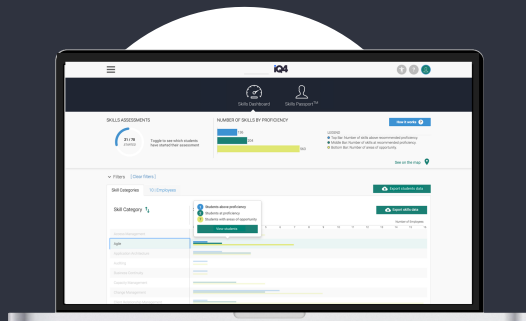
STUDENT DASHBOARD



Academic Records, Portfolio, Skills, Pathways

- Auto generation of competencies, knowledge, skills, abilities, credentials, educational verification, work experience, personal interests.
- Analytics to understand skills gap, course recommendation, Career Pathways and jobs
- Life long learning 5Ps- measure and capture skills proficiencies (multi source) , progression, pathways, potential and purpose in a “Digital Persona”

EDUCATION DASHBOARD



Supply / Demand Skills Gaps Analytics

- Ability to define course to competency to skills mapping, using NICE as the core standards taxonomy framework and data model
- Supply / Demand career pathways gap analytics for curriculum and student development
- Define job families, role profiles, competencies, knowledge, skills, ability, credentials, proficiencies based on standards-based taxonomy

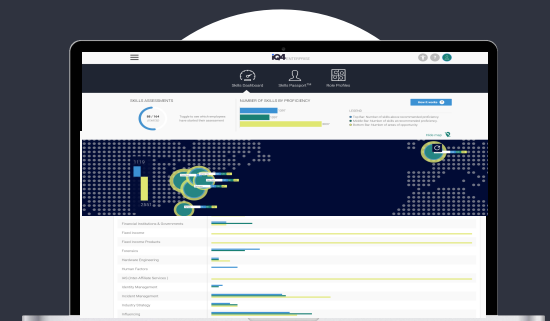
ENTERPRISE PIPELINE DASHBOARD



Finding & Building Talent

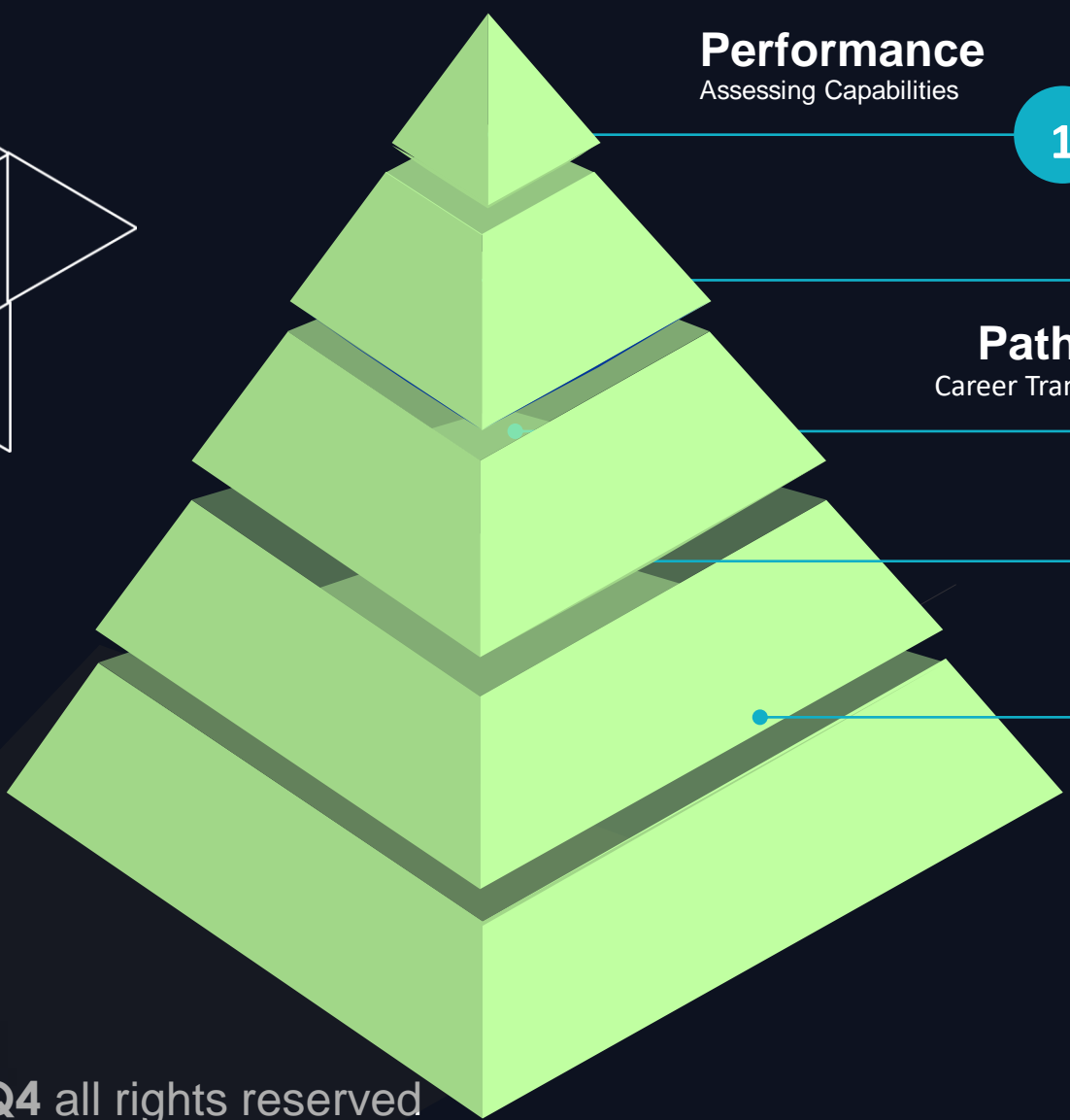
- An Analytics Pipeline Dashboard to discover talent, assess skills, identify skills gaps, recommended learning and development
- A Talent Search Engine to source, assess and build talent, suggest courses for individuals and academic institution development
- Define job families, role profiles, competencies, knowledge, skills, ability, credentials, proficiencies based on standards-based taxonomy

ENTERPRISE RE-SKILLING DASHBOARD



Course Recommendation, Retention, Mobility

- Learner dashboard to suggest courses leading to performance improvement, career pathways to retain talent and “T-Shaped” data visualization to speed use of the tool and effectiveness in user experience (Net Promoter Score-8)
- Analytics Dashboard to optimize supply and demand of skills to roles, leverage strengths for agile and gig economy, and support development to drive productivity.



Performance
Assessing Capabilities

1

Progression
Continuous Growth

2

Pathways
Career Transparency

3

Potential
Assessing & Optimizing
Potential

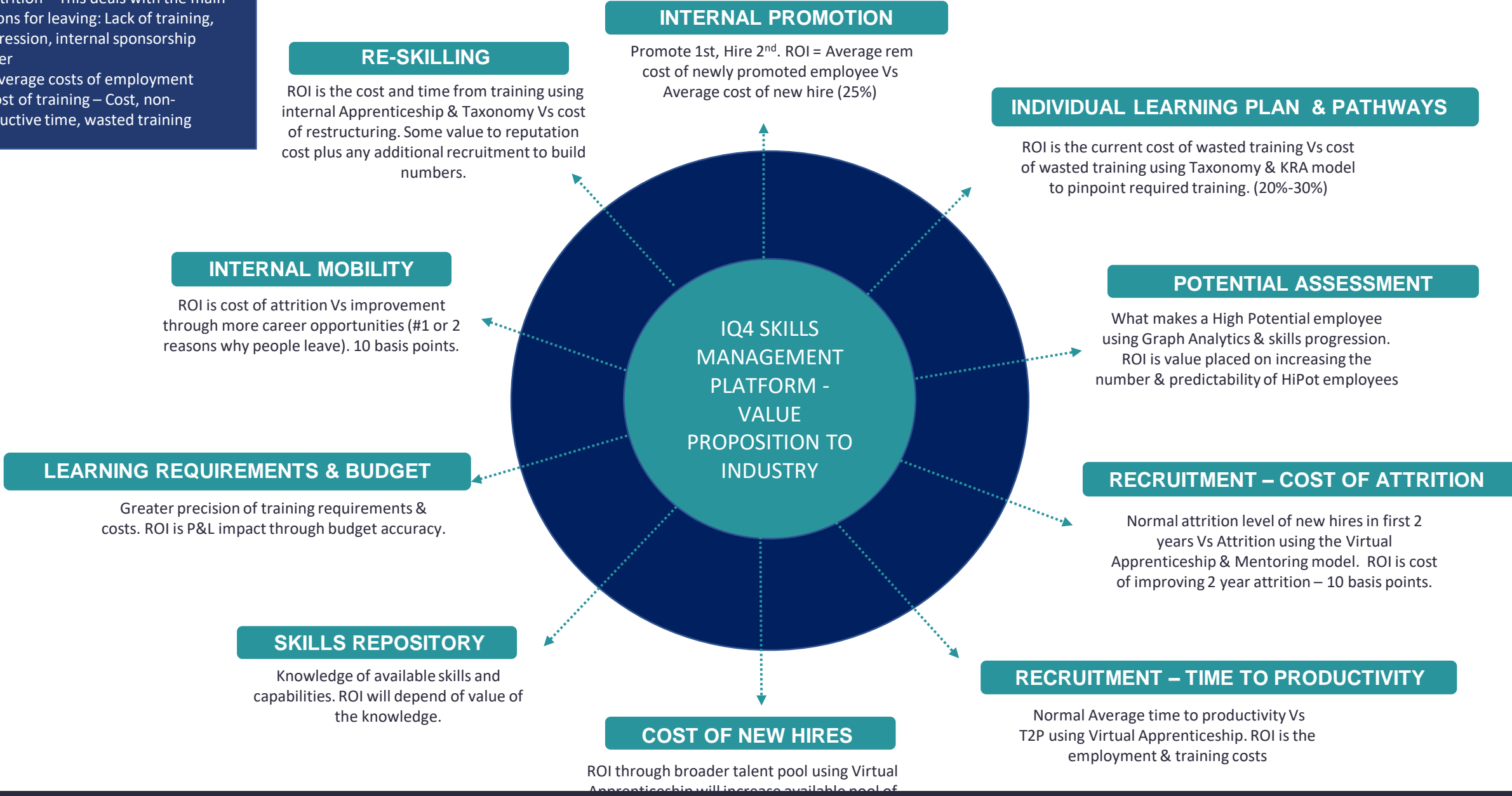
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Purpose
Integrating Business Objectives

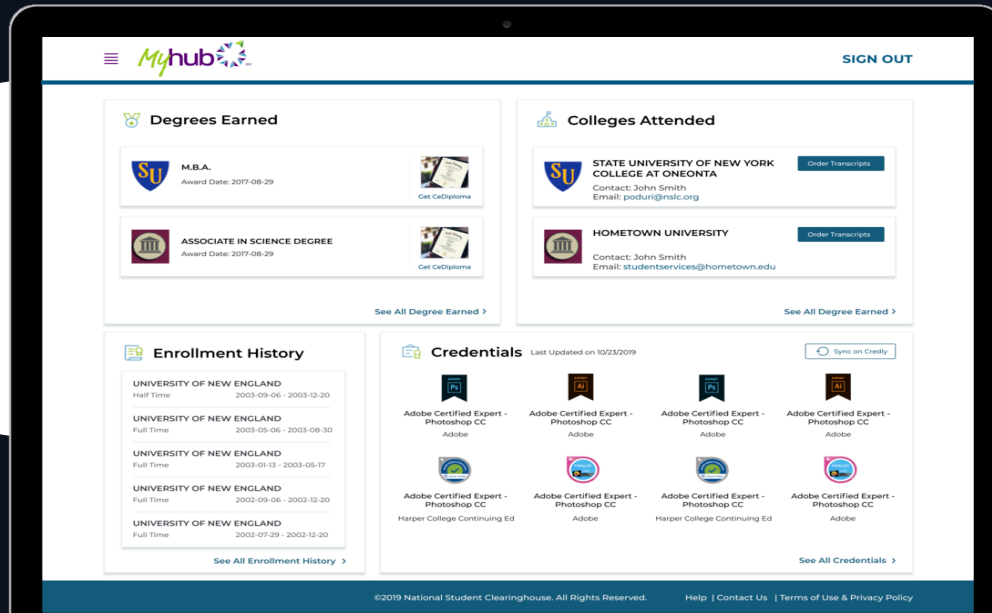
5

Key business metrics impacted will be:

- 1) Attrition – This deals with the main reasons for leaving: Lack of training, progression, internal sponsorship Career
- 2) Average costs of employment
- 3) Cost of training – Cost, non-productive time, wasted training



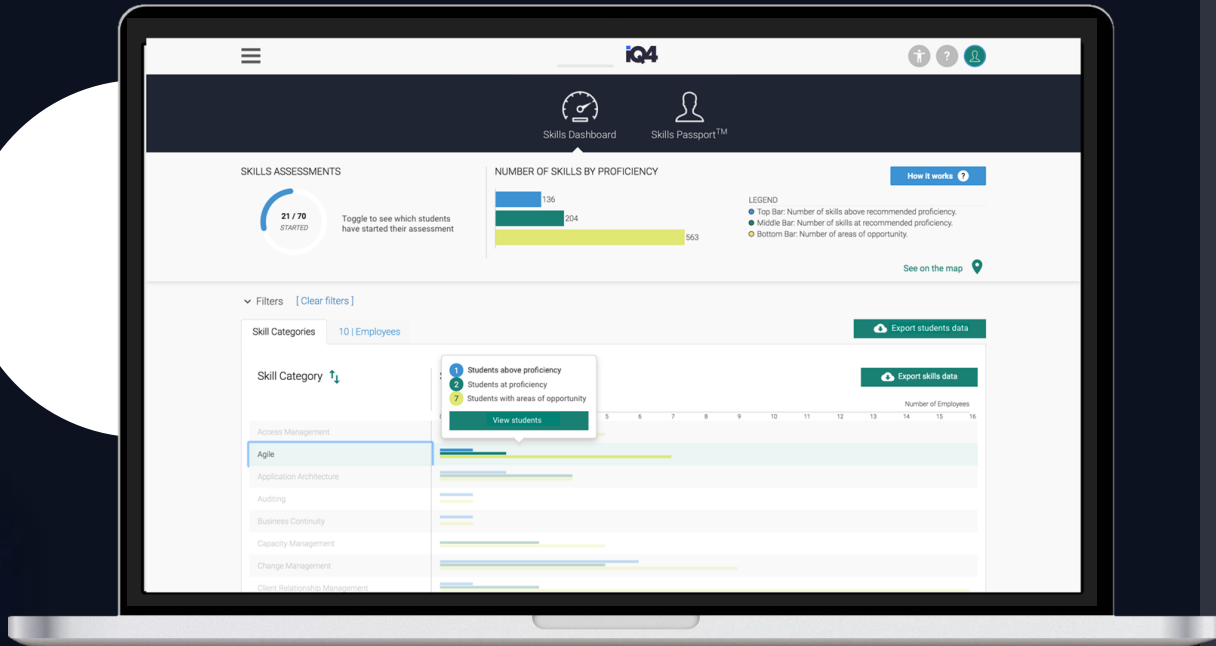
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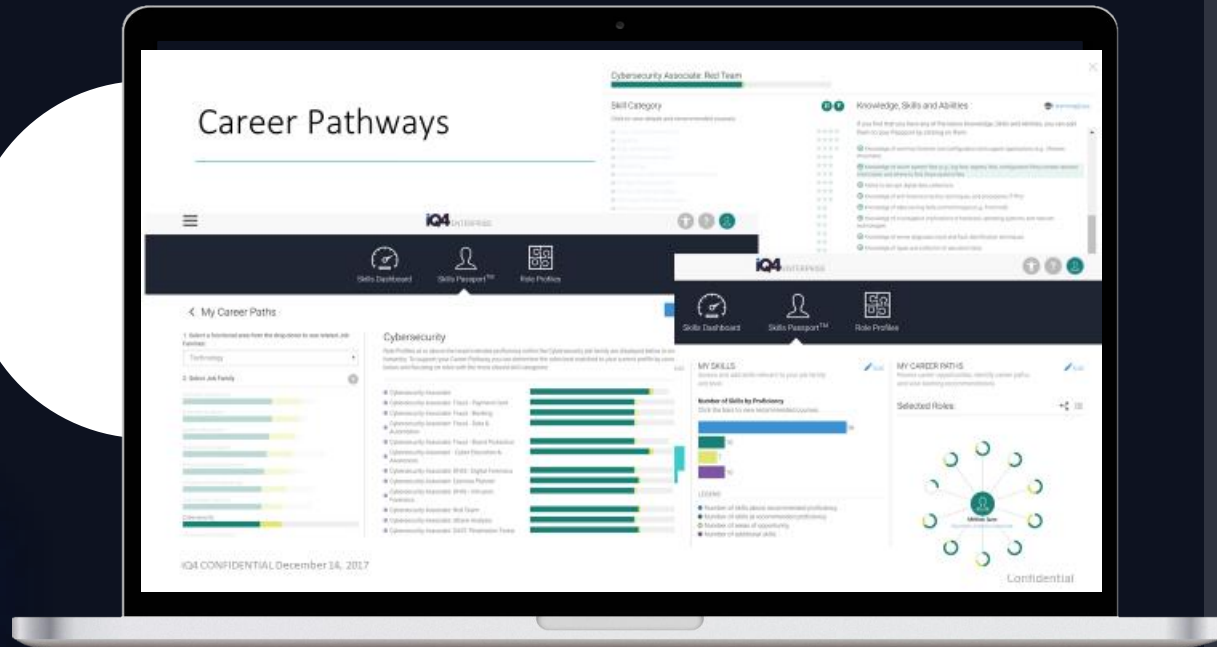
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ENTERPRISE PIPELINE DASHBOARD



Finding & Building talent

- An Analytics Pipeline Dashboard to discover talent, assess skills, identify skills gaps, recommended learning and development
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ENTERPRISE RE-SKILLING DASHBOARD



Internal Re-Skilling

- Learner dashboard to suggest courses leading to performance improvement, career pathways to retain talent and “T-Shaped” data visualization to speed use of the tool and effectiveness in user experience (Net Promoter Score-8)
- Analytics Dashboard to optimize supply and demand of skills to roles, leverage strengths for agile and gig economy, and support development to drive productivity.

Q & A



Workforce Transformation

Leveraging the NICE Framework to Build Effective
Cybersecurity Training

ABOUT US

CyberVista is a cybersecurity workforce development company.

Founded in 2016, CyberVista's mission is to build and strengthen organizations by providing cybersecurity professionals with the knowledge, skills, and abilities needed to drive growth and defense.



NICE Framework

Benefits

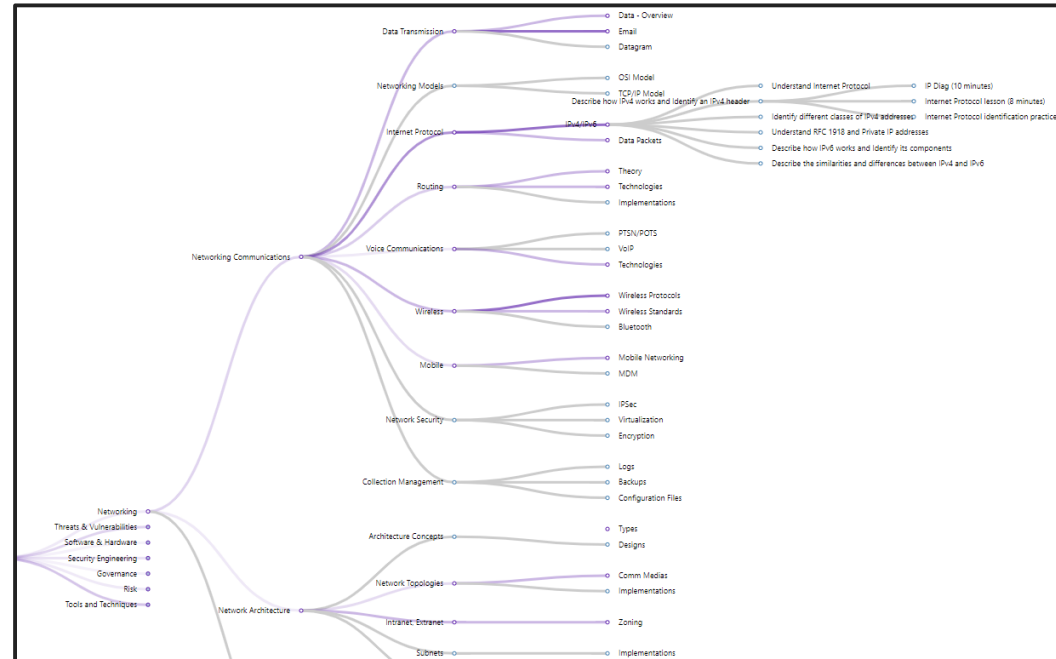
- Robust
 - Over 1,600 KSATs
 - 50+ Roles
- Good at helping define job descriptions or inventory roles

Limitations

- Unmanageable
 - Over 1,600 KSATs
 - 50+ Roles
- Doesn't provide bridge to upskill/provide effective or measurable training
- Some KSAT's are not well defined
 - K0015: Knowledge of computer algorithms

BREAKING IT DOWN

Taxonomy



Steps

- Define the common core of cyber domains
- Organize the content based on
 - Subject
 - Prerequisite / Dependency
 - Levels
- Create Learning Objectives
- Match against the NICE KSAT's

Subject	Section	Topic	Learning Objectives	NIST Knowledge	Knowledge of classification and control	Knowledge of both knowledge of client	Knowledge of how	Knowledge of	NIST Tasks							NIST Skills		NIST Abilities						
Risk	Security	Basic Concepts	CIA Triad, Roles and Responsibilities, Due Care / Due Diligence, GRC.	Knowledge of classification and control					T0001	T0003	T0072	T0264	T0466	T0550	T0163	S0034	S0152	A0006	A0056	A0111	A0115			
		Organizational Processes	Acquisitions/Mergers, Divestitures and Spinoffs.	Knowledge of organization, including						T0206	T0276	T0082	T0277	T0407			S0008	S0359	A0006	A0056	A0111	A0009		
	Risk Management / Assessment	Assessment Process	Prepare, Conduct, Communicate, Maintain	Prepare, Conduct, Communicate, Maintain	Knowledge of organization's risk					T0525	T0177	T0205	T0552	T0892	T0928	T0158	S0171		A0023	A0009	A0046	A0008		
			Frameworks	COSO, ITIL, COBIT, ISO 27002, NIST SP 800-30r1, CRANM, FRAP, OCTAVE, SOMAP, VARR	Knowledge of the Risk Management Framework						T0525	T0486						S0171		A0118	A0008	A0009		
		Types	Qualitative, Quantitative, Impact, Risk Determination, Mitigation Techniques	Qualitative, Quantitative, Impact, Risk Determination, Mitigation Techniques	Knowledge of management and mitigation strategies.						T0072	T0509						S0171		A0008	A0118	A0009		
			Training and Awareness	Controls, Training, Awareness, Policies	Controls, Training, Awareness, Policies	Knowledge of instructional design and					T0073	T0157						S0064	S0171	S0152	A0008	A0006	A0033	A0034
	BCP/DRP/COOP	Development	Project Scope / Plan, Team Selection, BIA, Documentation, etc.	Project Scope / Plan, Team Selection, BIA, Documentation, etc.	Knowledge of how to establish priorities for					T0196	T0002	T0044	T0051	T0070	T0092	T0109	S0326	S0032		A0068	A0019	A0098	A0034	
			BIA Concepts	Asset Identification, Impact Analysis, MTD, RPO, etc	Asset Identification, Impact Analysis, MTD, RPO, etc	Knowledge of continuity and disaster recovery continuity of					T0070	T0155	T0051	T0070	T0548			S0171	S0027	S0032	A0119	A0081	A0080	
		DRP Concepts	Natural Disasters, Recovery Sites, Fault Tolerance / Resiliency, etc.	Natural Disasters, Recovery Sites, Fault Tolerance / Resiliency, etc.	Knowledge of disaster recovery continuity of						T0051	T0070	T0548					S0032	S0171		A0081	A0098	A0085	A0080
			Testing	Read-Through, Walkthrough, Simulation, Parallel, Full-Interruption, Maintenance	Read-Through, Walkthrough, Simulation, Parallel, Full-Interruption, Maintenance	Knowledge of testing and evaluation methods					T0061	T0051	T0070	T0477				S0030	S0282		A0040	A0089		
Incident Response	Incident Management	Steps	Detection, Response, Mitigation, Reporting, Recovery, Remediation, Lessons Learned	Knowledge of crisis management protocols,					T0627	T0343	T0654	T0510	T0306			S0186	S0054		A0025	A0097	A0080			
		Roles/Techniques	Handling and Response, Triage Phase, Investigation, Containment, Analysis / Tracking, Recovery, etc.	Knowledge of technology integration						T0163	T0229	T0306					S0054	S0145	S0148	A0089	A0097	A0085	A0080	
	Compliance	Metrics / Reporting	SEIM, Technologies, Log Audits, Log Monitoring, etc	Knowledge of auditing and logging procedures						T0433	T0161	T0027					S0054	S0120		A0025	A0102	A0080		
		Laws / Regulations	Chain of custody, Investigations.	Knowledge of classification and control					T0087	T0523	T0923					S0047	S0068	S0133	A0033	A0094	A0113	A0080		

PUTTING IT INTO PRACTICE

Training Development

Our work allowed us to define seven critical knowledge areas required across all cybersecurity roles. This formed the basis to develop an assessment and training program designed to ensure that cybersecurity teams are proficient in foundational concepts and skills across those skill categories.

NETWORK
FUNDAMENTALS



THREATS &
ATTACKS



NETWORK
SECURITY



SECURITY
ENGINEERING



RISK MANAGEMENT
& GOVERNANCE



SECURITY
OPERATIONS



OFFENSIVE &
DEFENSIVE SCHEMA



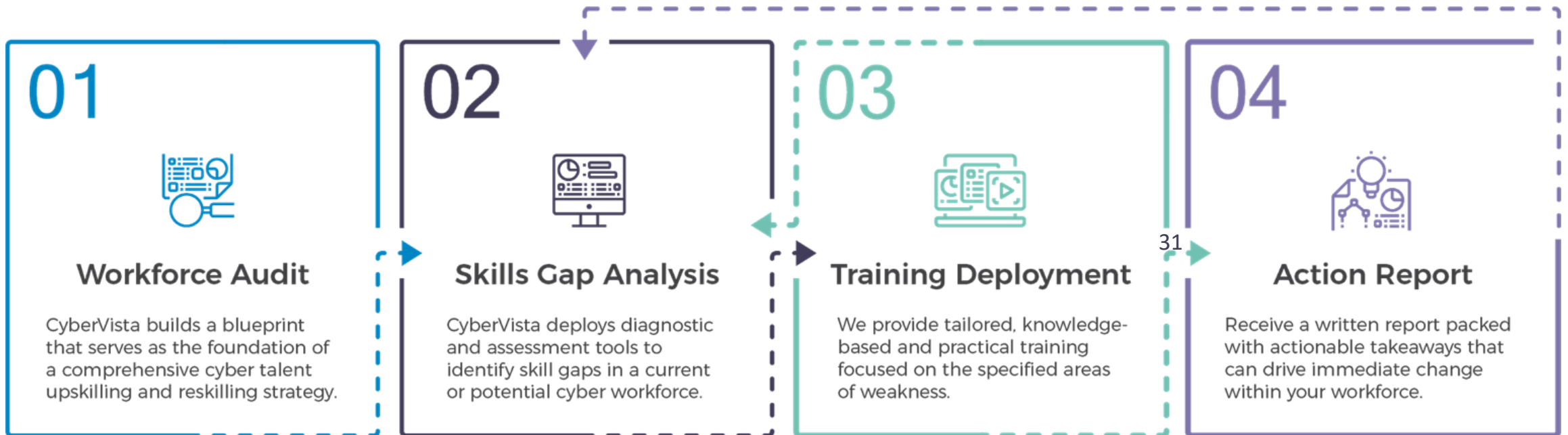
These knowledge and skill areas were selected and aligned directly to the [NICE Cybersecurity Workforce Framework \(NCWF\)](#).



HOW IT WORKS

Training Development

Every organization is different and has different goals. It's important to work with organizations to understand their objectives and build training initiatives around their unique situations.



Workforce Audit

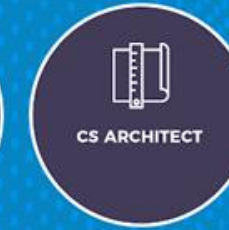
A Workforce Audit is an excellent entry point for organizations looking to determine what roles and skills your organization needs to achieve your goals.

SKILLS NEEDED:

Voice Communications
Mobile
Cloud Computing
Security
Languages / Coding
Network Components
Architectures

Vulnerability Analysis
Password Auditing
Exploitation Tools
Sniffing & Spoofing
Programming /
Development
Vulnerability Management

Advanced



Mid Level



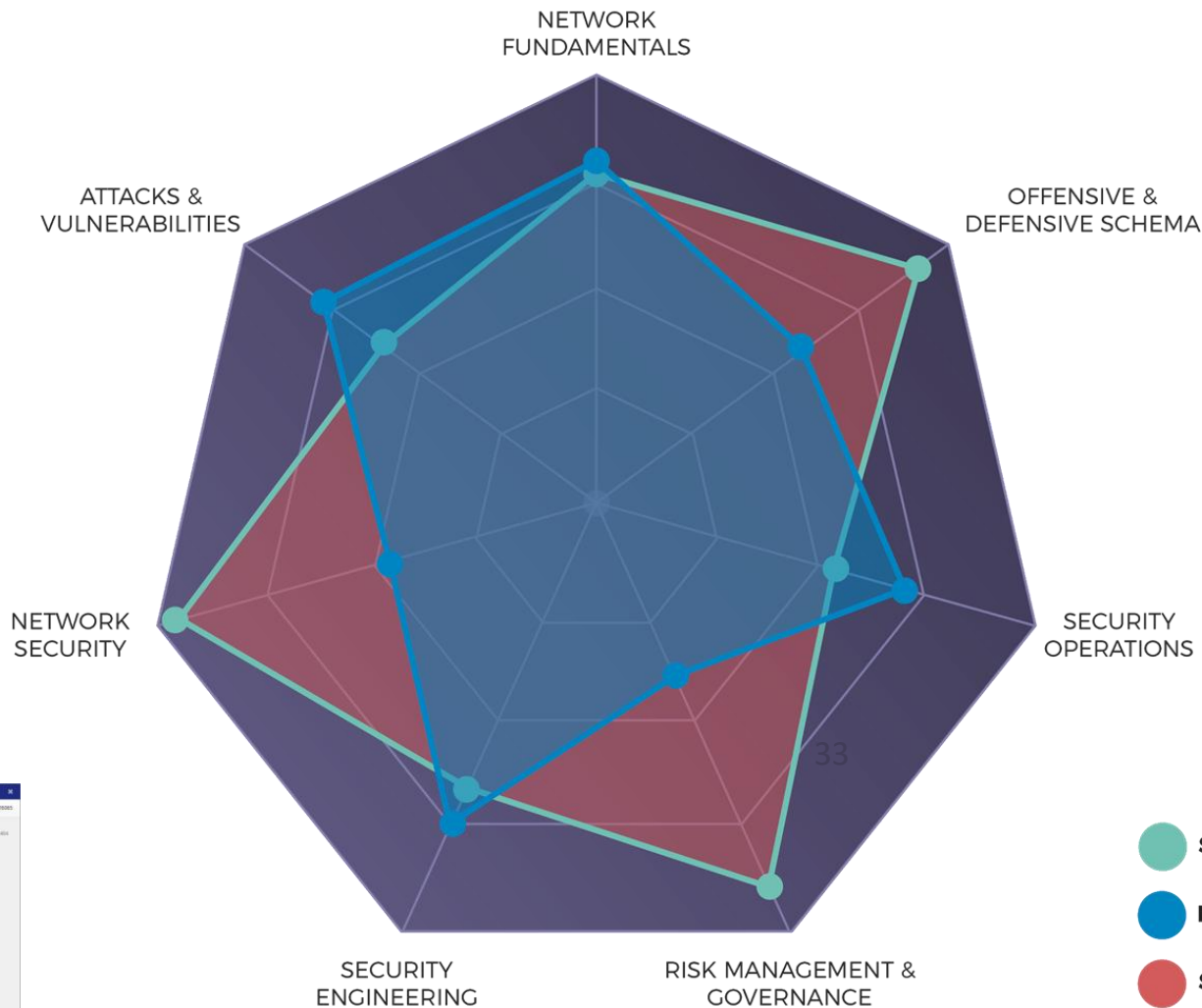
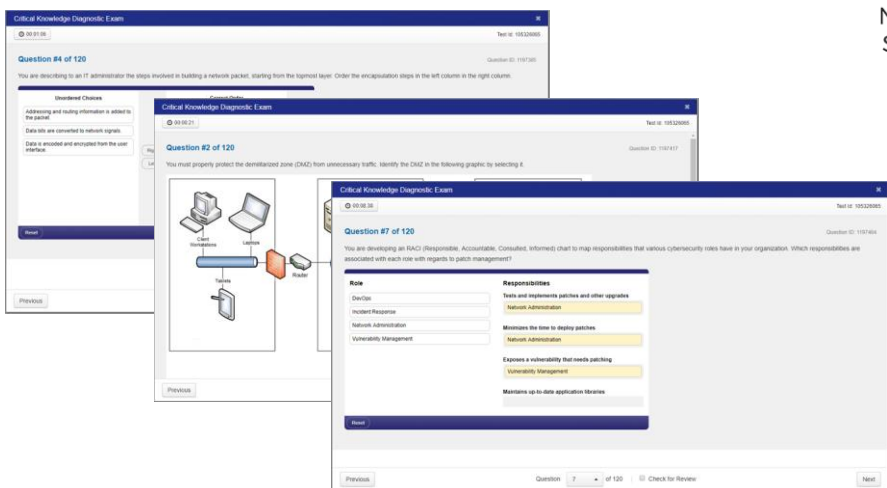
Entry Level



Skills Gap Analysis

As the saying goes, you can't improve what you don't measure.

Within the Skills Gap Analysis, participants complete a an efficient assessments to identify specific strengths and weaknesses.



- SOC Target Competency
- Practitioner Competency
- Skills Gaps

Training Deployment

Upskill, cross-skill, and reskill top talent.

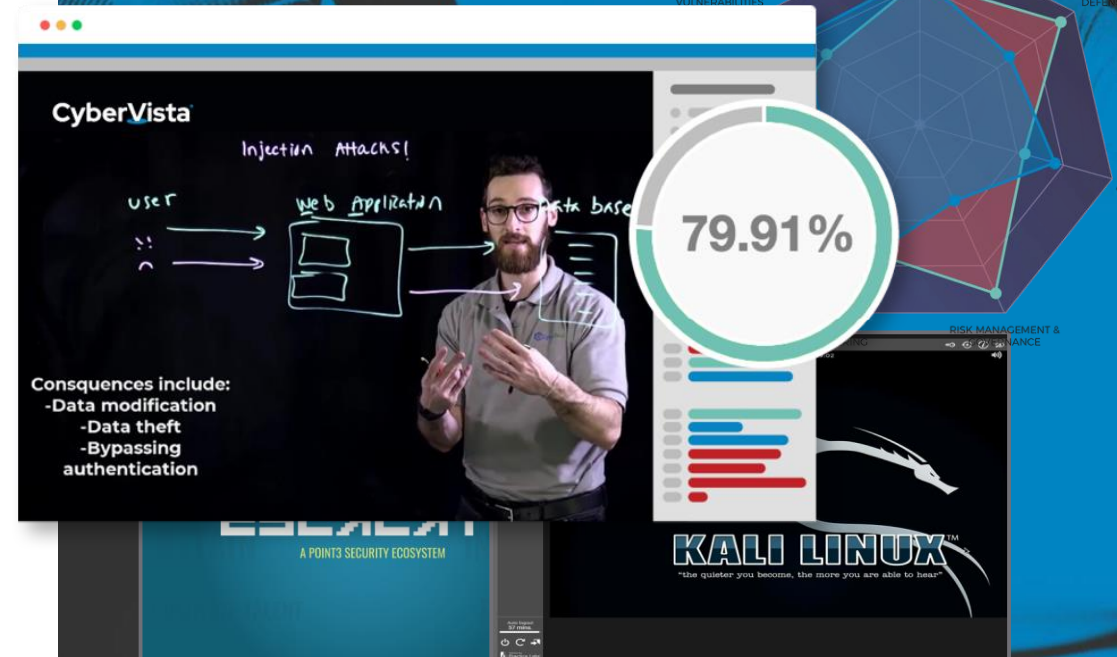
- Mitigate immediate weaknesses across fundamental cybersecurity knowledge and skill areas
- Efficiently improve knowledge, skills, and abilities within specific roles
- Bolster career pathways for long-term retention and employee satisfaction



Our detailed taxonomy is aligned to the National Cybersecurity Workforce Framework from the National Initiative for Cybersecurity Education (NICE) led by NIST..



Live Online availability
On-demand training
Practical Labs
Practice Assessments



Action Report

‘Where do we go from here’ is clear.

The action report phase includes a written report packed with actionable takeaways that can drive immediate change within your cybersecurity and cyber-enabled workforce.

- Initiative prioritization based on end-state knowledge, skills, and abilities
- Training recommendations for filling remaining skills gaps
- Organizational structure, role, and career pathing recommendations
- Talent hiring plan for future growth



IMPLEMENTING IN PRACTICE

Accelerating the Sales Cycle Through Cyber Training at **Palo Alto Networks**

Challenge:

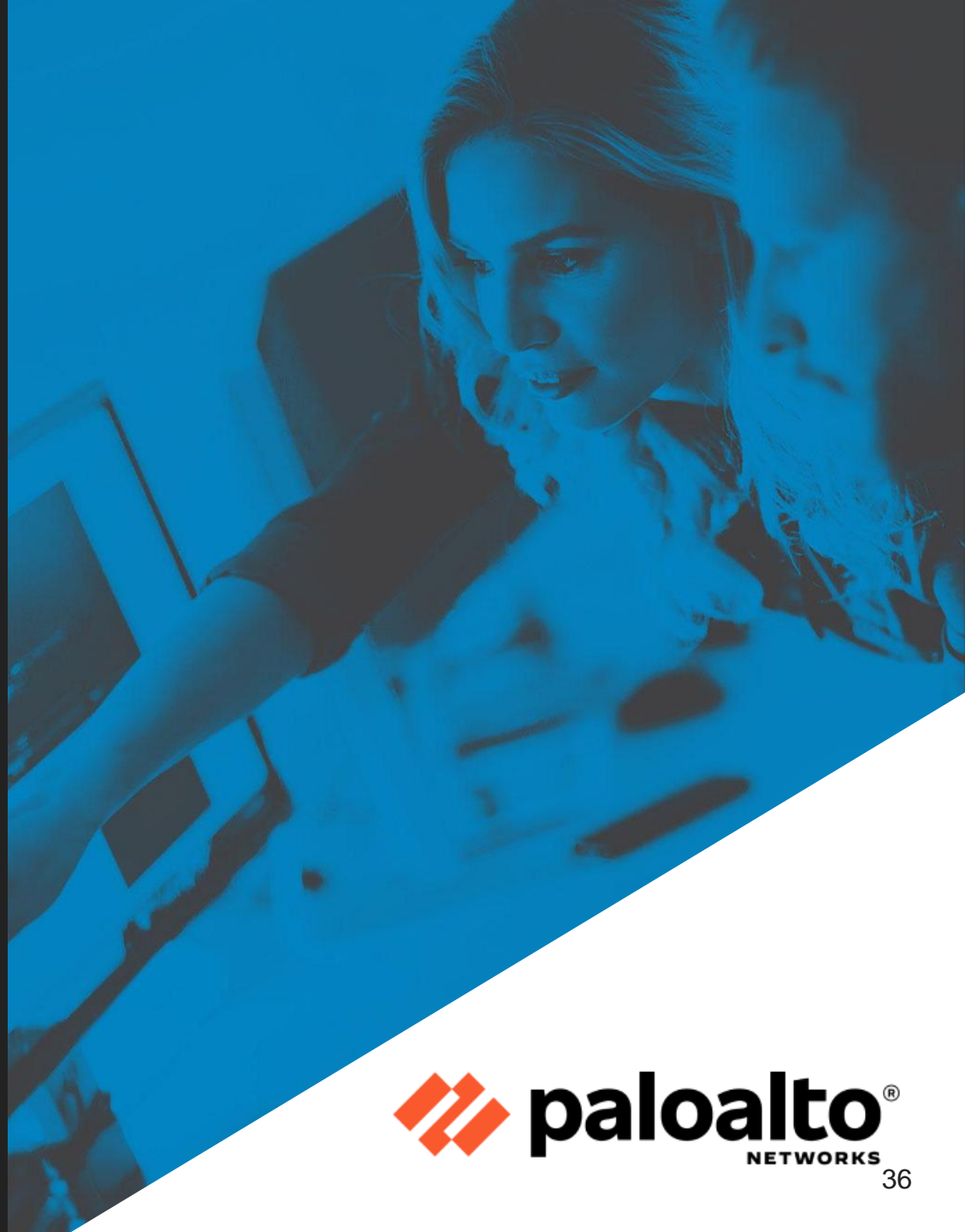
Palo Alto sought a comprehensive and fundamental training program to establish a base level of cybersecurity competency for their System Engineers (SE) team.

Applying Critical Knowledge:

CyberVista was able to deliver a **Top Performer Analysis (TPA)** to SE top performers so to inform PANW leadership of optimal content configuration. Once a knowledge baseline was established, the same diagnostic assessment was delivered to the rest of the SEs.

Results:

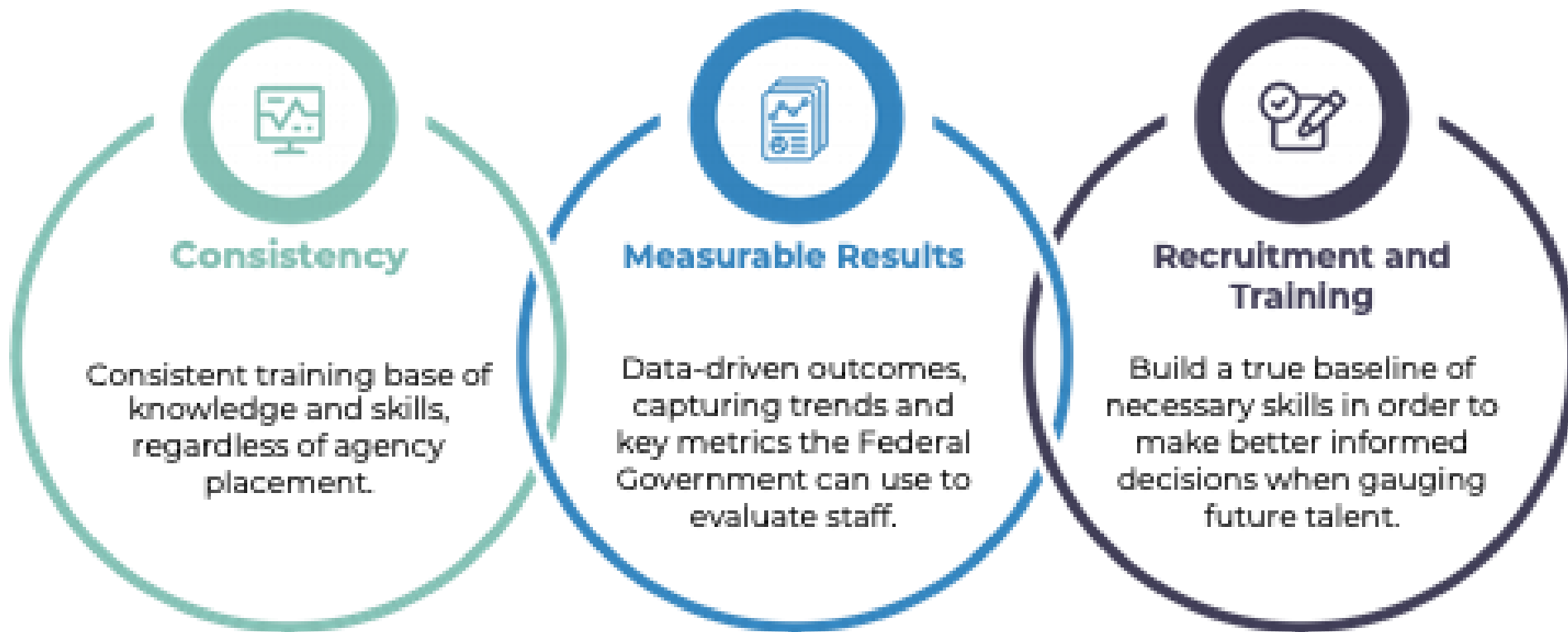
Over the course of eight weeks of live online instruction, the average score between the initial diagnostic exam versus the final completed at the end of the course, **increased by 15.9 percent.**



Cyber Talent Initiative

What we're looking to accomplish...

By mitigating immediate weaknesses and reducing ambiguity across fundamental cybersecurity knowledge and skills, we will provide an actionable solution to recruit and train a world-class cybersecurity workforce.



Contact Us



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Q & A

Thank You for Joining Us!

Upcoming Webinar: “The Role of the School Counselor in Promoting Cybersecurity Career Opportunities”

When: Wednesday, April 15, 2020 at 2:00pm EDT

Register: <https://nist-nice.adobeconnect.com/webinarapr2020/event/registration.html>

nist.gov/nice/webinars