



Measuring Skills at Work

Lessons from the Field

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Acronyms

ACRONYM	FULL TERM
AARTS	Army/American Council on Education Registry Transcript System
AHLA	American Hotel and Lodging Association
AI	Artificial Intelligence
AIR	American Institutes for Research
CAN	Chicago Apprenticeship Network
COOL	Credentialing Opportunities Online
COVID-19	Coronavirus Pandemic 2019
DOD	U.S. Department of Defense
DOL	U.S. Department of Labor
EMC	Engage My Career
ETJ	Electronic Training Jacket
HR	Human Resources
HRIS	Human Resource Information System
IBM	International Business Machines Corporation
JST	Joint Services Transcript
LMS	Learning Management System
NRF	National Retail Federation
O*NET	Occupational Information Network
OMB	U.S. Office of Management and Budget
ROI	Return on Investment
SHRM	Society for Human Resource Management
SMART	Sailor/Marine American Council on Education Registry Transcript
USCCF	U.S. Chamber of Commerce Foundation
USDS	U.S. Digital Services
USMAP	United Services Military Apprenticeship Program
VMET	Verification of Military Experience and Training

Introduction

“The new world of work is about skills, not necessarily degrees.”

—JP MORGAN CHASE CHAIRMAN & CEO, JAMIE DIMON

Business growth and success rely on having a workforce with the right skills, in the right place, and at the right time. Today’s dynamic and rapidly changing economy means that businesses are faced with a difficult task of continuously identifying the skills they need their employees to have to stay competitive today and in the future and of keeping pace with these needs. These demands are not always met by traditional approaches to recruiting, selecting, developing, and promoting employees, which tend to rely more on résumés, educational credentials, and networking-based methods. Traditional approaches may also fall short of supporting organizational goals related to diversity, equity, and inclusion. As a result, more employers are examining the specific skills employees possess to ensure they are able to meet the demands of the business rather than relying solely on educational credentials, which may not necessarily indicate the level of skill proficiency an individual can bring to the job. Recently, integrating skills-based practices into the human capital life cycle has emerged as a more agile means of supporting organizational workforce needs and goals than traditional résumé and educational credential-based methods. The most well-known of these changes has focused on recruiting and selecting job candidates, specifically identifying skills that are important for job success and eliminating degree requirements in the hiring process in favor of these more specific skill requirements. For example, in 2015 Ernst and Young announced they would be removing degree requirements from entry level jobs and instead using online assessments to measure applicant qualifications (Maurer, 2018).

Another critical step to the implementation of skills-based practices in organizations is to be able to measure and track the skills that employees are learning on the job. Regularly measuring employee skill acquisition can allow employers to have up-to-date information about the current skills of their workforce, which can be used in workforce planning to target upskilling and reskilling efforts and to identify future recruiting needs. Likewise, skill validation methods that link to a tracking system can provide employees with an accurate record of their skill acquisition and can allow employers to use this information as part of their performance management system (e.g., factoring into promotion and pay increase decisions), as well as their career and succession-planning processes. Therefore, a closer examination of the processes used to identify, validate, and track skills learned on the job is critical to ensuring employers have the correct resources to meet their demand and that employees can maximize their career potential.

Research Goal

This research, funded through a grant from Walmart, seeks to lay the groundwork for understanding the landscape of employer skill validation practices by conducting case studies with 10 employers. In addition, we sought to gain an overview of systems or tools that employers are using to facilitate the validation and tracking of skills learned on the job.

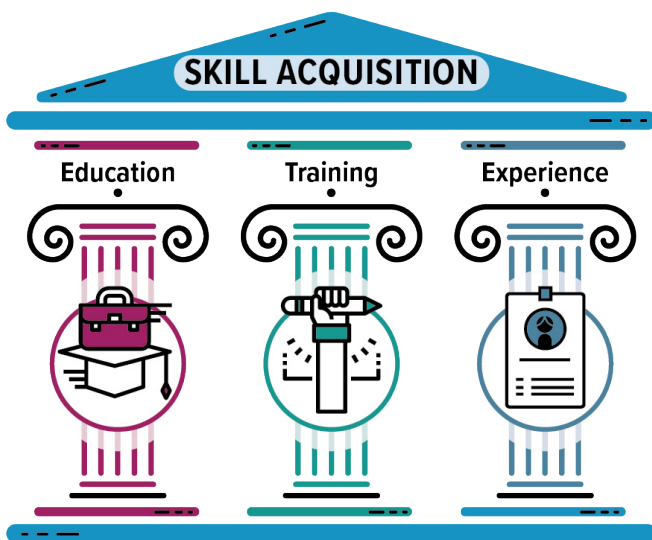
Skill Acquisition

Skill acquisition typically happens through education, training, and/or experience (Exhibit 1).

EDUCATION

Employers have a long history of relating educational credentials to job requirements. Inherent in this linkage is the idea that educational credentials provide employers with a reasonable degree of confidence that a candidate has a particular skill set. Skills-based practices present an opportunity to cast a wider net when identifying candidates or employees with particular skills than what is afforded through traditional educational credentials, both in the process of bringing candidates into an organization and once candidates are on the job. Skills-based practices also allow the employer to define, with a greater level of granularity (i.e., skills versus degree), what is needed to successfully perform the tasks associated with an occupation.

EXHIBIT 1. SKILL ACQUISITION METHODS



TRAINING

Completion of formal training, ranging from micro-learning sessions to longer learning programs, also provides an opportunity to measure skill acquisition. However, the definitions of skills and the levels of proficiency targeted in training programs tend to vary widely, making this an inconsistent process for determining exactly what skills an employee has acquired. Some credentialing organizations are helping to make sense of the wide array of opportunities by creating shared taxonomies, stackable credentials, and digital badges, which are gaining traction and becoming more recognized by employers.

EXPERIENCE

Through the course of daily work, employees have the opportunity to gain skills through work experience. This notion is generally supported by the practice of looking at work history to assess job candidates for their match to open job opportunities. However, beyond initial job candidate screenings, measuring or verifying the acquisition of skills once a person is on the job could further an organization's ability to accurately track workforce skills and allow employees to understand what they can be doing (outside of formal learning) to acquire skills needed for successful job performance.

Skill Validation Framework

As skills-based practices rise in popularity, additional opportunities to measure skill gains and gaps are emerging. To provide a framework for our research, we developed a notional model of the design attributes that would be included in a robust system of skill validation and tracking. **This model includes four primary design attributes:**

1. [Skill Identification](#)
2. [Skill Measurement](#)
3. [System Integration and Tracking](#)
4. [Skill Validation Benefits and Outcomes](#)

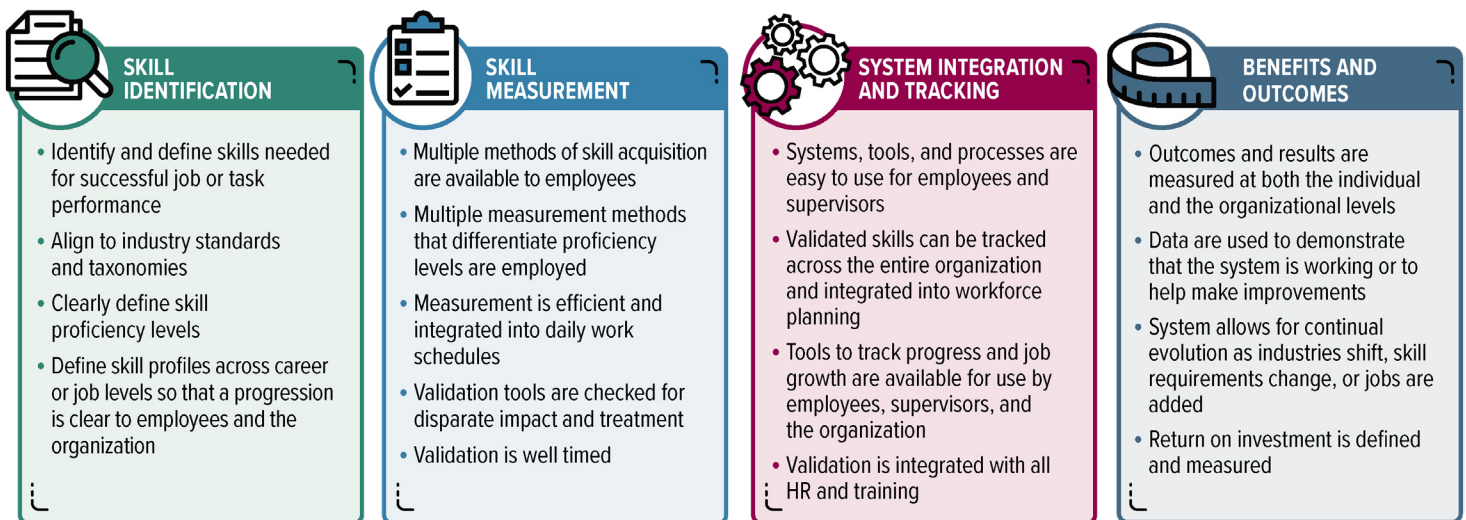
For each design attribute, we developed exemplar characteristics that we would expect to find in a fully mature model for validating skills (Exhibit 2).

Because of the emerging nature of validating skills learned on the job, we anticipated that we would find that organizations would be at different stages of development and implementation within each of the design attributes. Some organizations may be at the beginning stages of skill validation, and other organizations may have made significant inroads with some attributes but not with other attributes. For example, some organizations may have identified the skills that are important

for their current and future workforce and may have mapped those skills to career pathways but may not yet have robust methods for measuring and tracking employee skill proficiency levels. Yet, other organizations may have more robust or mature models in place. Given the variability within the organizations and how they are defining and implementing skill validation, we thought it was important to collect information and lessons learned at various stages along this continuum to serve as a resource for other organizations that are at similar stages of their skills validation journey.

In addition, some features cut across all four design attributes and can affect their success. For example, intentional communication related to skills validation processes is important for facilitating the successful implementation of a skills-based validation model, as it is with any new organizational intervention. In addition, the creation of a fostering climate is paramount to successful skill validation implementation. A fostering climate can increase buy-in to the process, ensure transparency regarding skill validation practices, and ensure that implementation is consistent within the organization. Therefore, we also gathered information about these features, focusing specifically on how they relate across the design attributes.

EXHIBIT 2. SKILL VALIDATION CHARACTERISTICS



Primary Findings

Overall, this research resulted key takeaways from each of the four areas in the skill validation framework:



SKILL IDENTIFICATION

Case study participants indicated that **identifying and defining skills is an essential starting point for skills-based practices that helps focus human capital investment on the most relevant and critical skills.** Several organizations reported using skills identification information to develop skill profiles and progression paths that facilitate internal mobility for employees and help prioritize new skills to acquire. A few organizations reported

using skills identification to increase external mobility, developing innovative solutions such as a “skills wallet,” or more holistic learning records that capture skills acquired through training, education and on the job experience. Organizations mentioned the utility of leveraging existing resources that can serve as building blocks—and customizing these using subject matter experts and survey data.



SKILL MEASUREMENT

Organizations surfaced diverse and innovative measurement practices, but also acknowledged that they are seeking to continue progressing in this area. Innovative practices included creating “gig” assignments (short term assignments that employees can take on in order to build skills) and the use of Artificial Intelligence to extract skill information from employee training, education and

experience profiles. The need for efficiency of measurement was also noted by employers and addressed by practices like integrating skill measurement into daily work, the use of rubrics for observational assessments, and the use of tablets for capturing and tracking skill acquisition as it occurs. Finally, measuring skills at various proficiency levels is an area where more investment is needed.



SYSTEMS INTEGRATION AND TRACKING

For skills validation practices to be adopted at scale and yield desired returns, their integration into an organizations' existing HR IT infrastructure is critical. Employers reported adopting digital credentialing technology (such as Badgr and Credly) to facilitate skill validation and tracking and, in some cases, improve skill portability. Several employers mentioned an integration step to make skills data more widely accessible

to both employers and employees, increase professional development and provide more accurate workforce planning information. Recognizing the importance of integration for skills validation scale up, tool providers such as Questionmark and Learn on Demand Systems are helping make the integration of skill validation into organizational systems more seamless.



SKILL VALIDATION BENEFITS AND OUTCOMES

Case study participants identified many benefits of skill validation for both employers and employees. Benefits and outcomes of skill validation to individual employees include the ability to track progress on skill development and identify better/new career options within or outside of their organization. Employers mentioned skill validation benefits such as providing an accurate assessment of the

current workforce's capabilities, facilitating future readiness and noting this can lead to greater employer resilience in the face of crises. Having a skill validation system can also be presented as a benefit when recruiting new talent by showing the career opportunities available. Finally, organizations mentioned using metrics such as retention, engagement, and promotion to measure the organizational benefits of skill validation programs.

The methodology and more specific findings in each area represented by the skill validation framework are detailed in the remainder of this report.

Methodology

Recruiting Goals

Our goal was to identify case study participants who were engaged in innovative practices related to skill validation. Ideally, we sought U.S.-based organizations from different types of industries (e.g., technology, retail, health care) that are making progress with skill validation practices related to skill identification, skill measurement, systems integration and tracking, and/or skill validation benefits and outcomes. Apprenticeship programs are one area that has a long history of built-in processes for measuring skills learned on the job. So, we sought to include apprenticeships in our study as a potential resource for best practices in measuring skills learned on the job.

In addition, because we recognize that implementing skill validation practices requires having the necessary tools and technologies in place for measurement and tracking, we also sought to identify a range of tool or system providers that offer technology that supports the skill validation process. In this regard, we looked for tool and system providers with offerings related to badging and credentialing, assessment administration, employee development, human resources (HR) information technology systems, and tracking. We used three mechanisms to identify and recruit potential participants: a review of the literature, social media analysis, and direct connections or intermediary recommendations.

DOMAINS OF INTEREST

1. Skill validation
2. Skills-based practices or systems
3. Skills-based tools
4. Work-based learning

Literature Review

To assess the landscape of skill validation practices among employers and identify potential case study participants, the American Institutes for Research (AIR) conducted a literature review focused on information from the past 5 years regarding skill validation and skills-based practices, systems, and tools, with a focus on work-based learning. This review involved conducting a total of 89 searches of public information (e.g., press releases), academic sources (e.g., peer-reviewed journals), and gray literature (e.g., marketing materials) for key terms related to skill validation and skills-based practices. Search queries were performed using combinations of key terms (e.g., “skill* validation” OR “skill* assessment”). Search terms receiving the highest number of relevant results included “talent pathway” (13), “skill* monitor*” OR “skill* tracking” (12), and “career pathway” (9). The 89 searches produced 118 results. Next, to analyze the relevance of each result to the current effort, the research team applied a rating system across several relevant domains (e.g., skill validation, work-based learning), resulting in 71 articles that were fully reviewed. The literature review findings helped identify about 30 potential case study and about 30 tool or system participants for potential inclusion in the study. The ratings provided insight on the level of relevance of the skills-based practice or tool or system to be studied, as well as ensured potential employers and tools or systems from results with the highest relevancy ratings were considered for inclusion. The literature output also provided a broad perspective on the current skill validation and skills-based practices being implemented by employers at large and was used to help create the protocol for interviewing case study participants. More detailed information about the literature review can be found in [Appendix A](#).

Social Media Analysis

We used social media analysis as an additional tool to supplement our literature review. First, we leveraged Meltwater—an online media-monitoring software—to identify organizational influencers, those organizations engaging in conversations about skills-based practices, and determine the frequency of influencers’ conversations during the March 2020 to January 2021 time frame. Meltwater is most effectively utilized when there is a large volume of information available for analysis. Of note, this software is not able to cull information from LinkedIn®. Using Meltwater, our digital and social media strategist found a lack of volume and authors participating in skills-based practices and skill validation conversations with which to conduct meaningful analysis. Therefore, we targeted LinkedIn® to manually review public information provided regarding skill validation and skills-based practices, systems, and tools.

We developed a tracking framework for LinkedIn® searches and results and then identified key word searches and a rating system based on the same domains utilized during the literature review. After conducting 195 LinkedIn® searches across five source types (i.e., posts, people, groups, companies, events), we reviewed 117 results. The majority of these results generated information that fell within the skills-based practices or systems domain (79 total) or the work-based learning domain (59 total). From there, we identified about 30 unique case study participants and about 10 unique tool or system participants that were not gathered through the literature review. As a final step, we posted an invitation to participate in the study on LinkedIn®, with the hope of capturing any organizations that are validating skills learned on the job that did not emerge in our literature review or social media searches.

Intermediaries

To further develop our list of potential participants, we sought out intermediary organizations to help us identify employers and tool providers that were engaged in skill validation. We sought assistance from foundations (e.g., U.S. Chamber of Commerce Foundation [USCCF]), National Retail Federation (NRF) Foundation’s RISE Up program, nonprofit organizations (e.g., Brookings), professional associations (e.g., American Hotel and Lodging Association [AHLA]), Society for Human Resource Management (SHRM), and researchers at universities (e.g., University of Kentucky, The George Washington University, Northeastern University). In total, we spoke with about 20 intermediary organizations, leading to the identification of additional employers and tools, as well as verification that some organizations we had already identified were important potential contributors. Several intermediaries identified their own tools and processes to provide support related to skill acquisition and tracking, which are also noted in this report.

“A lot of companies have bought into using skills for training and assessment, but many are just getting into it.”

—CASE STUDY PARTICIPANT

Case Studies

Based on our literature review, social media analysis, and intermediary contacts, we identified more than 75 employers as potential case study participants. We then prioritized the potential participants, based on the extent to which we had knowledge that they were engaged in skill validation practices and on our ability to leverage our network to connect with organizational decision makers. This initial participant recruitment list combined with our intermediary conversations led to a total of 34 employer recruiting reach-outs. This overall recruiting process resulted in 10 employers of various sizes and across a range of industries agreeing to participate in the case study interviews (Exhibit 3).

Across our literature review, social media analysis, and intermediary contacts we identified more than 50 tools or systems for potential inclusion in the study. We then prioritized the tool and system providers based on the extent to which we had knowledge that they were engaged in skill validation practices and with the goal of representing different aspects of skill validation, resulting in 15 tools or systems that we sought to learn more about for this study. A total of 7 tool or system providers agreed to participate in the study. The tools and systems represented a range of tool and system types, with different types of content, tracking features, and assessment tools.

EXHIBIT 3. CASE STUDY PARTICIPANTS

PARTICIPANTS	DESCRIPTION (AND WEBLINK)
ACCENTURE APPRENTICESHIP*	Consulting and processing services
AON APPRENTICESHIP*	Professional services
CAREERWISE	Professional training and coaching
COMCAST	Telecommunications mass media entertainment
U.S. DEPARTMENT OF DEFENSE/NAVY CREDENTIALS PROGRAM	Government agency/Defense
DUKE ENERGY	Electric power and natural gas holding
IBM	Computer hardware
PAX8	Information technology and services
PETSMART	Retail
U.S. OFFICE OF MANAGEMENT AND BUDGET (OMB)	Government agency

Note: Accenture and Aon’s apprenticeships are affiliated with the Chicago Apprentice Network (CAN), which was cofounded by the two organizations. Although there is a relationship between the company members of the CAN, the program is tailored to meet the individual needs of each organization, so they are featured here separately.

For both the employers and tool and system providers, we asked organizations to participate in a 1-hour interview. We reviewed relevant publicly available documents in preparation for each interview and tailored interview protocols to ensure depth of coverage in each area of our skill validation model. Although each protocol varied, the employer interviews included gathering information about programs, the target audience, specifics of skill validation methods and outcomes, and information about tools or systems that have been helpful in implementation. For the tool and system providers, the protocols focused on an overview of the tool or system, potential audiences, and specifics tool or

system features, such as how skills are validated and tracked. In addition, for some interviews, we had follow-up communications with additional organizational representatives to clarify specifics regarding skill validation, and participants often provided supplemental materials for us to review. Each interview was conducted by a senior researcher and supported by a second senior researcher and two notetakers. Individual case study information for employers can be found in [Appendix B](#), and information for tool and system providers can be found in [Appendix C](#). Information from each case study was coded into the design attribute categories and is synthesized in the following sections.

TOOLS OR SYSTEMS

Badgr (Concentric Sky)

Credly

Learn on Demand Systems

COOL/MilGears

USMAP

PAIRIN

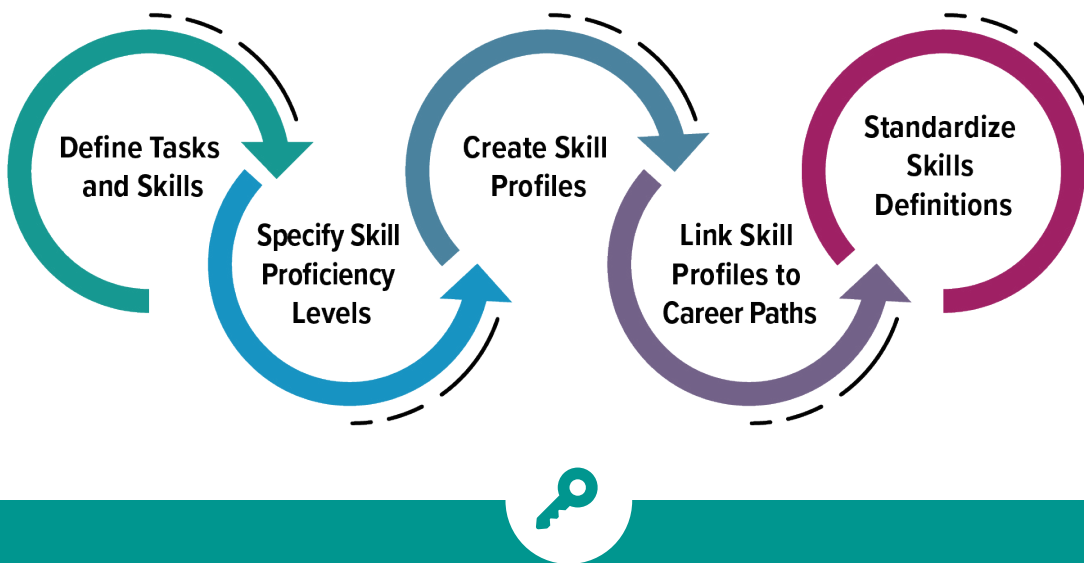
Questionmark

Skill Identification

Accurately identifying and defining the skills needed to successfully perform job tasks is critical because skills definitions are the foundation for all human capital efforts (Brannick & Levine, 2002). Skills definitions used to ensure hiring, development, performance management, and career planning all target the correct aspects of the job. They set the stage for business success by improving the odds that businesses will be more readily able to identify the right people with the right skills at the right time.

Skill identification ideally begins with an employer defining the critical tasks and the job-relevant skills associated with those tasks (Exhibit 4). The employer will also specify the proficiency levels associated with the skills to ensure learning can be provided at the appropriate level. These two elements can then be combined to create the skill profiles associated with each occupation. Ideally, employers will also stack or link skill profiles into career paths and/or career lattices. This section describes insights from organizations' practices across these aspects.

EXHIBIT 4. ACTIVITIES TO OPTIMIZE SKILL IDENTIFICATION



KEY SKILL IDENTIFICATION TAKEAWAYS

- Employer organizations emphasized the importance of identifying skills as a starting point.
- Most employers use skill definitions **and** their associated proficiency levels to create skill profiles for the target occupations within their organization.
- Creating standardized occupational skill profiles that allow for these profiles to be easily transferable across organizations is an area for development that should be prioritized.

Define Job-Relevant Tasks and Skills

Ideally, a job analysis is conducted to **define essential tasks for the jobs and the skills (or competencies) needed for those tasks**. **IBM**, **Pax8**, and **OMB** are examples of organizations that begin by identifying the tasks performed on the job and then determining what skills are directly aligned to these job tasks. **PetSmart** similarly defines what its associates should be demonstrating on the job, identifies the skills needed to perform those roles, and determines how best to develop those skills. **Creating this task-to-skill linkage ensures that the most relevant and critical skills are the focus of any human capital functions** (e.g., hiring, learning, and development). **Duke Energy** has leadership imperatives (groups of skills and behaviors for three levels across the enterprise, from individual contributors to senior leaders) that they created in house and use within their Duke Energy Leadership Academy. They socialized these leadership imperatives enterprise-wide to increase buy-in.

Organizations that are identifying their own skills can **benefit from using existing frameworks as a starting point but are well advised to use additional data sources to tailor the frameworks to their organizational needs**. In several industries, industry-defined skills or standards may already be available. Examples of these occupations include health care, manufacturing, information technology, cybersecurity, financial services, and construction. Organizations such as **CareerWise** and **Pax8** mentioned leveraging these standards where applicable. The **USCCF** uses existing competency frameworks and job descriptions and supplements them with subject matter expert conversations and surveys when working with organizations and industries to establish skill profiles. This information is used to right-size hiring requirements and communicate where there are similarities as well as where differentiation in skills requirements is needed.

Organizations can also **leverage existing information and then tailor it to their organization**. One example of existing information that organizations can leverage is the Occupational Information Network (O*NET) online database, which is a source of occupational information developed under sponsorship of the U.S. Department of Labor (DOL) Employment Training Administration. The **U.S. Department of Defense (DoD)** uses this information as a starting point and then tailors the information to define the skills needed for **DoD** occupations. It also aligns skills needed in civilian occupations with those acquired in **DoD** occupations to assist Service members in transitioning from military duty to the civilian workforce. The **NRF Foundation** has also coordinated with the DOL to determine how best to define skills, specifically customer service and sales skills, across targeted occupations. In all of these instances, the organizations looked to leverage existing skill information and then tailored the information as needed to their organization.

From an apprenticeship perspective, **accurately defining the skills needed can benefit the students within an apprenticeship program as well as the employer**. For example, through their apprenticeship programs, both **Aon** and **Accenture** have been able to determine which tasks and related skills are best suited to the students within those programs. And by doing this, they have been able to determine which tasks (and subsequent skills) are better suited to apprentices versus entry-level employees who are not part of the apprenticeship program, thereby maximizing the work experiences of both the students and the entry-level employees.



IBM Skill Identification

IBM uses practitioners to establish skill rubrics that define what is needed for a job or task (both current job as well as jobs for the future). These rubrics also identify the proficiency levels needed for the skills across career levels. IBM has also begun using artificial intelligence (AI) to assist in identifying skill information

that individuals possess. IBM is also working toward and is promoting the concept of skills standardization that would allow a common language to be used by employees (e.g., a skills wallet) to communicate the skills and associated credentials they possess.

Specify Skill Proficiency Levels

In addition to defining the skills needed for an occupation, it is important to **specify the proficiency level** (e.g., basic, intermediate, expert) needed for each skill within an occupation. Specifying the skill proficiency level **allows employers to differentiate what developmental opportunities are needed to assist employees in addressing skill gaps at each career level**. For example, **IBM** uses a rubric to assess the proficiency needed on each skill at every career level. **PetSmart** articulated how different skill proficiencies are needed by the pet groomers as they advance in their careers and the pet groomers need to increase their skill proficiencies before they are allowed to work independently. The training provided to the pet groomers is therefore linked to the specific skill proficiency levels needed, which allows for the pet groomers to increase their proficiency on the required skills. The **DoD** leverages proficiency-level information within the O*NET structure to determine the proficiency levels associated with the experiences and training completed while in the military, which can then be translated to demonstrate proficiency while service members are transitioning to the civilian workforce. Vendors who support skills assessment, such as **PAIRIN**, use skill proficiency levels within their assessments to determine where individuals are relative to the target proficiency range desired by the employers.

Create Skill Profiles

Skill profiles that define both the skills and their respective proficiency levels needed across career levels within an occupation can be **used to establish career progression options** (e.g., career ladders or lattices). Employees can use this information to **identify developmental opportunities associated with the skills they want or need to attain**. For example, **CareerWise** has career path information for the target occupations within its apprenticeship program that individuals can follow. The training **CareerWise** offers aligns with the skills that major companies have deemed important for specific roles and positions. **Pax8** also has progression paths linked to skill profiles that have been created to help employees understand the requirements and learning credentials needed to move up a level within an occupation. The information contained within these progression paths (i.e., defined skills and skill profiles) also allows for employees to make lateral moves across occupations because they are able to examine their current skill set in comparison to the skills and proficiency levels needed within other occupations. **IBM** similarly uses skills rubrics, which have been vetted by practitioners, to establish career pathways for employees. Employers that are proactive about addressing the rapid churn in skills needed also think about linking skill profiles across occupations to help their employees reskill to new jobs as needed. Having skill profiles linked across occupations allows for the creation of career lattices that encourage not only vertical progression but also horizontal and lateral progression.



Summary of Skill Identification Findings

A consistent message that was emphasized across all organizations we interviewed is the importance of identifying skills as a starting point. The organizations viewed identifying skills as critical to ensuring that hiring, learning, and career development are focused on the critical aspects of the targeted occupations. Most interviewees mentioned using these skill definitions and their associated proficiency levels to create the skill profiles for the target occupations within each organization. The tool vendors corroborated the importance of skills identification and described how their assessments assist in the validation of skill needs.

Our case study interviews suggest that an important stretch goal to pursue is to develop and promote **skill standardization that allows employers to speak the same language with respect to similar occupations.** Although most organizations agreed that skill standardization would support the transportability of skills across organizations (i.e., trusting that developmental opportunities associated with a skill have a uniform or standardized meaning), very few organizations mentioned being able to take this on because their focus is still on ensuring the skill definitions

are standardized *within* their organization. Intermediary organizations serving multiple organizations or industries can play a valuable role. For example, the **USCCF** concertedly brings together frameworks, job descriptions, and subject matter expert and practitioner expertise from multiple organizations to define the skills associated with a targeted occupation. By gathering this information across multiple organizations, the skill profiles developed apply more broadly across an occupation versus being applicable to only a single organization. This ability to standardize skill definitions in a manner that applies across organizations can increase the portability of skills across employers in a way that can benefit both employees (i.e., enhance job mobility and advancement opportunities across different employers) and employers (i.e., increased speed and confidence in interpreting skills brought in by an individual coming from a different employer). **IBM** also mentioned that its Learning Credential Network is based on skills and associated developmental opportunities (primarily technology-based skills) that **allow employees to bring a “skills wallet” with them to other organizations** to describe what they have attained throughout their career.

Skill Measurement

Skill acquisition can be measured through a variety of methods, including training completion; pre- and post-knowledge tests (typically multiple choice or fill in the blank); supervisor, manager, and trainer observations that use scoring rubrics; by meeting criteria set forth for the issuance of credentials, which may also involve underlying assessment types; and performance assessments or simulations. Across these methods, **it is desirable to incorporate multiple methods of skill acquisition** (e.g., training, education, experience) and to use a

variety of assessment types to increase the likelihood of accurately verifying the acquisition of a skill. In addition, skill measurement ideally tells an organization the **level of proficiency** that a person has within a particular skill. Finally, measurement should ideally be **integrated into daily work schedules** to minimize burden and expenses. Finally, any measurement or assessment should be **evaluated to reduce disparate impact and treatment** and timed at appropriate junctures of skill development for each employee.



KEY SKILL MEASUREMENT TAKEAWAYS

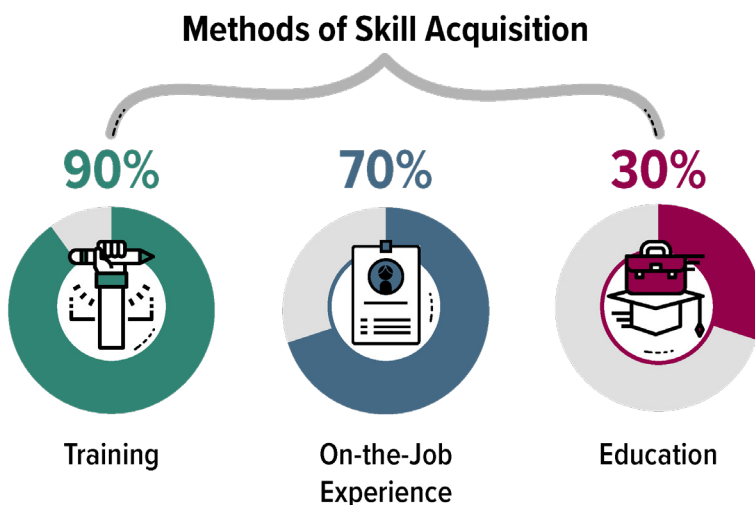
- **METHODS OF SKILL ACQUISITION**
Many of the employers use a variety of methods of skill acquisition, but skill acquisition through education was the least cited, which may indicate a need to more directly link educational offerings to skill frameworks.
- **ASSESSMENT FREQUENCY**
Frequent assessments based on work performance are highly leveraged among the apprenticeship programs and could be a practice that helps employers measure skills in a way that is more integrated into daily work activities.
- **INTEGRATION OF ASSESSMENT INTO DAILY WORK SCHEDULES**
Some employers have developed methods for integrating assessments in ways that do not take employees away from their day-to-day work.
- **METHODS OF MEASUREMENT**
Supervisor or manager observations with the use of assessment rubrics are among the most common measurement methods.
- **PROFICIENCY LEVELS**
More information is needed about efforts to measure different proficiency levels and how any disparate impacts and treatment in the assessment process are being mitigated.

Multiple Skill Acquisition Methods Are Available to Employees

Overall, 90% of participants mentioned employee access to training for skill acquisition; 70% have systems that account for skills acquired through on-the-job experience;¹ and 30% offer access to education or credit for prior education, with respect to skill measurement (Exhibit 5).

Two case study participants described a **robust ability to capture and track skills** acquired through training, education, and experience. At **IBM**, skills can be accounted for through a variety of means, such as past job experience, an external credential achieved, training (in person, virtual, lab), current project work, or from the award of patents. The **DoD/Navy** recently launched a platform called MilGears, which enables Service members and Veterans to capture all the skills acquired through training, education, and on-the-job experience via a Learning and Experience Record that encompasses their entire military career. In addition, the **skills have been linked to the O*NET framework**, which provides a framework of skills that link to jobs across the U.S. economy.

EXHIBIT 5. SKILL ACQUISITION TECHNIQUES



Across organizations a wide variety of training and skill acquisition methods are employed.

- **Comcast** offers a range of training through online programs and formal learning through classrooms, as well as learning curated by the organization.
- **Pax8** incorporates blended learning—live trainings, observations, and courses—through its learning management system (LMS; 80% or above required for credit), shadowing and reverse shadowing, and role-playing for sales and technology positions.
- **NRF Foundation’s** RISE Up program offers skill acquisition for the retail industry through three training and credential opportunities (retail industry fundamentals, customer service and sales, and business of retail), which are taken either online or in a classroom.
- At **PetSmart** associates learn the skills through e-learning modules, as well as manager coaching, and pet groomer apprentices attend classroom training with District Academy trainers.
- One of the more innovative practices that we heard about was at **Duke Energy**, where **employees can take on “gig” assignments to gain skills in new areas**. At the conclusion of the gig assignment, managers assess skill attainment and provide feedback.

¹ Note, the on-the-job experience may be over-represented due to the inclusion of many apprenticeship programs.

Multiple Measurement Methods That Differentiate Proficiency Levels

Case study participants identified a wide variety of methods for measuring skills. The apprenticeship programs that we spoke with tend to use **supervisory assessments** of on-the-job performance, with feedback provided to program participants at more frequent intervals than with a typical annual performance review. For example, **PetSmart** incorporates regular **observational assessments** into its Pet Grooming Program, with a focus on achieving a 100% pass rate on all aspects of the assessments, to align with its strong safety culture. **Accenture's** apprenticeship program utilizes **rubrics to assess apprentice performance** on a quarterly basis.

Case study participants also noted a range of additional assessment types. For example, **IBM's** credentials incorporate multiple quizzes and assessments throughout the training, as well as a final badging assessment, and all individuals are assessed against a rubric to ensure they demonstrate enough evidence that they possess the skill of interest. **Comcast** plans to implement a pilot study that will incorporate **pre-training assessments to assess gaps and post-training assessments to gauge reduction in gaps**. **Duke Energy** is currently using pre-and post-assessments, as well as manager feedback and manager assessments of skill attainment.

NRF Foundation and **Learn on Demand Systems** both mentioned incorporating **pass/fail criteria based on desired proficiency levels** for their assessments. However, overall, we did not glean a lot of information related to measuring skills at various proficiency levels through the case studies. Additional information in this area could be helpful, especially in linking skill assessment to career progression.



ACCENTURE'S APPRENTICESHIP PROGRAM includes a number of key features

- Training during onboarding (e.g., client-facing email etiquette)
- Formal documented feedback on a quarterly basis (vs. annual for other employees)
- A buddy/mentor system (i.e., previous apprentices)
- Skills tracking through assessments

Efficient Measurement, Integrated into Daily Work

Several organizations reported methods of **measuring skills through the course of daily work activities**. For example, **Pax8** uses a technique where manager or team leads listen to employee sales calls and use a standardized scoring rubric to score performance and then use the results to conduct a coaching session after the call. **PetSmart** assesses distribution center skills (e.g., forklift operation) and safety using observational assessments administered via a tablet that both the supervisor and employee log into and where performance scores are provided. **Questionmark** is one tool provider that has a **software interface that supports tablet-based assessments that include observational checklists, performance items, and knowledge assessments**. In addition, **IBM** uses AI for skill extraction from résumés, jobs, academic degrees, and credentials.

Timing of Validation

Employers reported a range of timing for measurement of skills. For **Accenture's** apprenticeship program, **quarterly feedback** is provided (versus annual for other employees) and there is a validation of the skills acquired that occurs at the completion of the program as well. For the United Services Military Apprenticeship Program (USMAP), participants have an online **working log that must be completed on a monthly basis until all hours of the trade are logged**. At **PetSmart**, the work of apprentice groomers is validated in real time until the apprenticeships are complete and groomers are able to work independently. **CareerWise** conducts apprentice performance evaluations every 6 months.

IBM has created a culture and expectations that encourage continuous learning and skill building, and all of its available training has integrated measurement. Assessments occur throughout the training and at the end of credential attainment. Additionally, rubrics created by practitioner subject matter experts are used to assess skill acquisition. Individuals using the rubrics are trained in how to use them consistently and accurately.



Summary of Skill Measurement Findings

Many of the employers in our study have robust systems for measuring skills. The primary means of obtaining and measuring skills occurred through training programs. A number of employers are also **integrating measurement into daily work activities using tried and true methods like supervisor/manager ratings, as well as some innovative techniques like offering “gig” experiences.** Perhaps one of the most powerful measurement methods occurs where employers have developed systems that account for all aspects of an employee’s skill attainments: prior work experience, current on the job experience, education, training (past and present). These systems allow employers to have a holistic view of individual employee skill sets as well as a view of skills across the organization. In addition, these allow employee to map all of their skills to future job opportunities, rather than only looking at the skills that they bring to their current job.

It is also notable that **many employers indicated their skills measurement practices are a work in progress.** Participants noted the challenges of moving to skill-based measurement in terms of organizational buy-in as well as practical challenges associated with the level of effort and amount of time that it can take to implement such changes.

It would be desirable to have more information on how employers are validating assessment in such a way as to minimize disparate impact and treatment. This was a topic that we did not explicitly explore in this study, but that is critical to implementation of skill-based practices that include goals around diversity, equity, and inclusion.

“The concept of skills and moving from degrees to skills has been a big change management initiative.”

—CASE STUDY PARTICIPANT

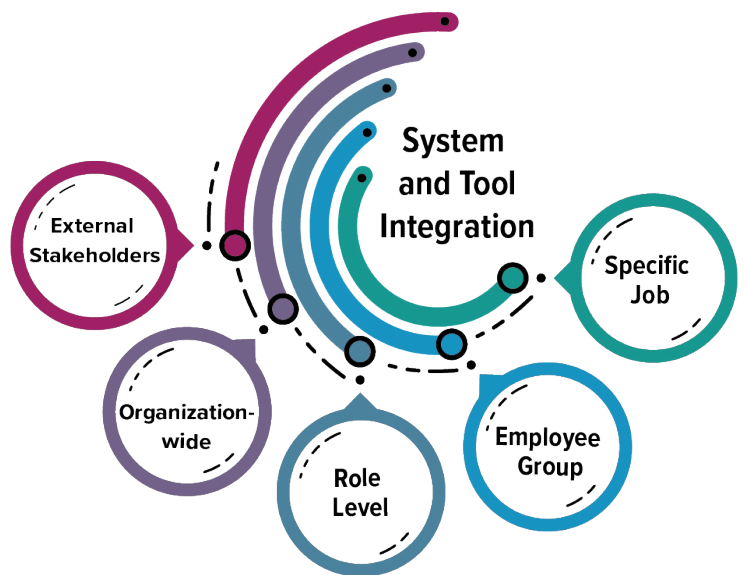
Systems Integration and Tracking

Given that skills-based practices can be used throughout all aspects of workforce management and often yield immense amounts of data, **systems or tools that support those practices by allowing for integration into an organization's current human resource information systems (HRIS) and the tracking of outcomes and trends are critical to successful skill validation processes.**

Organizations may choose to integrate these tools or systems for a specific job (e.g., job-specific apprenticeship), for an employee group (e.g., department, location), for a role level (e.g., front-line employees, managers), organization-wide (e.g., all-employee skill training, badging vehicle), or beyond (e.g., partner and client learning) (Exhibit 6). Additionally, skills-based tools and systems can offer functionality that address different facets across the skills-based validation spectrum, such as skill identification, skill assessment, skill tracking, skill data vehicle (i.e., digital badges using images as the vehicle to communicate metadata), or career progression.

As such, we sought organizations that use or offer tools that support these different aspects of systems integration and skills tracking. With the ability to track skills-based data over time and share that data internally, organizations can leverage that information in aggregate to report upon skill gaps, trends, or growth at all levels of the organization.

EXHIBIT 6. SYSTEM AND TOOL INTEGRATION LEVELS



KEY SYSTEMS INTEGRATION AND TRACKING TAKEAWAYS

- Organizations can leverage tools (e.g., assessments, digital badges) to seamlessly integrate skills-based practices into current workforce management structures.
- Data retrieved from integrating skills-based systems into current practices can feed into all workforce planning, including future of work, industry shifts, and workforce needs.
- Making that data widely accessible allows for employee job growth and professional development.

Integration Into HR and Training Systems

Transitioning from traditionally degree-based practices to skills-based practices is daunting for an organization of any size. **Having the ability to integrate a skills-based tool or process into systems that are already being utilized within an organization can ease such a transition.**

Integration into current systems allows for the use of skills-based data to manage employee performance, improve recruitment efforts, or create targeted trainings. For example, **Pax8** incorporates skills-based practices into its LMS, such as its managerial promotion process. The 6-week program called Aspiring Leaders is mandatory for employees seeking a promotion to a manager-level position in order for the employees to effectively gain the skills involved in supervising other employees. After they are promoted, individuals also must go through another set of mandatory classes as part of a new manager program and can use the LMS to track their progress throughout the transition.

Taking it one step further, **integrating skill validation practices with external partners amplifies impacts for employers such as IBM and NRF Foundation.** IBM has incorporated badging into its PartnerWorld® program, allowing business partners to receive IBM digital credentials. This program gives partners access to expanded areas of IBM's technology portfolio, the ability to gain incentives as a reseller, and the ability to consume learning. **NRF Foundation's** curriculum is used for organizational onboarding, professional development, and promotions. However, it is most often used by workforce and high school partners that are using it throughout career and technical pathways, alternative pathways to graduation, or community colleges (e.g., for retail program coursework).

Tool providers, such as the assessment providers Questionmark and Learn on Demand Systems, are helping to accelerate this integration and make it more seamless. Questionmark offers software that allows clients to create, deliver, and report on assessments, which can be layered into HR systems. **Learn on Demand Systems** also offers technology that can be integrated into various parts of HR (e.g., recruitment, performance assessments), via an open platform. **Learn on Demand Systems** offers lab environment assessment technology and methodology, in which a technology environment is emulated to allow an individual to demonstrate they have the ability to perform a task or use a program in that environment. A client can therefore deliver experiential learning and skill validation by designing in-environment lab tasks during a blueprinting activity or work with psychometricians to make content design decisions, such as determining task complexity, length of time to complete, candidate type, and technology required.

Some tools target workforce development from a different angle, such as **PAIRIN**, the social enterprise company that offers an all-inclusive coaching and development tool called PAIRIN Pro, among others. PAIRIN Pro matches individuals to jobs and training programs, while offering individuals tools and resources to identify their skill gaps and develop their skills. The tool can also be integrated into workforce management and promotion systems. For example, it allows an apprenticeship program to **measure and develop stacked level essential skills, which then link to promotions and greater autonomy.** Leveraging tools such as the aforementioned gives organizations the opportunity to create seamless integration of skills-based practices into current workforce management systems and tools.

Track Skills and Identify Trends Across the Organization

Once these skills-based systems and practices are integrated into HR and training systems, organizations then have the ability to **track skills data (i.e., attainment and development) across the entire organization during a period of time to identify learning progress and trends.** Tracking the data allows organizations to identify skills gaps and tailor learning and development to those particular areas. As aforementioned, **Comcast's** pilot study seeks to track skills data by providing a basis for skill gaps and help the company deliver the best training and development opportunities for workers to improve their skills. Other organizations seek **badging functionality to track data**, such as digital credential technology offered by **Concentric Sky** and **Credly**. **Concentric Sky** offers the Badgr platform, which simplifies the adoption of digital credential tracking technology, allowing anyone to see an individual's badge, verify credential attainment across multiple credentialing products, and create stackable learning pathways that incorporate those credentials. **Credly** similarly offers digital credentialing, which clients can integrate into their LMS and receive data on progress. For example, **IBM** marries its demographic data with credential completion data through **Credly**, allowing **IBM** to track strategic skills and credentials across the organization, as well as in particular jobs. Those data then maximize talent mobilization to meet evolving workforce needs.

Other organizations **utilize internal systems for tracking and reporting on trainings and credentials.** For example, each of the **DoD** services, independently maintains training and tracking within their service. The **Navy** internally accomplishes the tracking of completed training using its Electronic Training Jacket (ETJ), which records all training a Service member has received (e.g., initial technical schools, follow-on schools, computer-based training, annual awareness training, apprenticeships). Additionally, the ETJ is integrated with the other military program systems, such as Joint Services Transcript (JST), Verification of Military Experience and Training (VMET), and Credentialing Opportunities Online (COOL). In fact, the JST, an academically accepted transcript validating military experience and training, is a result of a movement to consolidate similar tools across services² and enhance data integration. This theme can be similarly seen throughout the other military program systems as well. For example, VMET aids Service members and Veterans in the creation of résumés and job applications using civilian verbiage but is also a database of demographic, training, and experience records that is automatically updated from service-specific systems. Last, but not least, **DoD** COOL highlights the benefits of extensive inter-service collaboration by providing a publicly accessible, single entry point to each participating service's COOL websites (i.e., Army, Air Force, Navy, Marine Corps, and Coast Guard). Each website mirrors the other websites in functionality by providing guidance and resources to aid Service members in gaining civilian credentials, enhancing system efficiency, effectiveness, and future savings. From the Service member perspective, this overarching

² JST replaced the Army/American Council on Education Registry Transcript System (AARTS), the Sailor/Marine American Council on Education Registry Transcript (SMART), and the Coast Guard Institute Transcript.

thread of data **integration and collaboration throughout the DoD systems creates more personalized recommendations on training, education, jobs, or services, thereby reducing burden** on members throughout professional development or the transition out of service.

When integrating a skills-based apprenticeship program, **organizations often utilize longitudinal evaluations to track employee training and skills growth.** **CareerWise** developed an apprenticeship program that incorporates supervisor assessment ratings on skill proficiency (e.g., novice, proficient, advanced) and apprentice self-assessments every 6 months using two tools: Salesforce for back-end competency tracking and Unqork for the front-end user experience. Individuals in **Accenture's** apprenticeship programs receive a formal midpoint review when they are 5 months into the program and a final review at 10 months, based on the goals that each project team sets up for their role. The standard list of questions that all supervisors answer during the reviews focus on **Accenture's** leadership DNA rubric, a rubric based on tracked and decoded data on **Accenture's** organizational DNA. Documenting progress and feedback over time allows for tailored skills training and recommendations to encourage growth within the role and organization.



CONCENTRIC SKY

Concentric Sky led the development of the 2.0 version of **Open Badges**, the global standard for portable digital credentials, allowing any learning achievement to be expressed in a machine-readable format. The credential travels as encrypted metadata that lives inside an image file, offering verifiable data in a portable format that gives users the ability to manage and share their credentials without the need to host software.

Track Progress and Job Growth

If organizations track skills-based data over time and make the data more widely available internally, the information can be leveraged in many ways (e.g., aggregated and reported across the organization to identify global trends, used by employees to demonstrate individual skill growth). **Making this data widely accessible allows for and encourages job growth and professional development, as well as enables better workforce planning.** **PetSmart**, for example, utilizes hand-held devices to track the learning of the workers and utilizes **Questionmark's** software to create exams tailored for specific roles (e.g., front-end positions). **Pax8** utilizes its LMS to track all internal instructor-led and self-paced courses, making this information widely accessible through its LMS system and dashboards. In other words, employees can view their completed, assigned, or outstanding trainings, and managers can view their team's progress in the form of a dashboard color coded by training status. Similarly, **IBM** offers two platforms targeted toward learning and development; **IBM's** Your Learning platform utilizes **AI to recommend training based on past learning or learning completed by others in similar roles.** Additionally, **IBM** utilizes a career growth platform offering employees career paths based on their skill set and what would need to be achieved to get there. Utilizing the data, employees are encouraged to engage in continual learning for job growth (e.g., switching departments, getting promoted).

MilGears, powered by COOL, **tracks all training, education, and experience of individual Service members and provides personalized recommendations.** The tool is publicly accessible, and the data are available to Service members for the purposes of providing recommendations and next steps to pursue and achieve industry credentials, in-service advancement, and post-service employment. Within MilGears, the Engage My Career (EMC) Tool acts as the guiding hand for Service members to explore their professional growth opportunities by analyzing their unique history and providing customized results.

By analyzing an individual's rating, pay grade, duty station history, training, Navy Enlisted Classification, Mariner career qualifications (if applicable), and civilian education and credentials, the **EMC Tool can determine a Service member's professional path opportunities.**

- Through this tool, Service members receive recommendations of civilian occupations that align closely to their skill set and experience, as well as details on how that experience compares to typical requirements for the civilian occupation (or credential) through a feature called *How You Stack Up*.
- Service members can also receive recommended apprenticeships, credentials, or education to fill skills gaps necessary for a particular civilian occupation or identify ways to strengthen a Service member's opportunities in that occupational field through a feature called *Next Steps*.
- Lastly, Service members can use the tool to compare occupations and analyze the occupations based on job growth, job openings, average salary, and more.

With all this crucial information provided to Service members through a single location, the **DoD** reduces guesswork in this process and provides Service members information about what their work and training can translate to in the civilian world. MilGears helps Service members build their résumés and identify their career paths by providing professional growth recommendations and translating military activities to civilian activities.



USMAP'S TRACKING SYSTEM

The United Services Military Apprenticeship Program (USMAP) provides formal skills-based training to active duty Navy, Coast Guard, Army, and Marine Corps Service members in order to complete civilian apprenticeship requirements. USMAP relies on online working logs to track progress toward achieving the apprenticeship, in which hours spent developing each skill for that specific trade are tracked. When this document is complete, it is validated by the DOL, and Service members have the ability to send it to their supervisor or potential employer post-service as proof of skill attainment.

Ease of Use

During adoption of these skills-based tools and systems across the organization, it is important to consider ease of use. Systems like **Credly**, **Badgr**, and **Questionmark** address this **facet of change management** by integrating a customized version of their capabilities within current client systems. For example, **NRF Foundation** makes it easy for individuals to sign up with **Credly** after completing their course to receive the credential in the form of a digital badge. **IBM** also tries to ease tool use by providing employees with both a tool for credentials (Your Learning) and a career path platform (Career Growth) that aid in skill set tracking and setting goals. **Badgr** facilitates change management with features and workflows designed to support organizations as they implement skills-based practices.

Some organizations facilitate the use of tools by offering resources, training, and information about the tools, such as **PAIRIN**, **USCCF**, and the **DoD**. **PAIRIN** offers curriculum tools that clients can easily modify to their customized needs (e.g., presentations, rubrics, assignments). Additionally, before using the classroom curriculum and rubric, clients must attend 4 hours of training on performance assessments to learn how to conduct and evaluate them in a qualitative way. Similarly, the **USCCF** offers customizable resources (e.g., surveys) and a web tool for data collection automation. Focusing more on information delivery, **DoD's** MilGears provides Service members credentials matched to particular occupations and details about each credential (e.g., source, availability, gap analysis, dollar signs if the program can pay for the license examination) or occupation (e.g., job openings, average salary, comparisons based on rapid job growth).



Summary of System Integration and Tracking Findings

The tool and system providers included in this study offer a wide array of skills-based solutions, from providing assessment and lab functionality to providing digital badging functionality. Not all of these solutions, though, offer organizations methods of measuring and tracking employee skills. An organization's ability to track skill attainment and development organization-wide allows for further analyses to measure return on investment (ROI), identify employee skill gaps, tailor learning and development, and create targeted recruiting. In addition to using data analyses to measure outcomes and results, being able to easily layer this functionality

within workforce management systems currently being used by organizations can accelerate adoption of the tools or systems. That being said, **one type of tool or system that is notably missing from the study is HRIS providers** (e.g., Workday®, Oracle® PeopleSoft). As the primary HR platform for many organizations, systems such as these play a key role in the successful implementation and integration of skills-based practices overall. If these systems do not measure and track skills or are unable to integrate additional tools that can measure and track skills, organizations could face major barriers to implementing skills-based practices.

Skill Validation Benefits and Outcomes

Validating the skills that employees acquire can provide benefits to the organization and to individuals. This information can positively impact the business by **providing an accurate assessment of the current workforce's capabilities and determine the effectiveness and efficiency of strategies designed to address and validate skill gaps.** From the

employee's perspective, they can gain confidence that they have acquired the skills needed to advance in their career, whether within the current organization or even while exploring a new career (Exhibit 7). This section discusses the benefits and outcomes of skills measurement and validation practices mentioned by case study participants.



KEY SKILL VALIDATION BENEFITS AND OUTCOMES TAKEAWAYS

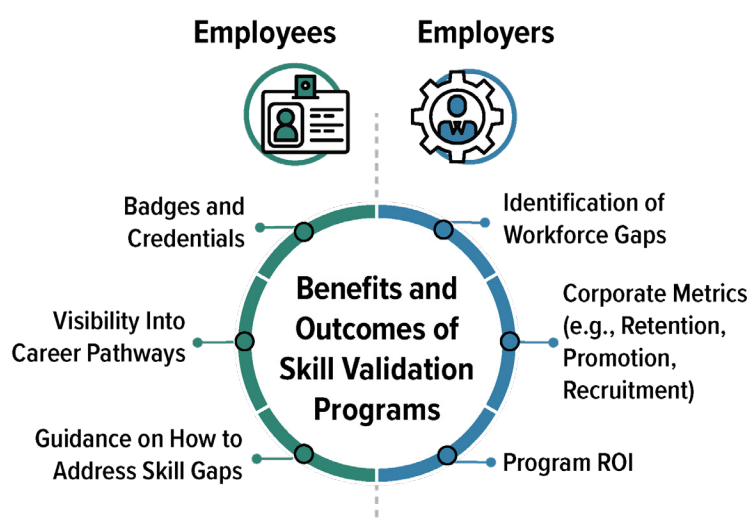
- Successful programs allow employees to track, monitor, and maintain their skill acquisition and see what is needed to assist in their career advancement.
- Benefits to employees can be communicated to potential hires to explain career opportunities within the organization.
- Organizations use specific metrics (e.g., retention, promotion and career progression, recruitment) to determine the impact of developmental programs and make improvements as needed.
- Organizations can use the outcomes of a skill validation program to ensure their employees are future -ready and prepared to adjust depending on the environment.

Benefits and Outcomes to the Individual

The **ability of employees to possess a validated skill profile that indicates their proficiency level on targeted skills allows them to track their progress.** The profile allows them to understand where they still have gaps and prioritize addressing those gaps and also have confidence that they do possess the necessary skills at the required proficiency levels. For example, in 2020, **IBM** issued more than 1.4 million badges worldwide, which equated to a digital credential being earned every 20 seconds. This outcome indicates an extremely large volume of skills is being validated. In **Comcast's** pilot program, employees will be able to track their progress through a talent profile that identifies validated skills attained through formal classroom learning, online and e-learning programs, or on-the-job learnings and prioritize their skill development. They will then be able to leverage this information to determine how to address and prioritize any identified skill gaps. **PetSmart** allows its associates the flexibility to validate the acquisition of new skills at their own pace and provides a range of activities they can complete to validate new skills gained. **Pax8** even has a reward shop where, each time an employee completes a course or earns an external credit, the employee receives points that can be redeemed for prizes. So, **Pax8** employees are increasing their validated skill profiles in an environment where it is also motivational and fun to do continuous learning. Communicating these additional benefits to the workforce can increase the engagement level of employees even beyond the outcome of employees increasing their validated skill profiles.

Employees can **use their validated skill profiles to identify better or new career options within the organization.** For example, within **PetSmart's** groomer apprenticeship, there are opportunities for career advancement both within the groomer's current store, as well as more broadly across **PetSmart** (e.g., salon leaders, super groomers). These opportunities for career advancement are based upon the increased proficiency levels of targeted skills within each groomer's validated skill profile. Graduates of the **Accenture** apprenticeship program have already been promoted two to three times since the start of the program in 2017, which indicates that the validated skill profiles these individuals gain offer careers within **Accenture** rather than just entry-level jobs. **Duke Energy's** leadership program provides employees with an opportunity to develop the skills needed to advance within its management levels.

EXHIBIT 7. BENEFITS OF SKILL VALIDATION PROGRAMS



Employees can also **use their validated skill profiles to identify future career opportunities.** Within the [DoD/Navy](#), Service members can identify which validated credentials they have gained through their military experience and training that apply directly to a target occupation within the civilian workforce and determine what skill gaps still exist and how best to address them. Their validated skill profiles can then be used to help strategize for their careers post-military.

Apprenticeship programs provide validated skill profiles that **benefit the employee by providing them with an education and improving their opportunity for full-time employment.** In the [Aon](#) apprenticeship program, the students pursue their associate's degree (paid for by the employer) while they are enrolled in the program. Participants are also incentivized within the [Aon](#) and [Accenture](#) apprenticeship programs by the ability to be promoted into a role within the business unit they are currently working at the end of the program, with approximately 82% of [Aon](#) apprentices and 89% of [Accenture](#) apprentices being hired following completion of the program. Additionally, the [Accenture](#) apprenticeship program is recruiting nearly 40% of their apprentices from the south and west sides of Chicago, so this program is positively impacting individuals from underserved populations.

Some programs work to **validate the specific skills needed for target occupations, so individuals can focus on what is critical for employment.** Within the [CareerWise](#) program, participants are able to target the skills related to high-demand positions without needing a 4-year college degree. The apprentices are able to manage the portfolios of their validated skill sets that they know are linked directly to the industry they are interested in, given that major companies provided direct input to [CareerWise](#) about what skills are important for certain roles and positions. The [NRF Foundation](#) provides individuals with industry-recognizable stackable credentials targeted toward customer service and sales roles that fit the needs across different types of organizations. The [NRF Foundation](#) has also partnered with [Credly](#) to offer individuals a mode of portability for their credentials through digital badges that they can then apply and transfer across employers.



PAX8 OUTCOMES AND RESULTS

PAX8 uses corporate measures such as retention, hiring rates, promotion rates, voluntary and involuntary terminations, and engagement to evaluate the effectiveness of its programs. These measures are examined by its board of directors quarterly to identify areas for improvement. In addition, Pax8 recently won the ATD BEST Award for 2021, which recognized the impact Pax8 University has on employees and the company.

Benefits and Outcomes to the Employer

Employers also experience significant benefits through the identification and validation of skills by their employees. This information can positively impact the business by providing an accurate assessment of the current workforce's capabilities and determine the effectiveness and efficiency of strategies designed to address skill gaps.

The ability to validate the skills efficiently and effectively within the workforce can **help make employers more future-ready**. By tracking the supply side, employers can determine potential gaps within their current workforce. For example, **IBM** anticipates future skill needs related to future jobs and then determines what gaps exist between its current talent and the skills likely to be needed. The organization can then use this information to proactively prepare its workforce by ensuring employees possess the skills that will be needed, which may include new skills or greater proficiency levels on current skills (Rometty, 2021).

This information can also **help employers be more resilient in the face of crises**. An **AHLA** representative noted that many employers within the hotel and lodging community were forced to cross-train many of their employees during the pandemic. So, although there was the need to reduce staff in many instances, given the significant decrease in travel, the staff who remained needed to gain a broader validated skill profile than before (i.e., cross-skilling). This idea of cross-training will likely result in greater efficiencies within an employer as employees are able to perform a broader range of responsibilities. The need to reduce staff also forced employers to look more closely at the tasks and associated skills across occupations to determine what was truly critical to the operation. Many of these practices will likely remain in place post-pandemic and result in continued efficiencies.

Organizations can use **corporate metrics such as retention, engagement, and promotion to determine the benefits of a skill validation program**. **Pax8** uses metrics such as retention rates, number of hires, promotion rates, voluntary and involuntary terminations, and level of engagement to determine how impactful its programs are. For example, **Pax8** uses the number of courses taken by employees, along with employees' involvement in shadowing or mentoring programs to help determine the level of engagement by employees. **IBM** has similar metrics it uses to track the success of its programs, including retention, career progression, and recruitment.

Comcast stated it will be measuring employee satisfaction and employee engagement, along with customer satisfaction scores, to recognize the benefits of its program. **PetSmart** stated it examines retention with respect to its groomers, with the average tenure for a **PetSmart** grooming team member being more than 12 years.

The apprenticeship programs use similar metrics to determine the benefits for members of their programs. The **Aon** apprenticeship program has resulted in a very strong retention rate (82%), which has allowed critical employment needs to be filled across targeted occupations. **Aon** has also been able to establish partnerships with local community colleges to support the programs. **Accenture** has also experienced very strong retention rates (89%), while being able to significantly expand the span of the program. Specifically, its CAN apprenticeship program has been able to expand from 5 apprentices in 2016 during the pilot program to more than 150 apprentices who work across business, technology, operations, strategy, and consulting aspects of **Accenture**, given the success of the original pilot program.

Employers can even use skill validation efforts to **attract new talent and ensure they possess the needed skills**. In general, the ability of an employer to indicate how its developmental programs are linked to skills and targeted on career development can positively impact recruitment because linking skills to career development indicates an individual is being hired for a career versus just a job. For example, the **DoD/Navy** systems and tools are used not only by active duty Service members but also by recruiters to demonstrate the long-term career options for individuals joining the military, as well as by employers to easily view the credentials and capabilities of individuals who served and by veterans who may be looking for new career opportunities. Outside of using skills for career development, **OMB** indicated how skills-based technical assessments developed from a proper job analysis allow the government to select the best candidates for each position.



Summary of Benefits and Outcomes Findings

The organizations included in this study have considered what benefits are available to the employee as well as the employer. Most of the organizations have specific metrics (e.g., retention, promotion and career progression, recruitment) that they use to determine the impact of the developmental programs, based on validated skills within the organization, and make improvements to the programs if they are experiencing unexpected or unwanted results. The developmental programs can also be used to upskill employees to ensure they have the appropriate skills needed for the business to remain competitive. Organizations can also use the validated skills to ensure they are efficiently using their limited training resources. And the organizations can use

the validated skill information to conduct a cost-benefit analysis to determine the value of the program (i.e., ROI; Phillips et al., 2018). Although the individual results will directly impact the employee, these factors can also positively impact the organization from a recruitment, retention, and engagement perspective. Specifically, the benefits to the individual can be communicated to potential hires to explain the career opportunities within the organization. Further, making sure to communicate the career development opportunities available to current employees and making these developmental opportunities easy for employees to track, monitor, and maintain will encourage employees to stay engaged and remain with the organization.

Conclusion

Across our case study participants, a number of promising and innovated skill validation practices are currently being used. In addition, a number of tool and system providers have aligned their offerings to support the validation and tracking of skills. Together, these show great promise for the continued implementation of skill validation practices and skills-based practices more generally. In this section, we provide ideas for accelerating the implementation of skill validation as well as some limitations of the current study. Finally, we provide ideas related to future research and practice.

Accelerators

We asked employers, in general, what could accelerate the adoption of skill validation. In this area, we heard several interesting ideas. First, **IBM** mentioned adopting skills-based methods related to creating standards for comparability between credentials. **IBM** also mentioned that there are public policy inhibitors related to this skill validation. For example, the way education is reimbursed, based on degree granting rather than skill development, inhibits the adoption of skill validation. The federal government could play a role in accelerating the adoption of skill validation through policy setting, and in setting the standard, as the largest employer in the United States.

We also heard that active partnership between organizations, such as employers and tool providers is an important component to improving processes and systems related to skill validation. There are tools that are working to bring organizations together in thinking about skills, such as the Open Skills network that has 30 million users or so and serves 25,000 organizations across 160 countries. Finally, **Accenture** noted the importance of building program awareness and the importance of networks of organizations for that purpose.

Employer engagement can also serve to accelerate adoption. **USCCF** noted that an important ingredient of success is employer engagement, citing the need for buy-in to get employers to invest in their talent strategy. The main challenge listed in its Talent Pipeline Management progress report is: “Survey respondents overwhelmingly identified employer engagement as the most common barrier to overcome, followed by both employer and host organization [e.g., state and local chambers of commerce, industry associations, economic development organizations] resource constraints.”

Limitations

One limitation for this study is the relatively small sample size. The goal of this study was to gain a broad stroke understanding of the current landscape of skill validation. Although we learned quite a bit from our participants, our sample was relatively small. Conducting this work with additional employers in additional industries and geographies could result in additional, useful information, as well as enrich the information gathered in this study.

Second, many of the employers that we spoke with are large organizations with robust infrastructures that have decided to invest in implementing skills-based practices. Although many organizations in our study reported the positive benefits that they are seeing as a result of such investments, there also are many smaller organizations or organizations that are still reeling from the effects of the coronavirus pandemic 2019 (COVID-19) pandemic that may not have the resources to invest in implementing and experimenting with new practices. Further information about small businesses that are implementing innovative practices and how they have managed their implementation processes

could be very valuable. Alternatively, a playbook for small businesses on how to implement skill validation practices that includes where to start and how to make incremental progress could prove to be a valuable tool for accelerating adoption. Considering that 47% of the American workforce works for a small business (Dilger, 2020), the adoption of skills-based practices among these organizations is critical to the successful adoption of these practices and ultimately critical to equitable economic recovery.

Future Research and Practice

INTERNATIONAL

Our study explicitly focused on U.S.-based organizations. However, through the course of the project, a number of international-based entities emerged that seem to have promising, innovative practices in the skills-based practices space. Our social media analysis found a trend of international organizations and governments taking a lead toward shifting toward skills-based practices. For example, the government of the United Kingdom launched a flagship global skills program called the Skills for Prosperity Programme, aiming to support education and skills systems across nine middle income countries in Southeast Asia, Latin America, and Africa by equipping them with skills for the future. Additionally, many posts were framed around recognition of the need for these practices, particularly within recruiting, with less focus on ways to incorporate and validate skills. This highlights the idea that industries seem to recognize the need for a skills movement but lack the understanding of how to approach it or concrete steps to take. Our literature search also revealed additional international entities, including SkillsFuture Singapore, Swisslog, and Australian Qualifications and Training Overseas, that may be able to offer additional insights on skill validation. Further research on skill validation practices in international settings may provide additional and valuable insights.

CROSS-SKILLING

In the current labor market, labor shortages are emerging. For example, we heard from [AHLA](#) that the hospitality industry is struggling to restaff now that hotels are starting to see an uptick in traveler demand. We also heard that during the pandemic, when hotels were forced to reduce their staffing dramatically, it became necessary for staff to learn multiple jobs in order to keep the hotel running (e.g., front desk staff also taking on accounting duties). This type of cross-skilling activity may also serve the industry well as it handles staffing shortages by creating staff who are more generalists that can fill in where needed versus being staffed to a specific line of business. In addition, the opportunity for cross-skilling may open up career latices that enable staff to gain a more holistic understanding of a particular industry than narrower career paths might enable. This more holistic understanding may directly impact the leadership pipeline in an organization by producing leaders who understand the organization more completely and can see how different lines of business interact and are dependent on each other. Research that details how industries are engaging in cross-skilling and the ROI that they are seeing from cross-skilling programs, including how these programs support diversity, equity, and inclusion, could be an important angle on skills-based practice implementation.

UPSKILLING AND RESKILLING

This study looked at practices related to validating skills learned on the job, which could include upskilling and reskilling activities. However, as the work continues to change at a rapid pace and organizations adjust to post-COVID-19 operations, needs for upskilling and reskilling are expected to continue (Connor, 2021; DiCioccio, 2021; Elfond, 2020; Ortiz-Barbachano, 2020; Waddill, 2021). Identifying best practices in how employers are meeting these challenges and what returns they are seeing could help more resource-constrained businesses implement

similar programs. In addition, understanding the upskilling or reskilling opportunities that are available to individuals outside of what is offered by employers could also provide a broader viewpoint on the state of upskilling and reskilling for the American workforce. Likewise, understanding barriers to accessing these types of opportunities and how different demographic groups are impacted by these barriers could provide valuable information for increasing the use of existing programs.

HRIS

Our study looked at tools that employers are using to support skill validation but was not able to look at the more fundamental HRIS (e.g., PeopleSoft, Workday®). Having a HRIS that can support skill validation and tracking is a critical, foundational component to the successful implementation of skills-based validation as well as skills-based practices more generally. Additional research is needed to understand how HRISs support skills-based measurement, tracking, and workforce planning.

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Appendix A

Summary of Literature Review and Social Media Analysis

	LITERATURE REVIEW	SOCIAL MEDIA ANALYSIS
SEARCH TYPE	Published academic or gray literature	LinkedIn
SEARCH SITE EXAMPLE(S)	Google Scholar, Google, Harvard Business Review, SHRM, Markle, McKinsey, ScienceOpen, Training Industry	N/A
SEARCH TERMS	<p>“skill* validation” OR “skill* assessment”; “skill* monitor*” OR “skill* tracking”; “skills-based practices” OR “skills-based training” OR “skills-based recruitment” OR “skills-based employment”; “skilled workforce” OR “workforce skills” OR “workplace skills”; “work-based learning” OR “hands-on training”; “upskill” OR “reskill” OR “skill improvement” OR “skill enhancement”; “talent pathway” OR “career pathway”; “work-based learning [AND] skill assessment” OR “work-based learning [AND] programs [OR] “evaluation”; “work-based learning” AND “tools [OR] assessment [OR] programs”; “learning behavior change” OR “training transfer” AND “organizational training transfer” AND “employee skill development”; “on-the-job training” AND “OJT” AND “practice-based learning”</p>	<p>“skill validation” OR “skills validation”; “skill assessment” OR “skills assessment”; “skill monitor” OR “skills monitor”; “skill tracking” OR “skills tracking”; “skills-based practices” OR “skills-based training”; “skills-based recruitment” OR “skills-based employment”; “skilled workforce”; “workforce skills” OR “workplace skills”; “work-based learning” OR “hands-on training”; “upskill” or “upskilling”; “reskill” or “reskilling”; “skill improvement” or “skill enhancement”; “talent pathway” OR “career pathway”; “training and retraining”; “skill progress monitoring assessments”; “on-the-job training skills assessment”; “workplace skills validation” OR “workplace skills assessment”; “career pathway” evaluation program; LinkedIn Skill Assessment (tool vs. employer)</p>
TYPES OF SOURCES (RESULTS)	Peer-reviewed journals, newspapers and magazines, press releases, organizational reports, marketing materials, books and book chapters, conferences and presentations, government documents, theses and dissertations	Posts, people, groups, companies, events
DOMAINS	<ul style="list-style-type: none"> • Skill validation: Measurement, tracking, or monitoring of workers’ skill levels • Skills-based practices or systems: Processes, infrastructure, and practices that support skill validation, development, or maintenance • Skills-based tools: Instruments or equipment (e.g., technology, hardware) used to validate skills • Work-based learning: Measurement or tracking of skills learned while on the job 	
RATINGS	<ul style="list-style-type: none"> • 0 = none—no relevance to domain • 1 = moderate—some relevance to domain (e.g., brief mention but not main focus; skills-based practices but not skill validation) • 2 = high—highly relevant to domain (e.g., potential case study, article focus) 	
INCLUSION CRITERIA	<ul style="list-style-type: none"> • Articles published 2015 or later • A rating of 1 or higher for at least one of the domains 	<ul style="list-style-type: none"> • Public information on LinkedIn • A rating of 1 or higher for at least one of the domains
DOMAIN RESULTS ³ (RATING OF 1 OR HIGHER)	<p>Skill validation (16) Skill-based practices or systems (38) Skill-based tools (31) Work-based learning (28)</p>	<p>Skill validation (22) Skill-based practices or systems (79) Skill-based tools (34) Work-based learning (59)</p>

³ Each result was rated four times, once for each domain. Therefore, an individual result could have a relevance rating of 1 or higher in multiple domains.

Appendix B

Summary of Employer Case Studies

CASE STUDY EMPLOYER

Accenture

Apprenticeship Program

INDUSTRY	SIZE	PROGRAM TYPE
Consulting and Processing Services	Large (10,000 or more employees)	Apprenticeship

DESCRIPTION/BACKGROUND

We interviewed Accenture about their apprenticeship program. In 2017, Accenture cofounded the Chicago Apprentice Network (CAN) with Aon in an effort to jump-start professional apprenticeship programs. The Accenture apprenticeship program seeks to create new pathways for community college students to access better jobs and longer-term growth potential. To create the program, Accenture examined the tasks and skills associated with their entry-level jobs to determine what aspects would be best suited

for an apprenticeship program and what aspects required a college degree. This process resulted in a fulfilling apprenticeship program and enhanced the job experience of newly hired college graduates. Accenture collaborated with Aon, the CAN, and the Business Roundtable to create an apprenticeship playbook to assist employers in developing their own apprenticeship programs.

DISTINGUISHING CHARACTERISTICS

APPRENTICE OPPORTUNITIES

- Currently, the program has about 425 apprentices ready for onboarding and will look to add 600 to 700 more apprentices by the end of 2021.
- Successfully filled roles associated with entry-level positions.
- Job positions (e.g., business, technology, HR, finance) that have apprenticeships vary based on company need.
- Apprenticeship programs, in different work fields, have grown 10% to 30% within the company.

PROGRAM ACHIEVEMENTS

- Started apprenticeship programs in 35 cities across North America.
- The program has grown to include more than 150 apprentices annually in Chicago and more than 1,000 apprentices across all cities involved, and growth is continuing amid the pandemic.
- The program converted 89% of apprentices to full-time employees.
- The program hired more diverse employees.

ADDITIONAL PROGRAM HIGHLIGHTS

- Apprentices receive quarterly performance assessments, which is more frequent than for non-apprentice employees.
- Prior apprentices established a buddy system to provide assistance and mentorship to new apprentices.
- Apprentices receive initial training in areas such as email etiquette and how to interact with clients to ensure apprentices are successful.

CASE STUDY EMPLOYER



Apprenticeship Program

INDUSTRY	SIZE	PROGRAM TYPE
Professional Services	Large (10,000 or more employees)	Apprenticeship

DESCRIPTION/BACKGROUND
<p>We interviewed Aon about their U.S. apprenticeship program. In 2017, Aon cofounded the Chicago Apprentice Network (CAN) with Accenture in an effort to jump-start professional apprenticeship programs. All apprentices are full-time employees (with full employee benefits) who also receive paid tuition, books, and fees toward a 2-year associate's degree.</p> <p>The program offers positions within various solutions and business lines (e.g., data analyst, information technology business analyst, customer service agent). Aon collaborated with Accenture, the CAN, and the Business Roundtable to create an apprenticeship playbook to assist other companies in developing their own apprenticeship programs.</p>

DISTINGUISHING CHARACTERISTICS

APPRENTICESHIP BENEFITS

- The Aon apprenticeship program is a 2-year program with full-time pay and benefits.
- Benefits include full tuition, books, and fees toward a 2-year associate's degree.
- The program has established partnerships with local community colleges.

PROGRAM ACHIEVEMENTS

- The program was launched with a class of 25 students.
- In 2021, the Aon program is expanding to six metropolitan areas, each with their respective networks.
- 82% of apprentices were promoted into a role in the business they are in after program completion.
- Aon's goal is to create 10,000 corporate apprenticeships in local apprentice networks across the U.S. by 2030.

ADDITIONAL PROGRAM HIGHLIGHTS

- Aon's apprenticeship program is certified by the U.S. Department of Labor.
- Apprentices have access to nonprofit partners as an additional support system.
- Apprentices are paired with a career navigator who supports them in balancing work, school, and life.

CASE STUDY EMPLOYER

CareerWise Colorado Apprenticeship Program

INDUSTRY	SIZE	PROGRAM TYPE
Professional Training & Coaching	Small (fewer than 500 employees)	Apprenticeship; Skill Validation; Skill Development

DESCRIPTION/BACKGROUND
<p>We interviewed CareerWise about their apprenticeship program, which launched in 2016. The apprenticeship program was created to address skill labor shortages in Colorado and has expanded to Indiana; New York; and Washington, D.C. They work closely with various industries to develop apprenticeships for different occupations (e.g., automotive technician, cyber security support technician). Specifically, CareerWise works with business partners to define competencies, develop assessments (which may include artifacts produced on the job demonstrating competency proficiency), and create training center learning plans for each occupational pathway. With feedback from various industries, CareerWise created rubrics with which they assess apprentices. CareerWise leverages industry credentials when available. CareerWise has programs that allow for apprentices to join the workforce without a college degree. The apprenticeships are designed to be an options multiplier, which means that career opportunities will be available for the apprentices within the targeted occupation.</p>

DISTINGUISHING CHARACTERISTICS

COMPETENCY DEVELOPMENT	<ul style="list-style-type: none"> Industry-desired skill sets come directly from the companies that are working with CareerWise. A portfolio of career competencies exists to ensure apprentices are developing competencies that are in demand and that will set them up for future success.
ASSESSMENT	<ul style="list-style-type: none"> Supervisory ratings. Supervisors use a rubric to validate skills learned and designate skill proficiency level (i.e., Novice, Proficient, Emerging, Advanced). Apprentice self-report rating. Every 6 months, the apprentice must rate their own skills and determine their proficiency level.
OCCUPATION PROGRAM SELECTION	<p>When considering an occupation for inclusion in the program, CareerWise examines the following factors, among others:</p> <ul style="list-style-type: none"> Expected salary outcomes Projected demand during the next 10 years Upward mobility and pathway options without a college degree
PROGRAM BENEFITS AND OUTCOMES	<ul style="list-style-type: none"> Apprentices develop occupation-specific competency sets, as well as career ready competencies (durable skills applicable across occupations). Perceptions of productivity. CareerWise is beginning to collect data to examine the productivity of an apprentice within the program compared to employees in similar positions who are not in the program.

CASE STUDY EMPLOYER

Comcast

Upskilling Pilot Program

INDUSTRY	SIZE	PROGRAM TYPE
Telecommunications; Mass Media; Entertainment	Large (10,000 or more employees)	Skill Validation; Skill Development

DESCRIPTION/BACKGROUND
<p>We interviewed Comcast about their Upskilling program, which is a pilot program. Comcast has many products and processes in development geared toward closing employee skill gaps. The use of assessments will allow employees to identify strengths and weaknesses within a personalized report and connect them to learning options to address any gaps (e.g., e-learning modules, live learning sessions).</p> <p>Comcast will be able to aggregate the assessments to identify overall skill gaps and opportunities across Comcast and ensure the learning programs created are intentional. The goal is to include the output of the upskilling program within the full HR system to allow for the skills to be mapped to career growth plans.</p>

DISTINGUISHING CHARACTERISTICS

SKILL GAP ASSESSMENT

- The pilot study will assess employee skills, generate a skills report to reflect the strengths and gaps of each employee, and create targeted learning opportunities.
- A goal of the program is to create a culture of empowerment and professional development. It will ensure employees understand that the assessments are designed to help them learn and develop.

SKILL ACQUISITION

- Curated content associated with specific skills will be available through the learning management system.
- Comcast realized that most professional development is not completed through formal training and that experiential learning must be included.

ADDRESSING SKILL GAPS

- Comcast developed a method to address specific skill gaps through learning modules:
 - Modules are business driven and designed to address the biggest skill gaps. It will be evaluated using more traditional training measurements.
 - Modules are learner led, which are individualized and will be evaluated using metrics such as employee satisfaction and internal mobility.
- Comcast is planning to create criteria to demonstrate and measure experiential learning and to apply learning for developmental opportunities not addressed through formal learning.

SKILL LEARNING CONTENT CURATION

- The goal is to ensure any curated content is scalable and a good fit for the audience (leverage AGILE product teams to create these learning assets).
- The program will first focus on frontline employees interacting with customers, as they are the largest and most complex audience.

CASE STUDY EMPLOYER

U.S. Department of Defense, Navy Credentials Programs

Credentialing and Apprenticeship Programs

INDUSTRY	SIZE	PROGRAM TYPE
Defense	Large (10,000 or more employees)	Credentialing; Apprenticeships; Skill Tracking; Identifying Skill Gaps

DESCRIPTION/BACKGROUND	
<p>We interviewed the U.S. Department of Defense (DoD), Navy Credentials Programs Office about a suite of programs offered to Service members for obtaining, measuring, and tracking skills and career paths. Since 1976, the U.S. Military Apprenticeship Program (USMAP) has provided Service members with apprenticeship opportunities. Currently, USMAP offers apprenticeships in 74 trades. Service members can track existing skills and credentials through the Verification of Military Experience and Training (VMET) and the Joint Service Transcript (JST) tools, which document training and academic achievements throughout their military career. To</p>	<p>help Service members plan their future civilian careers, the DoD Credentialing Opportunities Online (COOL) program links military occupations to corresponding civilian occupations and credentialing opportunities. The MilGears credentialing program, powered by the COOL system, offers individualized career planning and development. MilGears helps Service members build a career profile, incorporating information from COOL, VMET, and JST. Using this information, Service members can plan their postmilitary careers by identifying skill gaps and credentials and documenting experience and achievements with civilian-equivalent descriptions.</p>

DISTINGUISHING CHARACTERISTICS

BREADTH	<ul style="list-style-type: none"> The program provides comprehensive coverage of skill-based practices and tools to support credentialing, apprenticeship, monitoring, documentation, and generalizability to civilian occupations.
SIZE/REACH	<ul style="list-style-type: none"> USMAP supports more than 70 trades that match to civilian trade standards. DoD credentialing programs are available to all active-duty and Veteran members of the Navy, Army, Marine Corps, Air Force, and Coast Guard. Information on the COOL websites is available to the public, including potential employers.
VERSATILITY	<ul style="list-style-type: none"> COOL serves as a recruiting function by providing job descriptions of military occupations that can be used by guidance counselors. JST can communicate directly with academic entities to send and receive transcripts. Skill-based programs complement one another and work together (e.g., MilGears profile page incorporates VMET and JST data).
CAREER PLANNING	<ul style="list-style-type: none"> MilGears provides customized profile and career mapping based on specific military occupations. COOL helps military Service members plan for future civilian careers.

CASE STUDY EMPLOYER

Duke Energy Skills-Based Learning Programs

INDUSTRY	SIZE	PROGRAM TYPE
Electric and Gas Utilities	Large (10,000 or more employees)	Upskilling; Reskilling

DESCRIPTION/BACKGROUND	
<p>We interviewed Duke Energy about their Duke Energy Leadership Academy, as well as their processes used to address skill gaps, and their Opportunity Marketplace used to help employees increase their capabilities. Duke Energy reassessed their Leadership imperatives (competencies) when conducting a learning needs assessment as part of the development of their Duke Energy Leadership</p>	<p>Academy. Because Duke Energy embraces training, they develop their programs in house to reduce cost and to ensure any developmental opportunities align to their specific mission and needs. Additionally, they take into consideration different scoring metrics to evaluate the program and leaders' abilities. The use of various assessments at different times throughout the program allows Duke Energy to provide frequent and targeted feedback to employees within the program.</p>

DISTINGUISHING CHARACTERISTICS

DUKE ENERGY LEADERSHIP ACADEMY

- This initiative allows skilling of workers as they advance in their roles and positions within the company.
- Frontline Leader Fundamentals program (12-month program; currently virtually facilitated) offers an experiential learning program where Learn, Practice, and Apply methodology is used.

INNOVATIVE ASPECTS

- Skills learning has recently been developed for cyber and informational technology.
- In the gig program, employees can select a gig task within Duke Energy to gain skills in an area to which they may not normally have access.

PROGRAM ASSESSMENTS/ METRICS

- Leaders are assessed on their competencies based on the different leadership levels.
 - Duke Energy uses 360-degree assessments and personality assessments.
 - Employees are given an action plan, and Duke Energy is currently looking at sustainability tools.
- Three core areas are measured for program metrics:
 - Net promoter score
 - Leadership effectiveness
 - Mapping to leadership imperatives

TRAINING EMBRACED

- Training programs are built in house and business partners are engaged when the content is built.
- Collaborate with HR business partners and implement change management strategies for all campaigns to establish buy-in when new programs are launched.

CASE STUDY EMPLOYER

International Business Machines Corporation (IBM)

Digital Badging Program

INDUSTRY	SIZE	PROGRAM TYPE
Computer Hardware	Large (10,000 or more employees)	Digital Credentials and Badging; Upskilling; Reskilling; Apprenticeships

DESCRIPTION/BACKGROUND

We interviewed IBM about their digital badging program, which launched in 2016. Since then, the badging program has been used by more than 200 IBM-led initiatives (e.g., Skillsbuild upskilling program, New Collar apprenticeship program). The robust digital badging program offers courses and

credentials in areas such as data analysis, cybersecurity, and customer service. Learners gain knowledge about new technology and emerging practices, develop valuable workplace skills, and earn digital badges to reflect these accomplishments.

DISTINGUISHING CHARACTERISTICS

PROGRAM SIZE

- The program has grown exponentially in 5 years since its launch in 2016.
- In 2020, IBM issued over 1.4 million badges/credentials worldwide (approximately one digital credential every 20 seconds).

PROGRAM SCOPE

- The program is available to a broad range of learners, including:
 - All IBM employees
 - Part-time and gig-economy workers (e.g., freelance contractors)
 - IBM business partners
 - International upskilling initiatives (e.g., the Digital Nation in Africa and the Middle East)

INNOVATIVE ASPECTS TO ASSIST IN ACCEPTANCE/ADOPTION

- The badging program is integrated into the company culture and processes.
 - Self-paced learning, career planning tools, performance appraisals, recognition programs.
- Within the Learning Credential Network, individuals can have a “wallet” of all skills, degrees, and certifications achieved throughout their career.
- Artificial intelligence is used to extract and infer skills based on job roles and assignments individuals have completed/are involved in.

ADDITIONAL PROGRAM BENEFITS

- The program assesses technical and “soft” skill levels within the organization to help identify gaps that IBM can focus on building.
- The program ensures equity in hiring and promotional processes.
- The program provides benchmarks for market research.

CASE STUDY EMPLOYER

Pax8

Skill-Training Programs

INDUSTRY	SIZE	PROGRAM TYPE
Information Technology and Services	Midsized (500–9,999 employees)	Skill Validation, Skill Development

DESCRIPTION/BACKGROUND

We interviewed Pax8 about their skill training program. Pax8 has developed many systems of support for training different levels of employees. From onboarding to leadership roles, many programs and courses must be completed before beginning a new role to ensure the employee is maximally prepared. For example, new employees must work

with trainers and complete e-learning courses to garner skills before being able to work independently. Current employees who are looking for leadership roles must go through leadership-targeted training programs before and after taking on the role of manager. Pax8 also provides growth opportunities for leadership roles that are supported through the training programs.

DISTINGUISHING CHARACTERISTICS

ONBOARDING TRAINING

- Pre- and post-training skill assessments are completed by the employee and reviewed by the manager to prioritize developmental needs.
- Employees are assessed through trainer observations and online training assessments. They must score 80% on these assessments to be considered complete.
- Shadowing and role play allow employees to acquire skills and demonstrate skill proficiency, respectively.

LEADERSHIP TRAINING

- To be promoted to a manager, employees are required to complete a multilayered leadership training program:
 - The Aspiring Leaders Program prepares employees to become managers. It is geared toward team leads or employees expressing interest in management roles.
 - The New Manager Program provides continued development once promoted to the manager role. The program focuses on coaching skills, tools that the organization provides, and weekly one-on-one meetings.
- Additional programs are available as managers continue their career advancement.

PROGRAM BENEFITS

- Awarded the ATD BEST Award for 2021, which recognized the impact Pax8 University has on the employees and their company.
- Employees earn credits to redeem for prizes in the reward shop for completing courses.

CASE STUDY EMPLOYER

PetSmart

Employee Training Program

INDUSTRY	SIZE	PROGRAM TYPE
Pet Care Retail	Large (10,000 or more employees)	Upskilling; Reskilling; Apprenticeships

DESCRIPTION/BACKGROUND

We interviewed PetSmart about their employee training programs. PetSmart has three distinct training programs for the three types of retail positions: front-line staff, warehouse staff, and grooming staff. Front-line employees receive training primarily through their managers and onboarding

requirements. Warehouse employees are trained and assessed by supervisors. Observations are scored and documented on tablets. Grooming staff must complete the pet grooming apprenticeship program, which includes 800 hours of training, safety tests, and shadowing by the trainer.

DISTINGUISHING CHARACTERISTICS

SAFETY

- The focus for all employees is on safety (only 100% when it comes to safety).
- Groomers are tested thoroughly through online trainings about the different breeds and which cuts ensure animal safety.
- After groomers have completed the online testing, they are allowed to move into the classroom training.

TRAINING PROGRAM

- Overall, PetSmart uses the Learn It, Try It, Apply It framework to ensure employees are ready to work with customers and other employees.
- For front-line staff, any supervisor can help with training and ensuring employees have mastered the targeted skills.
- The Pet Grooming program requires 800 hours of hands-on training, as well as learning from the District Academy Trainer

ASSESSMENTS

- PetSmart uses third-party software to administer assessments for the distribution centers, where the supervisor can observe employee demonstration of skills learned.
- Employee may retake the training if needed to meet rubric specificity.
- Coaching is available if the supervisor feels it is necessary.

CAREER GROWTH

- Career growth and leadership roles exist for those who want to grow within the organization.
- The average tenure for grooming team members is more than 12 years. Advancement opportunities exist within the grooming role (e.g., trainer, salon manager).

CASE STUDY EMPLOYER

U.S. Office of Management and Budget Skills-Based Hiring Program

INDUSTRY	SIZE	PROGRAM TYPE
Government	Midsized (500–9,999 employees)	Upskilling; Reskilling

DESCRIPTION/BACKGROUND

We interviewed representatives from the U.S. Office of Management and Budget (OMB)'s U.S. Digital Services (USDS) team about their skills-based hiring program. They are partnering with other federal government agencies to focus more on measuring the competencies an individual possesses rather than relying on self-assessments. Applicants complete

assessments prior to HR review and assessment of minimum qualifications and eligibility for Veterans' preference. This process involves working closely with agencies to identify competencies and the proficiency levels within each competency that are needed for a job along with the best means to assess proficiency.

DISTINGUISHING CHARACTERISTICS

COMPETENCY IDENTIFICATION & ASSESSMENT

- The program assesses the competencies of applicants based on what is needed to be successful within the job role for which they applied.
- OMB attempts to refine the competencies that federal agencies need the most.
- The competency library for use in job profile development can be shared between agencies (under development).

INNOVATIVE TECHNIQUES

- OMB brings together hiring managers of different agencies to create applicant competencies for job recruitment that are shared between agencies (e.g., data scientist).
- OMB is working to create a shared certificate platform that would allow information to be shared across agencies (e.g., individual that meets a competency but may not fit a need within one agency may meet a need at another agency).
- OMB built a résumé review tool that is integrated within government HR systems and is designed to reduce bias within the review.
- The program focuses on competencies possessed by individuals (relative to what is needed on the job). Pilot studies have resulted in more Veterans being hired based upon the competencies they possess versus using a résumé alone.

Appendix C

Summary of Tool/System Providers Interviewed

CASE STUDY TOOLS/SYSTEMS

Concentric Sky

Badgr Digital Credentialing Tool

TOOL TYPE

Micro-Credentials; Digital Badges

DESCRIPTION/BACKGROUND

We interviewed Concentric Sky about Badgr, a tool that supports organizations through skill-based digital credentials, stackable learning pathways, and portable learning records. Badgr creates skills-based recognitions and guided learning experiences in a suite of tools that supports organizations and learners. Badgr stores encrypted digital credentialing data in a verifiable, portable, machine-readable badge that can be shared (e.g., via social media) and integrated into an organization's learning systems. Learners can leverage the badges and global learning network to connect to new opportunities to advance their careers.

FEATURES

- A machine-readable badge image hosts data that verifies the credential.
- Stackable digital credentials combine to build certifications and career pathways.
- Skill taxonomies are available by occupation so learners can identify micro-credentialing opportunities.
- Organizations can embed Badgr into their own skill validation platforms.
- Badgr is used by around 30 million users across 160 countries.
- Badgr is operated by 25,000 organizations, including those with large-scale capacity (e.g., trillion-dollar budgets).
- Each skill-aligned badge in Badgr can display real time labor market information and can connect badge recipients directly into job search marketplaces.

CASE STUDY TOOLS/SYSTEMS

Credly

Digital Credentialing Tool

TOOL TYPE

Training; Credentialing; Badging; Competency Testing

DESCRIPTION/BACKGROUND

We interviewed Credly about their digital credentialing tool (Credly Acclaim). Credly's cloud-based platform supports verification, sharing, and management of digital credentials. The platform provides analytics, including metrics and improvement areas, compiled in a dashboard that organizations can customize to fit their needs. Organizations can incorporate the badges into their own recognition systems and metadata.

FEATURES

- Credly establishes a standardized approach for providing details and context (e.g., number of years of experience, requirements) to learning outcomes and experience.
- Credly documents credentials that directly link to the credential source/provider (e.g., Project Management Institute).
- The customizable dashboard allows organizations to track and analyze their learning events.
- Credly is used globally.
- Credly offers more than 40 million digital credentials. Every second of every business day, a Credly credential is earned, verified, shared, or used.

Learn on Demand Systems Learning Lab

TOOL TYPE

Skills Validation; Training; Upskilling; Credentialing

DESCRIPTION/BACKGROUND

We interviewed Learn on Demand Systems about their learning lab development platform, which offers experiential learning and skills validation in a virtual environment. Specifically, they use challenge labs, which include hands-on scenario-based exercises that assess skills with brief, goal-oriented exercises. Learners receive digital badges after completing the challenge labs (or a set of labs), which can be given in conjunction with, before, or after training. These labs go beyond testing knowledge alone and assess a learner's acquired skills via three scoring strategies: knowledge checks, activity-based tests, and performance-based assessment. The platform allows organizations to create their own challenge lab, gain access to a library of existing labs, or connect organizations to available third-party labs.

FEATURES

- Challenge labs allow organizations to focus on the skills a learner acquires versus just focusing on their knowledge of the content area.
- Learn on Demand Systems allow users to test skills using customized lab environment assessment methodologies and technology.
- The open platform offers a fully customizable design according to an organization's specifications (i.e., as complex or as simple as needed).
- Assessment blueprints can be developed by psychometricians and then incorporated into the lab environment (e.g., technology type and requirements, candidate type, job task analysis).
- Challenge labs are organized by those offering a learning path, related to technology, required for a job role, required for a certification (e.g., AWS, CompTIA), or offering practice for a certification exam.
- Learn on Demand Systems offers organizations the opportunity to enhance learning using hands-on exercises and skills validation, extending beyond degree or knowledge attainment and toward skill attainment.

PAIRIN Skill-Based Tools (PAIRIN Pro, MyJourney)

TOOL TYPE

Skill Assessment; Training; Identifying Skills Gaps

DESCRIPTION/BACKGROUND

We interviewed PAIRIN about their skills-based toolbox that includes PAIRIN Pro and MyJourney. PAIRIN Pro is a coaching and development tool that matches people to job profiles and training programs, identifies skill gaps, and provides tools/resources to help develop essential skills (primarily soft skills). It begins with skill mapping by means of a survey that measures attributes on an intensity scale (which are based upon the most critical O*NET characteristics and then cross-mapped to the list of PAIRIN skills). After measuring and mapping an individual's skills to the target ranges, the individual is provided with reports on skill gaps and areas of growth. MyJourney connects individuals to education, career, and support resources while folding in some skill development.

FEATURES

- PAIRIN Pro includes a survey that measures over 100 (soft) skill-related attributes, including a list of approximately 300 adjectives measured on an intensity scale and clustered into skills and ranges.
- PAIRIN Pro can be used by a variety of organizations and industries to perform employee skills-mapping, skills-gap identification, and career trajectory planning.
- PAIRIN Pro contains a research-based mapping of relevant skills to jobs (e.g., machinist), job families (e.g., production), and career clusters (e.g., manufacturing).
- PAIRIN Pro measures and longitudinally tracks an individual's skill attainment and development.
- PAIRIN Pro provides a personal dashboard with insights based on each learner's survey results.
- The toolbox of complimentary products can be combined to maximize utility (e.g., coaches can access curriculum rubrics to measure outcomes).
- Micro-lessons and classroom lessons are available for skill development, which include rubrics aligning with system/content standards.
- The output is accessible to coaches and learners to work toward a learner's career advancement and skill development.

Questionmark Assessment Tool

TOOL TYPE

Skill Assessment; Training; Identifying Skills Gaps

DESCRIPTION/BACKGROUND

We interviewed Questionmark about their assessment platform, which is used by organizations within the United States and across the world to create, deliver, and report on assessments. Questionmark is used widely by corporations who want to develop tests, and measure or validate skills and competencies in the workplace. Questionmark offers a multitude of assessment options, such as compliance training, competency testing, and pre- or post-hire screening aptitude exams. The platform is notable for its ability to assess company-specific or job-specific skills that may not be readily available via off-the-shelf solutions. The platform is compatible with multiple devices (e.g., computer, tablet, form), making it a viable option for jobs that may not be based in a traditional office space.

FEATURES

- Fully customizable assessments can be built from the ground up.
- Questionmark is ideal for company-specific or job-specific skills not readily available via off-the-shelf solutions.
- Some off-the-shelf assessments are available (e.g., data literacy).
- Questionmark can deliver a job task analysis survey to support skill validation.
- Questionmark offers robust analysis and reporting options (e.g., data can be integrated into an organization's learning management system for analysis with other performance data).
- Services are organized by hubs: government hub, certification hub, and proctoring hub.



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