

Rework America
Business Network
A Markle Initiative

DIGITAL BLINDSPOT:

How Digital Literacy Can
Create a More Resilient
American Workforce

October 2019



MARKLE
ADVANCING AMERICA'S FUTURE

Acknowledgments

The Rework America Business Network would like to thank its member companies:

**Aon · Archer Daniels Midland · Boeing
Duke Energy · Kaiser Permanente
McKinsey & Company · Microsoft
Stanley Black & Decker · Toyota
Walmart · Zurich**

We would also like to thank the following people and organizations for their contributions to this report:

- » Bell Creek Consulting
Patrick Casey & Mohamed Elmalik
- » Digital US
- » Google.org
- » Greater Washington Partnership
- » Microsoft Philanthropies
- » Opportunity@Work
- » Walmart Giving
- » Whiteboard Advisors
- » Workday

ABOUT THE REWORK AMERICA BUSINESS NETWORK:

The Rework America Business Network is an initiative of the Markle Foundation. The Network was launched in 2018 with 11 large, founding member companies, which collectively employ approximately 2.2 million Americans. The network's primary objective is to increase the number of American workers with pathways to career success by driving the adoption of skills-based practices among employers through a combination of practice, policy, and tool development. In particular, RABN highlights innovative practices through case studies, convenings and practical guides to demonstrate the impact of these practices and offer a roadmap for employers to get started. RABN also works cross-sector to enable the deployment of skills-based practices at scale, including HRIT vendors, educators, and policymakers. To learn more, visit www.markle.org/RABN.

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Foreword

Read any report on the future of work and you will likely hear about the looming automation of large swaths of jobs and growing gaps of AI and computer programming skills. While these issues deserve attention, they mask an important but far more subtle shift in the world of work. Entirely new fields and functions are being created at a breakneck pace, and nearly every job is changing. And even incremental changes are—in aggregate—having profound effects.

From the engineers designing planes, to the mechanics repairing them, to the office workers handling process management or sales, workers are feeling the pressure to adapt and evolve the way they work. According to a recent report from the McKinsey Global Institute, while today's technology threatens just 5% of occupations with complete automation-driven obsolescence, far more jobs (60%) could have nearly a third (30%) of their work activity automated with the application of already-existing technology, dramatically changing the work experience of most occupations. Against that backdrop, there is a risk that in our race to close the most acute skill gaps, we might overlook the impact of technology on a much broader segment of our workforce.

This paper describes that risk as a “Digital Blindspot” that, in many ways, reflects the way the human brain understands and evaluates risk: we tend to worry more about the unknown than things we know and can control.

Avoiding the Digital Blindspot demands that we focus on building not just new tech skills, but also the sort of foundational digital literacy that undergirds a more digitally resilient workforce capable of adapting and responding to new systems, tools, and processes. This requires action across the ecosystem. This must include employers, but we know we can't do it alone: policymakers, adult education providers, and the K-12 and higher education sectors all have a role to play.

Some companies have already identified—and are working to overcome—the Digital Blindspot: our companies (Boeing and Microsoft) and others like AT&T and Stanley Black & Decker, who are profiled later in this report, have invested millions to help their workers build the digital literacy and technology skills they need to thrive. But more needs to be done.

This paper highlights the importance of digital literacy in enabling digital resilience by providing workers with the foundational skills and confidence to tackle new technologies. It provides a framework for defining the digital skills required for modern employment and a path forward for employers to prioritize segments of their workforce for investments in digital training.

We hope it serves as a useful tool for employers eager to join us in creating a more equitable digital playing field for all workers, and we welcome employers eager to tackle these issues to join us as part of the Rework America Business Network.

HEIDI CAPOZZI

Senior Vice President of Human Resources,
The Boeing Company

CHUCK EDWARD

Corporate Vice President, Head of Global
Talent Acquisition, Microsoft

Co-Chairs, Rework America
Business Network

Technology's Transformation: Opportunities and Risks



Technology's transformation of nearly every facet of our lives presents both profound opportunities and risks. Finding and applying for jobs, accessing medical records, or even reserving a picnic table at a park or answering a jury duty questionnaire now require access to an internet-enabled device. Our reliance on technology to perform even mundane tasks risks exacerbating gaps between technology haves and have-nots.



8 in 10 middle-skill jobs now require basic technology skills (e.g., office productivity software).¹

¹The Digital Edge: Middle-Skill Workers and Careers, Burning Glass, September 2017



“When we look forward in this era of rapid technological change, we know that technology and the interaction of our people with technology will impact nearly every role across our organization. It's not just engineers and data scientists. All roles will be affected and we must map the future skill requirements building reskilling paths to enable our collective success both today and in the future.”

STEPHEN M. SUBASIC

Vice President, Human Resources, Global Tools & Storage and Corporate Talent Management
Stanley Black and Decker

This risk that technology might widen, rather than narrow, already endemic gaps in access and equity is of particular concern in the world of work, where technology now impacts nearly every job in every field.

While the popular narrative focuses on the rise of automation, AI and robots coming for our jobs, a far more profound and subtle shift is taking place.

Rather than a sudden, single technological shift revolution, today's labor market is typified by a gradual—but inexorable—move toward digitization.

For some, that change is manifest in the digitization of once-analog processes (e.g., moving from paper medical records to digital ones).

Others experience it through small-scale automation, with tasks previously done by humans embedded in software (e.g., AutoCAD software automatically checking drawings against building standards).

Even the way individuals find opportunities is digitizing: the number of people who have applied for a job online has doubled since 2005, according to SHRM.

In aggregate, these seemingly small digital changes add up to massive shifts in how Americans find and do their jobs.

Technology's Transformation

Instead of decisive action to respond to these shifts, employers are stuck in uncertainty: either unaware of the everyday digital challenges their workers are facing (or will soon face) or aware but overwhelmed at the size and scope of change and unable to identify first steps in building an actionable path toward tackling the digitization dilemma.








“Over the next decade, technology and automation will continue to drive changes across the American economy and workforce. Employers recognize the critical importance of upskilling their people, but many are still trying to figure out the right model.”

BRYAN HANCOCK

McKinsey & Company Partner and
Global Talent Practice Leader

Part of the problem is that employers are struggling to answer a few foundational questions:

-  How can employers credibly define and assess digital literacy?
-  What do we mean by digital resilience, and how can employers develop it?
-  What are the roles or occupations that will be most impacted in the future workforce by digitization?
-  How can we prioritize these investments accordingly?
-  How can employers and educators work together to equip workers and future workers with the requisite digital skills?



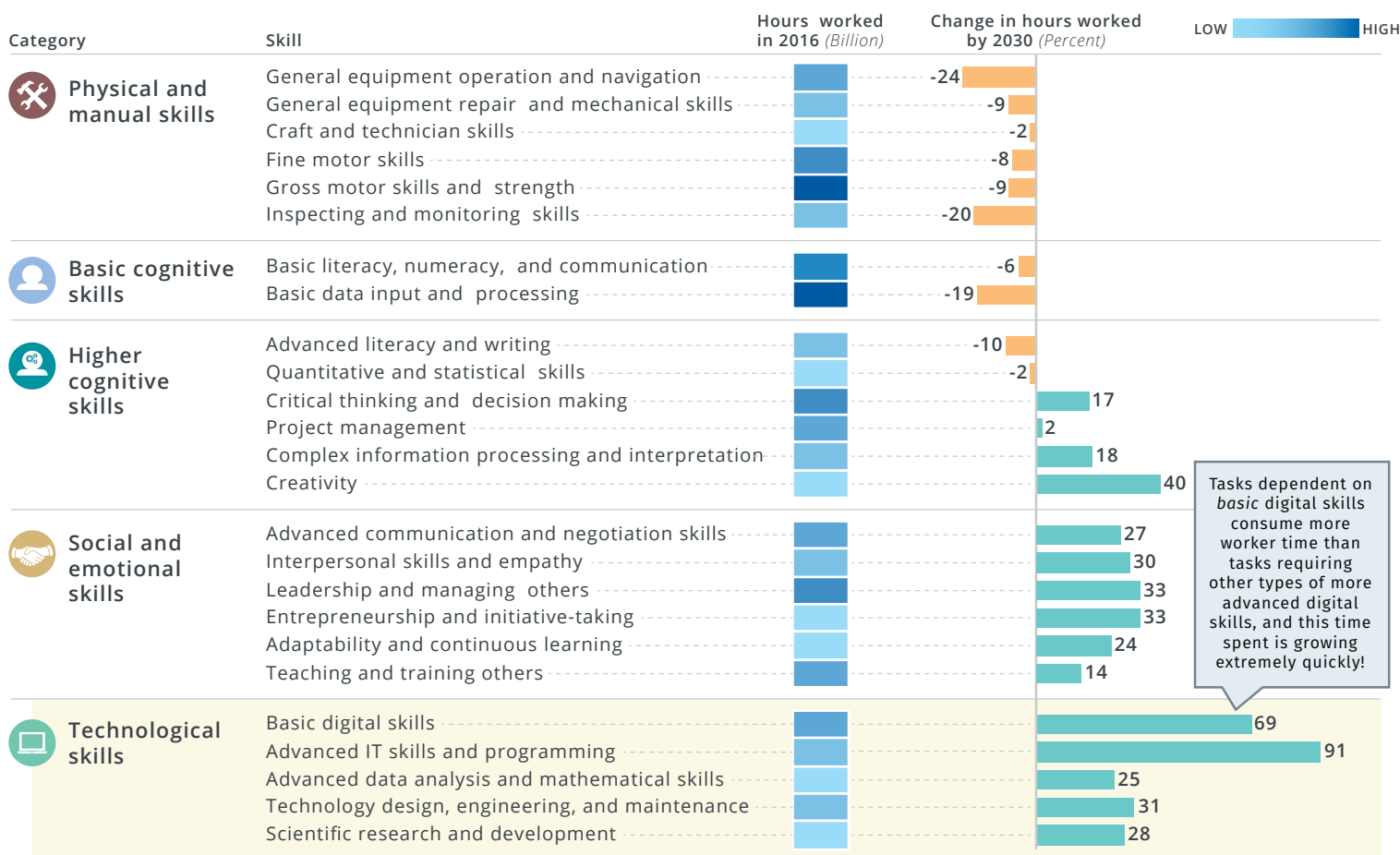
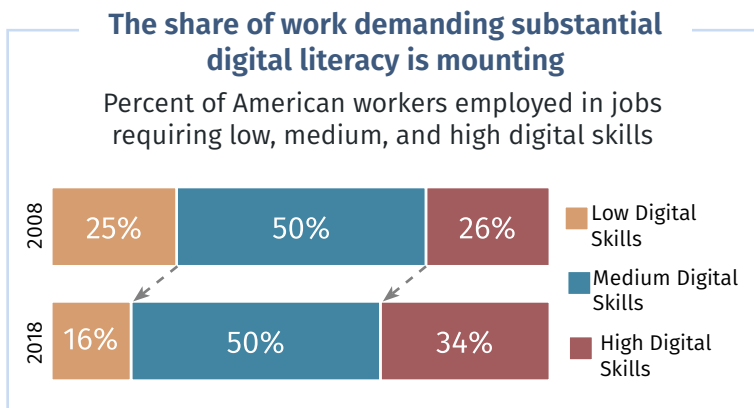
Without answers to these questions, workers don't have a clear picture of the digital expectations of employers, employers struggle to efficiently hire and train workers to fill critical needs, and educators and policymakers don't know what skills to prioritize for purposes of teaching or funding.

This report offers insights on the rate of digitization to help stakeholders identify priority roles for upskilling, provides a framework for creating a shared understanding of the skills that are required for digital literacy in employment, outlines the role of employers and educators in equipping workers with necessary digital skills, and offers resources to help employers embed such skills in their talent strategies. This report is part of a broader effort from the Markle Foundation's Rework America Business Network (RABN) to put skills at the center of the labor market.

Improving Workers' Resilience in an Era of Digitization

- » An estimated **77% of jobs will require some use of technology** by 2020.¹
- » Among middle-skill jobs, which represent the majority of jobs in America, **82% already require the use of technologies** such as spreadsheets, software programs for medical coding or billing, and digital platforms to track customers and orders.²
- » And **84% of small businesses** in the U.S. use at least one digital platform.³

The McKinsey Global Institute recently analyzed the number of hours spent by U.S. workers on various tasks, the skills required for those tasks, and how those are expected to shift by 2030.⁴ They found that the number of hours employees spent on advanced IT activities will nearly double (growing by 91%). However, tasks dependent on basic digital skills not only are expected to see the second-fastest growth but currently account for many more working hours (in aggregate) than advanced IT skills.



Source: Analysis of hours spent by U.S. workers on tasks requiring certain skills, by the McKinsey Global Institute, Skill Shift, May 2018

¹ No Longer Optional: Employer Demand for Digital Skills, Burning Glass, June 2019. ² The Digital Edge: Middle-Skill Workers and Careers, Burning Glass, September 2017
³ What's Tech's Impact on Small Business? Here's What We Found Out, Tim Day, Senior Vice President, Chamber Technology Engagement Center, U.S. Chamber of Commerce, January 18, 2018. ⁴ The McKinsey Global Institute, Skill Shift, May 2018

Improving Workers' Resilience

Even highly hands-on occupations like personal care aide are seeing significant growth in digitization, as new technology solutions like remote patient monitoring, telehealth, and digital portals for tracking client information become part of the normal course of business.

In some cases, increased digitization has actually made digital work more accessible, as tasks that once required coding (like building a website) can now be done with drag-and-drop tools—allowing workers with basic digital skills to do much more sophisticated work than ever before. However, the ubiquity of email, word processing, and sector-specific machines or software platforms means the penalty for lacking digital fluency is rapidly growing, creating barriers for those who lack the technology skills or confidence to use digital tools effectively.

For employers, the prevalence of digital tools in day-to-day life may create a false sense of security in the digital fluency of their workforce. But just as employers have doubled down on soft skills like communication—despite the fact that communication is also a day-to-day activity for most people—so employers must also look critically at the digital skills of their workforce and invest in ensuring workers have both today's digital skills and opportunities to learn the digital skills of tomorrow.

If properly framed, employers will be motivated to make this kind of investment as a result of better understanding this threat to their workforce. Investments in digital skills create measurable benefits for employers.

The Brookings Institution notes that digitally literate workforces are more competitive, creating cost savings, improving output, and generating productivity gains from the adoption of digital technology.



“The role of technology is changing: productivity tools like word processing, which were cutting edge a generation ago, are now table stakes for employment. Job seekers need clarity into the digital skills that are required for employment, and employers need to hire not just for the digital skills of today, but also for the digital resilience and growth mindset that will enable workers to continually upskill in their career.”

BECKY SCHMITT

Chief People Officer, Sam's Club, a division of Walmart, Inc.

A majority of Americans may be uncomfortable using digital tools in the way employers expect them to

A Pew research analysis found that

52%

of Americans are “relatively hesitant” in their use or adoption of technology

particularly in using technology to learn new things

and

as measured by OECD's Program for the International Assessment of Adult Competencies (PIACC)

41%

of Americans with less than a high school diploma

and

17%

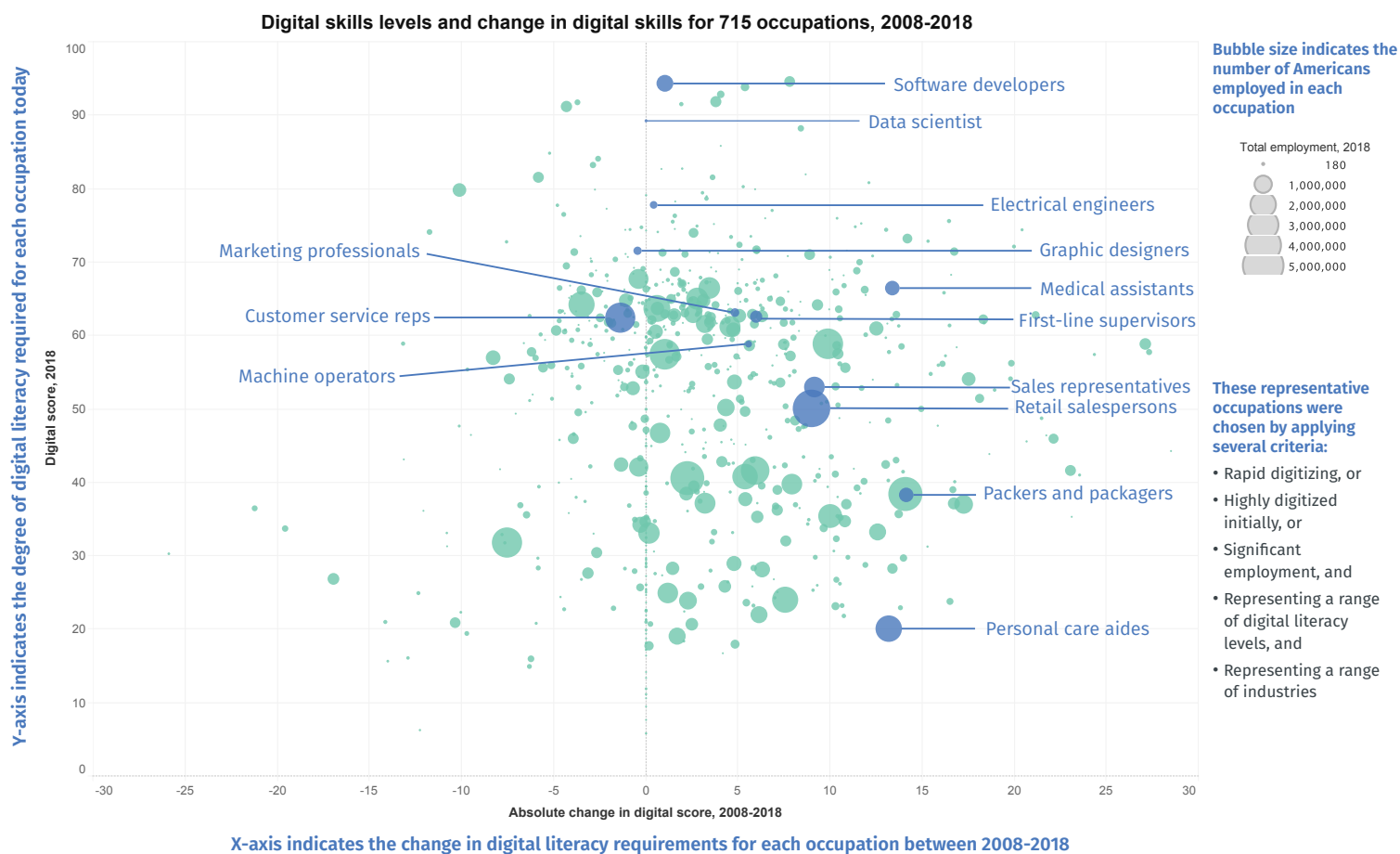
with a diploma, but no college degree

lack the foundational digital skills to navigate a digital environment

and find the information they need

Improving Workers' Resilience in an Era of Digitization

As part of our own work to understand where these digital trends create the greatest need for immediate action, RABN analyzed 715 occupations in the labor market, assessing both the current level of digitization within a given occupation and the rate of growth in digitization over the past decade. To access an interactive version of this analysis, please visit: markle.org/DigitalBlindspot. We found that while software developers and data scientists appear near the top of the spectrum for overall digitization, they show little to no increase in additional digitization. On the other extreme, warehouse packers and packagers have relatively low current digitization, but have experienced changes in digitization nearly twice those of the average occupation.



Source: RABN staff analysis of Bureau of Labor Statistics O*Net data, extending a methodology developed by the Brookings Institution in their 2017 report *Digitalization and the American workforce*

Understanding the rate of change in various roles and industries can help employers and policymakers prioritize investments in digital literacy to support both the incumbent workforce and future employees.

While the rate of change is one important factor for prioritization, other criteria, such as the number of employees impacted, may be equally important. When large occupational sectors experience digitization, even in relatively small ways, the impact can be significant. This is the case for the 4.5 million retail salespeople currently learning new systems for tracking or managing inventory and online orders, navigating new checkout software or hardware, or using virtual reality tools to train for high-volume days like Black Friday. Employers who are struggling with the question of where to begin investing in digital literacy should reference our *Getting Started Guide* on page 13 of this report to understand how to incorporate this kind of analysis into their own thought processes.

A Framework for Digital Literacy

The first step employers need to take to address the Digital Blindspot for their workforce is to establish a common definition for the digital skills needed across their organization. Today, employers struggle to identify these skills partly due to a lack of agreement across the workforce ecosystem on the basic components of digital literacy.

In order to understand the current landscape, RABN examined definitions of digital literacy from a cross-section of employer, non-profit, and NGO sources. These organizations or employers have, in many cases, developed extensive definitions and associated training programs, assessments, and certifications that support the identification and development of digital skills.

By identifying similar skills and themes across definitions, RABN created a framework to categorize the skills workers need, and the role of different stakeholders in providing that training. In particular, this framework distinguishes digital skills that are essential for work—employability digital skills—from those that are not. Thus, employability digital skills are the basic set of capabilities workers need in order to use devices, data, and computing proficiently, safely, and ethically to perform their job’s core activities in the increasingly digitized future of work. This distinction between work-relevant digital skills and other digital skills helps job seekers prioritize time and resources for professional development on skills that will lead most quickly to employment. It also helps educators and trainers develop curricula and programs aimed at these most job-relevant skills.

Because the technologies needed to perform each job are changing, the RABN framework provides guidance for identifying the skills needed for success—and identifying which skills are most likely the purview of educational institutions, as well as those skills employers should expect or be prepared to foster themselves.

Varying definitions of digital literacy



Awareness and command of the digital skills needed in today’s world; and proficiency in a combination of basic (e.g., Gmail, typing) and complex (e.g., SQL) tools and skills

Proficiency in the basic skills needed to use a computer and the internet in daily life, employment, and higher education



Digital literacy skills are the foundation necessary to use digital devices, software and tools to discover, use and create information

Possessing the skills needed to succeed in any environment that requires the use of computers, devices, or the Internet



The confident and critical use of ICT tools in areas of society including work, employability, education, leisure, inclusion and participation in society

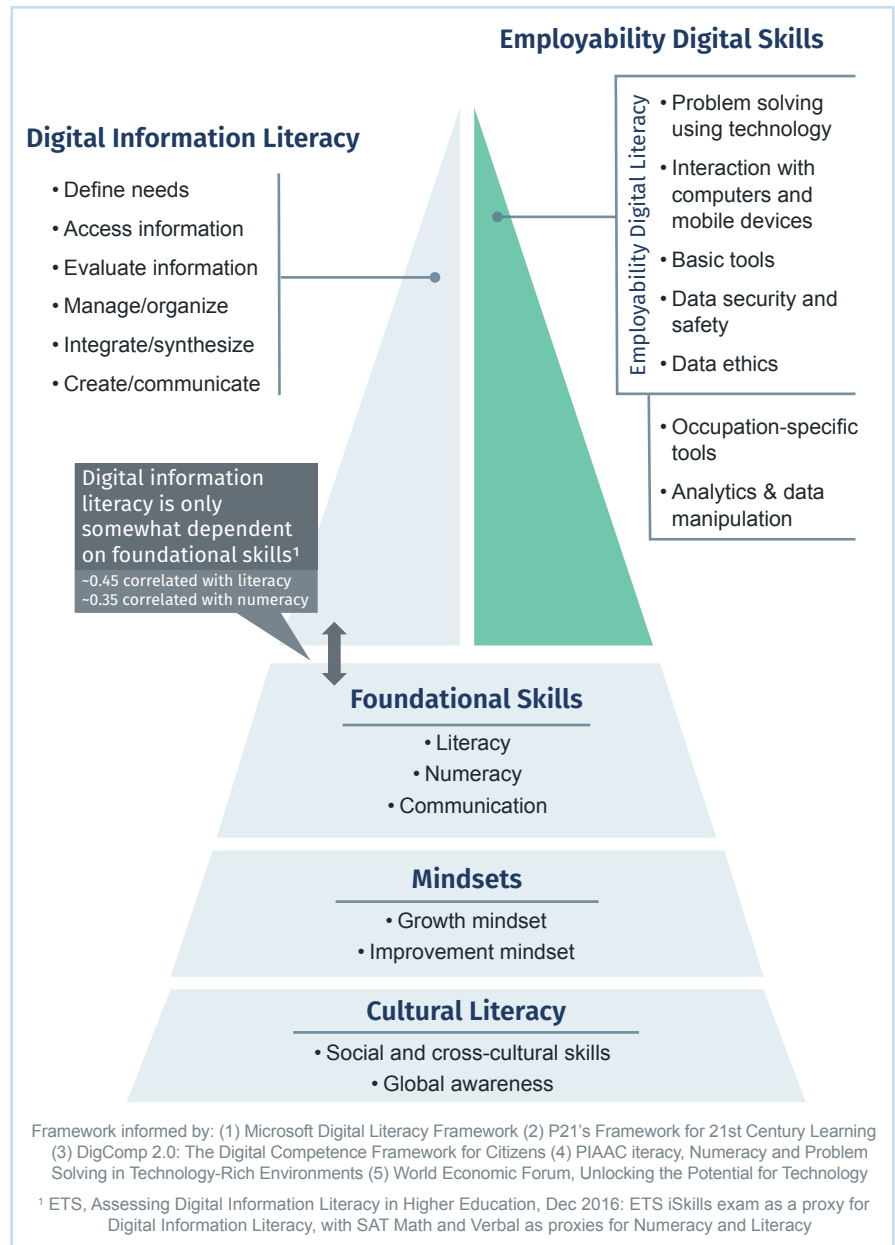
Digital/tech knowledge, skills and abilities needed by industry for entry-level positions in a wide variety of occupations



A Framework for Digital Literacy

The pyramid on the right begins with foundational, pre-requisite skills, including basic literacy and numeracy skills, mindsets, and cultural literacy. These lower levels of the pyramid represent areas of focus primarily for educators in either K-12 or adult basic education. The skills above—problem solving in technology-rich environments, the ability to use both basic productivity tools (e.g., email, word processing software) as well as occupation-specific software or hardware, and using and maintaining data accurately, safely and ethically—are the skills employers or postsecondary institutions may need to either teach or help upskill.

Those skills identified in this top-right group are **employability digital skills** because they constitute the marginal tier of skills without which a job seeker is increasingly likely to be ineligible for most modern employment. To illustrate: basic numeracy is required, but insufficient for employability in the increasingly digitized world of work. In contrast, possessing occupation-specific digital tool skills (e.g., photo editing in Adobe Photoshop) on top of basic, related skills (e.g., numeracy in mixing color values in Adobe Photoshop), does make the job seeker eligible for employment.



What each of these seven dimensions of employability digital skills looks like for a given occupation can vary based on the level of digitization of that occupation. For a parcel delivery person, for example, “interacting with computers and mobile devices” would include scanning shipping labels with a mobile device, while for many types of machinists, it might include 3-D model programming. These jobs require very different levels of computer and device proficiency, with neither falling into what are casually thought of as highly digitized industries.



“Employers really need to become the standard-bearers in defining and advocating for the basic digital literacy skills that American workers need not only to succeed in the workplace, but to ultimately author their own economic destinies. But promoting a common definition of tech literacy is no small feat for such a large workforce with high variability in the level of tech fluency required for different roles. That’s the challenge we’re grappling with today.”

GAYATRI AGNEW

Senior Director, Walmart.org

A Framework for Digital Literacy

Of the seven dimensions of employability digital skills identified in the RABN research, five constitute employability digital literacy. Taken together, these form the “floor”—the baseline expectations—for digital literacy that are true across nearly all (85% and increasing¹) occupations in the modern enterprise. They include problem solving using technology, interaction with computers and mobile devices, the use of basic technology tools (e.g., office productivity software, web browsers, and email), data security and safety, and data ethics.



“Digital needs vary greatly across organizations. Employers must ensure they consider both basic digital literacy as well as more role-specific technology expectations, or they risk overlooking a pressing need to invest in foundational digital skills development.”

ALISON ASCHER WEBBER

Digital US and EdTech Center @ World Education

While the primary five areas above are relatively stable across functions, the final two areas of employability digital skills—occupation-specific tools and analytics and data manipulation—have a significant degree of variability and encompass a wide range of technical skills.

¹ No Longer Optional: Employer Demand for Digital Skills, Burning Glass, June 2019.

Employability Digital Literacy Skills

BASELINE FOR EMPLOYABILITY DIGITAL LITERACY SKILLS

Problem Solving Using Technology	Computer and Mobile Device Interactions	Basic Tools (e.g., Word, Email)	Data Security and Safety	Data Ethics
Interpretation and use of digital information (e.g., data, research) to solve a problem	Understanding the basic skills needed to interact with computers and mobile devices	Mastery of basic productivity tools and software common to most occupations and digital settings	Awareness of threats to a computer and techniques to protect computers, and data, from those threats	Understanding how to behave legally and ethically in a digital context (e.g., on the internet)
<ul style="list-style-type: none"> Identify the correct data for resolving problems 	<ul style="list-style-type: none"> Typing Turning a device on and off Searching for a file 	<ul style="list-style-type: none"> Proficiency in word processing Sending and receiving emails Proficiency with GSuite 	<ul style="list-style-type: none"> Identify the various threats to your computer and the data stored on it 	<ul style="list-style-type: none"> Explain intellectual property and copyright as they apply to computing.

ADDITIONAL EMPLOYABILITY SKILLS

Occupation-Specific Tools (e.g., Photoshop)	Analytics & Data Manipulation
Use of advanced digital tools and programs, used for execute specific tasks (e.g., programming)	Understanding how to interact with and manipulate data for a specific purpose (e.g., to yield visualizations)
<ul style="list-style-type: none"> Proficiency with programming languages (e.g., Python) 	<ul style="list-style-type: none"> Create and edit simple data structures and storage Manipulate data to render desired visualizations

- Synthesized “meta dimensions” of digital literacy
- Definitions
- Example skills

The framework described above provides a roadmap for action across multiple stakeholders. For employers, the next step is to establish a definition for employability digital literacy within their organization and embed that definition in various parts of the talent cycle. See our Getting Started Guide on page 13 of this report for advice. For educators and policymakers, it outlines the types of foundational skills necessary to ensure workers can gain the marginal skills they need to adapt to a changing economy.

Getting Started Guide

To help employers take action and ensure their workers possess the necessary digital literacy skills, RABN created a Getting Started Guide, rooted in emerging best practices used by members and other leading employers to embed digital literacy in their talent strategies. While implementation will look different across companies, these steps can provide a roadmap to inform thinking and guide the process.

1 ALIGN ON AN ENTERPRISE-WIDE DEFINITION OF DIGITAL LITERACY

A definition provides clarity and purpose to an otherwise vague concept prone to differences in interpretation. The process of determining a definition will look different for each organization, but there are a few common themes:

- ◆ **Don't reinvent the wheel:**

Start by exploring the existing third-party definitions highlighted in this report. Many of these definitions come with associated frameworks and definitions, skill assessments, and training options that will save time and make implementation easier. [See Appendix A for an illustrative approach to landscaping a sample of third-party definitions]

- ◆ **Map the definition to specific skills:**

The final product should highlight the baseline digital literacy skills necessary for workers to possess now and in the future. Allow for some variation in the skills for very different segments of your workforce (e.g., office vs. production).

- ◆ **Encourage broad participation throughout the process:**

Engage stakeholders throughout the company to participate in the process. Interview leaders about their vision for a digital workplace and speak with hiring managers and workers about the ways in which digitization is impacting their work on a daily basis. Share draft definitions with key constituents and get buy-in from senior leadership to create broad support for the definition internally.

2 ASSESS SKILLS

Implement a data-driven, credible way of assessing the skills employees have, or that future job candidates may have.

- ◆ **Again, don't reinvent the wheel:**

Many digital skill assessments exist already for out-of-the-box use. If these don't meet your needs, you can partner with educators to develop new models. [See Appendix B for an illustrative approach to landscaping a sample of third-party assessments]

- ◆ **Make it as easy as possible for employees to take assessments:**

Platforms like Degreed.com allow organizations to embed customized assessments into existing learning tools. Other services like mobile apps enable HR teams to reach employees where they are. Creating contests and getting senior leaders to publicly take assessments can also drive employee participation.

DIGITAL LITERACY IN ACTION: COMPANY PROFILES

See Appendix D for more detail on each initiative

BOEING

- » In the midst of a \$100 million enterprise-wide initiative to modernize its workforce's digital skills.
- » Working with a third-party provider to pilot skill definitions, assessments, and training across three key divisions.
- » Plans to embed assessments and training in its learning platform to increase adoption.

STANLEY BLACK & DECKER:

- » Continuing to identify skills they have, need and potential gaps with business heads across the company.
- » Now working to implement a number of upskilling initiatives focusing on digital fluency, including a partnership with Coursera, micro-credential programs with academic institutions, and a digital fitness app that assesses literacy across a number of digital dimensions.

AT&T:

- » Launched reskilling initiative in 2012 to respond to seismic shifts in the company's business model from hardware to software.
- » Seven years later, more than half of the AT&T workforce has participated, completing nearly 2 million courses annually and earning approximately 200,000 learning credentials.

MICROSOFT

- » To help their suppliers and further their global mission, Microsoft has played a leading role in providing digital skills training for the past two decades.
- » As digital skill needs have become more complex and omnipresent in work and life, Microsoft has worked to define required skills, categorize them into job types, and build supporting training materials.
- » The training is publicly available and supported via partnerships with suppliers and non-profits around the world who have delivered the content to over 75,000 people around the world.

3 IDENTIFY TARGET ROLES FOR UPSKILLING PILOTS

What roles are digitizing most quickly? Where are the biggest gaps in digital skills? Which occupations comprise the biggest segments of your workforce? Which functional leaders are most excited about piloting new training initiatives? Start with a manageable number of functional areas and occupations, and plan to expand quickly from there to balance the desire to cover the whole organization with the need to test solutions first. [See RABN analysis of digitization across jobs, available at www.markle.org/DigitalBlindspot, to inform your answers to these questions]

4 DO DEEP DIVES ON OCCUPATION-SPECIFIC SKILLS

Work with functional area leaders and managers participating in the pilot to identify occupation-specific skills that aren't captured in the baseline digital literacy definition.

5 SELECT AN IMPLEMENTATION PARTNER

Your company's need for support will depend on its size and complexity, as well as the resources it is able to bring to bear internally. Implementation partners can include upskilling providers, consulting firms, or other supporters. [See Appendix C for elements of a real-world RFP used by Boeing to select an implementation partner, based on their specific needs and resources]

6 MONITOR RESULTS, ITERATE, AND EXPAND

Work with the functional area leaders to determine key metrics to track, potentially including individual and group performance, adoption and usage rates of new technology, and retention. Set up tracking to evaluate those metrics before and after training.

Over time, digital literacy can be embedded more holistically throughout the employee lifecycle, including in hiring, pre-employment training, and advancement. RABN is developing a series of implementation guides and associated case studies to help employers take a skills-based approach to talent management.

The U.S. labor market is undergoing a major shift as technology advances rapidly. But for all our focus on seismic change—jobs that are being rendered obsolete by automation or entirely new roles that are being created by technology—the nature of work is being most profoundly impacted by the steady adoption of digital processes and tools across all jobs. The nation’s economic prosperity depends on a labor market resilient enough to keep up with this steady march of technological innovation and change.

Addressing this challenge requires a skills-based approach to managing digital literacy needs. With such an approach, HR executives can ensure companies identify and develop talent to meet the shifting demands of key roles, while meeting diversity, equity and inclusion goals. We hope the tools and resources in this report help companies chart a path forward. We also hope that they help inform educators, policymakers, and individuals about the changing skills needed to thrive in the digital economy.



“With the pace of technological change quickening and today’s rapidly evolving labor market, it’s time to rethink the way that we equip students and adult learners alike with the sort of technology skills that will empower them for mobility and independence in the digital age. This requires a shift in policy and employer practice. This report should serve as a clarion call for U.S. education providers, employers, and policymakers alike—not a moment too soon. It’s time to take action not only for today’s students and workers, but for generations to come.”

BRIAN KRINOCK

SVP, Vehicle Manufacturing & Production Engineering, Toyota Motor Manufacturing North America

We know change cannot be achieved through a few companies, or even one sector. All stakeholders must act to ensure our labor market thrives during these changing times. Employers must be able to clearly articulate the skills workers need in order to perform in-demand jobs. Education and training providers must work closely with them to ensure their courses and curriculum are designed to teach employability skills. Policymakers must work not only to remove barriers to implementing better assessment and training, but also to provide much-needed funding and resources to support these efforts. And finally, individuals must work to develop in-demand skills and to learn to use tools that send clear signals about their capabilities to employers.

The RABN will be publishing a series of guides for HR executives and managers on how to implement various skills-based practices throughout the talent cycle. We also will be working across sectors to release a set of policy recommendations at both the state and federal level to ease adoption and implementation of these practices.

We know this work cannot be done alone—and that’s why we will be working closely with our member companies to identify challenges, lessons learned, and best practices from their experiences navigating the future of work. We also are working with partners, like Digital US (JoinDigitalUS.org), which is a new national coalition advocating for all American workers to obtain foundational digital skills by 2030.

We urge you all to please join with the members of the RABN in a dialogue with developers of digital literacy assessments, credentials, and upskilling solutions to make sure that they are developed to meet employers’ future workforce needs, and in so doing are better positioning job-seekers, educators, and trainers for success in the future of work.

Appendix A







Many companies can benefit from beginning their digital literacy journey by evaluating existing digital literacy definitions as a starting point rather than starting from scratch. Several factors should be considered to determine the best-fit definition for a company including the degree to which a definition addresses the elements of employability digital skills and digital literacy. A company should also weigh the degree to which a definition provider backs its definition with other resources that can help operationalize this definition within a company (e.g., with digital skill assessments aligned to this definition). Finally, a company should consider how mature the definition and provider are, to ensure both refinement of thinking and sustainability of support.

The diagrams in this appendix offer an illustrative approach to considering such factors for a sample of providers in this space. Companies considering this approach should complete their own review of options, weighing factors tailored to their particular needs.

Each existing definition focuses on a different subset of the overall digital literacy picture

Skill Requirement Coverage

Thorough Partial

						
BASELINE FOR EMPLOYABILITY DIGITAL LITERACY SKILLS	Problem Solving Using Technology	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Computer and Mobile Device Interactions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Basic Tools <i>(e.g., Email, Word Processing)</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Data Security and Safety	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Data Ethics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ADDITIONAL EMPLOYABILITY SKILLS	Occupation-Specific Tools <i>(e.g., Photoshop)</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	Analytics & Data Manipulation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Source: Definitions analyzed here were sourced from a combination of desk research and dialogue with employers, intermediaries, and funders in the workforce space with whom RABN is connected. Skill requirement coverage was assessed by comparing definition providers' publicly-available materials and, where possible, a follow-up validation phone call, to compare their relative coverage of the digital literacy meta-dimensions synthesized by RABN staff across all definitions

Each definition also differs in its readiness for enterprise adoption



BREADTH OF SUPPORT

Overall						
Target Customer						
Assessment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Credential	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Upskilling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Additional Detail		Indiana workforce organization WorkIN identifies IC3 and MSFT MOS certifications as helpful in administrative staff hiring in Indiana	Google also offers Applied Digital Skills, a free online curriculum. Teaches basic digital skills: data analysis, conducting research and communicating via digital tools, and basic coding and digital literacy.			Greater DC area companies inform curricula for digital credentials and preferentially interview graduates

MATURITY OF MODEL

Overall						
Scale of Usage	NORTHSTAR MN, RI, VT, NY, KS, GA, DE Educated 1M over 3 yr with Goodwill Digital Career Accelerator 631 U.S. testing centers. Adopted by nearly 800 test locations in all 50 states and six foreign countries.	IC3 14,000 worldwide testing centers Customers include community colleges, government agencies, and non-profits worldwide	GOOGLE 125 community-based Goodwill organizations has been funded by Google.org to use this offering to train 1M Americans over 3 years	EUR. COMM. Offered to Microsoft's full partner and supplier communities, in addition to use to teach 75k community members via partner CSR, to date	MICROSOFT Used by variety of non-profit programs to upskill citizens (e.g., Wynne Computer Recovery Program to provide TX criminal justice system offenders	GWP Began in the summer of 2018 with 13 partner universities and 10 partner companies
Additional Detail		Comprehensive definition is aligned to the ISTE Standards, DigComp and other leading thinkers in this space		Developed 2013-2015 in collaboration with the Joint Research Centre as a scientific project meant for public use		Greater DC area businesses identified greatest local skills gaps and partnered with local colleges to develop KSAs most needed

Source: Definitions were sourced from desk research and dialogue with employers, intermediaries, and funders in the workforce space. Breadth of support and maturity of model were assessed by review of definition providers' publicly-available materials and, where possible, a follow-up validation phone call. Overall ratings are qualitative team analysis and relative across definitions assessed

Appendix B

Many companies can benefit from beginning their digital literacy journey by evaluating existing digital literacy assessments and credentials as a starting point rather than starting from scratch. Several factors should be considered to determine the best-fit assessment or credential for a company including the degree to which a definition addresses the elements of employability digital skills and digital literacy. A company should also weigh the degree to which an option's provider backs its assessment or credential with other kinds of resources (e.g., providing digital skill training curricula aligned to the assessment). Finally, a company should consider how mature the assessment or credential and its provider are, to ensure both refinement of thinking and sustainability of support.

The diagrams in this appendix offer an illustrative approach to considering such factors for a sample of providers in this space. Companies considering this approach should complete their own review of options, weighing factors tailored to their particular needs.

Each existing assessment and credential focuses on a different subset of the overall digital literacy picture

Skill Requirement Coverage

Thorough Partial

	 NORTHSTAR	 Microsoft	 indeed		 IC3 DIGITAL LITERACY CERTIFICATION	 GREATER WASHINGTON PARTNERSHIP	Occupation-specific credentials
BASELINE FOR EMPLOYABILITY DIGITAL LITERACY SKILLS	Problem Solving Using Technology	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
	Computer and Mobile Device Interactions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	Basic Tools (e.g., Email, Word Processing)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
	Data Security and Safety		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	Data Ethics					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ADDITIONAL EMPLOYABILITY SKILLS	Northstar	Microsoft	Indeed	Google	IC3 Dig Lit	GWP	Occupation-specific credentials
	Occupation-Specific Tools (e.g., Photoshop)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
	Analytics & Data Manipulation		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Source: Assessments and credentials analyzed here were sourced from a combination of desk research and dialogue with employers, intermediaries, and funders in the workforce space with whom RABN is connected. Skill requirement coverage was assessed by comparing providers' publicly-available materials and, where possible, a follow-up validation phone call to compare their relative coverage of the digital literacy meta-dimensions synthesized by RABN staff across all definitions

Each assessment and credential also differs in its readiness for enterprise adoption and application



BREADTH OF SUPPORT

Overall						
Target customer						
Assessment	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Credential	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Upskilling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Additional Detail		Sacramento Sheriff's dept. uses curriculum to teach digital skills to police trainees Workday integration		Google developed an IT Support Certificate hosted on Coursera Helps users to become ready for an entry-level job in IT support in under six months	Certification management is through Certiport's Compass System with additional Digital Badging delivered through Credly. Plug-ins to other solutions.	

MATURITY OF MODEL

Overall						
Scale of Usage	Northstar 3,800,000+ assessments completed Comprehensive classroom curriculum Self-study materials, at Northstar Standards, <i>rolling out</i> . Learner Management System <i>in dev</i> .	Microsoft Offered to full partner and supplier communities, in addition to use to teach 75k community members via partner CSR, to date	Indeed Large enterprise clients for assessment platform include: Whole Foods, Sam's Club, Dollar General, Warby Parker	Google \$10M invested 1k employee volunteers 125 Goodwill organizations supported. 1M Americans trained in 3 years	IC3 Dig Lit 5M exams delivered in 148 countries Endorsed by ISTE, DigComp, and many other digital literacy SMEs	GWP Began in 2018 13 university + 10 company partners

COST

Cost / Duration	Northstar Free ~40 questions, multiple choice	Microsoft Free 30 questions, multiple choice	Indeed Free 10 min per module	Google No B2B pricing model yet available	IC3 Dig Lit Varies by enterprise size	GWP Commitment to review grads' resumes
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Source: Solutions were sourced from desk research and dialogue with employers, intermediaries, and funders in the workforce space. Breadth of support and maturity of model were assessed by review of providers' publicly-available materials and, where possible, a follow-up validation phone call. Overall ratings are qualitative team analysis and relative across providers assessed



BOEING REQUEST FOR PROPOSAL (RFP)

In August 2019, Boeing launched a RFP to identify a partner to help it build out its Digital Workforce strategy. The summary of the contents of the RFP shown below illustrate key items other employers might consider as they work to identify implementation partners.

Project Overview: Digital Workforce Initiative

In reaction to the adoption of digital technologies that demand new skills and ways of working, Boeing has launched an initiative called Digital Workforce that is a comprehensive approach to creating a more productive and adaptive workforce, using digital technology to reinvent the employee experience. As a result, we need to lead businesses and reimagine the nature of work, pivot our workforce to create new forms of value and “up-skilling.”

Target: Digital Workforce Project Integration, Readiness Assessment, and Plan

» Project management for the Digital Workforce initiative:

- Definition of team setup, roles, and responsibilities (across Boeing, Consulting organization, Degreed, or other partners involved in execution).
- Project plan with timeline, change management and communications plan.
- Creation of an onboarding package for key business stakeholders.
- Establish governance/escalation process for project management.
- Integration across the entire system to ensure connectedness to other HR programs, functions, and capabilities.

» **We must first determine our readiness against the initiative, determine a target state, identify gaps, operationalize a way to continually assess progress, and produce a recommended plan to close gaps.**



Target: Digital Workforce Project Integration, Readiness Assessment and Plan (*cont.*)

» Key responsibilities, outcomes, deliverables, integrations:

- Clear definition of the click-down definitions of skills and capabilities using the Boeing Digital Workforce Attributes as a baseline.
- Deliver an integrated and holistic Digital Workforce Readiness method, framework and scorecard that includes targets and related processes for individual and organization assessments along with any tools required for execution.
- Identify relationships/dependencies and incorporate the impacts on culture, diversity, and leadership development, ensuring alignment to key business challenges.
- Detailed plan for how Digital Workforce Readiness assessment process will get operationalized to continually assess progress.
- Detailed analysis on assessment data along with all other information gathered to produce a clear picture of current readiness compared to future state targets.
- Develop documentation of future state personas representing the types of skills and capabilities required in the workforce, descriptive environments representing requirements for the workplace, and storylines describing the way we work.
- Clearly identify gaps in readiness and provide strategy and recommendations for closing gaps to realize Digital Workforce Readiness for the Workforce, Workplace and The Way We Work at both the individual and organization level.
- Pilot the Digital Workforce Readiness Assessment methodology, framework, and tools with three Boeing pathfinder groups already identified. Produce key learning from pathfinders and outline plan for scaling recommendation to the rest of the Enterprise.

Proposal: Engagement from Partner to Execute against the Target

- » **Provide a summary of understanding of the Target work statement to ensure alignment.**
- » **Provide a clear proposal, including a definition of your approach, to solve for the Target outcomes above.**
- » **Outline in the proposal the method and process you will use to ramp up and gather information to ensure business/leadership input and alignment.**
- » **Proposal should also outline how the end-state deliverables—along with the process, tools, and capabilities to continuously assess readiness—will be transferred to Boeing to execute on moving forward.**
- » **Timeline of execution is the next 3-6 months to complete pathfinders to gain insights, test readiness assessment and plans to close gaps, and produce plan for scaling to the Enterprise.**



BOEING'S DIGITAL WORKFORCE INITIATIVE

In June 2018, Boeing announced a plan to invest \$100 million in workforce development with an initial focus on equipping current employees with modern digital skills, including AI and machine learning.



"Digital literacy is a big buzzword, but there's not a lot of clarity around what it means. Our first task was getting everyone to align on what specific skills we were talking about."

MICHAEL FORS

Executive Leader,
Boeing's Learning Team

Armed with on-the-ground knowledge, the team took a number of steps to embed digital literacy in the talent management process, including:

- » Crafting and socializing with hiring managers a baseline definition of digital literacy relevant to all occupations in the company.
- » Identifying a set of occupations to pilot assessment and upskilling efforts, which were: IT, communications, quality, and an internal innovation group.
- » Selecting a consulting partner to identify the occupation-specific digital skills needed for each pilot role and to develop a skills-based scorecard with definitions and assessments for each skill. They issued an RFP to secure the consultant (see Appendix B for the major elements of this RFP, to use as a thought-starter in your own potential search for support).

Boeing is now in the process of finalizing the definitions and assessments for the pilot and plans to build these into its enterprise-wide learning platform, integrating with Degreed.com. Employees will be able to assess themselves across the identified target skills and build individual development plans with associated training modules. The company will be able to track utilization of the platform offerings and measure employee performance among program participants to quantify the impact of the program.





STANLEY BLACK & DECKER'S COMMITMENT TO UPSKILLING

**Stanley
Black &
Decker**

As part of a broader initiative to modernize its workforce and meet the technological challenges of Industry 4.0, in 2018 Stanley Black & Decker conducted a series of interviews with the heads of each business unit to understand the highest demand skills and areas in need of upskilling.

Not surprisingly, the business leaders' priorities centered on digital skills: data fluency, comfort with new software, and baseline digital skills. To address these gaps, a pair of learning team leaders, Ashley Baron, Vice President of Human Resources for Industry 4.0, and Mike Murray, Director of Talent Innovation and Lifelong Learning, launched a number of initiatives, including:

- » Partnering with Coursera to upskill 1,000 workers across business units with a focus on digital skills. Managers will recommend courses with business-line relevance, and pilot employees will have access to all courses.
- » Developing a digital literacy micro-credential program in partnership with Business Higher Education Forum and multiple Connecticut-based academic institutions, all strategically important to supporting the company's World Headquarters workforce.
- » Piloting a digital fitness app that the professional services firm PwC developed to assess digital skills of employees. The app asks employees to answer 23 questions, provides scores on digital dimensions, and links to a library of relevant content to help employees improve.
- » Investing in its online learning platform, Stanley Black & Decker University, to develop skill categories that map to job pathways within the company and then enable the platform to integrate with courses from a wide variety of sources to allow employees to gain in-demand skills.



“Our overarching goal is to foster a culture that supports employees engaging in training. That means making the content relevant and easily accessible, providing time in the day for learning to occur, and intentionally thinking about ways for employees to apply what they're learning in an upskilling program to their day-to-day work.”

MIKE MURRAY,

Director, Talent Innovation and Lifelong Learning, Stanley Black & Decker

AT&T'S RESKILLING INITIATIVE

AT&T has committed significant resources to equipping its workforce of over 250,000 employees with the skills needed to compete in a rapidly changing digital sector.



The initiative began by cataloging skills necessary and creating "future role profiles" in many focus areas. AT&T encouraged employees to acquire new skills and created a career platform, enabling employees to assess their skills, highlight their credentials and achievements, see internal jobs that are growing fastest, and link directly to needed training for a particular job.

AT&T also formed partnerships with education providers, including Udacity and Georgia Tech. The company invests about \$200 million a year in internal training programs—providing nearly 18 million hours of training a year—and over \$24 million annually on tuition assistance.

To date, more than half of AT&T's workforce has participated, with most participating employees spending five to 10 hours a week on retraining, completing nearly 2 million courses annually and earning approximately 200,000 learning credentials.

This investment has translated into returns for employees. The company is increasingly finding employees are able to immediately apply their new skills in their existing positions, or to use them to successfully transition into a new role. Employees who have completed training as part of the reskilling effort are much more likely to get a new job within the company, and they're much more likely to make a career advancement.



"When you have engaged employees, that leads to satisfied customers and increased profits for the company. Having a mantra of continuous learning is all part of that equation."

BILL BLASE

Senior Executive Vice President for Human Resources, AT&T



Sources: "AT&T Invests \$1 Billion in Employee Reskilling," Aspen Institute, March 12, 2018; "AT&T's \$1 billion gambit: Retraining nearly half its workforce for jobs of the future," CNBC, March 13, 2018; "AT&T Talent Overhaul," Harvard Business Review, October 2016.

MICROSOFT



Fortune 500 companies with large, well-resourced HR departments may consider trying to internally answer the core questions posed by this report about where to begin in preparing their workforces for the digital future.

The small- and medium-sized companies that employ the majority of Americans, however, generally lack the resources and personnel to mount such an effort. For these companies, a productive course can be to look to providers like those in the illustrative samples landscaped in Appendices A and B, to benefit from their already deep consideration of the space.

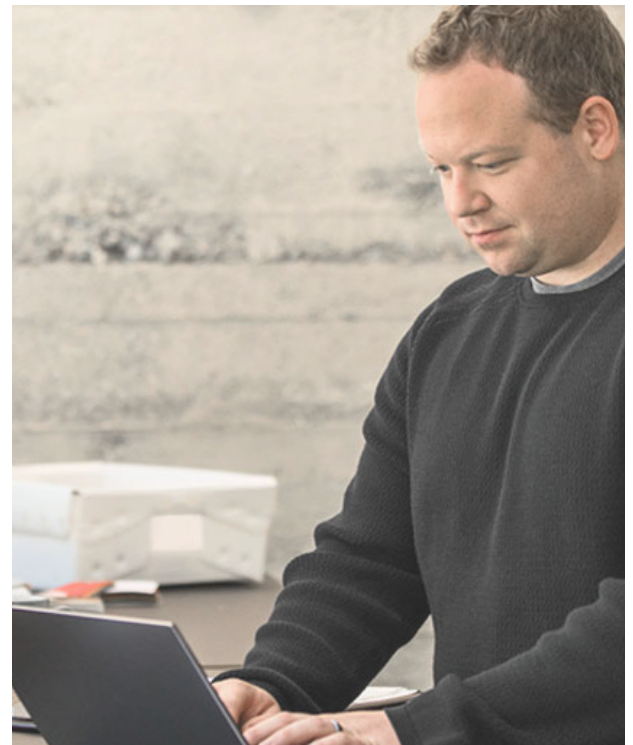
Microsoft's Digital Literacy offerings are just one example of such a resource. As one member of Microsoft Philanthropies' Skills & Employability team observed, "Microsoft has held the top 'digital literacy resources' search engine result for 20 years," offering an evolving take on the digital skills needed by the workforce as the nature of technology and work has progressed. Recently, in response to the penetration of basic computing, office productivity, and web tools into a wide range of work, Microsoft has undertaken a broad investigation into the digital skills needed in the future of work--within and outside its traditional product categories--and articulated an overarching definition of digital literacy in its Future Ready Framework. This framework offers a detailed definition (13 skill families, and nearly 50 skills), for members of society participating in the digital future in one of four increasingly digitized roles: Citizens, Collaborators, Creators, and Innovators.

Microsoft is in the process of building upon existing public learning content to offer fully updated upskilling resources to supplement the skills needed by these Citizens and Collaborators to:

- » Work with Computers
- » Access Information Online
- » Communicate Online
- » Participate Safely and Responsibly Online
- » Create Digital Content
- » Collaborate and Manage Content Digitally

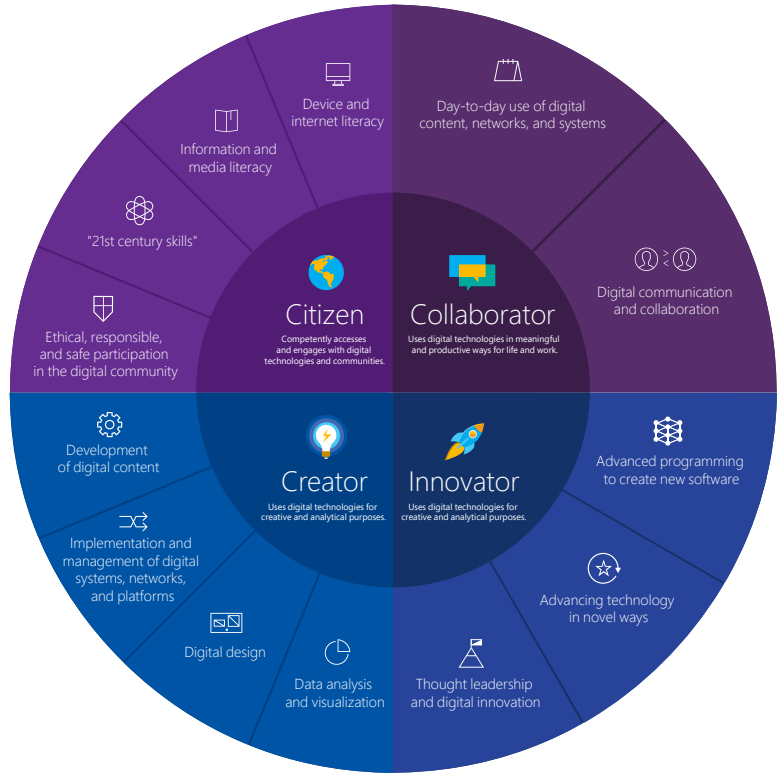
Of course, this broad content for Citizens and Collaborators is supplemented by deeper offerings for Creators within Microsoft's traditional product categories, where Creators can earn certifications that help candidates pursue jobs in technology management, development, and security, for example.

In addition to making this content publicly available on the web, Microsoft historically has offered it directly to companies, nonprofits, and community organizations to serve internally as the backbone of digital skill building programs for those firms--a model that small- and medium-sized companies more broadly could consider. Traditionally, Microsoft has offered this to their community of Suppliers and Partners. Through relationships with some of these suppliers, Microsoft digital literacy content has been further shared with supplier communities and their nonprofit partners to build the skills of nearly an additional 75,000 community members globally.



MICROSOFT

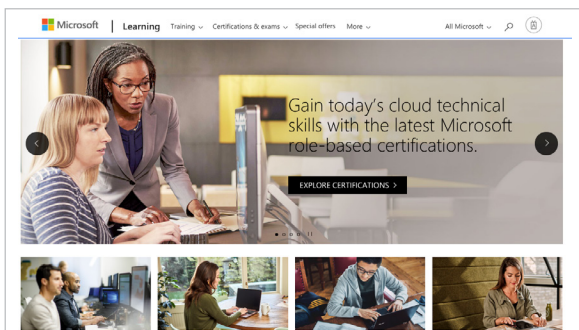
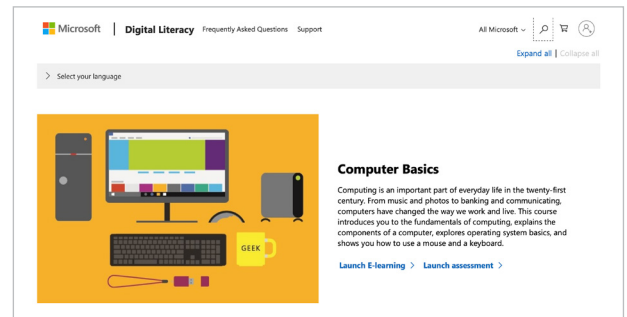
Companies adopting these resources as their internal digital literacy backbone have at their disposal:



A COHERENT DEFINITION OF DIGITAL SKILLS FOR THE FUTURE OF WORK

UPSKILLING CURRICULA AT BASIC SKILL LEVELS:

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www.microsoft.com/learning