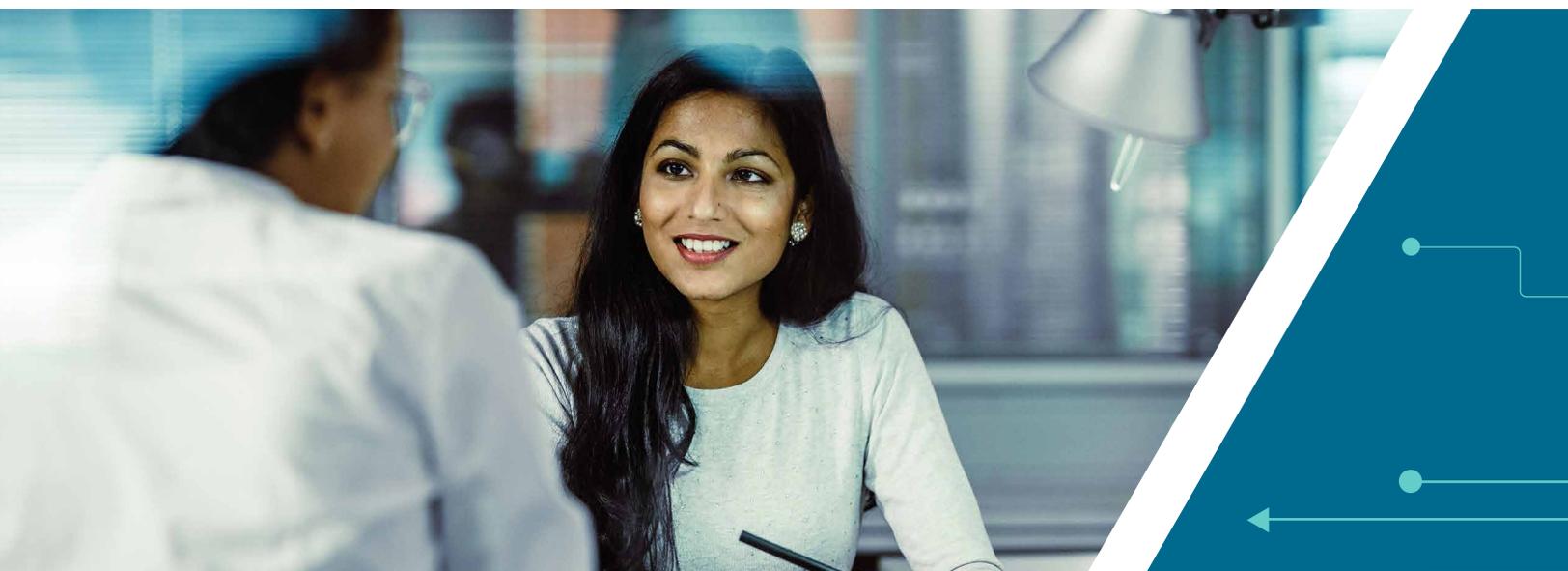# CompTIA.

Workforce and Learning Trends

Navigating the Talent Constraints Era

The Great Resignation — the center of gravity in every business trends report in the last year — was not just a headline. A confluence of factors created an environment of profound change and a rethinking of the institution of work.

Employers face a number of overlapping constraints to hiring and talent development: New skills requirements emerge faster than education can keep up; outdated systems don't account for the expectations many workers have around remote work, work-life balance and meaningful career opportunities; the right people are often in the wrong roles during digital transformation; persistent inequalities in and out of the workplace limit the ability to hire and advance the full pool of available workers; and so do outdated evaluation and hiring criteria.

Workforce and Learning Trends 2022: Navigating the Talent Constraints Era focuses on five forces shaping the workforce:

- reimagining employee experience to address new expectations;
- investing in human infrastructure;
- committing to skills-based hiring and skills-based employee development;
- prioritizing durable skills and digital competence; and
- talent management that balances data-driven and people-driven approaches.

To develop *Workforce and Learning Trends 2022*, CompTIA conducted a quantitative survey of nearly 600 U.S. human resources and workforce learning professionals about their organizations' challenges, plans and investments in HR, L&D and talent management. Qualitative insights captured via 1:1 interviews with subject-matter experts in these fields and a comprehensive literature review of trend reports and data from other authoritative organizations provided an additional layer of context. See Methodology for details.

Trends to Watch | 2022

1
Employers and Workers Negotiate a Great Resetting of Expectations on Both Sides

2
Talent Pipeline Deficiencies Highlight the Need for Human Infrastructure Investment

3
More Employers Drop 4-Year Degree Requirement in Favor of Skills-based Hiring

4
Cracking the Durable Skills Code Requires New Approaches

5
HR Strives to Balance Data-driven and People-driven Approaches to Talent Management

2.0%
Tech jobs unemployment rate.[1]

1.1 million
Quarterly count of U.S. employer job postings for tech positions.[2]

2X
Projected growth rate of tech jobs compared to overall U.S. employment through 2032.[3]

73%
of HR executives expect hiring to become even more challenging over the next 12 months.[4]

3 in 10
workers (or 30%) reported some form of job seeking during Q1 2022.[5]

4.7 million
workers (or 30%) reported some form of job seeking during Q1 2022.[6]

84%
of job seekers with an interest in a technology field expect to need additional training.[7]

92%
of job seekers (net) rate digital skills as important to most job roles today.[8]

77%
of Americans are looking for more flexibility in their job and career.[9]

2X
as many global execs say they are focusing on productivity through technology and automation in 2022 compared to 2016.[10]

+343%
Change in mentions of "flexibility" in company job posts on LinkedIn since 2019.[11]

67%
Share of workers who feel more empowered to take advantage of flexible working arrangements now vs. 26% pre-pandemic.[7]

1 | Employers and Workers Negotiate a Great Resetting of Expectations on Both Sides

Employees continue to reset expectations about career paths and their relationship to work. The notion of employee experience (EX) will become holistic, structured, strategic, measurable and creative.

I t will be some time before we account for all the upheaval caused by two years of a global pandemic and how it has shaped the future of work. But shifting behaviors and mindsets clearly signal a great resetting of expectations among workers and employers.
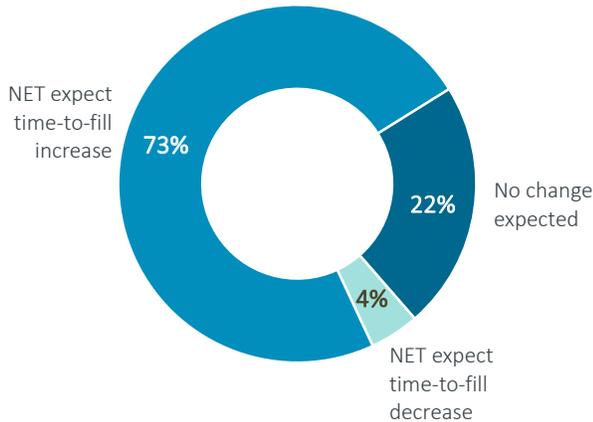
Work-life balance discussions were turned upside down while employees working from home navigated education for their children, persistent threats to their health, a shifting "return to normal" calculus, and imperfect policies and procedures. Despite these challenges, the changes forced by the COVID-19 pandemic also demonstrate that remote and flexible work are possible and, for a sizable share of workers, preferable.

Expectations have also been reset around career opportunities, engagement and meaning. For example, our survey of HR professionals found that factors contributing to the challenging hiring landscape include:

- Work-life balance expectations
- Remote work expectations
- Career advancement expectations
- Corporate culture and employee experience expectations

Majority expect the time it takes to fill open positions to increase

3 in 4 expect time-to-fill time to increase over next 12 months

NET expect time-to-fill increase **73%**

22% No change expected

4% NET expect time-to-fill decrease

Top reported factors contributing to recruiting and retention challenges

From perspective of HR professionals

57% Rising salary expectations

53% Work-life balance expectations

45% Remote work expectations

41% Competition for well-rounded candidates: technical and soft skills

38% Career advancement expectations

Source: CompTIA Workforce and Learning Trends | n = 587 HR professionals

Scheduling . . . time on premises . . . engagement . . . opportunity. Many workers feel those factors are within their control now, in collaboration with employers, in a period when the rest of their lives have felt out of control.

Recalibrating around these new expectations begins with dialogue and data, says James Stanger, Chief Technology Evangelist at CompTIA. "Understanding what it means to have truly engaged employees has to be data driven," he explains.

"A lot of companies are taking a look at what it means to create a healthy work environment that attracts talent and allows people to contribute at their best level. The main thing is the dialogue you engage in with your workers and with potential hires. If that's your goal, then you have to be asking what your hiring process looks like."

Meanwhile, expectations are resetting on the employer side in response to a range of competitive pressures. The demand for ever-greater levels of technical and digital skills continues to accelerate alongside new expectations around durable skills like team-centered communications, critical thinking and resilience. Remote work and hybrid teams require employers to emphasize skills and tools for a collaborative corporate culture across physical and virtual spaces.

The talent constraints era is also influenced by competitive pressures to hire and retain talent against a backdrop of global supply chain woes, the highest rate of inflation in nearly 40 years and geopolitical conflict. Employers across many industry sectors undoubtedly face significant challenges in adjusting to the great resetting of expectations.

"Before the pandemic, there was a war to attract talent, and now there's a war to keep talent," says Yvette Steele, Senior Director of Member Communities at CompTIA. "Employers are having to get more creative. Meaning from work is part of that and only comes when you have a close relationship and pay attention to the needs of the individual. When the individual has meaning in the work, they're more engaged, they're more creative and they're more likely to stay."

Amy Kardel, Senior Vice President of Strategic Workforce Relationships at CompTIA, says, "We can anticipate a soft skills gap with all this remote work. If you entered the workforce in the last couple of years, you never had the socialization period others benefited from. We're going to have to update our soft skills thinking. We've been fighting fires and now it's mop-up time."

2 | Talent Pipeline Deficiencies Highlight the Need for Human Infrastructure Investment

With the demand for tech talent routinely outpacing supply, employers rethink "buy, build and borrow" workforce strategies.

Employer hiring activity for tech jobs was at a record high during the first quarter of 2022. Total tech job posting volumes during the past 12 months reached nearly 4 million, with employers across every industry sector in the U.S. economy competing for the workers to implement their technology-centered strategies.[16]
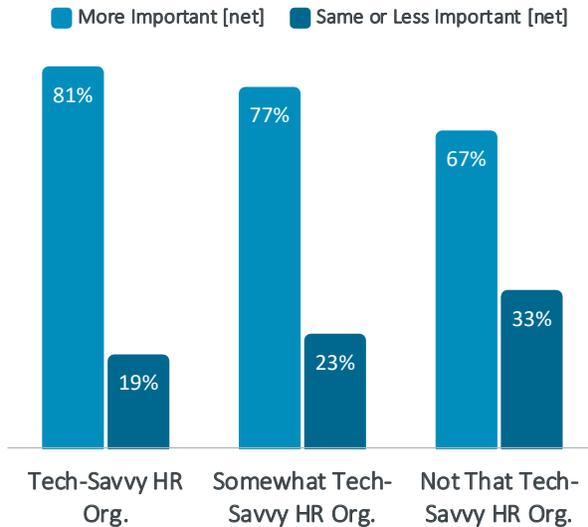
Talent constraints are created by multiple factors. The pandemic magnified longstanding challenges associated with digital divides, skills obsolescence, demographic shifts, perception problems and other leaks and bottlenecks in the talent pipeline. These collectively have resulted in a talent pipeline that works fitfully.

Two-thirds of senior HR professionals believe persistent hiring constraints may become the "new normal."

Tech-Savvy HR organizations expect a greater focus on reskilling and upskilling

■ More Important [net]　■ Same or Less Important [net]

Tech-Savvy HR Org.: 81% / 19%
Somewhat Tech-Savvy HR Org.: 77% / 23%
Not That Tech-Savvy HR Org.: 67% / 33%

Source: CompTIA Workforce and Learning Trends | n = 587 HR professionals

Top drivers and motivations for reskilling and upskilling efforts

From perspective of HR professionals

63% Increase skills of existing staff to offset need for outside hiring

61% Retention strategy

45% Cost or efficiency gains of developing talent internally

41% Proactive strategy to address skills/job role obsolescence

38% Competitive strategy to elevate internal technical/digital skills

Like physical infrastructure, human infrastructure investment requires a mix of renovating established approaches and expanding through new approaches like employment on-ramps or career transition bridges. Because talent pipelines pass through the complexities of local schools, higher education, government agencies, workforce development providers and employers, it follows that strategies and incremental gains are often disjointed.

One example of a growing talent pipeline investment is the "bootcamp" model, which typically encompasses programs running from a week to 12 weeks of intense training and job-readiness preparation. More employers are participating directly in these programs to boost participation and align training to their specific job requirements.
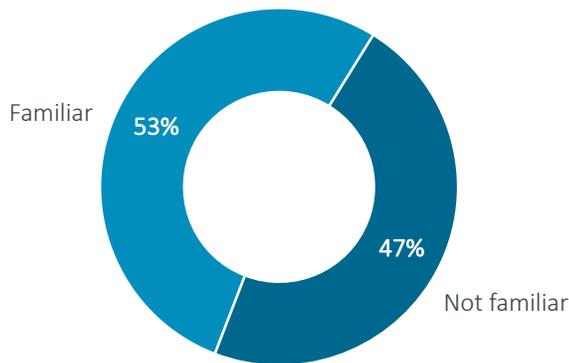
Charles Eaton, Chief of Staff for CompTIA and CEO of Creating IT Futures, says he sees examples from large employers collaborating with nonprofit providers of IT skills training like Per Scholas and CompTIA Tech Career Academy: "Companies are saying, 'We've got to work directly with these providers and pull folks in.' There's momentum around education."

The disjointed nature of talent pipelines has to be addressed on several fronts. As noted by Stanger, "There's too hard a break between the program and the job. There needs to be more blending. On the education side, there's an attitude of 'We've given you that magic thing — that education. Now go get the job.' The more successful programs say, 'We're going to actively work to transition you.'"

Talent pipelines increasingly rely on apprenticeship programs updated for the information age, as we noted last in last year's edition of this report. Remote work and growing government emphasis are new facets to the apprenticeship picture.

Modernizing and expanding apprenticeship programs to grow the talent pipeline

HR familiarity with efforts to modernize and expand apprenticeship programs

Familiar 53%

Not familiar 47%

Top requests from employers for further improving apprenticeship programs

1 Refining the "earn and learn" model to work for both apprentices and employers

2 Expand programs to more job roles, e.g. IT/Technology/Data positions

3 Messaging directed at young people to change perceptions of apprenticeships

4 Streamlining implementation for employers, e.g. more turnkey options

5 Messaging directed at employers to change perceptions of apprenticeships

Source: CompTIA Workforce and Learning Trends | n = 587 HR professionals

Zeshan Sattar, Director of Learning and Skills Certification at CompTIA, works primarily with employers in Europe, where apprenticeships are more common. During the pandemic, many apprenticeship programs have picked up some of the same tactics the rest of the workplace has.

"They're learning remotely, which makes sense, because they're next going to embark on working remotely" Sattar says. "With remote apprenticeships, there's a risk that the passive learning from the mentor is lost. But programs create virtual office environments for passive learning and for impromptu communication. An emerging habit is just to leave a video chat window open all day to virtually 'lean over' to ask a quick question or to observe."

Kardel, who serves on the U.S. Department of Labor's Apprenticeship Advisory Committee, says, "The Department of Labor thinks funding apprenticeships to get people into the tech workforce should be a priority, because it gives the biggest lift for the least effort. There's data coming out on that, so it's becoming a federal policy priority. Employer adoption is the biggest issue."

Whatever the form of investments in talent infrastructure, Kardel says, "The key thing is to develop a plan. There's no magic in it, and it's hard work. It's not a surprise that planning is what it comes down to. But if you work the plan and use it to recruit and to develop people, you get results."

A more critical look at the 'equity' in DEI

Many of the ideas discussed in this report have second-order effects in support of diversity, equity and inclusion (DEI) goals. Clearer career paths (section 1), internships (section 2), skills-based hiring (section 3) and a focus on durable skills (section 4) can remove structural obstacles that screen out underrepresented racial, ethnic, and religious minorities, immigrants, non-native English speakers, disabled workers, women and LGBTQ workers.

But embracing DEI principles during the hiring process will have limited effect if retention efforts are not equally pursued. As noted in the 2021 edition of this report, HR professionals acknowledge the many challenges of putting good intentions into practice.

The pandemic forced a more critical look at the E in the DEI equation — identifying, confronting and removing barriers to equity. For many organizations, this means a conscious departure from "colorblind" approaches that can center the experiences of dominant groups. Barriers to equity in the workplace may include:

- Inflexible scheduling
- Expectations to represent a group
- Tech tools not designed for accessibility
- Infrequent or ineffective feedback
- Limited access to organizational leaders
- Unconscious bias
- Discrimination, harassment and abuse

Meanwhile, other social barriers to equity like limited social capital and limited access to childcare, transportation and healthcare can impact retention of underrepresented employees.

Innovative organizations minimize or remove equity barriers through conscious design of onboarding and orientation, mentoring, internal communications, targeted training, and strong policies and procedures for stopping discrimination.

3 | More Employers Drop 4-Year Degree Requirement in Favor of Skills-based Hiring

Market forces elevate skills-centered pathways to complement and, in some cases, substitute for traditional 4-year degree.

Apple, IBM, Google and Tesla, just to name a few, announced the elimination of the four-year bachelor's degree as an application requirement. As noted by former IBM CEO Virginia Rometty, "cloud, cybersecurity, financial operations and many healthcare jobs can all begin without a four-year degree, and many applicants may choose to get more education later on."[17]

Granted, these large tech companies tend to attract the best and brightest candidates and that alone wouldn't suggest that the four-year degree is losing its influence on hiring. But the movement to consider a broader range of indicators of career readiness may be reaching a tipping point.

45% **36%** — **45%** of organizations report using a skills framework to provide structure around recruiting and developing their tech workforces; another **36%** are exploring the idea.

An extensive study of 51 million employer job ads between 2017 and 2019 by The Burning Glass Institute showed that 46% of occupations had some level of "degree reset" or "downcredentialing."[18] A structural change may have been underway before the pandemic.

The trend is also apparent in the CompTIA survey of HR leaders: Net support for eliminating or relaxing degree requirements in hiring increased from 76% to 85% this year; 76% say certifications are a factor in IT hiring; and 47% expect certifications to become even more important as a candidate evaluation tool.

Other skills-based hiring practices include:

- Revising job descriptions and ads to focus on required skills
- Removing the skills wish list that discourages applicants
- Auditing materials for bias that discourages applicants
- Developing skills-based interviewing guides
- Masking names of applicants to remove unconscious "like-me" bias
- Designing onboarding of new employees around skills gaps
- Aligning training with the organization's skills priorities
- Revising and tracking goals
- Aligning compensation for managers with revised hiring goals

Moving to skills-based hiring and career development requires rethinking and redesigning many familiar processes. Sattar says that performance assessment using virtual machines that are informed by real-world examples and problems is becoming more common. This method has the advantage of prioritizing results over process, compared to traditional assessments.

HR support and expectations grow in relaxing or eliminating 4-year degree requirement during hiring process

2021 Rate   2022 Rate

| 100 | 80 | 60 | 40 | 20 | 0 | | 0 | 20 | 40 | 60 | 80 | 100 |

76% — HR support and expectation [net] for eliminating or relaxing 4-year degree requirement of candidates during hiring process — **85%**

Looking beyond 4-year degree requirements to skills-based certifications

Organizations continue to value tech certifications during the hiring process

■ Generally a Factor in Hiring   ■ Generally Not a Factor in Hiring

Category	Generally a Factor	Generally Not a Factor
Tech-Savvy HR Org.	85%	15%
Somewhat Tech-Savvy HR Org.	74%	26%
Not That Tech-Savvy HR Org.	72%	28%

Source: CompTIA Workforce and Learning Trends | n = 587 HR professionals

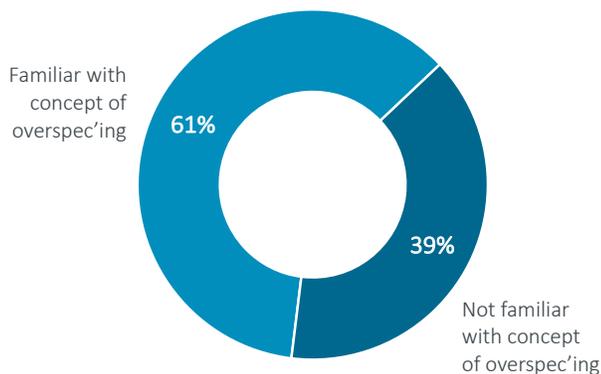## Top drivers and motivations for relying on tech certifications during the hiring process

From perspective of HR professionals

1. Alignment to specific technologies and skills domains

2. Time savings/efficiency in screening/evaluating candidates

3. Helps to expand and diversify pool of candidates

4. Industry-recognized validation is important to our organization

5. More up-to-date measure of expertise with current technologies than most 4-yr college degrees

Overspec'ing in job descriptions and postings limits candidate pool

Despite prevalence a notable segment of HR professionals are not familiar with the concept of overspec'ing in job postings

Familiar with concept of overspec'ing — 61%

Not familiar with concept of overspec'ing — 39%

Source: CompTIA Workforce and Learning Trends | n = 587 HR professionals

Reported reasons overspec'ing remains an issue in job descriptions and job postings

1. Employers not fully understanding the skills needs of a job role and asking for too much

2. Employers trying to find perfect "unicorn" candidates

3. Employer bias toward 4-yr degrees/advanced degrees from top schools

4. Employers believing there is little downside to asking for a lot in job postings

5. Employers copying job postings and overspec'ing mistakes carry over

Teresa Sears, Vice President, Product Management at CompTIA, says pre-assessment is one tactic that can help. "A big challenge I hear from employers is understanding the skills gap," she says.

"You need to know both where you are and where you want to get to. Without pre-assessment, it's really hard. But you can't take away the context of the organization that person is working in and what the goals of that organization are."

The overspecing habit is hard to break

Overspecing is the tendency to specify more (sometimes far more) skills and credentials than are necessary. It results in job descriptions that few if any individual workers are qualified for, hence the myth of the "unicorn" candidate.

"Too many employers are asking for the moon and back," Sattar says. "I see entry-level cybersecurity jobs with a list of specs as long as my arm. No wonder there is no one applying for them."

Our HR survey indicates awareness of overspecing is growing, but it remains an unfamiliar concept to a surprisingly large segment of HR professionals (39%). It's possible it could be referred to by other terms such as hiring inflation.

One cause of overspecing is that managers or hiring committees believe there is little downside to a long wishlist, since they intend to be flexible about it once they have candidates in front of them. But before that can happen, many potential applicants remove themselves from consideration. They are discouraged by the distance between themselves and an unrealistic ideal.

The overspecing habit takes three common forms: defaulting to a degree requirement without considering if it is truly necessary; asking for years of experience as a proxy for mastery; and the tendency for "updated" job ads to only acquire new requirements without losing any.

Breaking the overspecing habit may lie in so-called skill taxonomies that are agile enough to enable both employee and employer to signal and update job fitness across business units and across industries. Earlier this year, the World Economic Forum published a framework intended as a "universal adaptor" between skill taxonomies.[19]

Such an approach, they argue, should create "fairer labor markets where individuals are able to rapidly transition between roles; have greater access to learning opportunities; and be matched to employment through unbiased and skills-based evaluation."

30% of HR professionals indicate possible confusion around the many tech certifications, certificates and digital badges on the market may inhibit their use during the hiring process.

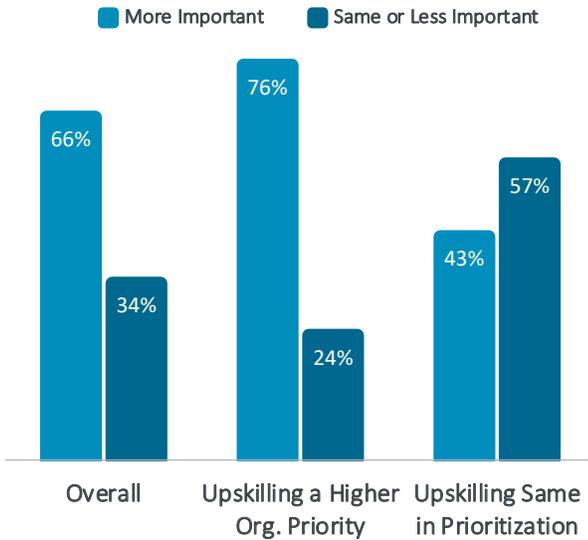# 4 Cracking the Durable Skills Code Requires New Approaches

Employers are as focused as ever on durable skills that signal readiness and adaptability and that stand the test of time, but the formula for developing and measuring them at scale remains elusive.

As we discussed in the previous two editions of this report, employers and the L&D community struggle with the nuances of soft skills development. Defining, assessing, prioritizing and aligning soft skills to job-specific outcomes presents obvious and not-so-obvious challenges. Even the term is a misnomer given the underlying technical components of communications, project management or critical thinking.

Alternative positioning by various publications have attempted to add structure to the concept of soft skills. Professional skills, People skills, Human skills, Employability skills, 21st Century skills and Durable skills are all used to convey the set of skills required to succeed in a growing share of jobs.

Assessing the importance of durable skills

Organizations assign more importance and focus to durable skills development

■ More Important **■ Same or Less Important**

	Overall	Upskilling a Higher Org. Priority	Upskilling Same in Prioritization
More Important	66%	76%	43%
Same or Less Important	34%	24%	57%

Top drivers and motivations for increasing importance of developing durable skills

1 Contributes to developing well-rounded employees with more career growth potential

2 Contributes to more innovation and collaborative problem solving

3 Contributes to a strong, healthy corporate culture

4 Contributes to more adaptability and resilience from staff

5 Competitive advantage, e.g. higher customer satisfaction, loyalty etc.

Durable skill development priorities reported by HR professionals

Overall weighting of the 10 skills categories defined by the American Succeeds durable skills model | Areas of development will differ by staff level

1 Critical Thinking
Problem solving, analytical, intellectual curiosity

2 Collaboration
Teamwork, cooperation, team building

3 Character
Professionalism, self-motivation, integrity

4 Communication
Written, verbal, presentation

5 Growth Mindset
Self-starter, resourceful, goal oriented

6 Leadership
Management, decision making, influencing

7 Fortitude
Resilience, self-discipline, confidence

8 Mindfulness
Emotional intelligence, listening skills, humility

9 Metacognition
Organizational skills, planning, multitasking

10 Creativity
Innovation, ideation, imagination

Durable skills is one concept that conveys the importance of skills holding value throughout a career, whatever changes in technology, industry or business models might come along. America Succeeds, a nonprofit that organizes collaborations between education and industry, is leading the Durable Skills Initiative in conjunction with supporting partners such as CompTIA and SHRM. The initiative defines durable skills as a "combination of how you use what you know — skills like critical thinking, communication, collaboration and creativity — as well as character skills like fortitude, growth mindset and leadership."[20]

America Succeeds analyzed 82 million U.S. job postings and found that 7 of the top 10 skills requested were durable skills. The demand for durable skills spanned educational attainment level, industry sector, and geography. Notably, 59% of job postings in the IT sector listed three or more durable skills, suggesting they are at least as important as mastery of specific technologies.

This analysis brings some rigor and definition to what non-technical skills employers actually need, but developing durable skills remains a challenge, as the accompanying charts illustrate.

Ironically, while this part of the L&D landscape is the most interpersonal, it may be where immersive VR training and AI-powered training get traction. In our survey, one of the top reasons for interest in VR is scenario-based training to develop soft skills and empathy.

Defining digital competence

Much of the conversation about durable skills refers to either digital literacy or digital fluency. For example, LinkedIn's annual Workplace Learning Report declares digital fluency the power skill of 2021,[22] and a McKinsey survey documented a 16% year-over-year increase in the share of companies saying basic digital skills are a priority.[23]

Charles Eaton at CompTIA's Creating IT Futures developed a model for digital competence that shows when and where digital skills might be acquired. Ideally, he explains, students leave post-secondary education, whether a degree or certificate program, with a foundation of digital fluency necessary for employability.

"Fluency is when it doesn't matter what the technology is," he says. "You're capable across all of it."

After that, a professional might focus on digital expertise if they are in a tech role, or on digital transformation if they are in a role usually not defined as tech specific.
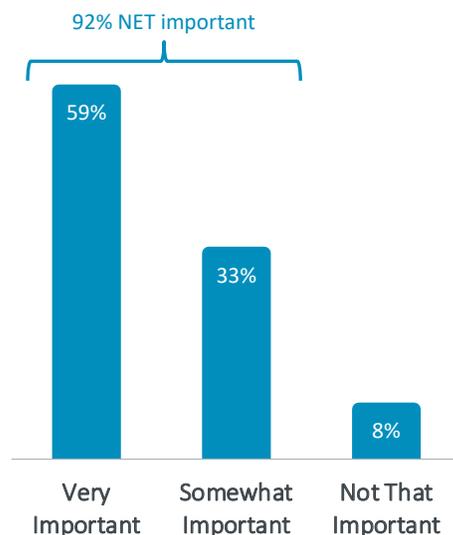
Scalable platforms don't necessarily have to cut out the human element. HR technology analyst Josh Bersin identifies a fast-growing market of digital platforms that match workers with coaches. Think telehealth but for success coaches.[21] Many of the platforms are designed to expand use cases and, as Bersin points out, democratize the kind of coaching previously reserved for the C-suite and rising stars.

That would be a welcome trend, according to Stephanie Morgan, Senior Director of Education and Edtech at CompTIA. "The old mode of training and coaching focused on so-called high potentials and high performers," she says. "We can't limit talent development to management anymore. Even if you expect someone to stay an individual contributor in the same position, that position is going to change, so how do we keep that employee relevant? Providing an opportunity for that relevance is shifting back to the employer."

Kardel says some employers are in a phase of relaxing their expectations for specific technical experience, betting that if they can find workers with durable skills, they can train on anything else lacking: "In some markets they're just not finding enough people to hire, so they are more open to looking for someone part-way there and adding the necessary skills as they go."

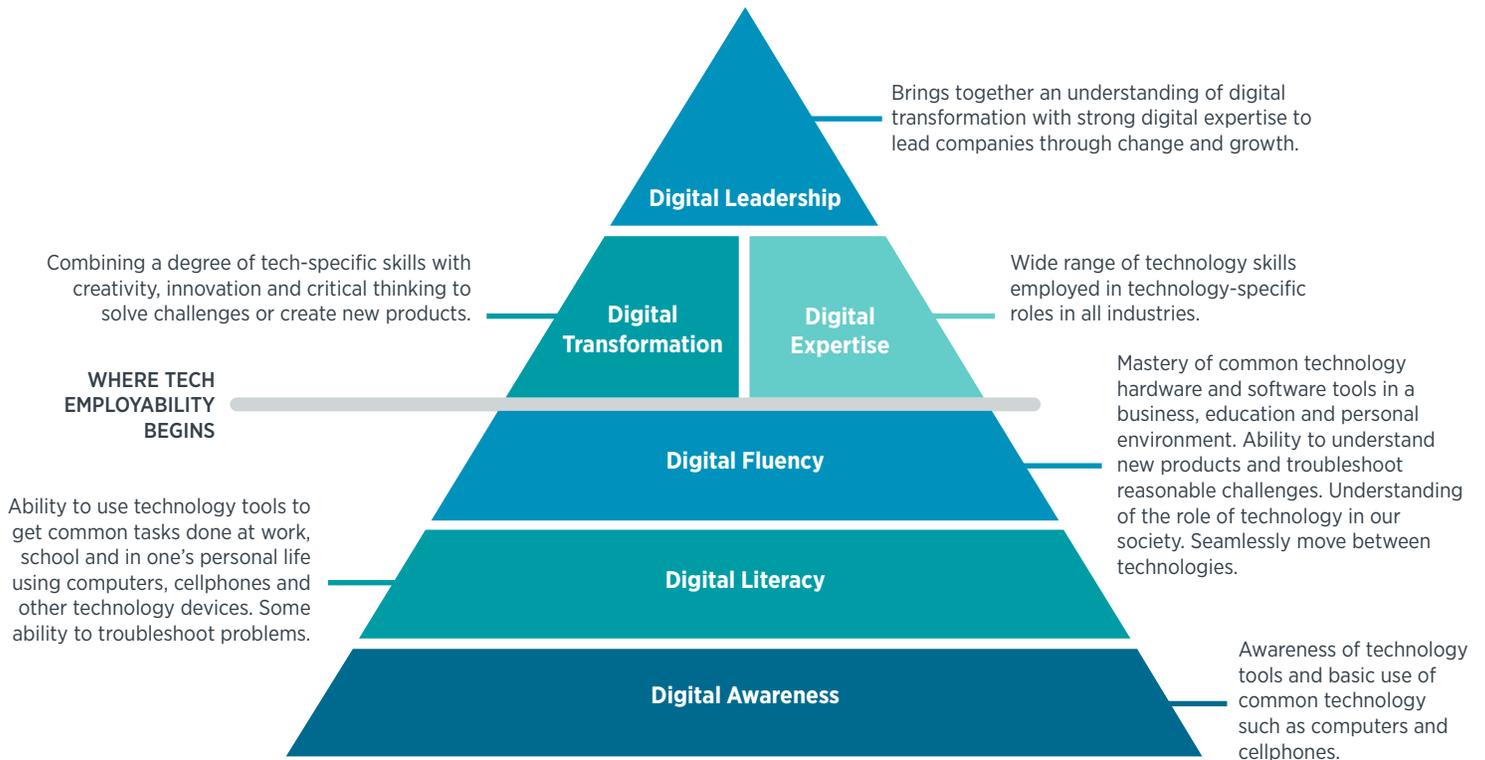## Assessing the importance of digital competency

Job Seekers recognize the importance of digital competency across every occupation category

Source: CompTIA Job Seeker Trends | n = 1,119 job seekers

Sears says, "Everyone's looking for the unicorn. The ask really has not changed significantly over the years. They want agile learners. They want critical thinkers. And they want experience in the technology *du jour.* But there is more openness to signals of someone's willingness to learn new technologies and then to support that with L&D."

CompTIA Model of Digital Competence

Brings together an understanding of digital transformation with strong digital expertise to lead companies through change and growth.

Digital Leadership

Combining a degree of tech-specific skills with creativity, innovation and critical thinking to solve challenges or create new products.

Digital Transformation

Digital Expertise

Wide range of technology skills employed in technology-specific roles in all industries.

WHERE TECH EMPLOYABILITY BEGINS

Mastery of common technology hardware and software tools in a business, education and personal environment. Ability to understand new products and troubleshoot reasonable challenges. Understanding of the role of technology in our society. Seamlessly move between technologies.

Digital Fluency

Ability to use technology tools to get common tasks done at work, school and in one's personal life using computers, cellphones and other technology devices. Some ability to troubleshoot problems.

Digital Literacy

Digital Awareness

Awareness of technology tools and basic use of common technology such as computers and cellphones.

5 | HR Strives to Balance Data-driven and People-driven Approaches to Talent Management

The promise of data-driven HR has seemingly been imminent for a decade or more, and the data reservoirs available to HR are fed by a growing number of data streams, but realizing the potential remains a struggle.

Corporations are being offered a bewildering menu of people analytics tools that promise predictions and recommendations to improve talent strategies. While HR traditionally holds data from employee records, people analytics draws in data generated across the organization — from wearables, AI-enabled everything, candidate screening platforms, the transition to cloud architecture, the digital transformation in production and services, worker surveillance software and, perhaps coming soon, AR/VR and blockchain applications.

People analytics tools potentially offer insights to support work on equitable pay, retention, emerging skills gaps, workforce planning, internal job boards and optimal training investments. However, as Oracle's State of HR Analytics survey shows, most organizations are struggling to get these tools deployed and maintained; only 29% of respondents said their organizations were able to make positive changes using people analytics.[24]

CompTIA's survey of HR leaders reinforces how challenging this is. A net 74% of respondents said a priority this year was either modernizing their HR systems or data-driven enhancements to people management. In a question about most desired changes, more investment in HR technology was the top response.

Each new data source available to HR introduces a new set of challenges in collecting, storing and analyzing data and then converting it into something actionable. That produces a surging demand for data literacy. New job roles such as HR technologist, HR data analyst or people analytics data scientist confirm the need for greater expertise and specialization within the HR department.

Last year's Workforce and Learning Trends report discussed the concept of robotic process automation (RPA) and its path to becoming more widely utilized in organizations. The case for that has become somewhat clearer, particularly in HR where it can streamline employee communication, screening, recruiting, hiring and benefits management. PwC analyzes companies that are succeeding at digital transformation and show they have "invested significantly in process automation, putting tools in the hands of employees in order to accomplish tasks faster, leaving more time to dedicate to value-driven and insights-based work."[25]

Last year's report also said AI is becoming a partner in hybrid human-digital teams. But one risk of data-driven talent management is taking the human out of human resources and leaving too much to the algorithm. *The New York Times* reported last year on the extraordinarily high turnover in Amazon warehouses, with workers sometimes being fired not by a boss but by automated processes with questionable judgment.[26]

An area of HR where emerging technology seems to be yielding results is data-driven internal job marketplaces that reduce attrition and job hopping by identifying realistic career paths. A Bloomberg report makes the case that these platforms, by revealing hidden skills and less-obvious adjacencies, are getting the right people into the right assignments.[27]

We've also previously noted the emerging importance of algorithmic bias, and Seth Robinson, Vice President of Industry Research at CompTIA, says the risk it poses to the HR technologist is growing more acute. "Machine learning solves some problems and then introduces new ones," he explains. "If I'm thinking, 'I've got a very small talent pool, so let me use technology to get me the best candidates,' that still needs oversight."

Even a well-trained model without bias is unlikely to help with what Robinson calls the inevitable corner cases that every organization has. "RPA is picking the low-hanging fruit of routine processes," he says. "But so much of business is non-routine. You need humans who understand the corner cases. It doesn't seem like we're on the precipice of software taking that over."
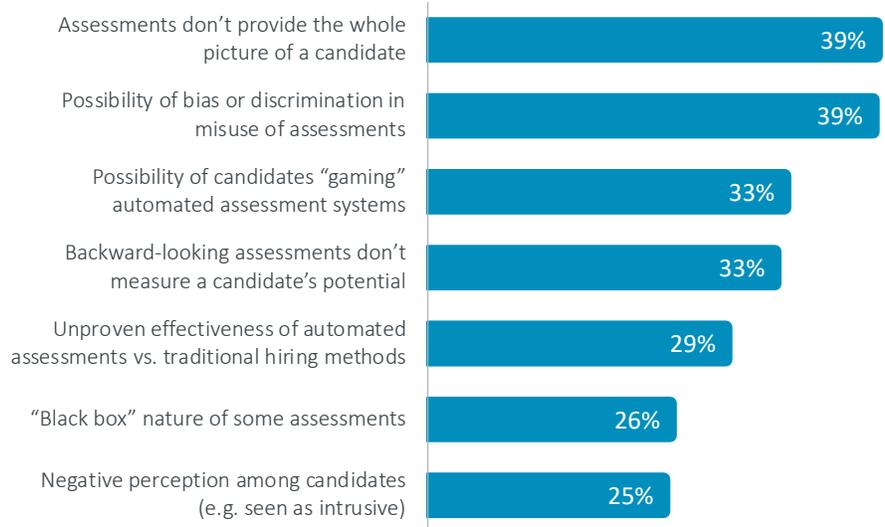
75% of HR professionals report needing improvement in some area of HR technology and data at their organization.

New data streams provide additional information during hiring process, but...

52%

Percent of organizations reporting using some type of automated assessments during hiring (with many increasingly having AI-enabled capabilities)

Top concerns reported by HR professionals in using automated AI-enabled assessments during the hiring processing

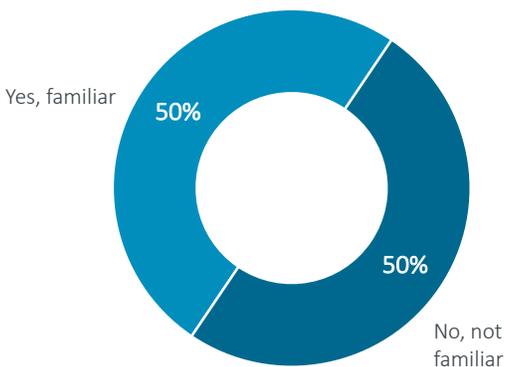| Concern	Percent
Assessments don't provide the whole picture of a candidate	39%
Possibility of bias or discrimination in misuse of assessments	39%
Possibility of candidates "gaming" automated assessment systems	33%
Backward-looking assessments don't measure a candidate's potential	33%
Unproven effectiveness of automated assessments vs. traditional hiring methods	29%
"Black box" nature of some assessments	26%
Negative perception among candidates (e.g. seen as intrusive)	25%

Source: CompTIA Workforce and Learning Trends | n = 587 HR professionals

With each new technology comes a corresponding new data stream to consider

Reported familiarity with uses of Virtual Reality (VR) for workplace training

Among HR tech-savvy organizations the familiarity rate is 66%

Yes, familiar 50%

No, not familiar 50%

Source: CompTIA Workforce and Learning Trends | n = 587 HR professionals

Top perceived benefits of using Virtual Reality (VR) for workplace training

1 More engaging/fun method of learning and development

2 Scenario-based training opportunities to develop soft skills and empathy

3 Immersive virtual environments for situations where training is difficult to do

4 Improved outcomes from learning-by-doing and experiential elements

5 Option for shorter, but more frequent training throughout the year

Over the horizon

Each year in the *Workforce and Learning Trends* report, we note what could be emerging trends but are not yet widely influencing talent management and L&D. These are some signals we picked up from over the horizon this year:

Web3 skills for Web3 applications

The growth of blockchain, cryptocurrency and token-based technologies will lead to enterprise applications, requiring developers and architects with specialized skills. The number of individual contributors on Github to Web3 projects has been growing 44% annually, signaling where creative and entrepreneurial talent is flowing.[28]

The pay transparency movement

In an effort to reduce pay inequities, New York City is the latest of several governments to implement pay transparency laws that require salary and wage information in job advertisements. Also, a growing number of companies are making it possible to look up co-workers' pay. Technology companies have particularly led the way in pay transparency, so much so that it may become a new expectation in the tech workforce.[29]

The fair-chance hiring movement

The liberalization of marijuana laws, ban-the-box laws and changing corporate practices are removing drug convictions from hiring considerations and potentially widening the available talent pool. A broader fair-chance hiring movement seems to be building. For example, Slack's internal Next Chapter training and hiring program for formerly incarcerated workers is now being offered externally to over 20 other employers.[30]

Work and training spread to the metaverse

As in the last two years, we still don't see that widespread use of AR/VR applications for work or workplace training is imminent. However, the conversation definitely had more energy last year. Facebook's rebranding as Meta and its demo of metaverse applications raised the question, and a growing number of startups are offering AR/VR solutions that promise better training on high-risk or high-stakes tasks. As we described in section 4, emotionally risky training in soft skills is a use case that may catch on soonest.

Work and training spread to the metaverse

As we've noted in past reports, algorithmic bias amplifies inequities, and model drift generates bad recommendations. These are two examples of risk to companies that use AI. A McKinsey & Company report describes other AI risks including regulatory compliance, privacy breaches and physical safety, and they recommend that forward-thinking companies begin developing a number of AI risk mitigation practices.[31]

Designing Within the Talent Constraints

T he Great Resignation and its causes, whether short-term or permanent, and which factors are most salient in a particular industry will take time to fully understand. That's why other publications have posited alternative descriptions like the great renegotiation, reawakening, redirection, rethink or reshuffling.

From a transactional perspective, workers have been able to exert more influence over factors such as work flexibility and in some cases pay. Of Course the next economic downturn could see the pendulum swing back. Other aspects may be permanent. Leaders in talent management and L&D have the challenge of distinguishing temporary weather from a change in climate and how to react without overreacting.

From a holistic perspective, however, the pandemic has highlighted important issues and fissures that have always been there. In the design profession, "design constraints" represent the opportunities for creativity and innovation. They clarify the boundaries of the playing field and the rules of the game, and that kicks off the creative process. The pandemic has provided similar clarity about the talent constraints era and the opportunities to build talent development strategies for the long term.

Appendix

Trends from Workforce and Learning Trends 2020: Meet the "New Traditional" Models

- The pace of change requires agility on many fronts.
- L&D increasingly shapes strategic direction, but resources don't always follow.
- A soft skills gap is bringing a new focus on challenges and solutions.
- Subject-matter experts remain core to the learning experience.
- Talent shortages push the reskilling and upskilling envelope.
- L&D aspires to create the seamless, blended experiences learners expect.

Trends from Workforce and Learning Trends 2021: Accelerating Through the Curve

- Companies renew focus on worker resilience.
- Business gets more proactive about DEI.
- Continuous learning is the new personalized learning.
- Alternative learning and career pathways are extending and branching.
- AI becomes a strategic partner of human-digital teams.

Methodology

CompTIA's *Workforce and Learning Trends 2022* report leveraged a number of inputs to produce the final output. The quantitative component of the study consisted of an online survey fielded to U.S. HR and L&D professionals across a range of industry sectors and company sizes. A total of 587 respondents participated in the survey, yielding an approximated overall margin of sampling error at 95% confidence of +/- 4.1 percentage points. Sampling error is larger for subgroups of the data. Data was collected during January 2022. A secondary survey conducted to a similar audience of HR professionals focused exclusively on the topic of soft skills, also referred to as durable skills. That survey was fielded during February 2022 and yielded 406 responses.

As with any survey, sampling error is only one source of possible error. While non-sampling error cannot be accurately calculated, precautionary steps were taken in all phases of the survey design, collection and processing of the data to minimize its influence.

The qualitative component of the study consisted of 1:1 interviews with experts spanning the fields of learning and development, certifications, edtech and more. Third-party research and literature searches provided additional context.

CompTIA is a member of the market research industry's Insights Association and adheres to its internationally respected Code of Standards. Any questions regarding the study should be directed to CompTIA Research and Market Intelligence staff at research@comptia.org.

Credits

Content development by Robert McGuire of McGuire Editorial Content Marketing Agency.

About CompTIA

The Computing Technology Industry Association (CompTIA) is a leading voice and advocate for the $5 trillion global information technology ecosystem; and the estimated 75 million industry and tech professionals who design, implement, manage, and safeguard the technology that powers the world's economy. Through education, training, certifications, advocacy, philanthropy, and market research, CompTIA is the hub for unlocking the potential of the tech industry and its workforce.

CompTIA is the world's leading vendor-neutral IT-certifying body with more than 3.0 million certifications awarded based on the passage of rigorous, performance-based exams. CompTIA sets the standard for preparing entry-level candidates through expert-level professionals to succeed at all stages of their career in technology. Through CompTIA's philanthropic arm, CompTIA develops innovative on-ramps and career pathways to expand opportunities to populations that traditionally have been under-represented in the information technology workforce.

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CompTIA Member Communities and Councils
CompTIA Academy and Delivery Partner Program

Sources

1. CompTIA, CompTIA Tech Jobs Report, January 2022

2. *ibid*

3. CompTIA, State of the Tech Workforce, 2022

4. CompTIA, unpublished survey of U.S. HR professionals, January 2022

5. *ibid*

6. CompTIA, Job Seeker Trends, January 2022

7. *ibid*

8. *ibid*

9. Randstad, Workmonitor wave 2, 2021

10. PwC, 24th Annual Global CEO Survey, 2021

11. LinkedIn, Global Talent Trends 2022: The Reinvention of Company Culture, 2022

12. CompTIA, unpublished survey of U.S. HR professionals, January 2022

13. ADP Research Institute, People at Work 2021: A Global Workforce View, 2021

14. *ibid*

15. Microsoft WorkLab, The Next Great Disruption Is Hybrid Work—Are We Ready?, 2021

16. CompTIA, CompTIA Tech Jobs Report, March 2022

17. *Wall Street Journal*, Some CEOs Suggest Dropping Degree Requirements in Hiring, May 5, 2021

18. Burning Glass Institute, The Emerging Degree Reset, Feb. 2022

19. World Economic Forum, Building a Common Language for Skills at Work: A Global Taxonomy, January 2021

20. America Succeeds, High Demand for Durable Skills, 2021

21. Josh Bersin, The Flourishing, Surprising, Badly Needed Market For Online Coaching, December 2021

22. LinkedIn Learning, 5th Annual Workplace Learning Report, 2021: Skill Building In the New World of Work, 2021

23. McKinsey & Company, Skill Building at Scale During the Pandemic, April 2021

24. Oracle, The State of HR Analytics 2021, 2021

25. PwC, How Business Leaders Can Raise Their Digital IQ, 2022

26. New York Times, Inside Amazon's Employment Machine, June 2021

27. Businessweek, Reinventing Internal Job Boards to Fight the Great Resignation, December 2021

28. SparkLine Capital, Value Investor's Guide to Web3, January 2022

29. Digiday, How Tech Companies Are Leading the Way in Salary Transparency, October 2021

30. JFF, Slack's Fair Chance Hiring Journey: How Starting Small Can Make a Big Impact, June 2021

31. McKinsey & Company, Global Survey: The state of AI in 2021, December 2021

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