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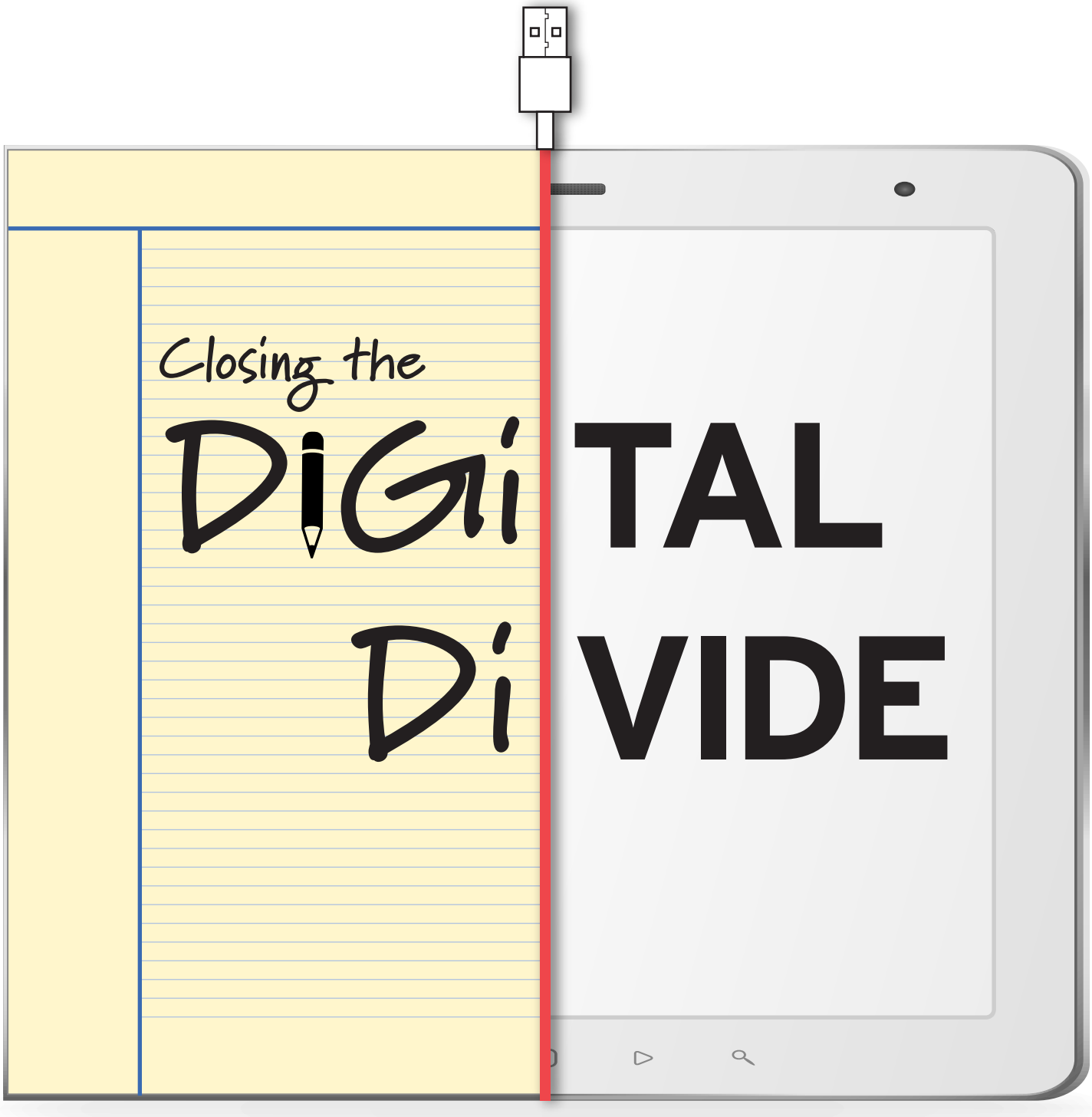

CLOSING THE DIGITAL DIVIDE

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CLOSING THE DIGITAL DIVIDE

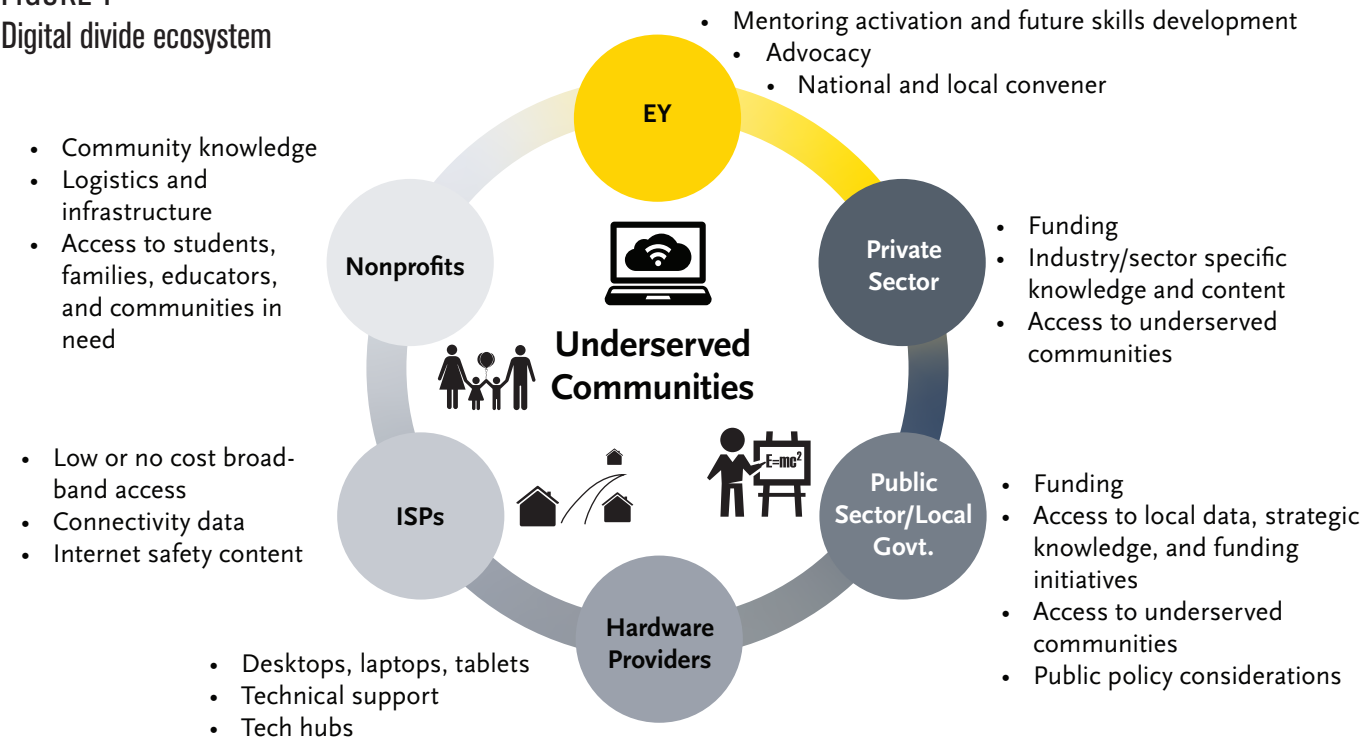
WHAT IS THE DIGITAL DIVIDE?

The digital divide refers to the gap between those who can access and take full advantage of computers and the internet and those who cannot. For those who cannot, the reasons range from lack of access to devices or internet to lack of access to digital training.

It's a form of inequality that can limit opportunities for those on the wrong side of the chasm. The digital divide can exist for a variety of reasons and can occur in different contexts.

The digital divide reflects and can exacerbate existing social and economic inequalities, including those based on race and ethnicity. In many countries, including the United States, people of color and people experiencing poverty are often less likely to have access to high-speed internet, digital devices, and digital literacy education.

FIGURE 1
Digital divide ecosystem



Source: EY, *Bridging the Digital Divide: The Path Forward.*

"We couldn't do what we're doing here without our offices activated in unison. We're seeing multiple small teams across the country who are using their local contacts to really understand the local needs, who the players are, how big is the gap, and what funding can they get access to and then beginning to create customized solutions by city with local clients and local companies."

Kevin Brown
Principal, Consulting Services and Life Sciences Technology Lead
EY US

The EY commitment to addressing the digital divide

Even before the COVID-19 pandemic, EY citizenship leaders including Kevin Brown identified concerning trends, including that one-third of young people (disproportionately Black, Latinx, and/or low-income) lacked access to broadband and devices at home. This disparity was intensified during the pandemic. To address this issue, the firm created several anti-racism interventions, including the Ernst & Young LLP (EY US) Bridging the Digital Divide initiative. EY people were inspired to use their time and connections to close the divide in their local communities. EY US noticed that there was a need for private sector leadership on the issue, so the organization used its network and influence to activate multiple stakeholder groups across the country and raise millions of dollars in support of the cause. The foundation of EY US's commitment to this issue is through its mentoring programs, where EY people volunteer to help upskill beneficiaries on how to succeed in a digital age.

In the three years since the Bridging the Digital Divide initiative was launched, the program has:

- Impacted more than 600,000 lives via programs that provide mentoring, hardware, and/or connectivity.
- Established targeted local programs involving more than 4,300 EY professionals and including dozens of mentoring and learning programs.
- Raised $4.3 million through public-private coalitions and an additional $4.8 million in charitable contributions from EY professionals through the company's annual United Way giving campaign.
- Engaged the support of and established collaborations with other corporate leaders, including clients whose mission and purpose align to the firm's.
- Convened more than 200 collaborations with other organizations, including coalitions of education departments and public sector agencies, nonprofits, community service organizations, and the private sector.

Who is most likely to experience the digital divide?

The digital divide can be addressed, and business has a role to play. First, let's unpack how the divide is created and who is affected. The digital divide creates a chasm of opportunity within the U.S. and across regions around the globe. The divide exists across several dimensions, including but not limited to socioeconomic status, race, ethnicity, and physical location. Addressing racial, ethnic, geographic, age, and gender digital divides is crucial for achieving equality, as digital technology plays an increasingly important role in education, employment, and social participation.

Because the digital divide is a multifaceted issue that intersects with various aspects of society, factors contributing to digital inequality often interact in complex ways. For example, low-income urban households may find the cost of high-speed home internet and digital devices prohibitive. Low-income, rural households may also experience these issues and face difficulties accessing connectivity due to infrastructure limitations. To effectively bridge the digital divide, it's necessary to take a comprehensive approach that addresses all these factors.

The following provides some examples of how digital inequality can play out.

REGIONAL DIFFERENCES

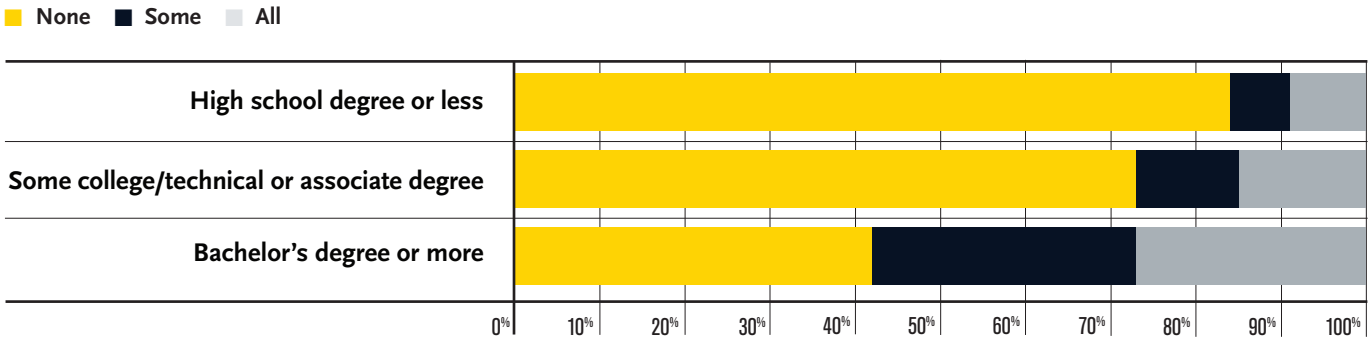
High-income vs. low-income: Generally, high-income regions have a higher level of internet penetration and greater access to digital technologies than low-income regions. For example, in many parts of North America and Europe, broadband access is widespread, yet there are still areas where access is much more limited. The reasons for this discrepancy include lack of infrastructure, high costs, and lower levels of education. The World Bank estimates that a 10 percentage point increase in broadband penetration can lead to a 1.2% jump in real per capita GDP growth and a 3.6% increase in economic efficiency.[1]

Urban vs. rural: Even within developed countries—including the U.S.—there can be a significant digital divide between urban and rural areas. Urban areas typically have better internet access due to better infrastructure, whereas rural areas often lack the necessary infrastructure (fiber optic cables, cell towers, etc.). This issue is prevalent in both developed and developing countries. Another barrier to connecting rural communities is the expense and difficulty of building the infrastructure in far-flung locations. Within the High-Speed Internet for Everyone initiative of the federal government, for example, leaders are discovering that the cost of creating some of the rural broadband connections initially planned exceeds the value of the properties they are connecting. They are then faced with the tough choices about whether to connect more people elsewhere or to pursue the more expensive rural network.[2]

SOCIOECONOMIC STATUS

Income: Households with higher income generally have better access to the internet and digital devices. On average, racial and ethnic minority groups often have higher proportions of lower incomes, which can make it harder to afford internet service and digital devices. The cost of digital access can be a significant barrier for these families. Many people with lower incomes have access to the internet only at work, school, or in public spaces where there is free Wi-Fi. This limits how and when they can connect and for what purpose. People with lower incomes spend a higher proportion of their incomes on basic needs. For example, a family of three earning 200% above the 2023 poverty line of $49,720[3] still uses at least 75% of their monthly take-home income of $3,838 to pay for basic needs[4]—a higher proportion if they live in a high-rent area. Twenty-two percent of these households will not be able to pay their bills in full each month, and almost 40% will not be able

FIGURE 2
Amount of work done from home (by education)



Source: Federal Reserve System, *Economic Well-Being of U.S. Households in 2022.*

to cover an unexpected expense of $400 using cash.[5] While cell phone service is on the list of basic needs, broadband is not. With the 2023 cost of broadband connection ranging from an average of $77 per month where fiber-optic cable is available to almost $189 per month where only satellite connection may be available, this additional expense of broadband is out of reach for almost half of Americans.[6]

Education: Higher levels of education are associated with better digital literacy, meaning those with more education are generally more experienced with technology and are therefore more capable of using digital technologies effectively. This is, of course, a two-way street. Those who have support to develop better digital literacy earlier will have more educational opportunities. Schools in low-income areas, which are often predominantly populated by students of color, may lack the resources to provide quality digital education. This limits the types of work and options available to those with lower levels of education. For example, lower education levels typically correlate to lower wages and less flexible work arrangements, further burdening these households with higher commute time requirements and transportation costs and lower work-life balance.

Lower levels of digital literacy can also create disadvantages and reluctance to engage with technology, which impedes progress. Those who don't adopt early may also be more vulnerable to misinformation or scamming, hacking, or bullying. Having an experience with any one of those negative events can create reluctance to engage further with technology.

RACE, ETHNICITY, AGE, AND GENDER

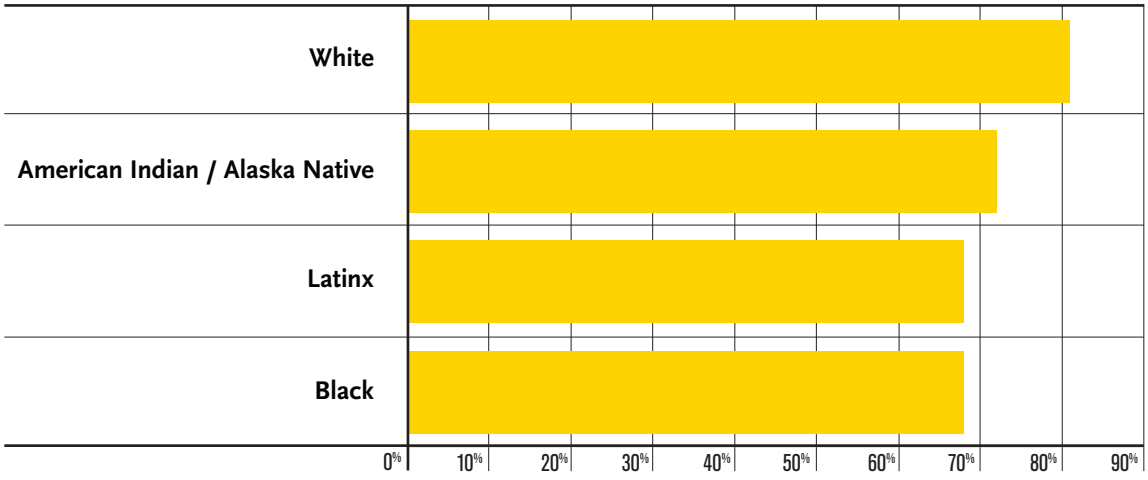
Minorities and marginalized groups: Based on our research, racial and ethnic minorities and other marginalized groups have lower rates of internet and computer access. This can be due to a complex mix of factors, including lower average income levels, less access to education, and systemic discrimination.[7] People of color are generally underrepresented in leadership roles, in business in general, and in tech-related careers even more acutely. The public and private programs intended to bridge the digital divide in disadvantaged Native American tribes sometimes exacerbate the issue with complicated processes of grant applications, requirements for cost share, demands for tech-savvy leadership,

and other hurdles that disadvantage tribes. For example, according to an American Indian Policy Institute analysis of Federal Communications Commission (FCC) data, just 67% of tribal lands in the continental U.S. have access to broadband internet, with the majority having access only to broadband speeds considered by the FCC to fall short of what is "minimally acceptable."[8] The legacies of discriminatory racial policies from the 20th century—most notably the Depression-era practice of neighborhood redlining that restricted loans to neighborhoods that were mostly low income and inhabited by people of color—are seen even in current technology distribution. Despite internet service provider self-reports of similar technological availability, broadband access generally decreases in tandem with historic neighborhood classification.[9]

Women: The gender digital divide refers to the disparities between men and women in terms of access to and use of information and communication technology (ICT). Recent studies indicate that women are underrepresented in tech-related fields and roles. For example, despite making up about half of the global population, women hold only about a quarter of computer science jobs. This lack of representation can perpetuate stereotypes and discourage women from entering tech-related fields. Cyberbullying, sexual harassment, and other forms of online violence disproportionately affect women and girls, which can further discourage them from using digital technology.

Age: As people who have experienced the digital divide for the last 40 years age, their challenges with access to technology increase. Elderly people may be challenged to execute basic tasks, from booking tickets or renewing bus cards to claiming old-age benefits because most systems are now digitized. Social and economic exclu-

FIGURE 3
Access to home broadband by race



Source: Free Press Analysis of July 2015 Current Population Survey Computer and Internet Use Supplement.

sion also continue as many older people are not prepared for or supported to continue their working lives with remote work. Elder abuse can take the form of targeting older people for digital scams, which can create reluctance among older people to engage online. Loneliness and isolation may be more acute among disconnected older people because they cannot connect with peers through digital networks due to lack of digital skills.[10]

Sociocultural factors: Language barriers or cultural norms can also affect digital access and usage among gender, age, racial, and ethnic groups. For example, individuals who aren't proficient in the dominant language used online or in digital interfaces may find it more difficult to access and benefit from digital resources.

Addressing racial, ethnic, and gender digital divides is crucial for achieving equality, as digital technology plays an increasingly important role in education, employment, and social participation.

Inequality by the numbers: How the digital divide perpetuates economic inequality

Wealth and education already create a cycle of intergenerational advantage. Families that have more wealth can support more educational opportunities for their children, who can then take advantage of those opportunities in ways that set them up to be able to create more wealth.

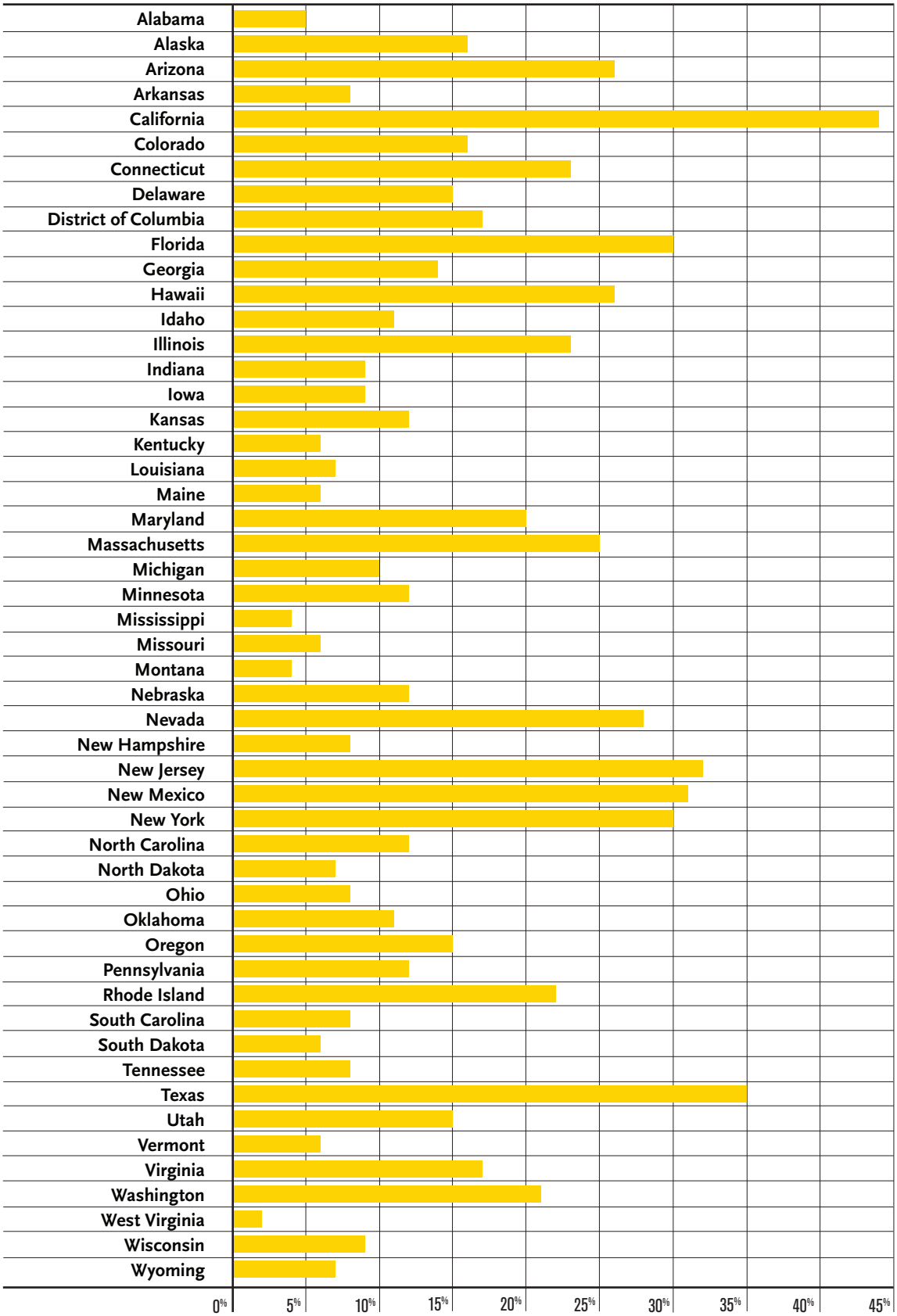
A recent study of households across all racial and ethnic groups that did not have reliable broadband internet and devices available revealed that these families were also much more likely to experience housing instability. Families without reliable broadband internet that were able to buy a house were also almost 100% more likely to have trouble paying a mortgage than families who had reliable high-speed connections. Renters were 50% more likely to have difficulty paying rent than families with stable internet and reliable devices. Children in low-connectivity households spent less time on remote learning, and parents spent less time helping them with homework. This lack of access then correlates with fewer remote learning opportunities, reducing children's future life outcomes and earning potential.[11] Non-native English speakers are further disadvantaged by the status of English as the predominant language of the internet.[12] Although many think of the U.S. as an English-speaking country, it is a true melting pot, with a population mostly descended from immigrants. Almost 22% of U.S. households speak a language other than English at home, and in some states, as many as 42% of households speak languages other than English.

Racial, ethnic, and gender digital divides have

> "Better access to broadband can mean improved communications with doctors, prescription reminders, and telehealth visits that can deliver preventative care and may help lower costs. By closing gaps in access to broadband, we may help communities have access to affordable care."
>
> **Rachel Hall**
> Consulting Digital Health and Smart Health Experience Leader
> EY US

FIGURE 4

Percentage of population in the U.S. speaking a language other than English at home in 2021

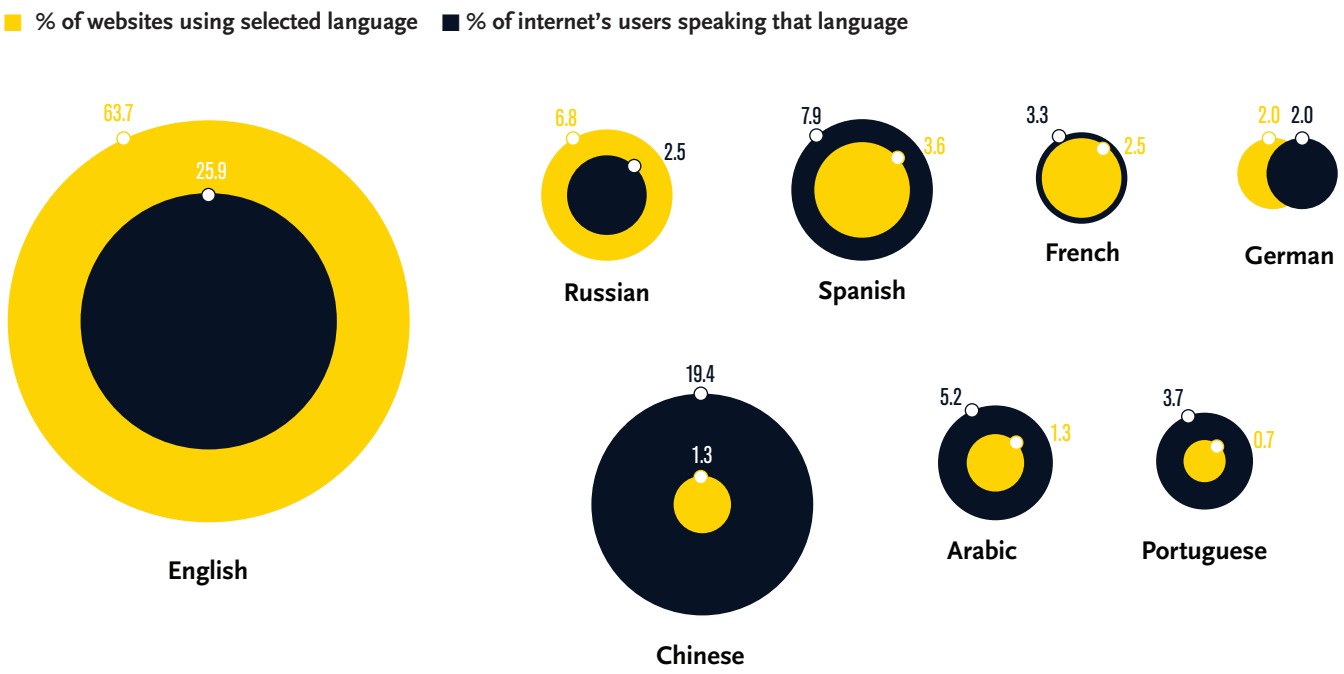


Source: U.S. Census Bureau, *Language Spoken at Home*.

serious implications for educational achievement, economic opportunity, health, and social mobility. During the COVID-19 pandemic, the digital divide became particularly apparent as schools moved to online learning, health care providers offered telemedicine, and many employees worked from home. Those without reliable internet access or digital devices were at a significant disadvantage. While the pandemic underscored inequalities that are experienced as a result of the digital divide, pandemics and endemics are by no means the only reason to pursue closing this gap. Access to technology and digital literacy are necessary for people to take full advantage of social inclusion, education, and economic opportunities.

FIGURE 5
English is the internet's universal language

Share of websites using selected languages vs. estimated share of internet users speaking those languages*



* Websites as of February 2022, internet users as of 2021.

Sources: W3Techs, Internet World Stats.

Economic benefits of closing the digital divide

As the technological enabling of all industries has intensified, so too has the value of knowledge-based work.[13] This has been true since the First Industrial Revolution in the mid-18th century, when the world moved from manual processes to machine-enabled production (and the resulting urbanization of manufacturing workers). Throughout the Second Industrial Revolution (electricity-enabled machines, advanced materials, combustion engines, transportation innovations, etc.) and Third Industrial Revolution (the computer-driven, new media, nuclear age), this effect has been amplified.

Compared with the median earnings for all other types of jobs in the U.S. ($38.85/hour vs. $19.30/hour), technology-related jobs pay exceptionally well and are projected to grow by 8% through 2030.[14] Increasing participation in technology-related jobs among those who have been historically marginalized would certainly make a significant dent in income inequality.

With increased digitization, multiple professions will be competing for scarce science and technology talent within the health care sector, which encompasses 10 of the 20 industries with the highest projected growth and which will gain significant attention in career planning due to population aging in the coming decades. The information sector is also predicted to demand tech talent and is projected to have three of the 20 fastest-growing real-output industries from 2019 to 2029: software publishers; other information services; and data processing, hosting, and related services.[15]

Technology and scientific services vacancies rank fifth among the highest value of unfilled jobs (377,500 per year; estimated value of ~$38 billion annually) and fourth among the level of economic impact those unfilled jobs have on the economy as a whole, according to the U.S. Bureau of Labor Statistics.[16]

FIGURE 6

Science and technology occupations, 2020 and projected 2030

(Numbers in thousands)

Occupation category	Employment, 2019	Employment, 2029	Employment change, numeric, 2019–29	Employment change, percent, 2019–29	Median annual wage, 2020
Total, all occupations	162,795.6	168,834.7	6,039.2	3.7	$41,950
STEM occupations	9,955.1	10,752.9	797.8	8.0	$89,780
Non-STEM occupations	152,840.5	158,081.9	5,241.4	3.4	$40,020

Source: U.S. Bureau of Labor Statistics. (September 6, 2023). Employment in STEM occupations. [Table]. bls.gov. https://www.bls.gov/emp/tables/stem-employment.htm.

Bridging the digital divide and building a better working world

As part of the company's effort to build a better working world and in support of our commitment to social justice, EY US is creating digital equity in the U.S. through the Bridging the Digital Divide program.

Fundamentally, EY believes access equals enablement and opportunity. With the right training, tools, and connectivity, more people can access more resources in pursuit of healthier, more connected, and successful lives. EY provides mentorship to digitally upskill and facilitate access to devices and broadband internet service.

There is no one-size-fits-all approach to bridge the digital divide. The key is to match local solutions to the needs and objectives of local communities, with an emphasis on hands-on support and training by individuals committed to making a difference. EY US is focused on local solutions, led by EY professionals and driven by members of the communities it aims to serve. EY leaders continue to raise public awareness of digital equity as a critical issue.

The firm is committed to engaging key stakeholders, including nonprofits and community organizations, technology providers, and other businesses to expand the impact of these efforts.

"Our initiative embraces a 'Now, Next and Beyond' strategy that applies our consulting acumen, with an eye toward social inclusion. 'Now' focuses on working with organizations to support students, families, and educators to provide devices and broadband access. 'Next' is a stabilizing phase where mentorship creates a path to digital upskilling that can transform communities for the 'Beyond.'"

Kevin Brown
Principal, Consulting Services and Life Sciences Technology Lead
EY US

The future of work—and prosperity

Key technologies of the Fourth Industrial Revolution

The Fourth Industrial Revolution, or Industry 4.0, is a term introduced by Klaus Schwab, founder and executive chairman of the World Economic Forum, to describe the current period of profound technological change.[17] It is characterized by a blend of technologies that blur the lines among the physical, digital, and biological spheres. Much like its preceding eras, opportunities to achieve economic security are increasingly linked to educational attainment and technological facility. In other words, more technologically educated and agile people are more likely to have the skills to pursue higher-paying and more secure career paths. Key technologies in the Fourth Industrial Revolution include:

- **Artificial intelligence (AI) and machine learning**: These technologies can learn, adapt, and potentially act autonomously. They can analyze more and deeper data for insights, augment human activity, and even automate tasks.
- **Internet of Things (IoT)**: The IoT is a proliferation of connected devices that collect and exchange data, creating a network among physical devices embedded with sensors, software, and other technologies.
- **The metaverse**: The metaverse is a network of shared, immersive virtual worlds where people can connect with friends, create and play games, work, and shop. The metaverse is a cyberspace, or an evolved internet where people can connect without ever meeting in person.
- **Robotics and automation**: Robots have become sophisticated enough to take over tasks previously carried out by humans, including those requiring complex cognitive skills.
- **3D printing**: The ability to print physical objects has revolutionized manufacturing.
- **Genetic engineering**: Innovations like the gene-splicing tool CRISPR are making genetic modification easier and more accessible.

How technologies will affect the way we work

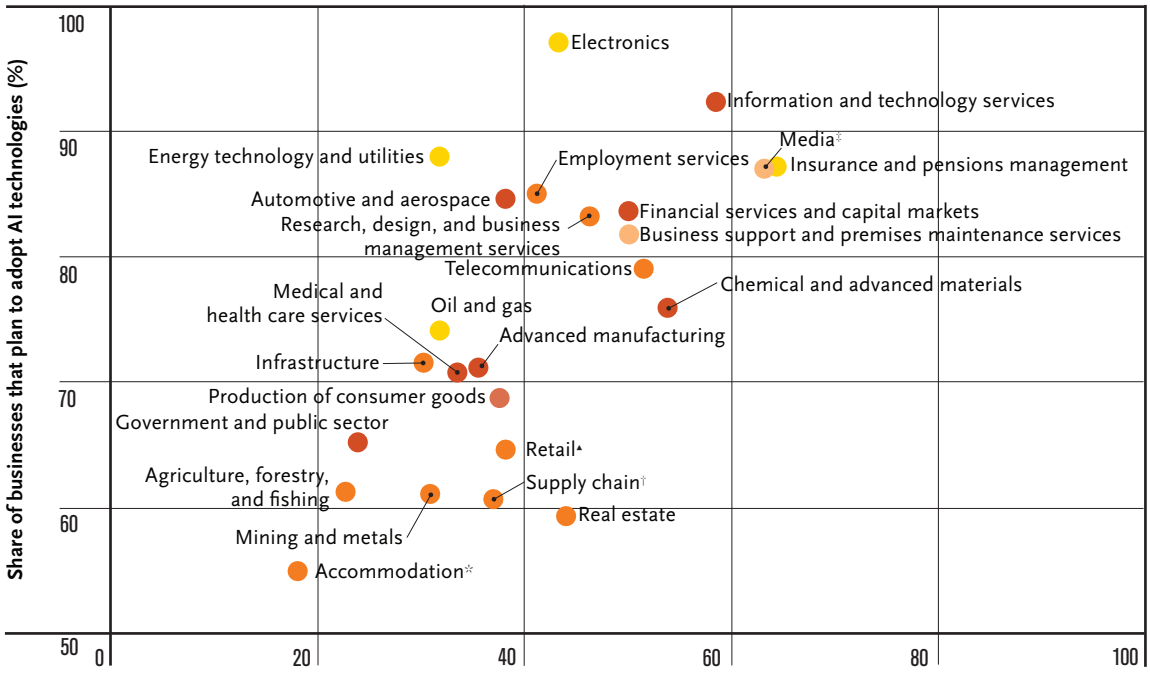
As for the Fifth Industrial Revolution, while it is not fully defined yet, experts suggest that it will be driven by further advancements in AI and the collaboration between humans and machines.

- **Advanced AI**: As AI continues to evolve, it will become more capable of complex tasks, leading to an even greater level of automation. With research toward advancements in technologies like artificial general intelligence (AGI), AI systems could potentially perform any intellectual task that a human being can. They could solve complex problems, understand and learn from languages, and make decisions based on a mix of logic and learned experiences.
- **Human-machine partnership**: While the Fourth Industrial Revolution was marked by machines replacing human labor in many instances, the fifth is predicted to be defined by a collaboration between humans and machines. Rather than replacing humans, machines will augment human abilities, leading to new possibilities in a variety of fields.
- **Ethics in automation and digital technology**: As digital technology becomes more autonomous, questions of ethics become more pressing. The Fifth Industrial Revolution may be defined by how these questions are answered and how a framework for moral AI behavior is developed. Policymakers will consider issues like transparency, explain-

FIGURE 7

Share of business that plan to accelerate automation

90 to 100% 80 to 90% 70 to 80% 60 to 70%



Source: World Economic Forum, Future of Jobs Survey 2023.

* Including food and leisure ‡ Including entertainment and sports ▲ Including wholesale of consumer goods † Including transportation

ability, and accountability when determining how to regulate technology.

- **Neurotechnology and digital technology**: The combination of digital technology and neurotechnology is already leading to breakthroughs in understanding the human brain. Nascent technology innovations include brain-computer interfaces, further blurring the lines between humans and machines.
- **Decentralization and digital technology**: With the rise of blockchain and related technologies, new forms of decentralized technologies could emerge. This could lead to a more distributed and less centralized system of governance of the technology, which could improve governance and also make it harder to maintain safeguards.

Addressing these barriers has never been more important. Allowing the digital divide to persist will impede our ability to address inequality, affect our competitiveness in the global economy, and present even greater challenges to addressing disparities in health and education. The time is now.

Future disruption: What's next?

Digital technology has the potential to disrupt virtually every sector and industry, but some are poised to feel its impacts sooner or more significantly. The Occupational Information Network, the U.S. Department of Labor, and the Bureau of Labor Statistics report that 40% of all hours worked in the U.S. today can be impacted by large language models such as ChatGPT,

whether through automation (little human involvement required) or augmentation (more human involvement required). Below are several sectors and industries that are most likely to be disrupted by technology.

Industry use cases

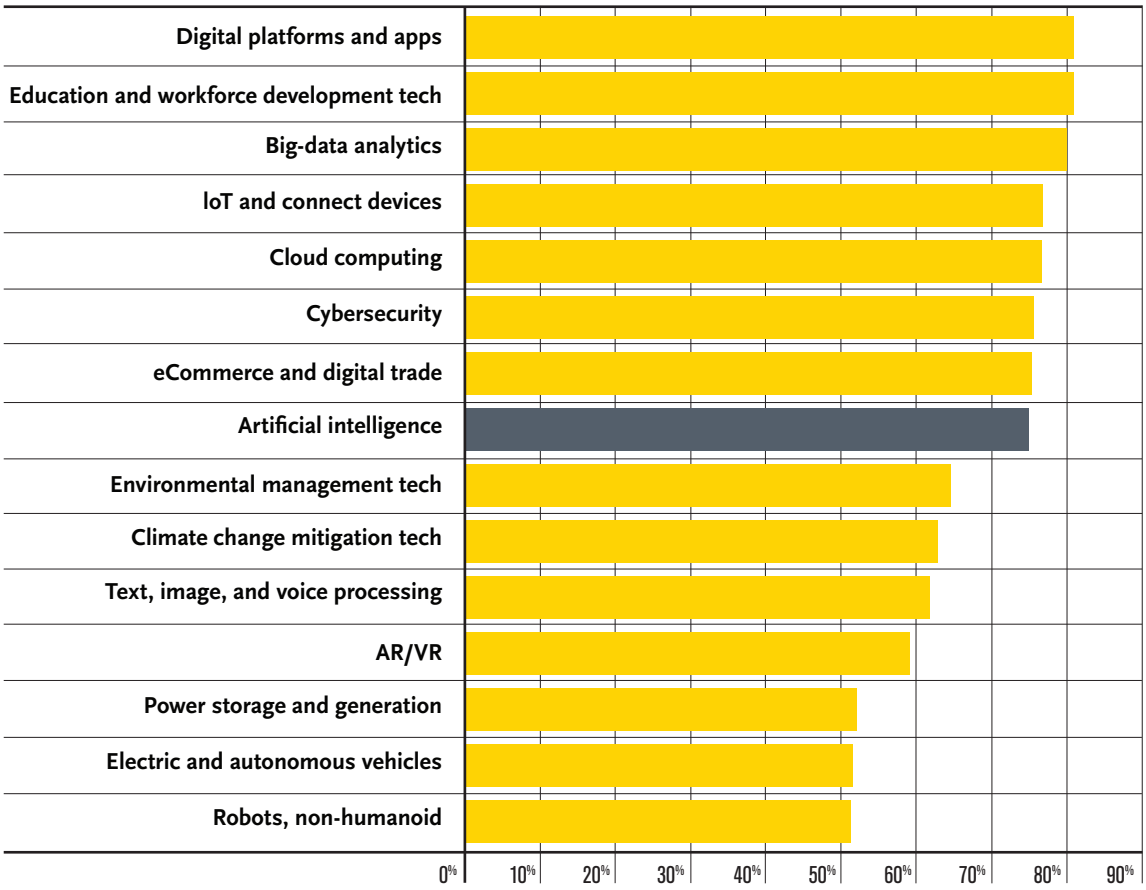
HOW DIGITAL TECHNOLOGIES ARE LIKELY TO BE ADOPTED ACROSS INDUSTRIES[18]

While the disruption brought by digital technology leaves many wondering if computers will make us even more productive or whether they will take our jobs, business leaders overwhelmingly prefer pursuing a path of greater productivity and wellbeing for workers.

Which industries will be most affected?

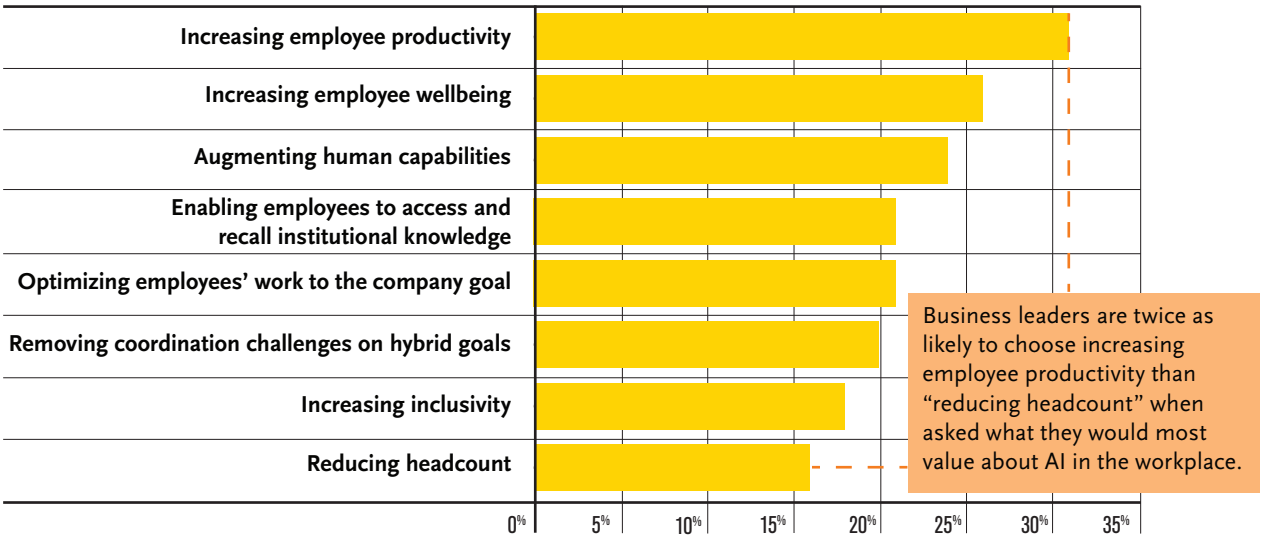
Health care: Digital technology is being used for scheduling appointments, virtual medical appointments, diagnostics, predictive health care, patient care, and pharmaceuticals. For instance, machine learning algorithms can process and analyze vast amounts of medical

FIGURE 8
Ranking of technologies likely to be adopted by companies from 2023-2027



Source: "Unleashing Artificial Intelligence's True Potential: How Generative AI Could Empower Innovation, Redefine Productivity, and Transform the Workforce," 2023, Statista website.

FIGURE 9
Opinions of business leaders on adoption of AI in the workplace



Source: Statista Market Insights 2023

data to help diagnose diseases, predict health trends, or optimize treatment plans. Robots can assist in surgeries, and chatbots can provide basic health advice or mental health support.

Manufacturing: New automation technology can greatly increase efficiency in the manufacturing process. Predictive maintenance can reduce downtime. AI can also improve supply chain logistics and quality control and help design more efficient systems for resource use.

Transportation: Self-driving cars and trucks and digital routing and mapping have the potential to revolutionize the transportation industry. Technology can also be used to optimize routing, improve safety, and make transportation more efficient.

Retail: Digital technology can improve personalization, making product recommendations more accurate. It can also optimize inventory management, improve logistics, and enhance customer service with chatbots and new shopping experiences, like virtual fitting rooms.

Finance: Fraud detection can be enhanced by machine learning and pattern detection. Technology can be used to improve risk assessment and financial planning. Automated trading algorithms can make decisions in a fraction of the time required for human analysts. Robo-advisors can provide personalized investment advice based on an individual's specific goals and risk tolerance.

Agriculture: Remote sensing technology provides data about weather patterns, soil conditions, and crop features that can optimize planting and harvesting. Drones and automated machinery can perform tasks such as seeding and harvesting.

Education: Machine learning and AI can personalize learning for individual students based on their strengths and weaknesses. It can also automate administrative tasks, freeing up time for educators to spend with students.

Energy: Technology solutions can be used to optimize energy usage in power grids, predict equipment failures, and improve the efficiency of renewable energy sources.

Media and entertainment: Generative AI can create music, videos, and even write articles. It can also personalize content recommendations, improving user engagement.

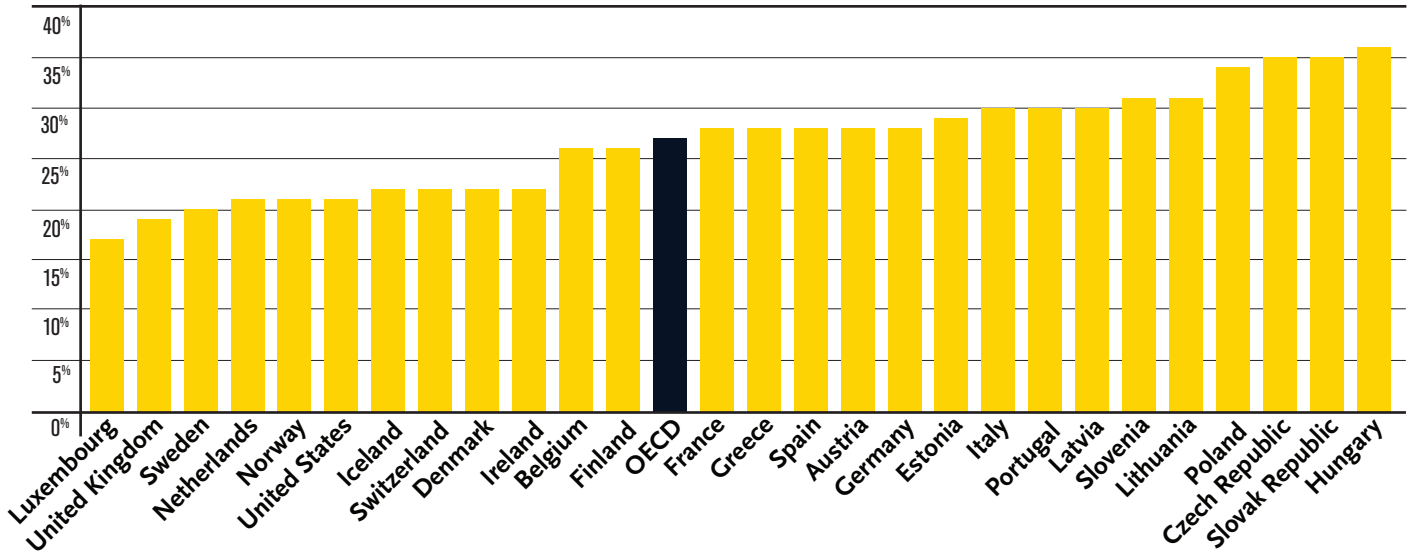
The potential applications of new digital technologies are vast and still being explored. As society reaps the many benefits of this latest economic and tech revolution, it will be presented also with challenges such as job displacement due to automation, privacy concerns, and ethical considerations. Balancing these aspects will be crucial to ensuring the successful and beneficial deployment of technological innovation across industries.

Which jobs are predicted to be most affected by technological disruption?

As digital technology continues to advance, certain sectors are more at risk for job displacement than others, primarily those that involve routine, predictable, and manual tasks. An estimated 300 million jobs could be affected by widespread automation through AI.[19] Below are some of the roles that are most likely to experience job displacement due to digital technology adoption. People in these roles should be prioritized for upskilling (i.e., teaching workers new skills to help them move up in their current field), reskilling (i.e., training workers for a different type of job), and mentoring.

FIGURE 10

Share of employment in occupations at the highest risk of automation by country, 2019



Source: OECD. *OECD Employment Outlook 2023*.

Manufacturing: This industry has already seen significant automation, and this trend is likely to continue. Jobs that involve repetitive tasks such as assembly line work are particularly at risk.

Retail: With the advent of self-checkout technology, online shopping, and AI-powered customer service bots, many jobs in the retail sector could be displaced.

Transportation and warehousing: Autonomous vehicles and drones could significantly disrupt jobs in these sectors, which include truck drivers, taxi drivers, and warehouse workers.

Food service: Automation is increasingly being used in food preparation and delivery, potentially displacing jobs in fast food and other areas of the food service industry.

Customer service: AI chatbots and automated phone systems can handle many customer inquiries, potentially reducing the need for human customer service representatives.

Data entry: Jobs that involve routine data input are highly susceptible to automation, as AI and machine learning algorithms can process and analyze data much more efficiently than humans.

Agriculture: With the development of automated machinery and drones, many tasks traditionally performed by farm workers can be automated.

Accounting and finance: Tasks like bookkeeping, tax preparation, and certain types of financial analysis can be automated, threatening jobs in these areas.

OpenAI predicts an even broader impact, reporting that approximately 80% of the U.S. workforce could see generative pre-trained transformers (GPTs) affect at least 10% of their job responsibilities, and 19% of workers could see more than half of their tasks affected.[20] It is estimated that advanced AI technologies can replace about 15% of overall worker tasks, completing them faster and at the same level of accuracy, and that much of this task replacement will affect higher-wage professions.[21]

FIGURE 11

Share of organizations likely to adopt technologies in the next five years (%)

* Including food and leisure ‡ Including entertainment and sports ▲ Including wholesale of consumer goods
† Including transportation

Adapted from World Economic Forum, Future of Jobs Survey 2023.

The toolkit: Concrete actions companies can take to build the bridge across the digital divide

Multiple types of digital technologies make us more efficient in our work. AI gets the lion's share of attention in the news media—and rightly so. Its adoption and impact are unprecedented in scope and impact.[22] However, the types of technology employed and impacts of digital technology are pervasive across all industries—from agriculture to advanced manufacturing. Because machines will soon be able to perform analytic, computational, and natural language processing at unprecedented speeds and levels, skills needed by workers will (once again) shift. Physical effort and basic cognitive skills will not be as important as they once were. While coding, engineering, and network and technology skills have been emphasized as crucial work skills related to digital technology, critical skills predicted to become more important with next-generation technology include critical thinking, leadership skills, emotional intelligence, and management. Importantly, these are skills that are best learned by working with great mentors in great corporate cultures.

It's also important to note that while some industries are at risk of job displacement, AI and automation are predicted to create new jobs that didn't exist before. In some sectors, digital technology might not displace jobs but rather change them, with humans working with new technology to become more productive. As such, reskilling and upskilling will be crucial strategies to help workers adapt to these changes. While formal training and professional development are important to reskilling efforts, apprenticeship and mentoring are equally effective supports for this kind of learning. The toolkit in the following pages is intended to help other companies benefit from the lessons learned by EY US over the last decade.[23]

Where can companies make a difference?

Elements of the digital equality ecosystem

- Bridging the digital divide is a monumental task that requires the collaboration of stakeholders, including governments, corporations, nonprofits, and individuals. It won't be solved overnight, but with concerted effort, significant progress can be made. The following represent just some of the actions that require public/private partnership.

Policy

- Develop a universal understanding and definition of what the digital divide is and its implications in today's world.
- Engage with policymakers at local, state, and national levels working to address the digital divide to share perspectives.
- Explore solutions to help companies provide affordable high-speed internet in underserved areas.

Broadband equity access and deployment

High-speed internet is no longer a luxury—it is necessary for Americans to do their jobs, to participate equally in school, to access health care, and to stay connected with loved ones. Yet more than 8.5 million households and small businesses are in areas where there is no high-speed internet infrastructure, and millions more struggle with limited or unreliable internet options.

Just like how Franklin Delano Roosevelt's Rural Electrification Act brought electricity to nearly every home and farm in America, in June of 2023 the Department of Commerce announced funding for each state, territory, and the District of Columbia for high-speed internet infrastructure through the Broadband Equity Access and Deployment (BEAD) program—a $42.45 billion grant program created in the Bipartisan Infrastructure Law and administered by the Department of Commerce.

President Biden's American Rescue Plan also included over $25 billion for high-speed internet, including:

- The Department of Treasury's Capital Projects Fund (CPF) provides $10 billion to states, territories, and tribal lands and communities for which high-speed internet is an eligible use. Today, over $7 billion has already been dedicated to high-speed internet deployment and connectivity across 45 states.
- The State and Local Fiscal Recovery Funds (SLFRF) delivered funding across the country to support the response to and recovery from the COVID-19 pandemic. About $8 billion is being used by states, territories, tribes, and local governments for high-speed internet deployment and connectivity.
- The FCC's $7 billion Emergency Connectivity Fund program helped schools and libraries close the "homework gap," providing schools and libraries with 10.5 million connected devices and over 5 million internet connections.

Additional information is available at InternetForAll.Gov.

Investment in infrastructure

- Collaborate with internet service providers, government agencies, and nonprofits to fund and build necessary infrastructure in both rural and low-income urban areas.
- Explore public-private partnerships to accelerate the process.
- Invest in long-term, sustainable tech solutions like 5G, satellite internet, or community broadband to cover remote areas.

Digital literacy education

- Implement digital literacy programs in schools and community centers.
- Develop adult education programs focused on digital literacy, targeting particularly those who have traditionally lacked access to technology.
- Ensure educators have the necessary training to impart digital literacy skills.

Device accessibility

- Support efforts to offer more affordable device options.
- Create device recycling programs where old but still functional devices are donated or sold at low cost to those in need.

Research and data collection

- Conduct comprehensive research to identify gaps and monitor the progress of digital divide initiatives.
- Use data-driven insights to continually adjust and optimize the strategies.
- Advocate for transparency from ISPs about pricing, speed, and availability.

EY commitment to addressing the digital divide of Now, Next, and Beyond

To meet all the dynamic needs of the communities in which EY US professionals live and work, the firm implemented a three-phase activation approach—Now, Next, and Beyond. The first phase (Now) focuses on addressing immediate needs around hardware and connectivity. The second phase (Next) focuses on stabilizing access to digital training and establishing supportive learning community networks. The third phase (Beyond) seeks to transform communities through mentorship focused on upskilling that promotes participation in the digital world.

EY US's decentralized approach enabled over 80 U.S. offices in the first year of the program to activate their local Digital Divide strategy. The activation model provided a step-by-step process to building collaborations and creating a city-specific ecosystem that works in tandem to meet communities' specific needs.

EY US's Digital Divide ecosystem follows the hub-and-spoke model. At the center are underserved communities. Each of the six "spokes" represents a source of support: the firm, nonprofits, hardware providers, internet service providers, private sector companies, and local governments and the public sector. Each group uses their core competencies to help bridge the divide. For example, nonprofits within the ecosystem can help direct hardware, connectivity, and mentoring efforts to the communities that need them most.

The EY office in Charlotte, North Carolina, is a great example of how the hub-and-spoke model works uniquely within each city. The office collaborated with their local government on the mayor's Racial Equity Initiative focused on bridging the digital divide. Their efforts included leading a corporate response team made up of more than 90 businesses—including clients, nonprofits, and public sector entities and community representatives tasked with developing strategies to bridge the digital divide and advance racial justice in Charlotte. EY Charlotte is making a differential investment in one of these nonprofits, Eliminate the Digital Divide (E2D). In spring 2022, 2,500 square feet of pro bono office space at the Charlotte EY wavespace™ facility was designated to this nonprofit and converted into a multiline computer hardware/software lab that receives donated corporate computers and refurbishes them to be redistributed at low or no cost to low-income communities in North Carolina. Since opening, 2,409 computers have been redistributed into the community by paid E2D student lab techs.

To further help local offices activate the Digital Divide strategy, EY US expanded its national nonprofit relationships to act as community liaisons. The nonprofits were also a conduit for EY professionals to donate to a Digital Divide campaign that funds hardware, connectivity, and digital programming.

With this innovative approach, the firm hopes to maximize our impact and continue expanding its reach to all underserved communities. Focusing on the strategy's Next and Beyond components, EY US wants to:

1. **Strengthen its convening power** by collaborating with ecosystem members to drive impactful volunteer programming.
2. **Increase its advocacy efforts** by using its platform to amplify the long-term value of bridging the digital divide.
3. **Use its core competencies** to develop sustainable solutions with clients for equitable outcomes.

EY US volunteer mentors make ripples in Utah

For the past two years, the EY Salt Lake City office has collaborated with One Refugee, an organization with a mission to champion students of refugee backgrounds by helping them obtain post-secondary education and skills to prepare for a professional life. EY US's support includes providing students with laptops and hosting a career panel and financial literacy workshops. Recently, scholars were invited back to EY US for an in-person lunch and career panel. The panel featured professionals in various fields, including business management, consulting, and tax technology. Even very small teams can make a difference in supporting people across the digital divide.

Public awareness campaigns

- Launch a public awareness campaign about the importance of digital access and literacy.
- Share success stories to generate more support and funding for the cause.
- Ensure the digital divide is part of the broader discourse about equality and social justice.

Long-term sustainability

- Develop sustainable business models for continued internet service provision and network maintenance in low-income and rural areas.
- Continually reassess and update strategies based on the latest technological advancements and research findings.
- Promote an understanding that digital connectivity is a necessity, not a luxury, and treat it as a fundamental right.

While companies have a vested interest in the success of all the initiatives above, they will more or less be prepared, depending on firm-specific know-how and capabilities, to contribute to each of those efforts. The concern that every company has is being able to hire and keep talented employees who have the skills to compete in the 21st century digital economy.

Developing digital talent for the next-generation workforce

Mentoring, upskilling, and reskilling for the jobs of the future

- Preparing people for work in a tech-enabled world will require a multifaceted approach, emphasizing not only technical skills but also a range of soft skills. As technology and automation continue to evolve, they will increasingly perform routine and manual tasks, while jobs requiring critical thinking, creativity, and interpersonal skills will continue to grow. Successful professionals of the future will require the following skills.

Digital literacy and technological skills

- Understanding the basics of digital technology will be crucial. Workers don't necessarily need to know how to code AI, but they should understand how AI and machine learning can be applied in their fields.
- Basic programming and understanding of algorithms could become more valuable even in nontechnical roles.
- Cybersecurity knowledge will become more important as the digitization of work continues.

Data literacy

- As businesses increasingly make decisions based on data, the ability to understand and interpret data is valuable in a wide range of jobs. This could include skills such as reading charts and graphs, understanding statistics, and making data-driven decisions.

Soft skills

- Skills like problem-solving, critical thinking, creativity, and emotional intelligence are difficult to automate and therefore are likely to be in high demand. Additionally, the ability to adapt to change and learn new skills or "digital agility" is crucial.
- Adaptability and resilience will be crucial as the rate of technological change accelerates.

Industry-specific tech skills

- In some cases, learning to use specific types of technology may be beneficial. For example, workers in the manufacturing sector might benefit from learning how to operate and troubleshoot automated machinery.
- While not necessary for every role, learning to code can open up new job opportunities. There are many online platforms where individuals can learn coding for free or at a low cost.

New sector skills

- For those looking to switch industries entirely, learning the skills required for a job in a growing field can be a good strategy. For example, there's a high demand for workers in fields like data science, cybersecurity, and renewable energy.

Specialized ethics

- Ethical understanding and judgment in relation to technology will be important, particularly for those designing and implementing AI systems.
- Jobs in AI ethics, AI law, and other areas relating to the governance and oversight of AI will likely grow.

Lifelong learning

- In a digitally enabled world, change will be the only constant. Workers will need to commit to lifelong learning to keep their skills up to date.
- Employers, educational institutions, and policymakers can facilitate this by creating opportunities for upskilling and reskilling.

As AI and automation reshape the job market, it's crucial to prepare workers in at-risk industries for the transition. This includes both upskilling and reskilling.

Employers, educational institutions, and policymakers can play a role in providing opportunities for upskilling and reskilling. This could involve on-the-job training programs, partnerships with local colleges or vocational schools, online learning platforms, or government-funded education and training initiatives. By investing in the workforce in this way, societies can help ease the transition to a technology-enabled job market.

Keeping talent on track for digital careers

> Given the fast-paced evolution of our world, we must proactively equip today's talent for future challenges by fostering an innovative mindset and essential skills. Achieving this and bridging the digital divide requires widespread involvement, particularly robust support from the private sector. Their skilled professionals are well positioned to educate and influence emerging talent."

Ken Bouyer
D&I Recruiting Leader
EY US

Upskilling and reskilling as paths to inclusion

Increasing diversity in technology fields is a crucial goal. Diverse perspectives can drive innovation and produce solutions that are more representative of and beneficial to a broader spectrum of society. Here are several strategies for providing inclusive pathways to employment in a technology-enabled economy.

1. Improve access to education

- Implement programs that offer scholarships, internships, and mentorship opportunities specifically to groups who are underrepresented in technology fields.
- Support initiatives that provide resources to schools in disadvantaged areas to improve their access to technology and mentoring programs.
- Encourage partnerships between schools and technology companies to provide resources, tutoring, internships, and mentorship for students in underrepresented communities.

2. Promote early exposure

- Introduce technology concepts at an early age to cultivate interest in and dispel stereotypes about these fields.
- Incorporate hands-on technology-enabled activities into early childhood education and elementary school curricula to stimulate interest.

3. Mentorship and role models

- Promote successful women and people of color to inspire others. Make sure that those role models are given substantial support to continue their own research and professional development so that their progress is not derailed.
- Establish mentorship programs where experienced professionals can provide guidance and support to those new to the field.
- Celebrate the achievements of women and people of color in technology to increase visibility and inspire others.

4. Create inclusive work environments

- Support programs that aim to reduce the education gap, promote diversity in technology education and careers, and support underrepresented groups.
- Ensure fair and transparent hiring practices and promotions in tech jobs.
- Promote learning to reduce unconscious bias and foster an inclusive work environment.

5. Foster collaborative networks

- Create or support networking groups and professional organizations specifically for women and minorities in tech. These can provide opportunities for mentorship, collaboration, and career advancement.
- Provide platforms for sharing experiences and advice and for building supportive communities.

It's important to remember that change in these areas takes time and requires the commitment of people across the firm. The benefits of this work, however, are well worth the effort, leading to more innovation, a more representative workforce, and a more equitable society.

EY US inspires interest in STEM careers

In collaboration with the United Way National Capital Area, the EY Greater Washington office supports students in Prince George's County (PGC) school district through the Pathways to College and Digital Literacy Program. EY volunteers demystify access to college and provide digital upskilling to help students build a digital foundation to thrive in higher education and beyond.

Hosted in the fall and spring of the 2021 academic year by EY volunteers, students attended two sessions per week over the course of four weeks. During these sessions, students learned about the requirements for college, how to apply, the difference between two- and four-year institutions, and the basics of the financial aid process. Students were upskilled with digital software such as Microsoft Excel and Word. As part of their participation in the program, students were provided with a laptop to help them utilize their learnings and apply to college. The program and laptops were funded by the EY Greater Washington office Digital Divide fundraising, which to date has raised over $150,000.

Since its launch, the Pathways program has upskilled 120 students in the Prince George's County school district. Working to expanding on their efforts and leverage their ecosystem of collaborators, the team will be launching a STEM Career Exploration series in the spring of 2024 to help expose students of Prince George's Country to the fields and professions of the future.

Tools for mentors and Digital Divide program leaders

Bridging the digital divide means making sure learners at all levels are supported as they pursue training and preparation to engage with technology. Because every industry (not just science and tech) requires properly skilled people, all companies will be confronted with the need to think about how they will prepare their people to succeed in technology-enabled work environments. Education and mentoring outcomes are shown to be better in terms of both the likelihood of learners to pursue and succeed in technology-related careers and in the satisfaction and perception of mentors if certain conscious practices are supported and adopted. Research suggests that there are four dimensions of support that can maximize persistence in programs of this type and yield, as outlined below.

Creation of "the engines that can"

This dimension of exploration is focused on the individual and addresses research on identity, particularly self-efficacy (the belief within oneself that you can be successful) and technology identity (the believe within oneself—and reinforced by others—that you belong and should rightfully be considered for a tech job).

Social interactions and support

Relational supports, such as career counseling or mentorship, engagement with peers through training cohorts, and other affinity groups support persistence and lifelong learning about how to use technology as an enabler in one's job.

Organizational structures

How organizations create structures and programs and how they choose to constitute themselves in terms of representation can either encourage further diversity and create inclusion or thwart it.

Organizational values and tech inclusion culture

Workplace culture, norms, and assumptions morph into shared beliefs and values over time. Science and tech workplace culture (like all culture) is derived from organizational values (i.e., what behaviors we value and therefore reward). Consciously rewarding mentoring behaviors and decision-making that prioritizes inclusion and equity will yield different results than when these are not prioritized.

Do I belong here?

Once people are given access to technology and training to use it, persistence for all groups—independent of race, ethnicity, or gender—is connected to underlying conceptions of individual identity, particularly beliefs of how successful they can be and whether they belong.[24]

Perceptions of low ability, even when untrue, impact and diminish persistence. For example, studies of female self-assessments of math found that even when their overall performance in mathematics is on par with the performance of male students, female students tend to report lower levels of mathematics success than their male counterparts.[25] The perception of low ability affects both behavior and motivation. This sense of identity is also a predicator of problem-solving skills and connectedness.[26] **The great news is that both self-efficacy and self-identification regarding tech and data mastery can be developed with support**.

Bridge building block: BELIEVE

The development of self-efficacy can be applied through multiple types of interventions. This commonly applied model has four dimensions:

1. **Personal experience of mastery**: Allowing people to experience and appreciate success and experience and recover from failure. One very effective tactic for creating these opportunities is to have people working collaboratively in integrated teams on specific problems. Multiple studies cited have noted that women and minority group emerging technologists are often either left to work in isolation or in like groups, creating a sense of otherness rather than belonging. When diverse teams are formed and the responsibility for success is shared, and the team identity is the focus, the pressure on individual performance can be relieved. Team members then tend to focus on their contributions to shared goals rather than on their possible (or perceived) deficits compared to peers.

2. **Vicarious experience:** The learning and development of beliefs about what is possible for oneself that comes from observing what happens to others and that encourages characterization of oneself as identifying with those who are being observed or modeled. Recent literature notes multiple opportunities to improve vicarious experiences, such as how mentoring increases the likelihood of developing a science identity.[27] Simply shifting narratives to focus on stories of success among like groups and/or shifting perceptions of similarity to get young scientists to see themselves as being like their mentors in ways other than their sociodemographic or gender identities. Vicarious experience is especially effective for women.[28]

3. **Verbal persuasion**: The narrative that is presented and/or the context that is constructed by or for an individual about their identity and/or the likelihood that they will be successful. In short, the more we tell young scientists that they can excel and that they are expected to be successful—the more likely they will be.[29]

4. **Positive framing**: The theory behind this principle is that if one is told repeatedly that a goal is out of reach, the motivation to pursue that goal will diminish. Research tells us that dedication comes from building upon small acts to escalate levels of commitment.[30] If someone is told after years of practice and commitment that a goal related to their pursuit is not likely attainable, they might perceive it as a challenge and try for it as such because they are optimistic about their chances of mastering new skills after having experienced many past successes. If a similar narrative is presented early in their journey or if goals are outsized for their level of play, or if every example of success presented to them does not resemble them *and* is not framed in such a way where they can find commonality with the example, they might perceive the narrative as a deterrent and abandon their efforts altogether.[31] They would also likely have negative feelings about their experiences (and/or themselves as a result of the experiences) and might even come to have negative feelings about the field of pursuit.[32]

Bridge building block: Digital mastery

Having success with achieving feelings of mastery is an important precursor to developing a sense of achievement with digital technology. Mastery and identity and feelings of belonging in technology and science is highly predictive of persistence in the field.[33] Women and other underrepresented people do not experience levels of belonging in science and tech fields equal to those experienced by men.[34] As higher levels of technology identity positively impact technology persistence, the impact of low levels of science identity and belonging is meaningful in explaining the lack of diversity within tech.[35] **Feelings of non-belonging can create a disconnect between the actual knowledge and skills people possess and their confidence in their own knowledge.**

Bridge building block: Technologist identity

Importantly, perceptions of mastery, effectiveness, and belonging can be changed over time. For example, those who have "incremental beliefs," like a belief that intelligence can change over time, are more likely to have a greater interest and sense of belonging in digital technology and other tech fields.[36] Feelings of belonging are also impacted by the larger social and organizational context. A study of people underrepresented in engineering and tech found that people who perceived their mentors believed everyone had scientific aptitude had a greater likelihood of feelings of belonging.[37] Feelings of belonging can be shaped at several levels, including by a peer group.[38] **Telling people they belong in digital technology fields is a strong pipeline-related intervention**.

THE INTERVENTIONS

Science identity can be strengthened through a range of program types, including experiential learning,[39] participation in supportive relationships and networks,[40] and exposure to technology professionals and careers.[41] Research has shown that short-term interventions, such as weeklong programs, can also strengthen science identity,[42] suggesting a range of possible intervention types that can help to build science identity and self-efficacy, subsequently increasing the likelihood of persistence.

From each side of mentoring

Bridging the digital divide is an important component of EY US's focus on social justice. Using its cornerstone mentoring strategy, EY US assembled groups of impassioned leaders who drove the firm's efforts to redress inequality. The digital divide was identified by the firm as a significant barrier to equality and thriving—affecting health, employment, education, and social connection. EY leaders are committed to providing financial resources and mentoring expertise to solving digital access and resource issues for as many people as they can reach.

Carolina Dominguez-Pasaoglu, EY Americas Assistant Director of Corporate Responsibility, is a leader who has experienced the digital divide from both sides of the chasm. The daughter of immigrants, Carolina was the first of her family to finish high school and pursue higher education. Without first-hand experience from which to draw, her family was unable to steer her on a course toward college acceptance as she neared high school completion. Carolina earned an associate degree and went to work. A mentor at EY recognized her intellect and work ethic and encouraged her to apply to Columbia University. With the encouragement and support of her mentor, she applied and was awarded a full-ride scholarship.

Carolina is the first to acknowledge that experiences like hers are not unique. Stories of finding a pathway with the help of a professional role model are common not only at EY US, but in organizations across the nation. However, one in three young people grow up without the presence and guidance of a mentor—a driving factor for EY US's continued focus on its mentorship program.

"The private sector can do something about providing mentorship," Carolina said. "In fact, you could argue that it's a business imperative. Because I had a mentor, I applied for college, received a full scholarship, attained a degree, and am now doing a job I could only dream of at a company I absolutely love."

EY US knows that firm-level efforts can be expanded through public policy initiatives that solve for household issues such as a lack of reliable access to electricity, internet, and devices.

Carolina is, herself, a mentor and has inspired hundreds of colleagues at EY US to commit to mentoring and has supported them as they have started their mentoring journeys. Beyond her contributions at EY US, Carolina has served on the Advisory Board for Mentoring at Barnard College and coleads the College Persistence working group—a network of nonprofit organizations advancing college access and persistence in New York.

"By empowering our people to bring their experience and expertise directly into classrooms, encouraging young people to elevate their aspirations, explore careers, and pursue their dreams, EY team members are both doing good in the community and laying the foundation for our future workforce and economy. As high-performing professionals, EY volunteers take the distinctive services and competencies they use every day and put them to work in the communities to make those communities stronger and more resilient now—and more prepared to be successful in our future."

ADVICE FOR THE FIELD:

"When I first started this work, I made an ask of a program sponsor. He agreed, then asked if there was anything more we needed. I excitedly and immediately jumped into other opportunities we had on our wish list. And he agreed to do more. At the end of our meeting, he called me out and said next time you need something, ask for it all, be bold. The worst thing that happens is that I say no and we work together to find another way."

Carolina Dominguez-Pasaoglu
Assistant Director, Corporate Responsibility
EY US

Supporting the bridge builders

MENTORING, ROLE MODELS, AND COHORT DEVELOPMENT

- **Mentoring** has been shown to be a key intervention. The pairing of mentors who are prepared to help people pursuing digital technology upskilling see themselves as belonging in tech jobs and being able to be successful (even if with support) is a very important intervention.[43]

- **Career education and career counseling** are important for underrepresented groups who may not have had exposure to potential career paths. Many people already working with digital technology may be aware of the lack of access that underrepresented groups have to very basic knowledge about career paths, required training, likely compensation levels, and how individual roles add value (i.e., what do we make happen in the world and economy?) and express values (i.e., is this a helping profession?).

- **Positive self-talk** coaching is important for underrepresented young people. Not only must positive identity narratives be created for them, but they must be encouraged to voice the narrative of success. The importance of a mental "tryout" of change and performance is well-documented in the social psychology literature among scholars, including Cialdini, Kotter, and Schein.[44]

- **Team-based projects and cohorts** help underrepresented groups enter work-related experiences in a supportive environment that emphasizes teamwork and contributions to shared goals. These experiences can help individuals from underrepresented groups see themselves on more equal footing than when they may believe themselves to be assessed individually. This can be an important step to persistence to individual internships or lab experiences.[45]

- **Coaching for mentors, enrichment programs, and other support systems** in the use of and coaching toward language that encourages underrepresented groups to be placed with, connected to, and identified with successful tech leaders—and not only technologists who look like them, but all tech workers. This tactic can be applied across multiple programmatic contexts.[46] Mentoring is successful in part due to the real-life examples of tech careers and the role models it provides to those who aspire to these careers and opportunities for growth created by mentorship

> "Access to abundant information without the right mentor is like a dam without a floodgate—there is too much to consume at a time. Mentorship should nurture the sense of belonging and guide younger generations to visualize success. Having the right mentors who represent them creates a long-lasting impact toward their future."
>
> **Dwarakesh Ravichandran**
> Technology Consulting Manager
> EY US

experiences.[47] Successful mentoring interventions can take several forms, including industry and peer-based mentorship programs.

For mentoring programs to increase persistence, mentors need to be trained. As one study noted, "mentoring has unquestionable positive impacts on abilities, mental health, and productivity, but most scientists lack the training or knowledge to effectively mentor."[48] **In addition to basic training, it is useful for mentors to receive cultural competency training to best serve the needs of diverse populations.**[49] Mentoring is not only impactful on mentees, but also impacts mentors positively. Research has shown that within peer mentorship programs, serving as a mentor increased perceptions of professionalism and made women feel more confident.[50]

Related to mentorship is the **concept of role models, who serve as examples of what successful navigation of the tech employment pipeline can produce.** Research has shown that role models are most effective when the example they set is seen as attainable and when they help to normalize the struggles experienced by people seeking technical competence.[51] For underrepresented groups, it is useful when role models reflect the identity traits of the underrepresented groups.[52] Employee mentors and mentees from underrepresented groups are often paired in mentorship or advisory roles, and when those mentors are less successful in their own careers, it negatively impacts the people they mentor. Several studies reveal opportunities to improve mentoring experiences through the framing of mentor and role model experiences and attributes, noting that another common downfall of mentoring programs is that **highly productive tech leaders from underrepresented groups are over-tapped as mentors for emerging talent. Our well-intentioned efforts to create science identity in this way has unintended consequences:**

EY MINI CASE:
It is never too early... or too late

Jacksonville, Florida was one of the first cities selected to launch Bridging the Digital Divide because of its need for digital readiness support and its robust nonprofit community. Census.gov data of Jacksonville households revealed that 6.4% of households lack access to computers and more than 12% of residents lack a broadband internet subscription. As a result, more than 55,000 Jacksonville students need mentorship, training, and devices.

The EY Jacksonville office teamed up with local nonprofits to support an organized, sustainable approach to coordinate hardware, connection, and mentorship.

"The EY Digital Divide program is a huge game changer for students living in underserved communities," said Rick Cartlidge, Executive Director of Sanctuary on 8th Street, one of the nonprofits. "EY US has connected us with great mentors, tools, and resources, and they are a blessing to us."

Bridging the Divide has reached more than 800 young people and adults in the community, with mentorship opportunities making an impact.

"Access to abundant information without the right mentor is like a dam without a floodgate — there is too much to consume at a time," said Dwarakesh Ravichandran, EY US Technology Consulting Manager. "Mentorship should nurture the sense of belonging and guide younger generations to visualize success. Having the right mentors who represent them creates a long-lasting impact toward their future."

Additionally, the program's employee-raised funds have been used to purchase laptops for underserved graduating students with the 5000 Role Models of Excellence Project, and EY community engagement funds helped purchase hardware and support internet connectivity for Sanctuary on 8th Street.

Together, EY US and the Jacksonville nonprofit organizations have helped community members access more digital resources in pursuit of healthier, more connected, and successful lives.

1. It limits the opportunities for scientist identity to the attributes that characterize both mentor and mentee as underrepresented rather than helping the mentee frame more overlaps between the circles of technology identity between the two.
2. It puts a greater burden for creating a diverse pipeline of digital technology and science leaders on very productive contributors from underrepresented groups, making it more challenging for them to be productive.
3. It implies a greater level of responsibility among underrepresented individuals for achieving a diverse pipeline—an unfair doubling of their own headwinds and responsibility that should be shared by all.

The interventions

Mentoring, role models, and cohorts all provide mechanisms through which high-potential talent from underrepresented groups can have positive vicarious experiences, which can help develop feelings of self-efficacy and science identity.

Diversifying mentors and role models so that leaders from underrepresented groups are not solely responsible for mentoring all emerging talent from underrepresented groups is critical. Though it is important to encourage people of color to take opportunities to act as mentors and role models when they are prepared to do so, it is a mistake to expect or require them to assume this role. Pulling technology experts from underrepresented groups away from their scientific or leadership work may disadvantage them in their careers by making them less productive in their own leadership roles. It may also have the unintended effect of making the people who have experienced inequality acutely responsible for solving a problem perpetuated against them. Offering opportunities to all senior leaders to act and be supported as mentors and sensitizing them to the inequalities created by the digital divide and other factors can help create a supportive culture where issues related to discrimination and inequality can be discussed and addressed with the input of senior leaders who have crossed the digital divide without making them responsible as "the solution." It can also keep the organization focused on progress.

Making diversity and inclusion everybody's business by making commitments, creating goals, reporting progress, and providing support for ongoing development for everyone in the organization is incredibly important to creating feelings of belonging among underrepresented groups. For these experiences to be as successful and productive as possible for both mentors and mentees, **coaching and cultural competence support should be provided to mentors.**

Pulling back the lens on framing of science identity for mentees is also important. Employee-generated content around science identity—"Everyone can be a scientist"—content can be communicated externally and used to support talent pipelines.

Bringing it all together: Employing an ecosystem of support for developing a tech-ready workforce

Work-related technology experiences

The importance of work-related experiences, such as internships, research opportunities, and field work, is a key theme in technology persistence. **Research and work experience contributes to persistence in building self-confidence and aspiration to do more with technology,[53] developing social capital,[54] and contributing to professional preparedness. Underrepresented groups experience outsized benefits of these programs.[55]**

While programs targeted at developing tech experiences are impactful, research also notes that interventions targeting underrepresented groups should consider that these experiences can produce anxiety for members of underrepresented groups, as people may experience imposter syndrome and face discrimination or bias in the work environment.[56] As such, supervisors in work-related experiences should be prepared for and trained to address the unique set of challenges that individuals from groups historically underrepresented may confront (as outlined in the barriers to access section). While the challenge of increasing representation in these fields is complex, research suggests that targeted interventions can be successful in supporting persistence throughout each stage of the pipeline.

It is clear that coaching people toward embracing technology as an empowering tool in their careers is important. What is somewhat surprising is that the cheerleading is almost equally as important. Throughout the research literature, a theme that emerges very clearly is that people from underrepresented groups do better and are more likely to persist in their pursuit of achievement in tech fields and with building tech skills if they are made to believe that they belong and can be successful in doing so. This is a simple concept that requires diligent design and reinforcement at every stage of support and over years of development.

See the table on the following pages for examples of how current programs can be further developed to focus outcomes on the key objectives of science identity, social supports, institutional improvement, and culture to provide a robust matrix of support to help people from underrepresented groups cross the digital divide.

How to use this matrix: This tool captures actions that companies can take to make their digital divide programs more effective and supportive for people who have been disadvantaged by the digital divide—and for the mentors who are supporting their journey to bridge the divide. The left-hand column lists experiences that make individuals more likely to persist and succeed in pursuing digital technology skills. The top row describes programmatic objectives. The cells in the matrix suggest some explicit actions that can be taken to ensure that each opportunity is designed to maximize outcomes for both the individual and the organization.

	Technology Identity	Social Interactions and Support	Organizational Culture and Values Characteristics	Digital Technology Adoption Culture
Personal Experience of Mastery	• Lab experiences supported with reinforcing identity narrative • Internships • Work under supervision of mentor • Cohort experiences (both with like characteristics groups and with diverse characteristics groups) ***Sample measure:*** • *Pre-and post-self-assessment of self-efficacy and feeling of belonging* • *Pre- and post-self and supervisor/educator assessment of growth* • *Number of cohort groups* • *Number of employees participating as mentors* • *Number of people with mentors; average number of mentor-mentee meetings* • *Number of lab experiences offered; length of lab experiences* • *Number of internships offered; length of internships*	• Team-based projects (identity-based and diverse) • Cohort experiences (both like characteristics groups and diverse characteristics groups) • Cohorts used as a scaffold for both peer- and digital technology-leader mentoring • Rotational internships leading to extended placements (developing networks) • Paid internships/lab opportunities • Paired cohorts of mentors/mentees in shared experiences ***Sample measure:*** • *Progression from teamed project to internship to lab work with mentor* • *Number of cohort groups; length of cohort experiences* • *Number of digital technology leaders participating as mentors* • *Rate of rotational internships leading to extended placements* • *Demographic breakdown of people in paid internships/lab opportunities*	• Commitment to remediation of skill deficits (remedial support for individuals with aptitude but not training) • Adequate opportunities for lab and other experiential learning ***Sample measure:*** • *Progression from teamed project to internship to lab work with mentor* • *Employee involvement in university-partnered programs, student participation in university-partnered programs* • *Number of university partnerships developed; number of remedial support programs developed* • *Number of people in experiential learning opportunities; length of experiential learning opportunities*	• Emerging talent organizations (e.g., Girls Who Code) as a means of understanding the professional landscape/developing networks • Internships/other professional development as a means of understanding work culture developing networks • Employee-generated content around science identity—"Everyone can be a scientist"—content communicated and used to support talent pipeline ***Sample measure:*** • *Participation of employees, engagement rate on employee-generated content* • *Number of successfully completed internships, progression from internships to full-time jobs* • *Pre- and post-internship self-assessment of self-efficacy/confidence in pursuing digital technology career*

	Technology Identity	Social Interactions and Support	Organizational Culture and Values Characteristics	Digital Technology Adoption Culture
Vicarious Experience	• Mentoring with mentor training for identity narrative • Diverse role models with identity narrative framing • Group observation with explicit identity narrative (i.e., helping people see themselves in similar roles even if a role model has different attributes) • Career education/ counseling ***Sample measure:*** • *Pre-and post-self-assessment for mentors surrounding mentor training* • *Pre- and post-self-assessment on knowledge/confidence in pursuing digital technology career* • *Number of employees participating as mentors; demographic breakdown of employees participating as mentors* • *Number of people with mentors; average number of mentor-mentee meetings*	• Team-based projects (identity-based and diverse groups) with project visibility • Peer mentor and study groups • Most productive digital technology leaders assigned to mentor regardless of demographic attributes ***Sample measure:*** • *Pre- and post-supervisor/mentor assessment of team/ group growth* • *Number of team-based projects produced, complexity of project, time to complete project* • *Number of digital technology leaders participating, demographic breakdown of digital technology leaders participating, length of digital technology leader mentorship*	• Exposure to individual digital technology leader career paths • Discussion of required competency and how to acquire, expected competency, how the role both creates and reinforces value • Pull from women and minority success in life sciences (adopt intern practices) ***Sample measure:*** • *Pre- and post-assessment on understanding (perception) of digital technology careers* • *Length of time to find employment* • *Rate of progression into digital technology career*	• Exposure to Employee Resource Group (ERG) members/issues mentors and role models as a means of understanding careers and career paths, the professional landscape, and developing networks ***Sample measure:*** • *Pre- and post-self-assessment of self-efficacy and feeling of belonging (specifically within digital technology culture)* • *Number of participating ERG members/mentors/ role models (break down by job level)* • *Employee participation in ERGs; number of ERG programs*

	Technology Identity	Social Interactions and Support	Organizational Culture and Values Characteristics	Digital Technology Adoption Culture
Verbal Persuasion	• In all programs, define key identity messages to be delivered in addition to technical content • Explicit narratives about identity • Explicit narratives about self-efficacy and belonging • Reinforcing successes • Level-setting beliefs about comparative performance • Coaching positive self-talk ***Sample measure:*** • *Pre- and post-self-assessment of self-efficacy and feeling of belonging* • *Pre- and post-mentor/supervisor assessment of growth* • *Number of employees offering personal narratives about identity, self-efficacy, and belonging*	• All mentors coached for reinforcing identity narratives • Career education • Career counseling • Discussion of career options/progressions/compensation ***Sample measure:*** • *Pre- and post-mentor/supervisor assessment of growth* • *Pre- and post-self-assessment of confidence in pursuing digital technology career* • *Pre- and post-self-assessment for mentors surrounding coaching* • *Length of time to find employment* • *Rate of progression into digital technology career* • *Number of employees participating in career education/counseling programs* • *Number of employees participating as mentors*	• Discussion of importance of representation • Discussion of commitments to representation and inclusion • Discussion of progress toward representation and inclusion • Solicitation of mentee perspectives on all of the above ***Sample measure:*** • *Pre- and post-self-assessment of self-efficacy and feeling of belonging* • *Number of employees participating in discussions* • *Employee/mentee feedback on progress toward representation and inclusion (positive vs. negative outlook)*	• Discussion of importance of representation • Discussion of commitments to representation and inclusion • Discussion of progress toward representation and inclusion • Solicitation of mentee perspectives on the above—implement good ideas ***Sample measure:*** • *Pre- and post-self-assessment of self-efficacy and feeling of belonging* • *Number of ideas implemented within the organization, length of time to implementation, involvement of senior leadership in implementation of ideas, number of employees volunteering to lead implementation of ideas*

	Technology Identity	Social Interactions and Support	Organizational Culture and Values Characteristics	Digital Technology Adoption Culture
Psychology of Support	• Progressive goal-setting • Explicit learning paths • Supported (checked and positively framed) self-evaluation of progress through learning paths • Coaching positive self-talk ***Sample measure:*** • *Student progression through learning paths* • *Number of learning paths developed* • *Post-self-assessment on confidence in reaching goals* • *Number of learners who set goals for themselves; number of learners who meet set skill-attainment goals*	• Coaching positive self-talk • Reframing "likeness" • Reinforcing belonging • Cultural competence awareness/ support for mentors ***Sample measure:*** • *Pre- and post-assessment on understanding (perception) of "likeness" and belonging* • *Pre- and post-self-assessment for mentors surrounding cultural competence training/support* • *Number of participants in training programs; length of programs*	• Implementation of policies and practices that support participation among women and minorities • Cohort groups for development • Family-friendly policies ***Sample measure:*** • *Participation among women and minorities* • *Pre- and post-self-assessment of development (from cohort groups)* • *Number of cohort groups* • *Feedback of employees on policies* • *Number of new policies created/ policies changed*	• Responsibility for inclusion programming shared across organization (coaching identity narrative) • Training for mentors, mentees, managers • Reframing "likeness" ***Sample measure:*** • *Pre- and post-self-assessment for mentors, mentees, managers surrounding training* • *Participation of organization members in inclusion programming* • *Number of inclusion programs implemented; frequency of inclusion programming*

A roadmap for getting your company engaged in addressing digital inequality

In 2020, EY US made a public commitment to anti-racism, which led to the creation of the Bridging the Digital Divide program in the U.S., a joint effort between EY Corporate Responsibility and EY Consulting.

The initial team included:

- One Corporate Responsibility executive sponsor
- One Consulting executive sponsor
- Core team of consulting analysts and corporate responsibility professionals
- Advisory panel of senior leaders
- EY-Parthenon data analysts
- Brand, Marketing and Communications professionals
- Office Managing Partners and additional leaders who were tagged to drive the program at a local community level across the U.S.

Step 1: Outline the process

- The first step was gaining an understanding of the digital divide, what EY US's role is to bridge the gap, what the program goals were to be, and how to measure progress. These were solved through extensive research and conducting interviews with a variety of internal and external stakeholders.
- The core team developed a detailed playbook on how to activate efforts, held one-on-one tactical strategy sessions with local teams, worked with United Way (the company's annual fundraising platform provider and community collaboration partner), and developed communications toolkits for internal and external audiences.
- EY US identified a handful of national partners and activated them across multiple geographies.
- The Activation Playbook included step-by-step instructions for local teams, and the core team provided support along the way to ensure a successful rollout of programs. A handful of offices were chosen as a pilot to then help the next wave of offices with lessons learned.
  - Activation step 1—how to mobilize the local office team, how to assess your current state of the digital divide in your community, and how to identify key programs and stakeholders.
    - Framework: In this step, local offices were asked to mobilize their own local activation team and leverage two key roles that will be very important driving forces of the digital divide city activation: the Digital Divide program manager and the Digital Divide executive sponsor.
  - Once that local activation team is mobilized, they should assess the "state of the digital divide" in their respective cities to get familiar with the nature of their city needs. EY-Parthenon and the Consulting team have worked together to provide a comprehensive data package that summarizes the state of the digital divide in each city.

- Next, the local office leaders have a tremendous opportunity to leverage their existing relationships with public and private sector organizations to make the greatest impact in their city. Based on the nature of these relationships the leadership will seek to identify and understand planned or ongoing initiatives where EY US could amplify its contributions in its focus areas: convening, consulting, and mentoring and future skills.

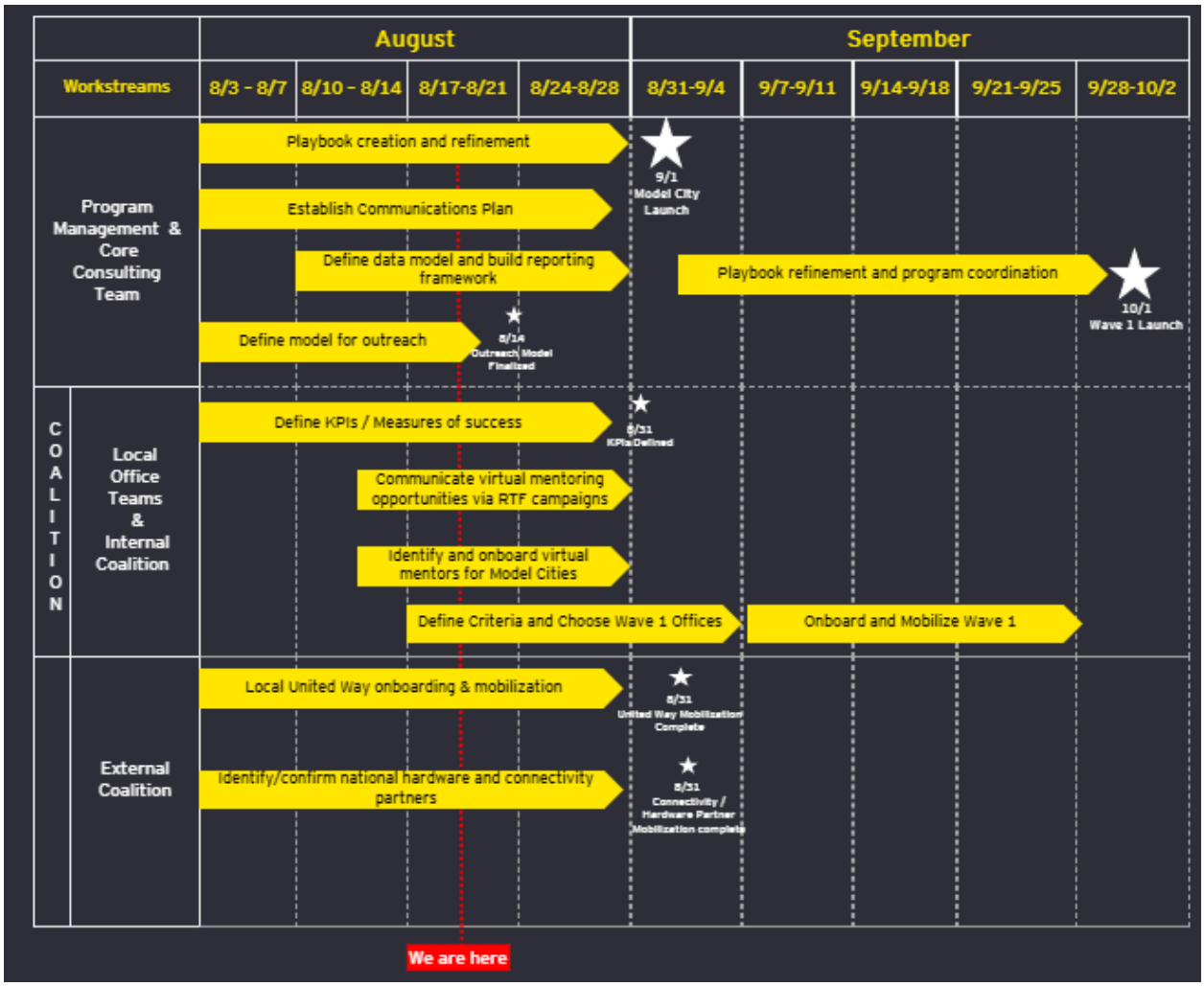
Step 2: Engage with collaborators, focus efforts, and refine your KPIs and an action plan

- In this step, the local activation office team develops a strategic plan to approach the potential collaborators in the private and public sectors to evaluate ways teams can collaborate to help bridge the digital divide. Once the approach is defined, engage potential collaborators.
- Next, the local activation teams will focus their efforts to meet specific outcomes. While doing so, teams should evaluate topics such as: Which organizations will they work with? Is there line of sight to a solution for all three focus areas? What mentoring programs will be activated, pivoted, or extended in a city, and how will the local office be mobilized? How will families (school districts where you have mentoring in place, areas where your external stakeholders have existing relationships and where we can easily lend our time) be targeted?
- Finally, refine city-specific goals and KPIs. There are influential variables that may vary from city to city such as the presence of a nonprofit organization, the specific digital gaps in each city, and internal and external stakeholder desire to activate one or many focus areas at a time; therefore, there is flexibility in allowing the cities to define their own program goals and KPIs.

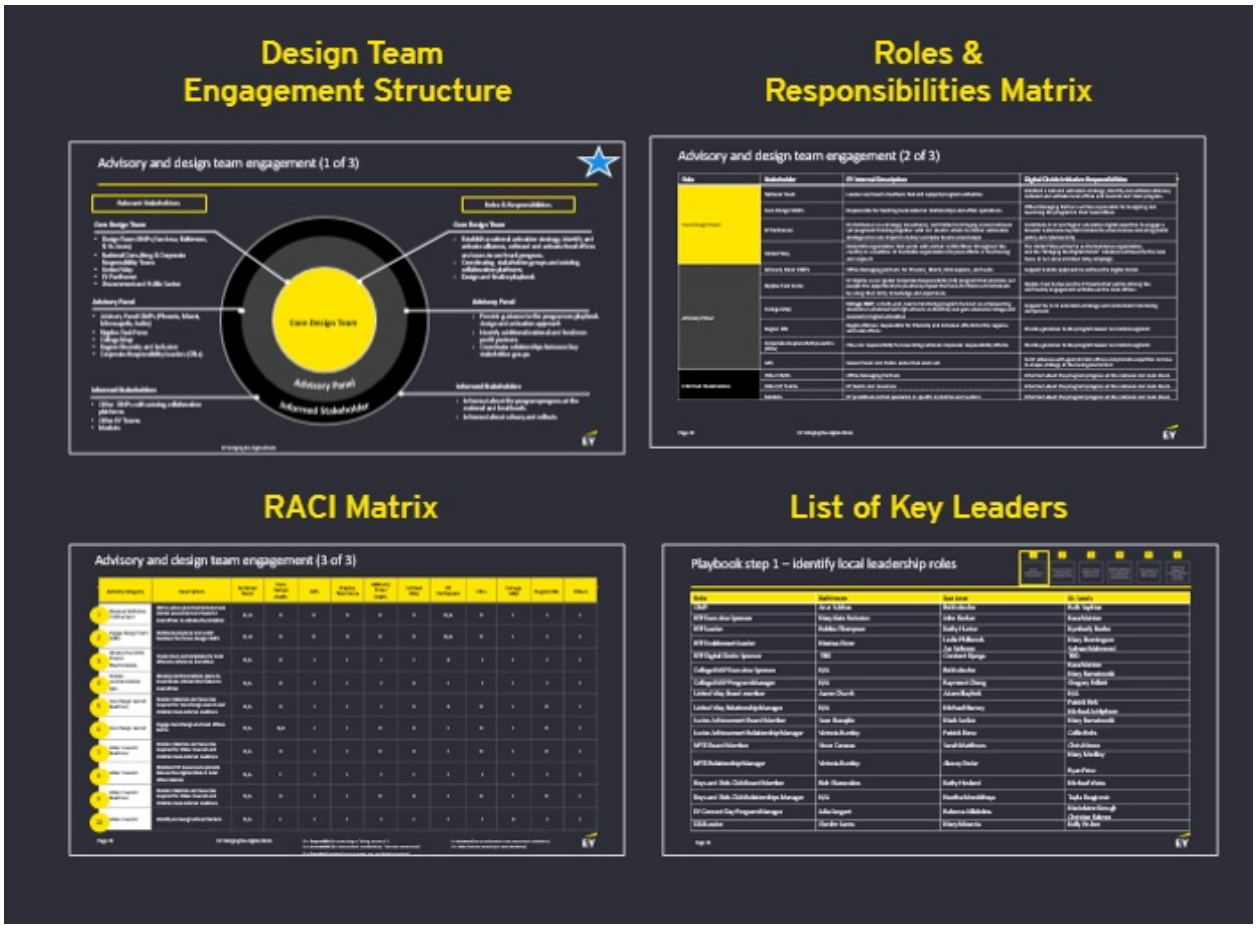
Step 3: Execute your plan, monitor and control progress against KPIs, and close pending activities

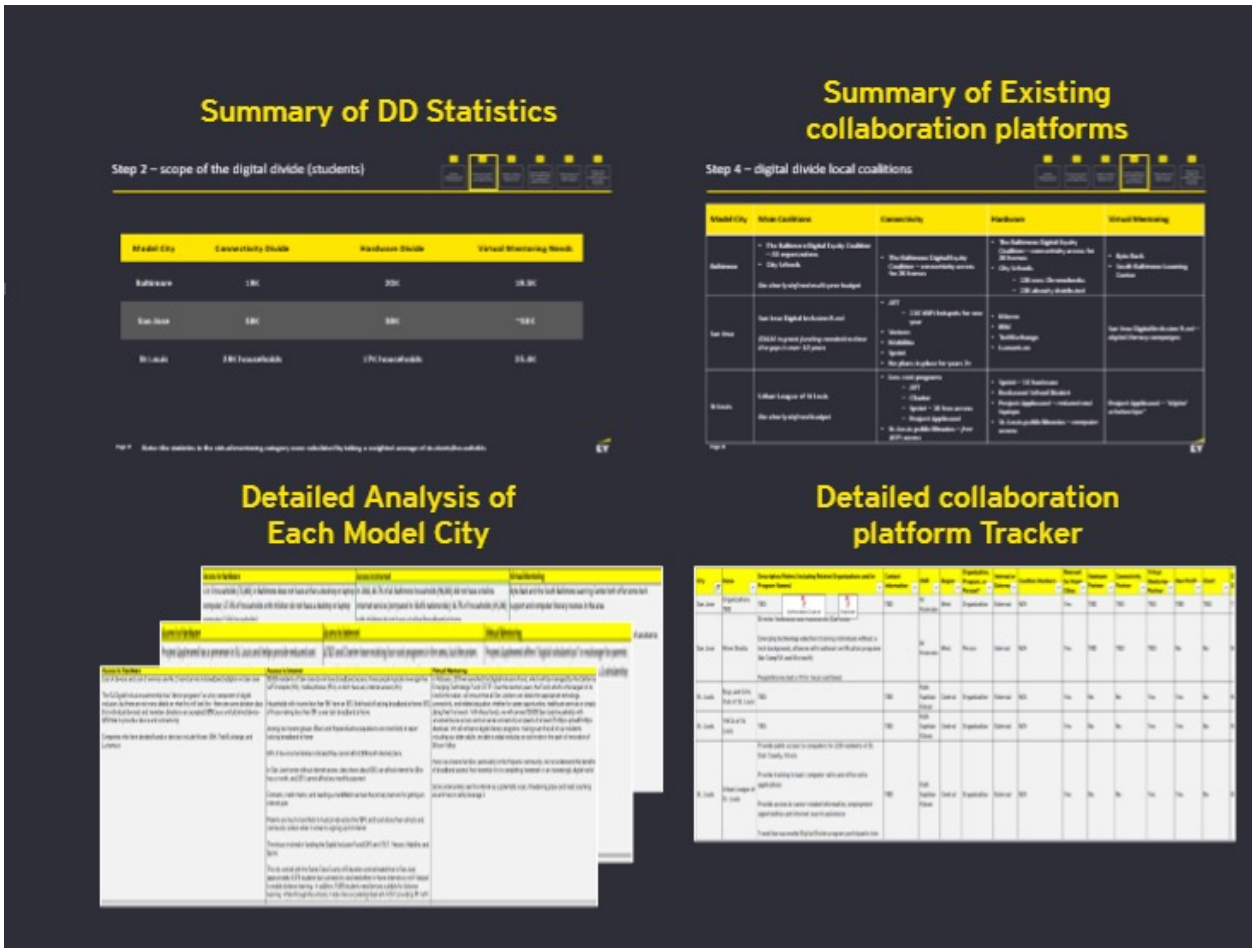
- In this step, local activation teams will be largely centered on executing the plan and deploying volunteers through the various mentoring programs that will be offered. Note that the students who will participate in mentoring programs have already had their connectivity and device needs met through the programs.
- A continuous monitor-and-control process will keep projects on track and focused on meeting program objectives as well as national goals. The data gathered while monitoring the project will help Digital Divide Program managers make informed decisions.
- As digital divide efforts are closed, the team should confirm that all action items and activation steps have been executed and that there is a final closing/sign-off for the program. This step also gives the team an opportunity to capture and share lessons learned and evaluate the project's performance and its benefit to our students in need.
  - The playbook also included links to supporting materials including:
    - RACI matrix for key roles and responsibilities
    - Digital Divide statistics
    - Project management and reporting trackers
    - FAQs

The following pages include excerpts of select materials that aided in the process.


August
September
Workstreams
8/3 - 8/7
8/10 - 8/14
8/17-8/21
8/24-8/28
8/31-9/4
9/7-9/11
9/14-9/18
9/21-9/25
9/28-10/2
Program Management & Core Consulting Team
Playbook creation and refinement
9/1 Model City Launch
Establish Communications Plan
Define data model and build reporting framework
Playbook refinement and program coordination
10/1 Wave 1 Launch
Define model for outreach
8/14 Outreach Model Finalized
COALITION
Local Office Teams & Internal Coalition
Define KPIs / Measures of success
8/31 KPIs Defined
Communicate virtual mentoring opportunities via RTF campaigns
Identify and onboard virtual mentors for Model Cities
Define Criteria and Choose Wave 1 Offices
Onboard and Mobilize Wave 1
External Coalition
Local United Way onboarding & mobilization
8/31 United Way Mobilization Complete
Identify/confirm national hardware and connectivity partners
8/31 Connectivity / Hardware Partner Mobilization complete
We are here


Local office activation list
Completed
On Track
Should be Accelerated
Initial Framework Creation
(Led by National Team)
1
Identify leadership roles in local offices
Review/confirm list of identified team members provided by national team
2
Assess local need – current state of local digital divide
Examine city-level data provided by national team
Validate data with local government offices
Supplement data with any additional data you might have; share updates with national
3
Identify existing alliances at the national level
Review list of national alliances to identify potential partners for your specific city
Coordinate with national team to set up introductions to national alliance members
Customization and Deployment
(Led by Local Office Team)
4
Identify additional local relationships to complement national alliances
Confirm Independence compliance dos and don'ts
Outline preliminary list of local partners/collaboration platforms
Select key local partners based on outlined criteria
Communicate local relationships to other alliance members and national EY team
5
Define goals and design of local office collaboration platform
Identify high-level timeline for execution of each program component
Organize session(s) to define goals and KPIs with local office leads and collaboration platform members
Document key metrics and expectations
6
Project lead engages all collaboration platform members and begin to execute
Develop detailed program execution strategy (across connectivity, hardware, and virtual mentoring)
Deploy program across all involved stakeholders
Evolve program based on changing needs and feedback
As you complete each step, ask yourself:
Can we identify our RTF sponsor(s), D&I lead(s), and GPS contacts?
Do we understand local needs and the estimated cost to meet them?
Do we know which national organizations will be our partners?
Have we chosen committed, education-oriented local partners?
Have we defined SMART goals for measuring program success?
Are all procedures and tools understood and ready for use?
Page 5
Activities occur concurrently
Activities occur concurrently
EY


Design Team Engagement Structure
Advisory and design team engagement (1 of 3)
Roles & Responsibilities Matrix
Advisory and design team engagement (2 of 3)
RACI Matrix
Advisory and design team engagement (3 of 3)
List of Key Leaders
Playbook step 1 – identify local leadership roles


Summary of DD Statistics
Step 2 – scope of the digital divide (students)
Summary of Existing collaboration platforms
Step 4 – digital divide local coalitions
Detailed Analysis of Each Model City
Detailed collaboration platform Tracker

Since 2021, three full-time corporate responsibility professionals were hired to take the program from the pilot phase to a sustainable model. These professionals manage program execution by working with respective region leadership and local office digital divide teams. They are responsible for driving the national strategy, communicating best practices, and sharing success stories internally and externally. They serve as the primary point of contact for the local offices, including the Digital Divide executive sponsors and Digital Divide program managers, enabling the local offices with the appropriate tools, resources, and opportunities to drive success. This includes:

- Providing consultation regarding programing and collaborations with nonprofits that specifically help support underserved populations in an evolving digital world.
- Advising on execution strategy.
- Assisting with measuring progress against KPIs.

Getting to a digital support ecosystem

Building an ecosystem of support to address inequality in digital access and digital literacy happens over time. For the past three years, EY Dallas has joined forces with United Way of Metropolitan Dallas (UWMD) to build an ecosystem of digital literacy support for people of all ages and backgrounds. Through an annual pitch competition, the partnership has developed a network of nonprofit organizations doing the work to address ongoing digital inequality in the community. Hosting the pitch competitions has expanded the Dallas Digital Divide ecosystem, bolstered EY volunteer opportunities, and deepened relationships with ecosystem collaborators to expand breadth and depth of programming.

- **United to Learn:**[57] John Neely Bryan Elementary School was a participant in the first annual pitch competition. The school used the competition disbursement to purchase over 70 personal devices to be used by the students and teachers to work through their assignments and schoolwork in a digital-friendly environment. Since EY US became an ecosystem collaborator, volunteers have served as math tutors, created STEM kits, and worked with staff to create learning areas and student programs.
- **Dallas Innovation Alliance**[58] **(DIA)** won the second annual pitch competition; they are dedicated to developing programming and innovative solutions to support Dallas residents in gaining access to technology that is critical for economic mobility. The EY Dallas office volunteered with the DIA and the CARDBoard Project at "Get Connected—Dallas," a community event that supported residents with information on access to devices, internet connectivity, digital services, and skills training. EY volunteers were integral in connecting participants to resources (STEM village, job training resources, connection to benefits and services, internet services, health care services, etc.)
    - **Bold Idea**[59] participated in the second annual pitch competition and has been helping students discover the thrills of computer science through hands-on learning and mentoring since 2015. EY volunteers have served as mentors at their summer coding camp and their after-school technology program.
    - **Bachman Lake Together**[60] participated in the third annual pitch competition. EY volunteers have facilitated digital literacy trainings for parents so they can learn how to guide their children on safe and effective use of electronics needed for school. These events also support sustainability practices as EY volunteers and parents brought electronics and hardware that would otherwise go to the landfills for recycling.

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