Digital Inclusion Benchmark 2020

Synthesis Report

December 2020

World Benchmarking Alliance

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Key insights

In 2020 the World Benchmarking Alliance's first Digital Inclusion Benchmark ranks 100 of the world's most influential technology companies on four areas of digital inclusion:

1) Enhancing universal access to digital technologies.
2) Improving all levels of digital skills.
3) Fostering trustworthy use by mitigating risks and harms.
4) Innovating openly, inclusively, and ethically.

The global pandemic has highlighted the urgency of digital inclusion, as we increasingly rely on digital technologies to stay connected, purchase daily necessities, and access healthcare and education. However, this accelerated digitalisation is accompanied by widening digital divides that lock billions of people out of the digital economy. Furthermore, trust in technology is fraying as citizens and governments wake up to the risks and harms of its unexamined and unrestrained applications.

The Digital Inclusion Benchmark results show that commitment and contribution towards digital inclusion is highly uneven across industries in the digital sector, measurement areas, and markets of operation. While a few leading companies comprehensively demonstrate best practices, most have yet to embrace digital inclusion as a core responsibility.

Software and IT services companies have some growing up to do

Software and IT service companies are lagging with an average score of only 0.53 out of 2 (27%) compared to 0.82 (41%) for hardware companies and 0.85 (43%) for telecommunications providers. Many software and IT service companies, especially the platform giants, are the youngest in the sector, having only been founded since the commercialisation of the internet. To mature into responsible corporate citizens they need to learn from digital inclusion best practices of other industries in the digital sector.

Clear and consistent support to improve digital skills needed, especially for women and girls

Out of the four digital inclusion measurement areas, companies scored lowest in 'improving all levels of digital skills', with an average score of 0.57 out of 2 (29%). The development of basic digital literacy programs is a particular area that the digital sector will need to focus on in order to leave no one behind in a digital world. There is also an opportunity for companies to help bridge the gender digital divide, through initiatives that target skills training for women and girls. In order to improve their efforts, digital technology companies need to be more transparent about their contribution and engage third parties for an objective evaluation of impacts.

Ethics require an urgent update to match our rapidly evolving digital age

While digital technologies do much to benefit the world, they also pose risks such as the loss of jobs, insecure employment and the spread of false information, whilst the rise of artificial intelligence (AI) and automation raise concerns about potential harms related to fairness, bias and agency, to name a few. Of the 100 companies assessed, 55 had ethics oversight at a senior level but only 16 had an ethics policy for AI, of which only four are software and IT services companies. Traditional ethical issues such as bribery, corruption and harassment are often covered but ethical issues arising from AI and disruptive technologies also need urgent attention.

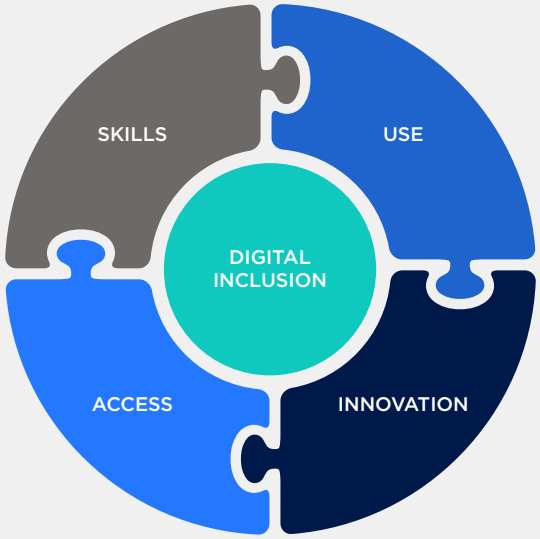
Online child safety should be a concern of all technology companies, but it isn't

All digital technology companies impact child online safety, whether directly through product features and control over data flows, or indirectly through the supply chain. Only 16 digital companies of the 100 assessed demonstrated a high-level commitment to child online protection. If all technology companies make this commitment, together they can play a key role in protecting children online worldwide, by raising awareness and attracting resources to deal with the problem.

Best practice means staying ahead of the regulatory curve

Global leadership entails forward-looking company policies and actions that stay ahead of the regulatory curve. Leading companies are those that are adopting a principled and harmonised approach towards issues such as privacy rights, cybersecurity, child online protection, among many others. The 2020 Digital Inclusion Benchmarks results provide the starting point from which the digital sector can show improvements in the coming year and demonstrate their willingness and effort to self-regulate as responsible corporate citizens. Lack of tangible progress should require governments to step in with regulation and enforcement to ensure a safe and trustworthy digital system that leaves no one behind.

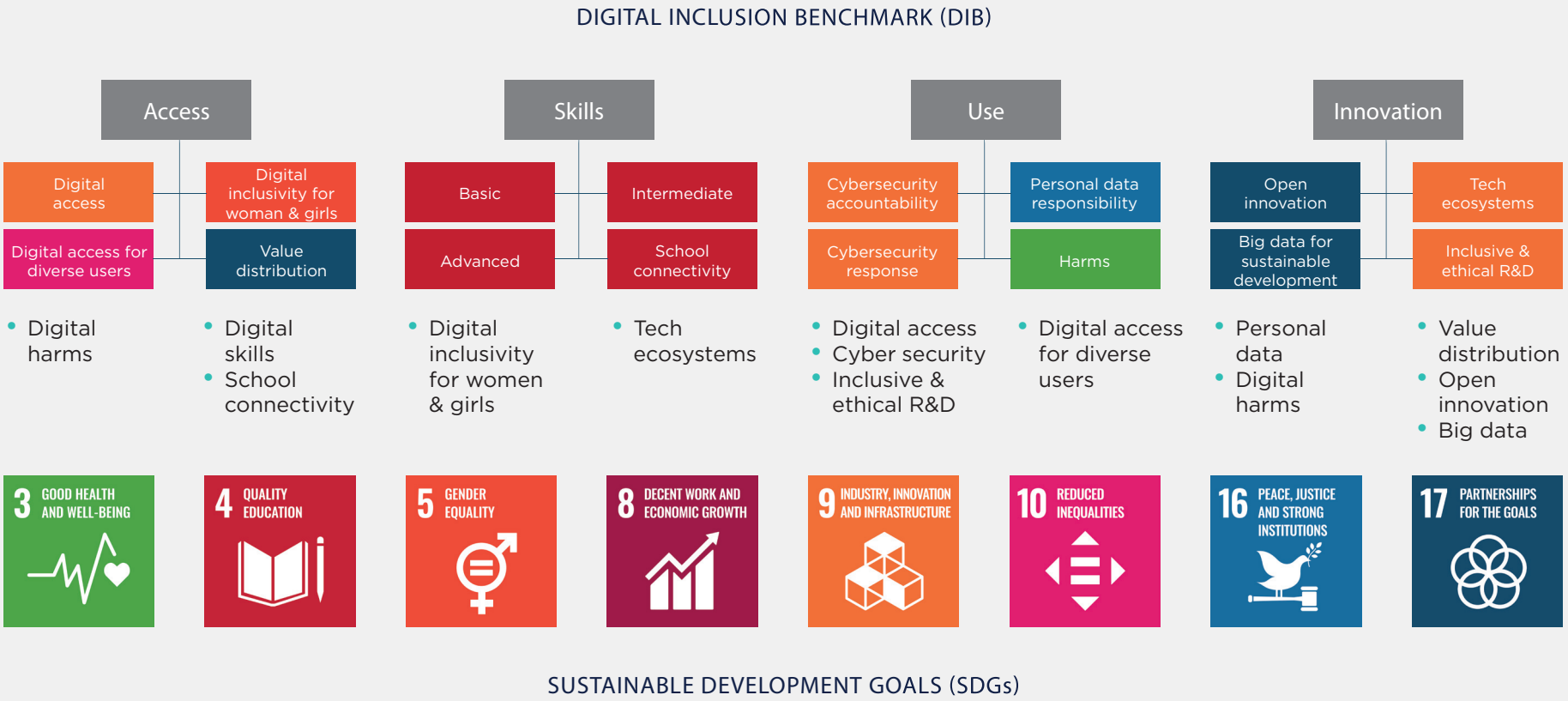
Introduction



This report presents the results of the World Benchmarking Alliance's (WBA's) inaugural Digital Inclusion Benchmark (DIB). It presents the performance of 100 keystone digital companies against 16 indicators in four measurement areas: access, skills, use and innovation.[1] These indicators are based on one or several of the 17 Sustainable Development Goals (SDGs) agreed by all 193 United Nations members in 2015 (see Figure 1.1), which provide a roadmap to a sustainable future for the world. The actions of private sector organisations – and digital companies, in particular – will be vital for achieving the SDGs by 2030. Evidence-based metrics for technology companies provide a yardstick for measuring their performance in the area of digital inclusion, which contributes to sustainable development. As UN Secretary-General António Guterres noted:

> "A set of metrics to measure digital inclusion will be essential for evidence-based policymaking … The development of annual scorecards on digital inclusion and the establishment of metrics to measure both digital inclusion and literacy will accelerate the promotion of an inclusive digital ecosystem."[2]

FIGURE 1.1: RELATIONSHIP BETWEEN THE BENCHMARK AND THE SDGS



Digital companies vary widely in their activities. Some manufacture equipment, provide telecommunications services or offer information technology (IT) or digitally enabled services, while others carry out two or more of these activities. Given the significant functional differences between digital companies, they have been classified into three industries: 1) hardware, consisting of the manufacture of digital goods such as end-user devices, network equipment and semiconductors; 2) telecommunications services; and 3) IT services, consisting of software applications, data centres, cloud computing and platform services.[3] When companies provide diverse products, they have been classified in the industry that produces the highest revenue in the most recent accounting year.

The companies in the benchmark have corporate headquarters in 33 different economies. Their footprint extends to almost the whole planet, either through subsidiaries or supply chains, or the countries where their products are bought and used. Companies have been classified into geographies for analytical purposes. Due to the large number of digital companies included from mainland China and the United States, they are shown separately.

TABLE 1.1: DIGITAL COMPANIES BY INDUSTRY AND GEOGRAPHY

Headquarters	Hardware	Telecom services	Software and IT services	Total
Asia (excl. China)	4	12	4	20
China	4	4	8	16
Europe	2	11	2	15
United States	13	5	20	38
Other	0	8	3	11
Total	23	40	37	100

Note: 'Other' refers to Latin America and the Caribbean, the Middle East, the Pacific, Sub-Saharan Africa and Canada.

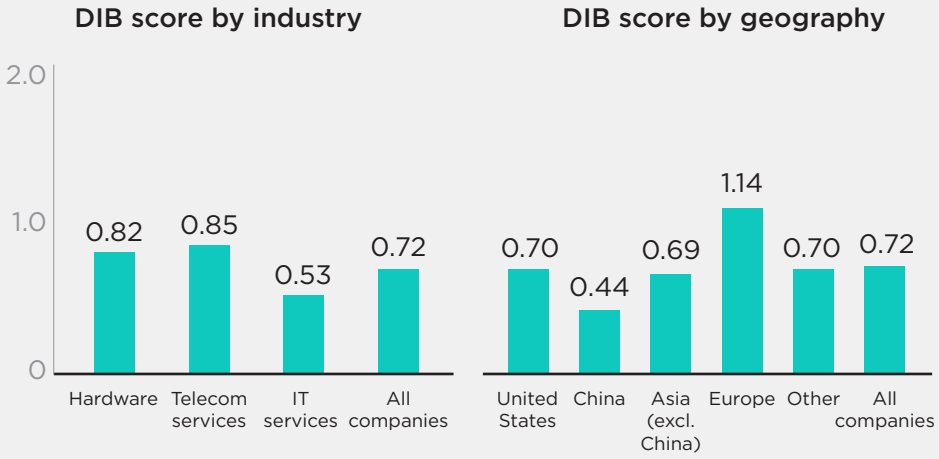
Companies from Hong Kong SAR, China and Taiwan, China have been classified in Asia due to the different legal environments they operate under.

Data was 'pre-populated' from a range of publicly available sources such as financial reports, and environmental, social and governance (ESG) reports. Information was also sourced from relevant company web pages. The pre-filled information was shared with companies, enabling them to review the data, provide input and clarifications, and send additional information. The 16 indicators are scored on a scale of 0–2. Measurement areas are scored as a simple average of the indicator

scores. A company's overall score will equal the average of the scores received for each measurement area. Because examples of elements of each indicator are publicly available, companies that did not provide relevant information received a score of zero. More information about the composition of the indicators and how they were scored is available in the scoring guidelines.[4]

Overall, the results show room for improvement. The average score is 0.70 or only 35% of the maximum possible score out of 2. While hardware and telecommunications services companies have above-average scores, IT services companies lag (see Figure 1.2, left). When analysed by geography, companies with their headquarters in Europe have a fairly strong lead in digital inclusion, while those headquartered in China lag (see Figure 1.2, right). IT services companies and those with their headquarters in China perform poorly in every measurement area.

FIGURE 1.2: DIGITAL INCLUSION BENCHMARK SCORE BY INDUSTRY AND GEOGRAPHY



One reason is that hardware companies and telecommunications services providers (or their subsidiaries) have a physical presence in the countries in which they operate; for example, through manufacturing plants or network infrastructure. This presence gives them greater visibility and increases their social responsibility obligations. By contrast, many IT services companies provide products virtually, either through a platform, in the cloud or via electronic outsourcing. They tend to list jurisdictions such as the Cayman Islands, Ireland and the state of Delaware for tax purposes.

Age is another factor. Many of the hardware and telecommunications services companies have a long history. As they have matured, corporate social responsibility and sustainability have become important concerns. IT software and services companies are younger, and many were founded after British scientist Tim Berners-Lee invented the worldwide web in 1989. While a number of IT software and services companies do support environmental sustainability, often the only stakeholders they consider are their shareholders. Mature companies also conduct materiality analyses in which areas covered by the benchmark are often considered of major importance.

The relatively strong performance of the telecommunications services sector is also due to its industry body, the GSM Association (GSMA), which leads through strong collaboration (see Box 1.1). All telecommunications services providers in the benchmark are also GSMA members. The hardware and IT services industries do not have an equivalent trade body that cuts across geographies and has such high visibility. GSMA is involved in a number of public policy issues relevant to the benchmark. There are dozens of examples of it collaborating with companies in areas including digital literacy, digital opportunities for women and girls, and child online protection.

Chinese companies fared worse than those in any other geography in the benchmark, both in terms of overall score and across all measurement areas. Chinese corporate social responsibility activities tend to address domestic problems; for example, improving general welfare, often through company charitable donations. The government is able to influence these activities, at least among telecommunications operators through its majority ownership. Digital inclusion activities therefore tend to align more closely to domestic policy frameworks rather than being in the service of universal access. Additionally, only four of the 16 Chinese companies included have been publishing ESG reports for some time. Reports from other Chinese companies do not consider most of the digital inclusion aspects covered in the benchmark. A general trend could be observed in the rankings of the Chinese companies, with those that have a global presence tending to rank higher than domestic-facing companies. Greater engagement with stakeholders and exposure to global reporting guidelines may help bridge these issues.

Other characteristics, such as whether a company is privately held and its size (in terms of revenue), have mixed results in terms of impact. There is a strong inverse relationship between whether a company is private and its benchmark score. In general, private companies performed poorly due to a lack of transparency about their activities relating to digital inclusion. However, the link between the size of a company and its benchmark score is also weak. Amazon, which had the highest revenue, ranks 54th. By comparison, Telstra, with the 44th highest revenue, ranks first.

The top ten companies in the benchmark are geographically diverse, led by telecommunications services companies, followed by several hardware companies but no IT services companies (see Table 1.2). One commonality among the top ten is maturity: they have a median age of 75 years. The group is also characterised by robust ESG reporting, a strong focus on digital inclusion topics in their materiality analysis, and engagement with the benchmark.

TABLE 1.2: TOP TEN COMPANIES IN THE BENCHMARK

Rank	Company	Headquarters	Founded	Industry	Revenue US$ billions (FY19)	Score	Score (%)
1	Telstra	Australia	1975	Telecom services	19	1.73	0.87
2	Telefonica	Spain	1924	Telecom services	54	1.62	0.81
3	Orange	France	1941	Telecom services	47	1.59	0.80
4	PLDT	Philippines	1928	Telecom services	3	1.52	0.76
5	Nokia	Finland	1865	Hardware	26	1.51	0.76
6	Cisco	United States	1984	Hardware	52	1.47	0.74
7	Deutsche Telekom	Germany	1947	Telecom services	90	1.37	0.69
8	NTT	Japan	1952	Telecom services	109	1.32	0.66
8	HP	United States	1939	Hardware	59	1.32	0.66
10	Samsung	Republic of Korea	1969	Hardware	198	1.30	0.65

The next four sections look at the results for each measurement area. Scores and ranks for the 100 digital companies are shown in the annex. More details, including company scorecards, are available on the benchmark website.[5]

BOX 1.1: GSMA AND DIGITAL INCLUSION

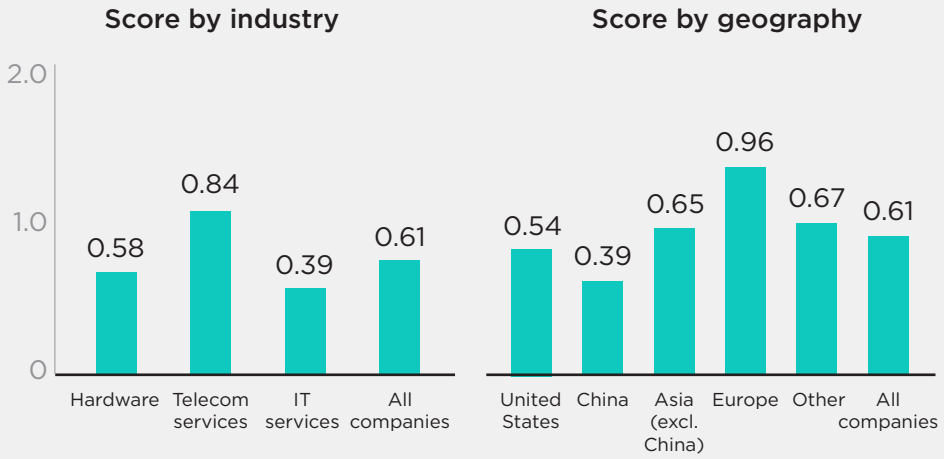
Formed in 1995, GSMA represents the interests of mobile operators worldwide. It has more than 750 members and about 400 associate members from the broader mobile ecosystem. Notably, in 2016, the mobile industry became one of the first sectors in the world to commit to the SDGs. GSMA is involved in several public policy issues relevant to the DIB, and telecommunications services operators reported partnering with GSMA on initiatives across the measurement areas. In the area of access, its Mobile for Development programme, which serves as an umbrella for initiatives to increase the availability of mobile services in developing countries, has produced a case study analysing the impact of Telenor's agricultural information system for farmers in Pakistan. GSMA also awarded the 2020 Global Mobile Best Mobile Innovation for Accessibility & Inclusion Award to SK Telecom for its solution that assists hearing-impaired taxi drivers. In the area of skills, Airtel and MTN are using GSMA's Mobile Internet Skills Training Toolkit to teach digital literacy in Rwanda. In the area of use, several telecommunications services companies participate in GSMA's Mobile Alliance Against Child Sexual Abuse Content. In innovation, its CleanTech programme identifies best practices in using digital technologies to enhance climate resilience in developing countries. One leading practice it has identified is PLDT's Rainforest Guardian project, which uses big data to monitor illegal logging in the Philippines.

Access

Access is the first of the four measurement areas, and in many ways it is the most fundamental. Without access to digital technology, users cannot begin to develop digital skills, use digital platforms or partake in digital innovations. As our world grows increasingly connected, those who are unconnected are at risk of being left behind. The COVID-19 pandemic has highlighted this risk. As physical restrictions set in across the globe, those who did not have access could not acquire information, access healthcare, make payments or participate in educational activities.

The four indicators in this area aim to measure whether companies are bridging the digital divide by contributing to universal access to digital technologies, supporting digital opportunities for women and girls, facilitating accessibility for users with disabilities and disclosing how they distribute the economic value they create among stakeholders. The average score in this measurement area is 0.61. Telecommunications services operators and European companies lead by a considerable margin (see Figure 2.1). Telstra has the highest score, followed by NTT. At the other end of the scale, 11 companies score zero.

FIGURE 2.1: DIGITAL INCLUSION BENCHMARK SCORE BY INDUSTRY AND GEOGRAPHY



For the first three indicators in this measurement area, older, more established companies tend to receive higher scores. These companies often have long-running initiatives with considerable depth, positioning them to reach large numbers of people. Their longstanding presence in certain communities appears to also give them advantages in establishing targeted programmes that address specific obstacles faced by particular population groups. Having established programmes also means companies are more likely to have a process in place for collecting and reporting metrics, leading to more transparent disclosure overall.

A.1 The company contributes to digital technology access

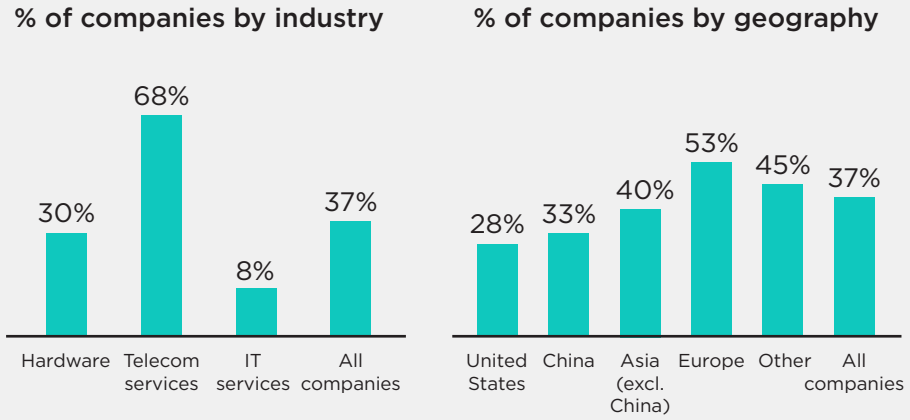
Closely based on SDG target 9.C[6], which calls for universal and affordable access to the internet, the first indicator is the starting point for digital inclusion – access to technologies such as smartphones, computers and internet services. This indicator recognises relevant initiatives to enhance access to digital goods or services, particularly for vulnerable and under-represented groups, provided it is not primarily for commercial purposes (see Box 2.1) or in conflict with net neutrality principles.

BOX 2.1: TELECOMMUNICATIONS SERVICES PROVIDERS INCREASING ACCESS IN THE COURSE OF BUSINESS

This indicator looks at non-commercial initiatives for expanding access to digital technologies, especially for vulnerable groups. However, it is important to note that the world's largest telecommunications operators are included in the 100 digital companies benchmarked, and their commercial activities are expanding access to digital services. Telecommunications operators covered by the benchmark accounted for 69% of all mobile subscriptions in the world and 61% of all wired broadband subscriptions in 2019. In that same year, these companies added 256 million mobile subscribers and 55 million fixed broadband subscribers around the world, equivalent to 65% and 73%, respectively, of the global total.

Overall, 37 companies had initiatives in this area. The vast majority (27) are telecommunications services providers leveraging their networks to provide discounted access for vulnerable groups. A total of 68% of telecommunications services providers had an initiative, compared to only 8% of IT services companies (see Figure 2.2, left). Although the United States leads by geography, accounting for 30% of all initiatives, it has the lowest share of companies with an initiative (28%) (see Figure 2.2, right). By contrast, more than 50% of European companies had an access initiative.

FIGURE 2.2: COMPANIES WITH AN ACCESS INITIATIVE



Initiatives generally involved providing discounted or free internet or phone services for certain vulnerable populations, such as seniors, students, low-income families, rural communities and users with disabilities. Optus, the Australian subsidiary of Singtel, had one of the most innovative initiatives, which allowed mobile users to donate their excess data to students in need.

There are also examples of companies providing hardware, such as laptops and mobile phones, to members of vulnerable groups. Recipients also appeared to vary by region. For example, Japanese telecommunications companies offered universal discounts for users with disabilities, while American companies assisted low-income or rural families. Non-telecommunications companies generally offered discounted devices or services to specific populations. HP and Apple offered education discount for computers, for instance. Some companies supported larger initiatives started by other organisations, such as Dell's provision of free laptops to Comcast's Internet Essentials programme.

Regardless of the type of support provided, the best performers in this area tend to be long-running, regular programmes integrated with training and other features, and with substantial disclosure, such as Telstra's Access for Everyone and Comcast's Internet Essentials. Several companies had programmes that showed close attention to local contexts and specific situations. NTT's Hometown Community System provided tablets to people who relocated after the Fukushima nuclear disaster, while PLDT (Philippines) offered free data, calling and charging stations to areas struck by natural disasters. Home quarantine restrictions due to the COVID-19 pandemic reinforced the importance of access to digital technologies, and a number of companies introduced supporting measures (see Box 2.2). Besides demonstrating how companies can tailor their solutions to novel situations, these are examples of how all digital companies can support universal digital access.

BOX 2.2: COVID-19 AND ACCESS

Facing an unprecedented increase in demand as a result of the global pandemic, digital companies worldwide worked to improve the accessibility of their services. Notably, many of the telecommunications companies in the benchmark offered customers free data, reduced or waived tariffs, or provided free access to online health information.

Some companies took a different focus by boosting the connectivity of health facilities and supporting medical workers. Chinese companies, such as China Mobile, China Telecom and ZTE established 5G mobile networks in emergency field hospitals, enhancing communications and enabling remote video consultations. CenturyLink donated high-speed internet connections to temporary hospital facilities in the United States. In South Africa, Vodafone subsidiary Vodacom and Samsung partnered to provide smartphones bundled with free calls and data to health workers.

COVID-19 resulted in an unprecedented rise in telecommunications traffic, largely due to giant increases in video use. Companies responded through initiatives to monitor and optimise capacity. Nokia developed a portal that analysed network traffic from around the world to help service providers anticipate capacity requirements and optimise resources. Netflix deployed a method to reduce its video streaming traffic in Europe by 25%.

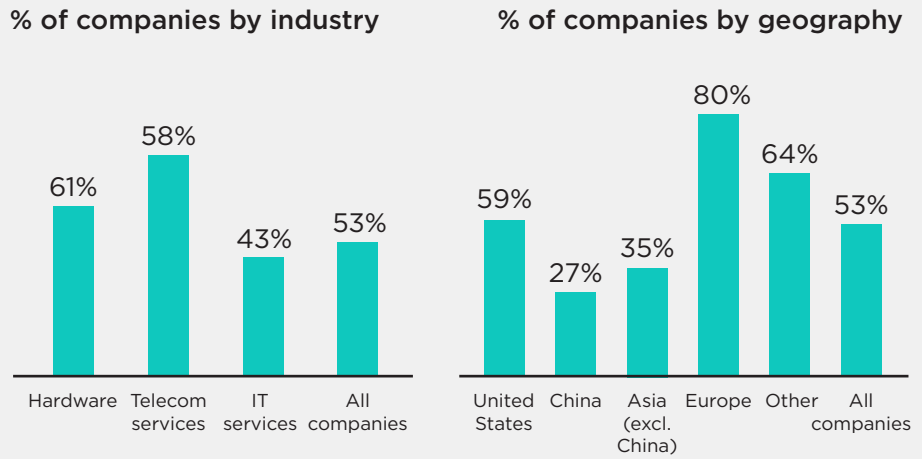
The rapidity of digital companies enhancing access in response to COVID-19 is admirable. If some of their measures are left in place post-pandemic, they could help to boost digital access for vulnerable groups. The speed at which interventions took place also suggests that digital companies have the resources and capacity to quickly improve connections to the unconnected.

A.2 The company supports digital inclusivity for women and girls

There is a significant global gender digital divide. Some 250 million fewer women use the internet than men, and in least developed countries, only one in seven women is online, compared to one in five men.[7] Women are also under-represented in the study of science, technology, engineering and mathematics (STEM) subjects and in the tech workforce. In Europe, only one in five computer science graduates is a woman.[8] In the United States, the proportion of women technology workers has remained stuck at just over 20% for many years.[9] Systematic barriers, such as cultural or social expectations, often discourage girls from digital opportunities, training and careers.

SDG 5 aims to achieve gender equality, and its target, 5.B, relates to technology: "Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women".[10] Yet just over half the companies (53) in the DIB had digital initiatives dedicated to women and girls. Hardware companies led the way (61%), closely followed by telecommunications services companies (58%) (see Figure 2.3, left). Regionally, Europe had the highest proportion of companies with an initiative, while Asia lagged (see Figure 2.3, right). Tata Communications and Telstra achieved the highest possible score for the indicator, while seven other companies scored highly but lacked either an impact assessment or didn't reveal how much they contributed to the initiative.

FIGURE 2.3: COMPANIES WITH AN INITIATIVE FOR WOMEN AND GIRLS



There were several ways that companies addressed the gender divide. These included providing active support through their own initiative or a partnership, or passive backing by contributing to a non-profit organisation working to promote digital inclusivity for women and girls.

One approach aimed to inspire an interest in STEM, generally through a camp or similar format. The levels of these programmes varied: some focused on teaching computer programming skills, such as AT&T's partnership with Girls Who Code, while others also focused on entrepreneurship, such as AMD's support for Technovation Girls. Samsung's DesArrolladoras programme, operated through its Spanish subsidiary, provided professional technical training for women in a two-stage course run over 200 hours.

Another approach was for companies to provide volunteers who mentor girls to stimulate their interest in STEM. This was popular among Nordic companies such as Nokia, Telenor and Telia.

A third approach involved providing scholarships to young women to study for STEM subjects. Companies such as Adobe and Booking Holdings gave this type of support.

Other examples include initiatives that supported vulnerable or under-represented women and girls. Lenovo, for example, hosted a coding event for African-American girls, while Huawei and Axiata partnered to support digital literacy for women in rural Bangladesh.

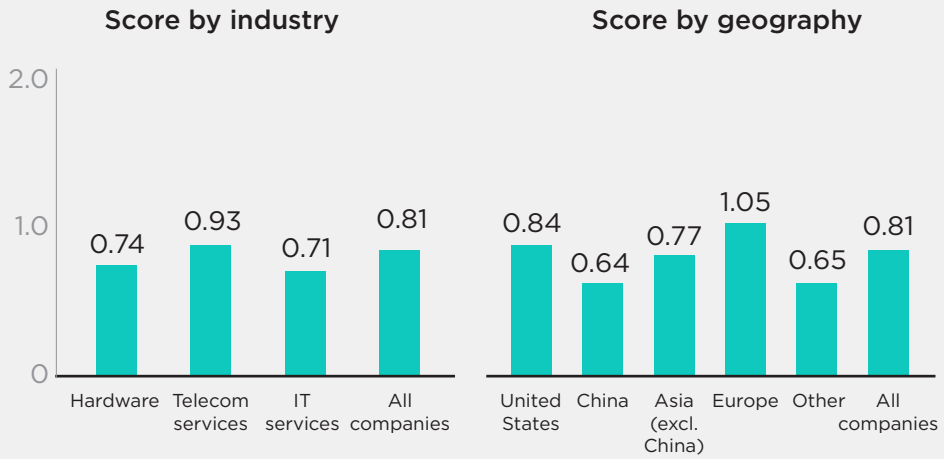
While most initiatives revolved around training, some used digital technologies to enhance women's well-being. The Baidu Women Caring Project included optimising keywords in the company's search engine relating to women, collaborating with experts to provide online consultations on psychological problems common to women, and a special feature in the Baidu Maps app to help breastfeeding mothers find nurseries. Vodafone's South African subsidiary's Mum & Baby provided free online access to health information for more than 1 million women.
The various approaches highlighted above demonstrate that there are numerous ways companies can support women and girls in digital inclusion. The relatively even distribution across all three industries indicates that digital companies broadly recognise its importance. However, the clear regional divide shows that lagging geographies have an opportunity to draw inspiration from the best practices of leading regions.

A.3 The company facilitates digital access for diverse users

The third indicator addresses people with disabilities, a group whose well-being can be significantly improved by digital technology. The SDGs call for a reduction in inequalities and target 10.2 is particularly relevant: "By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status".[11] The ability of diverse groups of users to access digital products is critical for inclusion. One billion people, or 15% of the world's population, experience some form of disability, and its prevalence is higher in developing countries.[12]

Six elements were examined: 1) accessible design; 2) accessible products and services; 3) initiatives supporting users with disabilities; 4) employment of people with disabilities; 5) inclusive workplace; and 6) feedback from people with disabilities. Companies were awarded points for each elements they had an activity for. Evidence was found of 78 companies having information for at least one element. The average score is 0.81 out of 2. Five companies, all telecommunications services companies (AT&T, NTT, Orange, Telstra and Telefonica), received a full score. Overall, they also received the highest average score (0.93), followed by hardware companies (0.74) and IT services companies (0.71) (see Figure 2.4, left). European headquartered companies registered the highest average score (see Figure 2.4, right).

FIGURE 2.4: AVERAGE COMPANY SCORE FOR THE ACCESSIBILITY INDICATOR



Thirty-three companies showed adherence to recognised accessible design principles. For many, this included following the Web Content Accessibility Guidelines (WCAG), which are voluntary standards for accessible webpage design.[13] But leading practices go beyond this, with companies consulting on accessibility principles early in the design process. Companies such as AT&T, Intel, NTT and Samsung showed such a commitment.

Fifty-four companies had a variety of accessible products and services, which included incorporating special features into products, such as text-to-speech or subtitle options. Other support included customer service options, such providing sign language interpreters, bills in braille, discounts for people with disabilities and accessibility ramps in stores.

Half of the companies supported initiatives for people with disabilities, most of which were conducted in partnership with other organisations or stakeholders. Several companies also partnered with universities or research organisations to develop user-friendly products or find new ways of using existing products. Examples include Dell, which worked with Electronic Vision Access Solutions to develop computers for users with disabilities, and SoftBank, which partnered with the University of Tokyo to create mobile devices for children with special needs. Some companies also partnered with governments to provide education solutions, such as Turk Telekom's Sunshine project, which supports low-vision students in classrooms.

Companies were asked about the number of their employees who are disabled and the steps taken to create an inclusive workplace for them. Only 28 companies disclosed statistics on the number of employees with disabilities. Companies in some jurisdictions reported that it was illegal to disclose the number of employees with disabilities. Note that for several of these companies, employment of people with disabilities is legally mandated by their jurisdiction and they must meet a certain ratio.

Forty-one companies reported on efforts to create an inclusive environment for employees with disabilities. Measures included providing accessible ramps, elevator operating panels and toilets; sign language interpretation during meetings; and flexible working hours or the option to work from home.

Evidence was found of only 23 companies soliciting feedback from stakeholders, including people with disabilities. Broadly, companies used three methods to get feedback: by building in accessibility testing in their products' design cycles, creating specific channels for feedback related to accessibility, or consulting disability organisations.

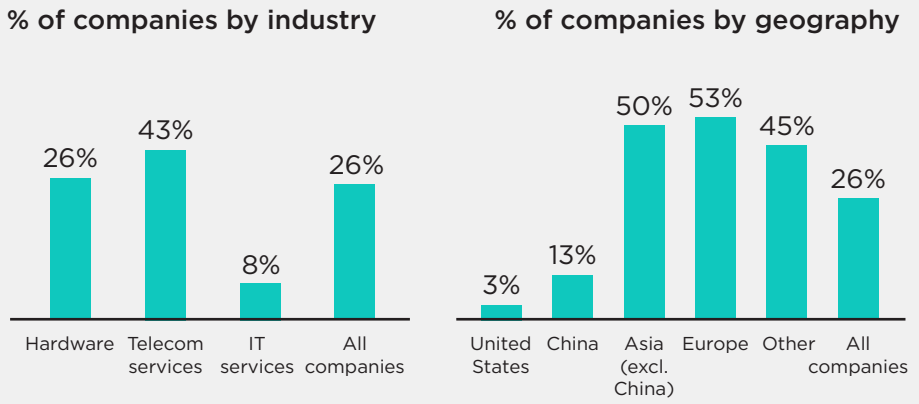
A.4 The company discloses its direct economic contribution

Direct economic impact was based on the Global Reporting Initiative (GRI) 201-1 standard[14], which calls for companies to disclose economic value generated and distributed (EVG&D) among their stakeholders (that is, suppliers, employees, providers of capital, governments and the community). This should be reported at both the group level and by significant markets.

Though many digital companies stated the importance of their different stakeholders, when it came to actually disclosing how value is shared among them, most were opaque. Just 15 companies provided all of the elements regarding economic distribution, in conformity with GRI 201-1. A further 31 listed the standard in their GRI index and typically referred to their annual financial statements. However, of those, only ten actually provided all the elements needed. Regardless, referring to financial statements is insufficient because they do not include community investments and they obscure transparency. Of the companies headquartered in the United States, only one disclosed employee costs in its financial statements, and EGV&D cannot be calculated for the remaining companies. The reason for this lack of transparency is not clear.

A large void exists in relation to digital companies' direct economic contribution, with value added not being available at the group level let alone at the market level. At the group level, telecommunications services companies led in reporting EVG&D, while only 8% of IT services companies disclosed this information (see Figure 2.5, left). European companies led by geography (53% disclosing information), closely followed by Asia excluding China (50%) (see Figure 2.5, right). By contrast, only one American company disclosed this information.

FIGURE 2.5: COMPANIES REPORTING ECONOMIC VALUE GENERATED AND DISTRIBUTED



Of the companies reporting all the elements of EVG&D, almost 60% of economic value created was distributed to suppliers, 18% went to employees in wages and benefits, 14% went to providers of capital (in the form of finance costs and dividends) and 8% went to governments (taxes). Community investments were 0.1% of economic value distributed.

Companies were also asked to provide EVG&D at the significant market level. Only one company furnished this (Telecom Italia), while a further nine provided a breakdown of taxes paid in their significant markets. Government stakeholders, in particular, have been impacted by imbalances between where profits are made and taxes are paid, sometimes due to companies' complex and opaque tax structures. This threatens governments' ability to fund infrastructure, schools, hospitals and other national and local priorities.[15] The impact of digitalisation on taxes is a high-level concern and is being examined within the context of the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting.[16]

Companies were asked about evidence of their indirect economic impact. Fifteen companies had available information, including those that did not report their direct economic impact.

No company received a perfect score, mainly due to failing to disclose EVG&D at the significant market level. Rogers Communications, a Canadian telecommunications operator, is worth citing as an example of best practice. The company was very transparent, disclosing all elements of direct and indirect economic impact as a time series in a dedicated section of its Corporate Social Responsibility Report. Additionally, the company, which does not operate in foreign markets, also included a breakdown of taxes paid at the provincial level in Canada.[17]

Fifty companies reported community investments. Those investments – largely to fund corporate social responsibility initiatives, although not all related to digital inclusion – were valued at more than US$3 billion in 2019.

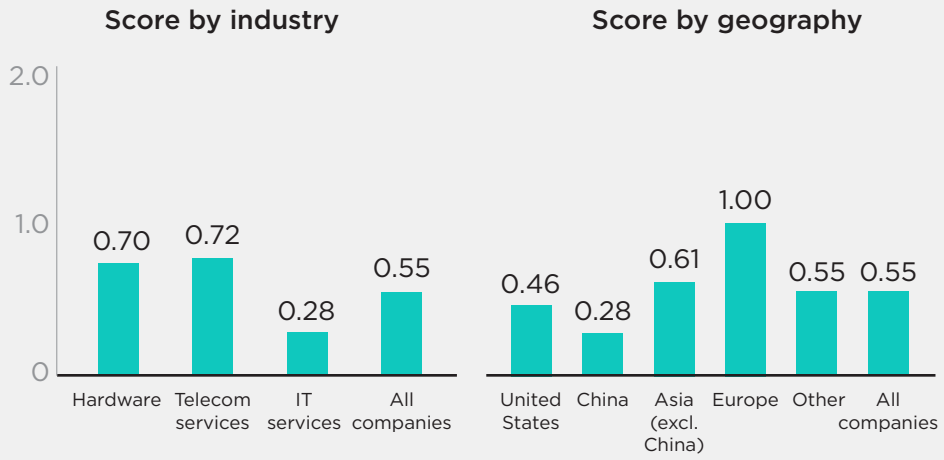
Skills

A lack of basic digital skills is emerging as the main barrier to getting online as access becomes more widespread and usage more affordable. Intermediate digital skills, such as the ability to use word processing and spreadsheet applications or web design and digital marketing, are increasingly important in the digital economy. Technical skills are needed for specialist IT occupations. Many of the digitally unskilled are from under-represented and vulnerable segments of the population – such as women and girls, people with limited incomes and the elderly – and a special effort is needed to boost training for these groups.

SDG 4 focuses on education, and target 4.4 relates to technical skills: "By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship".[18] Three of the indicators in the skills measurement area directly linked to the tracking indicator (4.4.1) for this target: "Proportion of youth and adults with information and communications technology (ICT) skills".

A total of 81 companies reported having at least one programme supporting digital skills development or supporting school connectivity in 2019. The average score in this measurement area is 0.55 out of a maximum of 2. To put the scores in perspective, companies could produce evidence of a programme, such as the number of participants, geographical focus or starting date, without providing any further information. This information alone grants a score of 0.50, just below the average. Only five companies (Cisco, Tata Communications, Telstra, Telefonica and Verizon) reported all the requested information for at least one of the indicators in the skills area. Telecommunications services providers and hardware companies perform best on this indicator, with European companies rating the highest (see Figure 3.1). The four highest ranked companies are Millicom, Nokia, PLDT and Telstra. What distinguishes the companies on top is that they report most of the required information.

FIGURE 3.1: SKILLS SCORE BY INDUSTRY AND GEOGRAPHY



Companies used one of two approaches to supporting digital skills development. The first was through a programme that involved staff commitment or, often, partnering with a non-government organisation (NGO) or UN agency. The second was by making a charitable contribution, typically to an NGO operating a dedicated skills programme, usually aimed at under-represented or vulnerable groups.

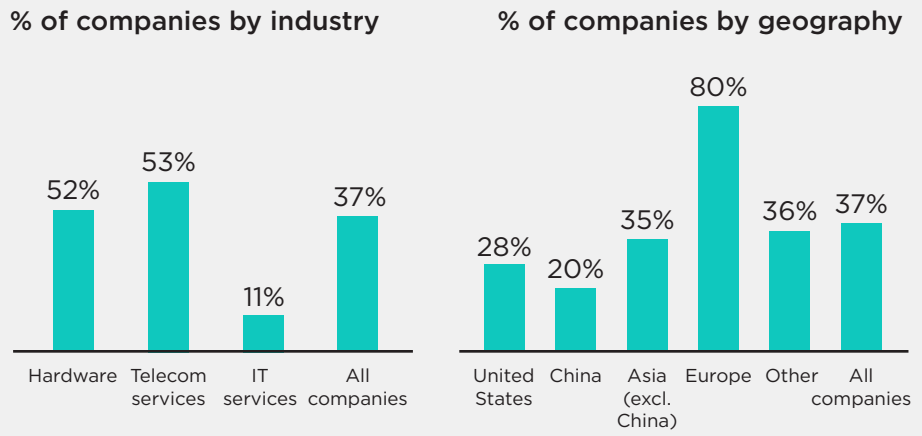
Some companies stand out with well-established, long-serving, flagship programmes delivered in multiple countries. Such programmes often focus on a specific indicator. Other companies have smaller initiatives linked to several indicators. Because of the different approaches, it is difficult to compare companies with multiple initiatives with those that have a flagship programme. Impact assessments show whether an all inclusive approach is more effective than a focused approach. Yet companies conducted impact assessments for only 13% of all programmes reported. So while the majority of companies reported at least one programme for developing digital skills, the impact of these programmes remains largely unknown.

S.1 The company supports basic digital skills development

According to GSMA, in 2019 some 3.4 billion people around the world had access to the internet but did not use it.[19] GSMA has found that around one-quarter of adults in developing countries are not aware of the internet, while among those who are aware of it, a lack of literacy and digital skills are the biggest barriers to using it. Given the magnitude of the problem, it cannot be solved by governments alone and will require partnership with other organisations, including those in the private sector.

Despite the magnitude of the problem, just 37 companies reported having an initiative supporting digital literacy. More than half of hardware and telecommunications services companies had initiatives compared to only around 10% of IT services companies (see Figure 3.2, left). Four out five European companies had an initiative, a far higher proportion than in other geographies (see Figure 3.2, right). Clearly, digital companies need to make a much greater effort to reduce the usage gap.

FIGURE 3.2: COMPANIES SUPPORTING BASIC DIGITAL SKILLS DEVELOPMENT



Digital companies that support digital literacy do so in different ways. One example comes from a partnership between two of the companies in the benchmark, Axiata and Huawei. Launched in 2017, the initiative uses digitally equipped buses to reach women in rural areas of Bangladesh. Similarly, HP is using a vehicle-based classroom model with the goal of training more than 15 million people in 6,400 Indian villages by 2022. MTN's digital literacy programme is based on GSMA's Mobile Internet Skills Training Toolkit[20] and was rolled out in nine African countries in 2019. To help users better deal with the spread of misinformation and disinformation online, some companies support training in media literacy.[21] For instance, Deutsche Telekom's Teachtoday, an initiative to encourage safe and competent media use among children, parents, teachers and grandparents, is available in a number of its European markets. Apple teams with media literacy groups in Europe and the United States, training students how to seek out accurate and reliable information online.

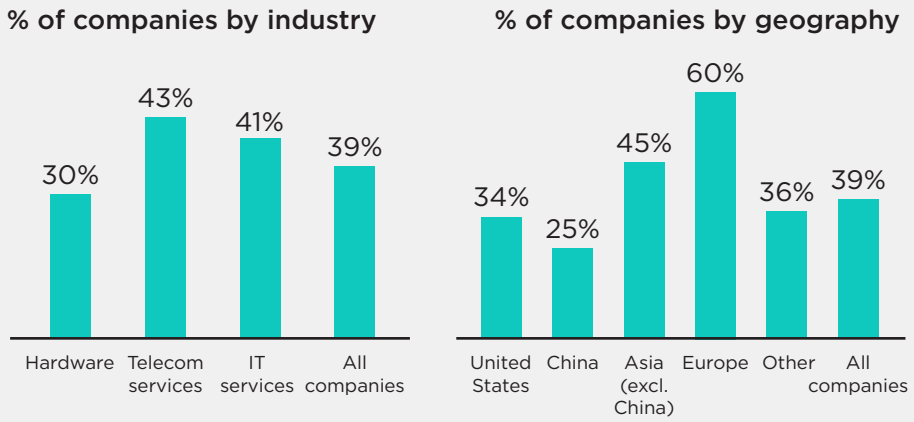
Top-scoring companies are those that report detailed metrics, such as their contribution to skills programmes and the number of participants. It is difficult to discuss the impact of programmes on beneficiaries because only two companies, Telstra and Telia, conducted assessments.[22] Both had initiatives for the elderly that had a positive effect, and Telstra's programme had a high social return on investment (Telia's impact evaluation did not measure this).

S.2 The company supports intermediate digital skills development

Intermediate digital skills give people opportunities to improve their economic livelihood. Examples include office-related skills such as word processing and competency with spreadsheets, while training in web design, desktop publishing and digital marketing prepares people for jobs in those areas. It also helps entrepreneurs use these tools to publicise and grow their business.

A total of 39 companies reported having a programme supporting intermediate digital skills development. Three telecommunications providers (Telstra, Telefonica and Tata Communications) received maximum points in the indicator because they provided a full set of metrics (for example, company contribution in funding and/or staffing; number of beneficiaries and impact assessment) for their initiatives. Across all 100 digital companies, telecommunications services providers had the highest proportion of companies with an initiative, while hardware companies had the lowest (see Figure 3.3, left). In all, 60% of European companies had an initiative, compared to only one-quarter of Chinese firms (see Figure 3.3, right).

FIGURE 3.3: COMPANIES SUPPORTING INTERMEDIATE DIGITAL SKILLS DEVELOPMENT



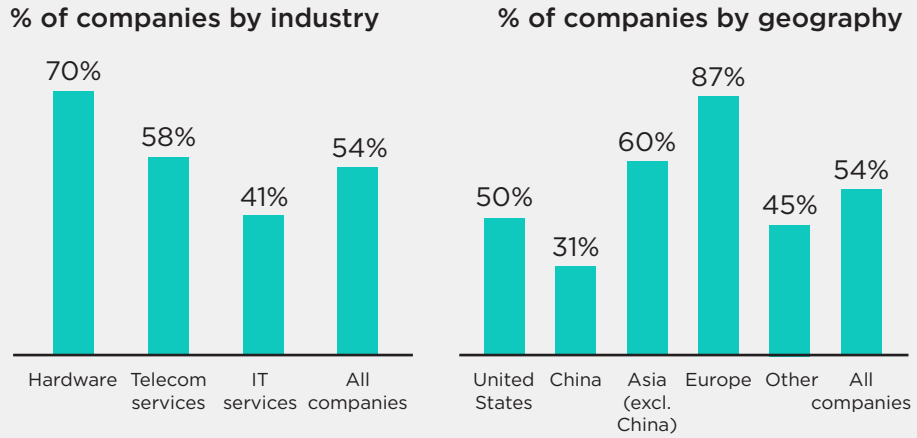
Leading practices in this indicator include programmes such as Tata Communications' MPowered, which is teaching poor women in India how to use a smartphone to access information that can boost their livelihood through increased productivity and profitability. Similarly, Conectadas, delivered by Millicom, teaches women across Latin America how to use the internet to expand their business. Some companies have initiatives teaching skills related to their area of expertise. For example, Spotify teaches programme participants how to start their own podcast, while Alibaba and eBay support training in how to sell products online.

S.3 The company supports technical digital skills development

There is an urgent need to develop technical digital skills around the world. Increasing digitalisation is driving the demand for workers with specialist information and communications technology (ICT) skills. The OECD has found that skills shortages are highest for occupations in the fields of computers and electronics.[23] However, there is a huge mismatch between labour market needs and skills development, a cause of concern for digital businesses. Further, women and other disadvantaged groups are under-represented in technical degree programmes. In the United States, women earn just 18% of all bachelor's degrees in computing, and of those graduates 75% are white or Asian, and only 25% are black or Latino.[24] More needs to be done to increase technical digital skills. Digital companies can play an important role, particularly because they have the expertise to support initiatives teaching skills such as software development and hardware design.

Fifty-four companies reported having initiatives supporting technical skills development, higher than the number reporting basic or intermediate digital skills training. The average score for technical digital skills initiatives is higher than for other skills areas, meaning companies report more information about their initiatives. Not only is this indicator different to the other two skills indicators (due to the number of companies with reported programmes), a higher proportion of hardware companies have initiatives, compared to telecommunications providers in the other two indicators (see Figure 3.4, left). However, by geography, Europe leads, with 87% of companies headquartered in that region having an initiative (see Figure 3.4, right).

FIGURE 3.4: COMPANIES SUPPORTING TECHNICAL SKILLS DEVELOPMENT



A notable example of a programme supporting technical digital skills development is the Cisco Networking Academy. This programme is delivered in 180 countries and has reached almost 11 million people since its inception in 1997. At the end of the programme, participants receive an industry-recognised certificate, improving their employment prospects. The academy is available to everyone, with special provisions for underserved and rural populations, veterans, prisoners and people with disabilities. Another example comes from Philippines telecommunications provider PLDT, which partnered with 32 colleges and universities all over the country to deliver courses in electrical and computer engineering and information technology.

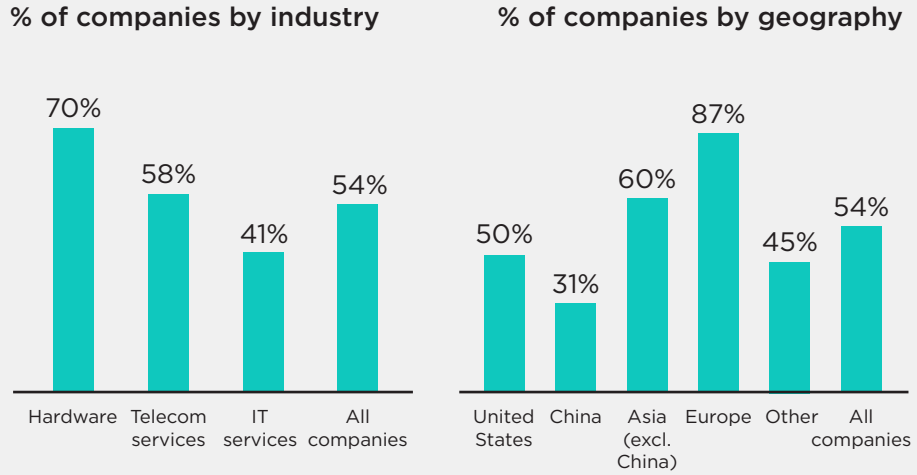
S.4 The company supports school connectivity

While the other indicators in this measurement area refer to training in digital technologies, this indicator has a different focus. Its emphasis is on using digital technologies in schools for learning other subjects. This relates to SDG target 4.A: "Build and upgrade education facilities ... and effective learning environments for all".[25] This target's SDG tracking indicator 4.A.1, and directly relates to the DIB indicator: "Proportion of schools with access to ... (b) the internet for pedagogical purposes; (c) computers for pedagogical purposes ..."

Comprehensive information on the status of global school connectivity is lacking, but data available for certain regions paints a sobering picture.[26] In Latin America and the Caribbean, one-third of secondary schools and around two-thirds of primary schools were unconnected to the internet in 2016. In the same period in South Asia, more than half of secondary schools were unconnected. And in sub-Saharan Africa, three-quarters of secondary schools were unconnected.[27] Even in countries where school connectivity is high, there are pockets of deprivation or equipment is obsolete and not suitable for 21st-century classrooms.[28]

While a lack of connectivity in schools is a challenge, the COVID-19 pandemic highlighted how home connectivity is also a concern. Millions of students around the world have been excluded from online learning because their household does not have a computer or internet access (see Box 3.1).

FIGURE 3.5: COMPANIES SUPPORTING SCHOOL CONNECTIVITY



Three companies (Apple, Telefónica and Verizon) received the maximum possible score for this indicator, due to the breadth of their reporting and having commissioned evaluations of the impact. Together, they spent more than US$800 million on their programmes. ProFuturo, a programme implemented by Telefónica in partnership with La Caixa, the foundation of a Spanish bank, provides multimedia educational content and supporting digital equipment – such as tablets, projectors and network gear – to schools in 38 countries in Latin America, the Caribbean, Africa and Asia, benefitting 11.5 million children. Apple and Verizon provide school connectivity to underserved schools across the United States. Verizon Innovative Learning, launched in 2014, provides free internet access, tablets and laptops to more than 150 under-resourced middle schools. Since 2014, Apple has donated tablets, computers and network equipment, and provided digital education planning and guidance to more than 100 underserved schools across the

United States as part of its ConnectED initiative. Another notable initiative is Instant Network Schools, the Vodafone Foundation's partnership with the United Nations High Commissioner for Refugees. This programme's digital 'school in a box' has assisted 36 schools in eight refugee camps in Kenya, Tanzania, the Democratic Republic of Congo and South Sudan, benefitting more than 86,500 refugee students and 1,000 teachers since 2014.[29] The 'school in a box', which takes minutes to set up, includes tablets for students, laptops for teachers, a projector and mobile broadband connectivity.

Flagship programmes that support school connectivity don't solely focus on providing hardware or software to schools. They can also include educational content and training for teachers on implementing digitally driven instruction.

BOX 3.1: COVID-19 AND SKILLS

The COVID-19 pandemic has led many education systems to introduce remote learning. This challenge resulted in digital companies immediately extending their support for education through various initiatives.

In some cases, companies worked together to build systems supporting online learning. Cisco and IBM launched a joint initiative to provide free video conferencing for students in Europe affected by nationwide school closures. They aimed to connect teachers and students through online classes, and also to help them use the technology more effectively. NetEase acted in the early stages of the pandemic, launching free online courses for primary and middle school students in Wuhan, China, which it later made available throughout the country. Telecom Italia introduced an initiative that allowed teachers and students to access the main remote learning platforms in the country for free. Other initiatives made access to educational content free. For instance, Vodacom provided free online educational content to primary and secondary school children in South Africa. Japan's KDDI made online English lessons available for free. Some companies contributed computers to students and schools: Lenovo gave free tablets to poor families in China, and Singtel staff members refurbished laptops and distributed them to schools in Singapore. A number of companies provided free or discounted internet access to students. In the United Arab Emirates, Etisalat connected students living in homes without internet access. In Kenya, Huawei provided free data bundles to students at its ICT Academy.

The pandemic highlighted the digital exclusion of the many students around the world who were unable to learn online due to a lack of a computer or internet access. Globally, some 826 million students (50% of students) do not have access to a household computer, while about 706 million (43%) do not have internet access at home.[30] While full-time remote learning will not be the new norm, the gap illustrates the challenge that arises when access to online education is needed. Digital companies have a role to play in reducing the gap so that all students can access online education when needed

Use

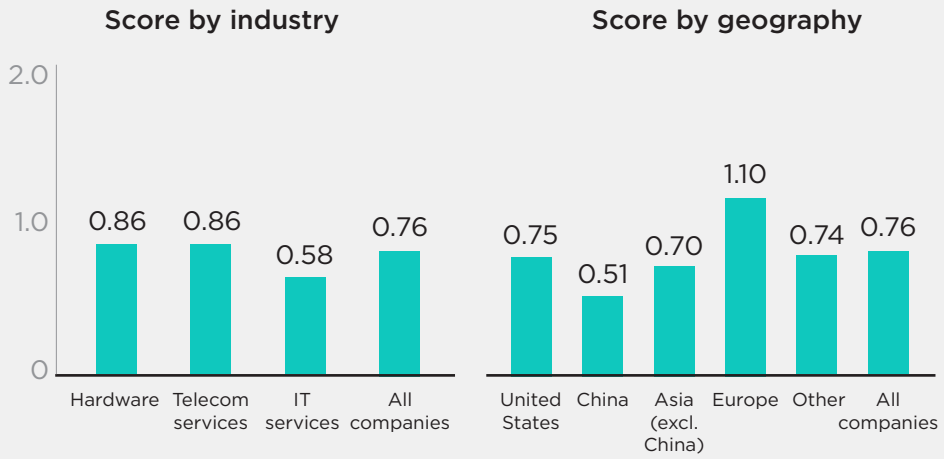
Trust is a key factor influencing the use of digital technologies. Users need to be confident that they have safe and secure resources. While data security and customer privacy are considered very important for digital companies[31], users feel that more work could be done. In the 2019 CIGI-Ipsos Global Survey of internet users in 25 countries, one in four respondents said they do not trust the internet. Three-quarters said they were concerned about data privacy, with 49% disclosing that they are sharing less data online as a result.[32]

The number of cybersecurity breaches has been growing, with a 67% increase over the past five years.[33] In 2019 alone, more than 7,000 data breaches led to 15 billion records being exposed.[34] This indicates a growing need for companies to take a proactive approach to protecting users from digital risks, including data breaches, and digital harms such as addiction to online gaming or gambling. COVID-19 has led to a big upswing in the amount of time people are spending online, magnifying the importance of protecting users, particularly those who are vulnerable (see Box 4.1).

The use measurement area covers company practices that protect users from digital risks and harms. Such practices include senior-level cybersecurity oversight and accountability, which ensure the safety of information assets, safeguard personal data, respond to data threats and breaches, and protect vulnerable users such as children.

The average score for this measurement area is 0.76. None of the companies scored 2, with Telefonica scoring the highest at 1.72. While average scores are roughly the same for hardware and telecommunications services companies, IT services firms scored below average (see Figure 4.1, left). Only European companies achieved above-average scores, with Chinese companies scoring the lowest (see Figure 4.1, right).

FIGURE 4.1: USE SCORE BY INDUSTRY AND GEOGRAPHY



BOX 4.1: COVID-19 AND USE

With an exponential increase in the number of individuals online due to COVID-19, companies have implemented several initiatives around safe use. For example, Orange's cybersecurity arm, Cyberdefense, has offered its expertise in preventing cybersecurity incidents to the medical community in France and around the world for free.

As the number of children navigating their education online increases, there is also a pressing need to protect them and be vigilant about their online activity. Millicom has moved its in-person child online safety training to help children, parents and teachers understand the risks of digital technologies.

The COVID-19 pandemic has also exposed the dangers of misinformation.[35] Facebook is trying to limit its spread in relation to COVID-19, redirecting users to content provided by the United Nations Children's Fund (UNICEF), the World Health Organization (WHO) and national health ministries. Twitter has worked to verify credible accounts that provide official updates on the virus and has added features to help users search for and share credible COVID-19 information.

The measures companies have implemented to mitigate risks should be ongoing and even expanded after the pandemic ends. All institutions, including hospitals, should be protected against cyberattacks; initiatives protecting children online during the pandemic should always be in place; and guarding against false health information should be extended to all types of misinformation.

U.1 The company assigns accountability for cybersecurity at a senior level

Assigning senior-level cybersecurity oversight indicates that a company considers it an important topic. For users, this implies there will be corporate accountability for mitigating and resolving cybersecurity risks.

A total of 59 of the 100 digital companies showed evidence of either appointing senior-level cybersecurity staff or having board oversight. Only 52 companies make high-level mention of cybersecurity in their company report, business codes or cybersecurity-focused documents or websites. Overall, only 12 companies have a dedicated cybersecurity website or document, such as a report or white paper.

Companies should follow leading practices and inspire trust in users. To do so, they should ensure senior-level oversight of cybersecurity and have a dedicated document describing cybersecurity practices. They could demonstrate additional commitment by having a dedicated committee such as Axiata's Cyber Security Steering Committee, Baidu's Information Security Committee or Citrix's Technology, Data and Information Security Committee.

U.2 The company monitors, remedies and reports cybersecurity incidents

Globally, cybersecurity incidents are projected to cost digital industries more than US$753 billion over the next five years.[36] Consequently, companies need to ensure they are capable of effectively monitoring and remedying cybersecurity incidents. If they are proactive about cybersecurity and publicly report incidents, users will feel safer using digital technologies, and digital inclusion will increase.

This indicator is measured by whether a company has a security incident response team and international certification for its information security management, and reports data breaches according to international standards.

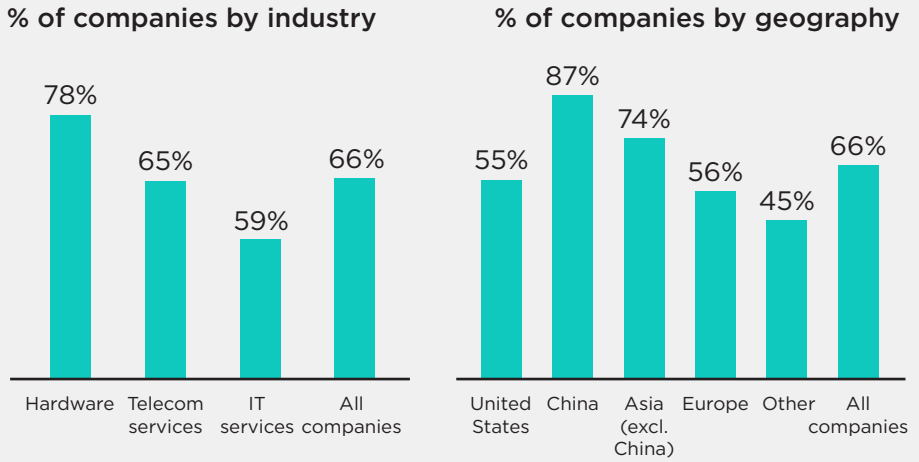
Security incident response teams

A security incident response team can go by many names, including 'computer emergency response team' or 'computer security incident response team'. The emergency response team protects, detects and responds to cybersecurity incidents. Evidence was found of only two-thirds of companies having such a team, led by hardware companies (see Figure 4.2,left). European companies led by region, with 87% having a team (see Figure 4.2, right).

Fourteen companies with an incident response team cooperate with other teams or cybersecurity organisations, such as the European Network and Information Security Agency.[37] Of the 66 companies with a team, 42 are members of the Forum of Incident Response and Security Teams (FIRST). FIRST works to bring together teams from around the world to foster cooperation and coordination in preventing incidents.[38]

Companies should follow best practice by having a security incident response team. These teams, especially those that actively collaborate with other teams, help to inspire user confidence in using digital services.

FIGURE 4.2: COMPANIES WITH A SECURITY INCIDENT RESPONSE TEAM



This Digital Inclusion Benchmark looked at whether each company had a security incident response team and if it collaborated with regional or international incident response organisations. Further research is needed to determine guidelines for allocating teams across subsidiaries and product lines.

ISO/IEC 27001 certification

ISO/IEC 27001 Information security management is an international standard.[39] Having this certification means the company has undergone an audit of its information security, reducing cybersecurity risks and instilling greater trust in users of its products.

Companies were asked if they had ISO/IEC 27001 certification and to provide a publicly available copy of the certificate. Evidence was found for 64 companies having certification. Given the importance of ISO/IEC 27001, including its ability to enhance confidence among users of a company's products, it is surprising that no evidence of certification could be found for more than one-third of the digital companies in the benchmark.

Only 20 companies provided a link confirming the existence of certification (see Table 4.1). Being able to view the certificate, verifying that it exists, enhances user confidence. The certificate also provides additional useful information, such as the products that are certified and the expiry date. Some companies stated that the certificate was confidential while others required a password to see it. Given that several companies make the certificate publicly available without the need for a password, there can be little argument that it is confidential. Further, some of the certifying authorities allow the public to view the certificates of companies they have certified. Hence, all companies with certification should follow best practice and provide a link to the certificate.

TABLE 4.1: COMPANIES PROVIDING A PUBLICLY AVAILABLE COPY OF ISO/IEC 27001 CERTIFICATION

Company	Certified by	Date of expiration
Alibaba	BSI	November 2021
Alphabet	EY CertifyPoint	April 2021
Amazon	EY CertifyPoint	November 2022
Apple	BSI	January 2023
Cisco	DNV	February 2023
Citrix	Coalfire	December 2022
Dell	NSAI	March 2022
Deutsche Telekom	TÜV RHEINLAND	November 2021
Ericsson	BSI	December 2020
HCL	Bureau Veritas	November 2021
HP	KPMG	September 2022
IBM	Bureau Veritas	November 2021
Lenovo	BSI	November 2021
NetEase	DNV	June 2022
Orange	AFNOR	December 2020
SAP	PWC	May 2021
Tata Communications	BSI	January 2022
Telefonica	AENOR	November 2022
Telenor	Intertek	September 2024
Vodafone	Lloyd's Register	December 2020

Note: The links included in this table were valid at 11 November 2020

One challenge with this element is that there could be a need for multiple certifications, such as for different products or for subsidiaries. This DIB simply asked for any examples of ISO/IEC 27001 certification. Further research is needed to determine guidelines for which products and subsidiaries should be certified. Once again, this is an instance where displaying a copy of the certificate would be useful because it describes the scope of the certification.

Data breaches

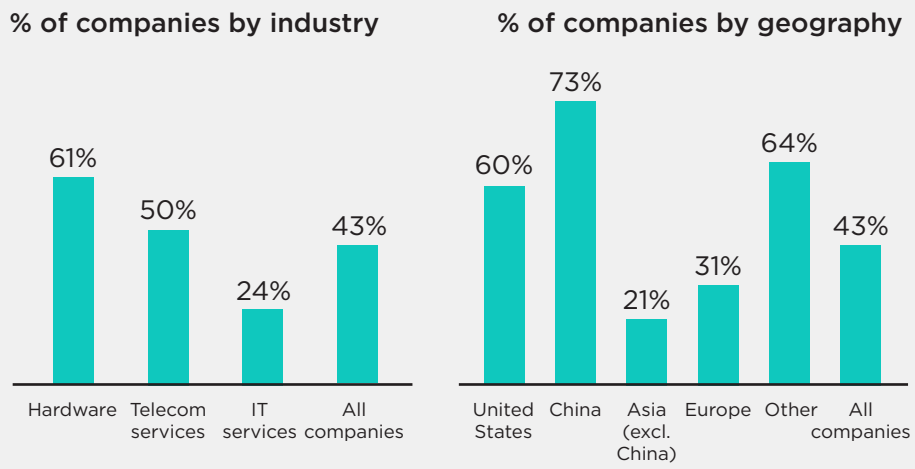
Data breaches are a specific type of cybersecurity incident affecting personal information. The GRI[40] and the Sustainability Accounting Standards Board (SASB)[41] both have global standards for reporting the number of data breaches. Some companies only disclose substantiated data breaches while others also disclose unsubstantiated incidents. Substantiated breaches are those identified in a written statement by a regulatory or official body and addressed to the company. Public disclosure of the number of data breaches and their nature will enable users to better understand digital risk and how companies are addressing it.

A total of 43 companies disclosed data breaches. The remaining companies were highly opaque about breaches. Several referenced data breaches in their GRI index, but did not provide relevant information. Others said the information was confidential. Of those that reported, most characterised the disclosure as 'substantial' or 'material'. Only eight companies disclosed additional details about data breaches.

Looking at data breach disclosure by industry, hardware companies were the most transparent, with 61% reporting breaches (see Figure 4.3, left). Less than one-quarter of IT services companies reported on data breaches, which is concerning given that this group includes a number of platform companies that collect substantial amounts of personal information. By geography, American companies were the most opaque, with slightly more than one-fifth reporting on data breaches compared to almost three-quarters of European companies (see Figure 4.3, right).

Of those that reported, 27 stated that they had not had any data breaches. Collectively, the remaining 16 had fewer than 1,000 data breaches. Similarly, among those that reported the number of people affected, the total was less than 1,000, except one case reported in 2020 that affected 29 million people.[42]

FIGURE 4.3: COMPANIES THAT DISCLOSE DATA BREACHES



Companies should follow leading practice by disclosing the number of data breaches and how many people were affected. They could also disclose all types of cybersecurity incidents and provide more clarity about the meaning of substantiated compared to all reported data breaches.

U.3 The company applies responsible practices for personal data

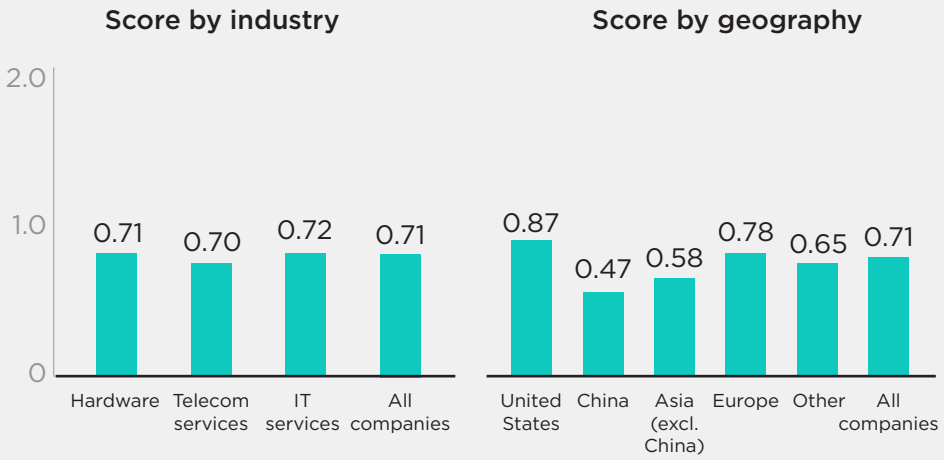
As part of their business activities, companies regularly collect their users' personal information. They collect this data for various reasons, ranging from using client contact details to process orders for products and services, to generating analytical insights for specialised services and placing targeted paid advertisements. Companies have a responsibility to their users to ensure their data is safe and is not used for nefarious purposes.

This indicator was developed in collaboration with Ranking Digital Rights (RDR). The RDR Corporate Accountability Index assesses internet and telecommunications companies on their publicly disclosed policies and practices that affect their users' freedom of expression and privacy.[43] In particular, this indicator draws on two RDR indicators: P.4 Sharing of user information and P.8 Users' access to their own user information.

In practice, applying this indicator to large digital companies was challenging. First, companies often had different privacy policies for their subsidiaries[44]. Second, those privacy policies depend on the user's location. This is due to jurisdictional differences in privacy laws. It is surprising that rather than create a single privacy policy fulfilling all jurisdictional requirements around the world, companies continue to persist with having different policies.

To score this indicator, privacy policies were examined to see whether they mentioned sharing personal information and who with, and whether users could obtain a copy of the personal information held about them and download it in a portable format. This was the one indicator where information was available for all companies. For companies with multiple subsidiaries, the privacy policy used was the one that applied to the country in which the company had its headquarters or its largest product. The average score is 0.71 (that is, only 36% of the maximum), with little difference among the industries (see Figure 4.4, left). Ironically, American companies perform best on this indicator, despite a lack of an all-encompassing federal law and only a few states having privacy laws. The top five ranked companies are all in the United States, which also has the highest average score by geography. They even outperformed companies headquartered in the European Union, which has enacted a privacy law (see Figure 4.4, right).[45] Nevertheless, progress is needed in relation to this indicator, with no industry or region reaching at least 50% of the maximum possible score.

FIGURE 4.4: AVERAGE COMPANY SCORES ON THE PERSONAL DATA INDICATOR



Companies should go beyond minimum legal requirements and follow leading practice by clearly disclosing whether they share personal data with third parties. Leading companies will go further and also disclose the names of those third parties. In addition, leading practice includes allowing users to see and download their personal data in widely used file formats. As noted earlier, company privacy policies change, depending on a user's region, and can differ between subsidiaries. Companies have scope to implement a universal privacy policy with one high standard for all subsidiaries and throughout all regions of the world, regardless of the location of the user. If this were the case, policies would reflect a uniform high standard because they would have to abide by the most stringent regulations adopted and apply them throughout all their operations

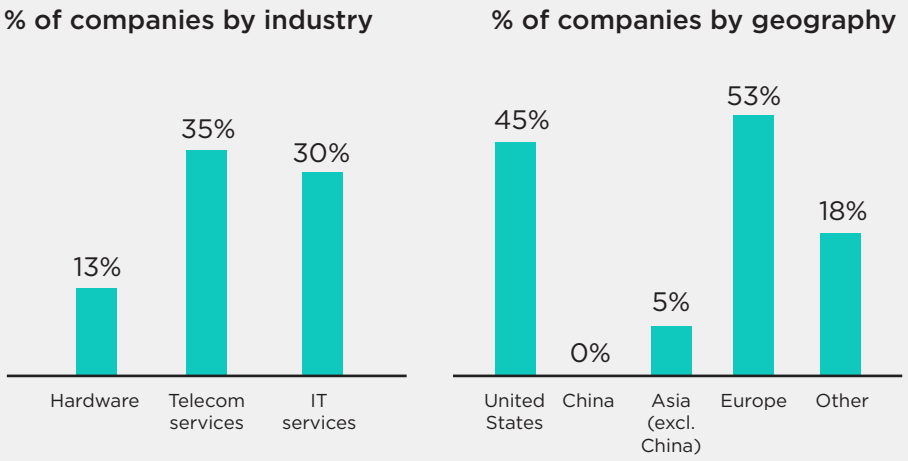
BOX 4.2: TRANSPARENCY REPORTS

One element captured was whether a company stated in its privacy policy that it shared personal information with law enforcement. In this regard, each company was also asked whether it produced a report about how many government requests it received for personal information. Evidence was found that 28 companies disclosed such information, many through a 'transparency' report.[46] Some provided only highly aggregated information while others gave breakdowns by each significant subsidiary or type of government request. Notably, most companies did not honour 100% of requests, particularly when they were based on freedom of expression rather than violation of an actual law.

Telenor, a Norwegian telecommunications operator with eight subsidiaries in Nordic countries and Asia, is an example of best practice in this area. It has been producing an annual transparency report since 2015, which provides a breakdown of law enforcement requests by subsidiary.[47] It also identifies the type of request. Apart from asking for personal information, requests range from innocuous demands to send text messages during a crisis to extreme measures such as blocking specific IP addresses or even shutting down a network.

While roughly one-third of telecommunications services and IT services companies published transparency reports, the figure was lower for hardware companies. This is understandable given that they tend to collect less personal information and most do not operate networks or platforms (see Figure 4.5, left). More than half of European companies published transparency data, while no Chinese company did (see Figure 4.5, right). Notably, almost twice as many American companies published a transparency report compared to the number that disclosed data breaches. This reflects a selection process about what sort of information to disclose and a type of herd mentality about certain disclosures. The same is true about inclusion and diversity reports, which quite a few American companies publish. On the other hand, far fewer American companies disclose information related to global reporting standards, such as economic value distribution or data breaches.

FIGURE 4.5: COMPANIES THAT DISCLOSE GOVERNMENT REQUESTS FOR PERSONAL INFORMATION

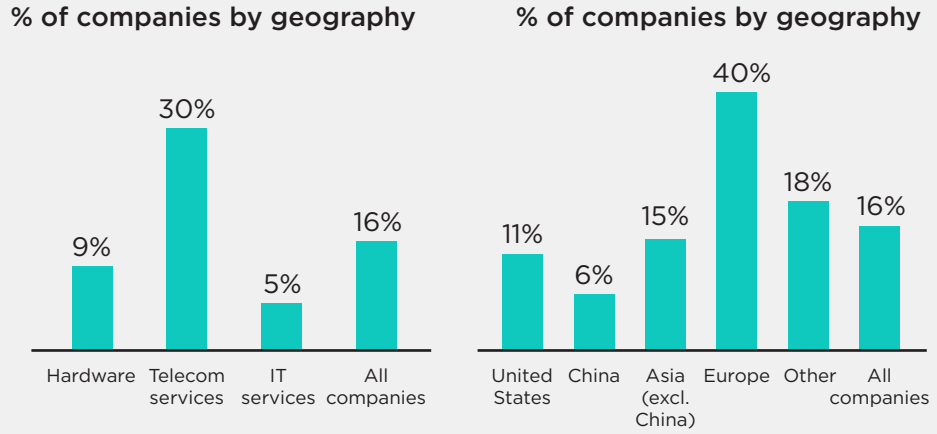


U.4 The company mitigates digital risks and harms

Using digital technologies brings a range of risks and harms that could lead to distrust, confusion, less frequent use or even addiction. Children in particular are at high risk as they do not have the emotional or cognitive capabilities to detect and mitigate dangers. Consequently, they can fall victim to cyberbullying, predators and the posting of private information online that makes them vulnerable. Nearly two-thirds of children surveyed around the world are exposed to cyber risks.[48] In the United States, the National Center for Missing & Exploited Children received almost 17 million reports in 2019 relating to child sexual abuse material and online enticement.[49] Given the gravity of the situation, the benchmark closely examined actions companies take to provide child online protection.

Measures included whether a company had made a high-level commitment to child online safety. All digital companies should agree to do this, given that they all produce products that can either indirectly or directly contribute to harming children.[50] Yet only 16 companies have an explicit high-level statement on child online safety. The vast majority are telecommunications services providers, with hardware and IT services companies lagging (see Figure 4.6, left). A total of 40% of companies that have a statement on child online safety are European (see Figure 4.6, right). This shows that more digital companies have an opportunity to demonstrate their commitment to child online safety.

FIGURE 4.6: COMPANIES WITH AN EXPLICIT HIGH-LEVEL STATEMENT ON CHILD ONLINE PROTECTION



Ideally, companies should incorporate commitments in their high-level corporate governance documents. One example of best practice is the South African–headquartered MTN, which has a dedicated policy document on child online safety that states, "MTN has a zero-tolerance approach to the abuse and exploitation of children."[51] In its Business Principles, Spain's Telefonica says, "We are especially committed to protecting children and young people online."[52] The Republic of Korea's SK Telecom includes the issue of child online safety in its human rights assessment framework. Other companies such as Sweden's Telia have committed to international guidelines on child online safety, namely the Children's Rights and Business Principles (CRBP) developed by Save the Children, UNICEF and the UN Global Compact. Child online protection falls under CRBP's Principle 5: "Restricting access to products and services that are not suitable for children or that may cause them harm."[53] However, it is not clear whether this generic definition is sufficient or a more explicit reference should be made to digital technologies.

Only 23 digital companies cooperate with international or national authorities to report child online abuse. Further, only 30 companies partner with third parties to mitigate child online harms. Companies collaborate with various third parties from the private and public sectors, including international organisations such as GSMA, Internet Matters and UNICEF. Some digital companies also belong to organisations working to protect children online.[54]

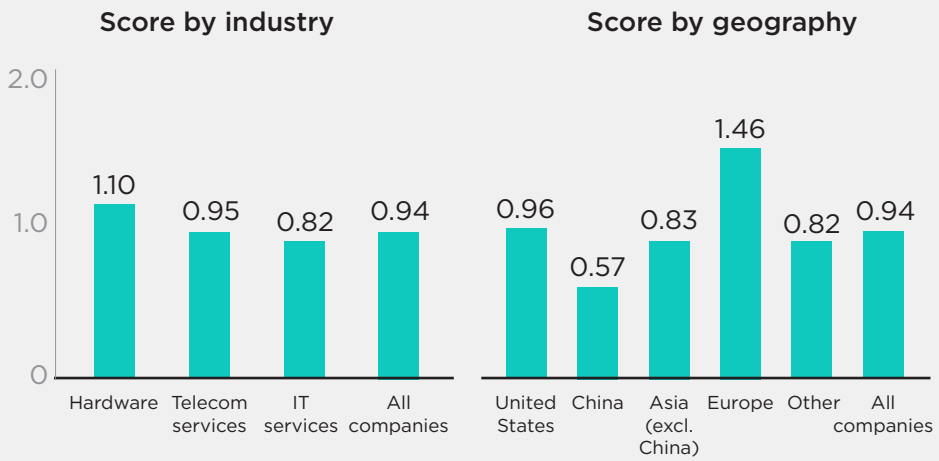
While many companies inform users about issues relating to their online safety, the explanations are often in language that is too complicated for the average user to understand.[55] Companies should follow leading practice by scoping the risks and harms associated with their products and services, and making this information publicly available in a format that is easy to understand. Leading companies have mechanisms in place to help users report online abuse. These companies also have a process for acting on these reports. Leading companies go further by aligning with international standards and partnering with organisations that advocate for online protection. Companies should also provide free content controls, where relevant, and support initiatives that have been shown to protect children online.

Innovation

Innovation is a critical enabling mechanism for developing hardware, software and services that facilitate safe, affordable and high-quality access. Further, innovation drives the creation of new digital technologies with potential to accelerate achievement of the SDGs across many areas. For example, companies developed innovative solutions for dealing with the COVID-19 pandemic (see Box 5.1). This measurement area looks at company support for open standards and open source that help to drive innovation, increase investment in bottom-up innovation, encourage cooperation on innovative big data solutions for sustainable development and foster inclusivity and ethical considerations in product development.

Innovation had the highest average score of any measurement area. Hardware companies perform best in supporting open, diverse, inclusive and ethical innovation, with an average score of 1.1 (see Figure 5.1, left). Of all the geographies, European companies lead in supporting innovation (see Figure 5.1, right). Overall, Microsoft and Orange achieved the highest performance in this measurement area, with a score of 1.94. At the other extreme, no evidence was found for two companies in any of the indicators in this measurement area.

FIGURE 5.1: INNOVATION SCORES BY INDUSTRY AND GEOGRAPHY



BOX 5.1: COVID-19 AND INNOVATION

Companies implemented a number of measures to support research and develop applications in response to the COVID-19 pandemic. Some companies leveraged their assets to allow researchers to crunch numbers and solve complex problems. IBM gave researchers free access to computing capacity and a free, cloud-based AI service that let scientists and academics query thousands of peer-reviewed papers and databases. Similarly, Ericsson developed information retrieval models to query more than 50,000 academic papers. Amazon collaborated with the WHO, supplying advanced cloud technologies and technical expertise to track the virus. In China, Alibaba, Baidu and Huawei offered researchers big data and free use of computing and cloud services. Several companies pledged to make their intellectual property available for free to aid in the fight against the virus. Other companies have leveraged their experience implementing consumer applications while balancing the need to protect privacy. For instance, Apple, Google and Vodafone helped governments to develop contact tracing smartphone apps. These interventions could be applied post-pandemic to other health challenges and more broadly across different areas of sustainability.

I.1 The company practices open innovation

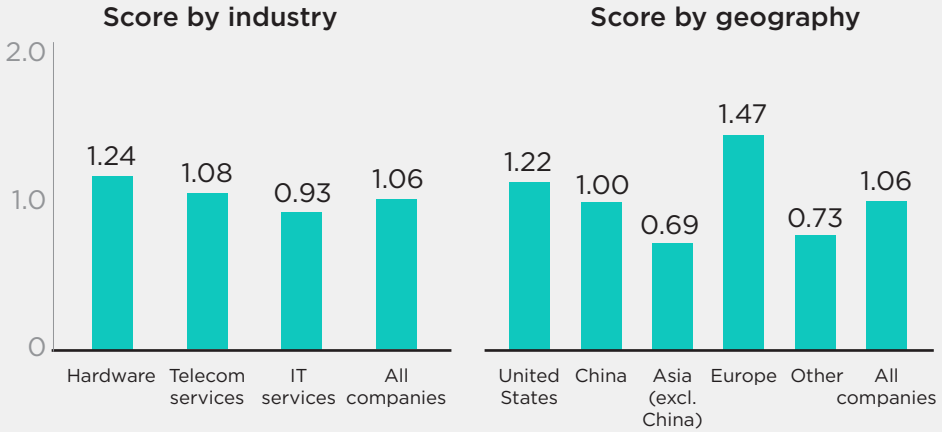
Open innovation is characterised by collaboration in research and development (R&D). Companies have found that moving in-house R&D to cooperative frameworks yields significant benefits and boosts innovation. This collaboration relates to SDG target 17.16, which calls for partnerships "that mobilise and share knowledge, expertise, technology and financial resources to support the achievement of sustainable development goals in all countries".[56]

Open standards help to boost innovation because they allow researchers to focus on the innovative aspects of their work.[57] They also lower the cost of product development by enabling interoperability, meaning engineers can put together pre-made pieces of a puzzle instead of building everything from scratch. Open source has transformed the way software is developed.[58]

Companies were asked to provide evidence of membership in standards bodies and their efforts to support open innovation, including making a statement or pledge, having open source projects and collaborating with universities to develop new technologies.

Thirty-six companies indicated support for open source or standards through a policy statement or pledge, while 47 have open source projects. More than half of the companies (53) report collaborating with universities. Overall, hardware companies had the highest scores, which was probably due to the greater need for interoperability in digital goods (see Figure 5.2, left). In terms of geography, Europe, a region with a long tradition of digital collaboration, particularly for wireless technologies, had the highest score (see Figure 5.2, right).

FIGURE 5.2: OPEN INNOVATION SCORE BY INDUSTRY AND GEOGRAPHY



I.2 The company supports technology innovation ecosystems

Just two decades ago, the handful of technology giants that dominate e-commerce, social media and content delivery today were start-ups or did not exist. The emergence of these tech giants was not an accident – they emerged from the pool of the many companies that were financed by venture capital.[59] Start-up ecosystems are the key source of bottom-up innovation in the tech world. They are characterised by entrepreneurial digital start-ups with a promising product idea that receive mentoring and other support such as incubation. To scale and bring their products to market, start-ups require financing. Given the risks associated with start-up financing, traditional funders have been reluctant to invest and venture capital has filled the void.

Companies were asked if they make venture capital investments, provide other types of assistance for start ups or support social or non-profit ventures. Half the companies make venture capital investments through their own funds. Others provide investment via third-party funds, although this was not included in the indicator. Companies were asked to provide details of their portfolio, such as the gender of the founder and their location, to gauge the diversity of investments. However, only three companies provided this information.

A total of 54 companies provided other types of support to start-ups, such as through incubators, accelerators, innovation hubs, competitions and free credits to use company products. A little over one-third (36) provided evidence of support for social and/or non-profit ventures. Other companies assist vulnerable or under represented groups such as women or ethnic minorities.

Just two companies – HP and Naspers – received a top score on this indicator. This was due to making direct venture capital investments and providing details about the investees, and also giving other types of support to start-ups and social and non-profit ventures. A further 22 received high marks, but missed out on a top score because they did not provide details about the investees of their direct venture capital investments. One-third of companies (33) showed no evidence of supporting the tech start-up ecosystem.

I.3 The company collaborates on big data for sustainable development

SDG target 17.18 calls for a significant increase in the availability of data for monitoring the SDGs.[60] Companies have vast amounts of data, including their users' personal data, which can be leveraged by using innovative techniques to generate important development insights. Collaboration between researchers and companies is essential for helping research communities to unlock the rich potential of the data. Big data sharing between companies and researchers is already yielding results. Mobility data from mobile phone networks can reveal the extent of displacement after a disaster and help predict the spread of infectious diseases, while prepaid mobile recharges can help track food consumption. Social media big data has been used to help forecast floods, detect depression, estimate travel demand and predict future house prices.[61] At the same time, research has quantified the impact of digital technologies on accelerating progress and mitigating risks for the SDGs, reflecting the important role that digital companies can play.[62]

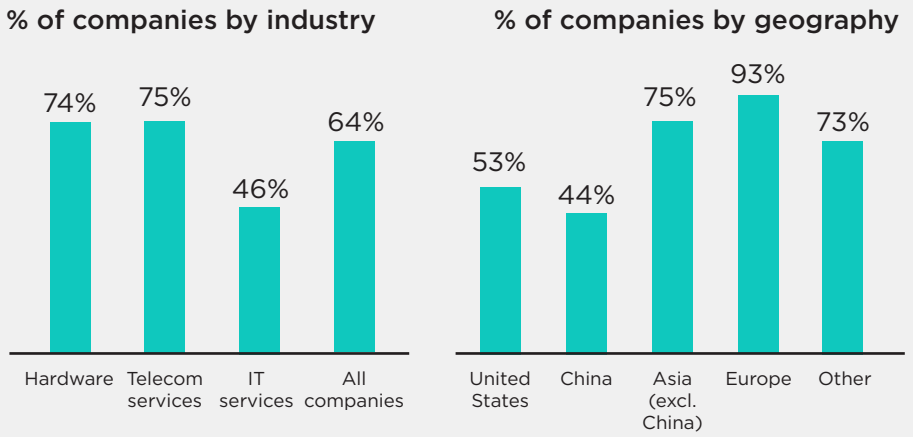
Not all digital companies collect data that may be relevant for sustainability research. So companies were asked whether they supported this area through funding or other means, or if they make data sets available for public research. In all, 42 companies contribute resources to research on sustainability issues, while 19 contribute data sets. Almost half (47) did one or both.

Companies such as Alphabet, Amazon and Microsoft, which provide cloud services, supported this area by providing free credits to researchers to access high-performance computers and analytics software. Several companies worked directly with researchers on sustainability topics, while others provided support by donating computer equipment or funding.

Telecommunications services providers were the main contributors of data sets, while some IT services companies also shared data. Telefonica stands out through its Big Data for Social Good unit, which uses big data and AI capabilities to address social and environmental challenges. The company collaborates with international institutions. For example, it works with UNICEF on the Magic Box initiative, collecting, combining and analysing aggregated and anonymised real-time data from private sector companies. The project was launched in 2014 to respond to the Ebola crisis in Western Africa, and more recently it has focused on the spread of the Zika virus. Telefonica also shares data sets with DataRepública in Latin America, which is promoting the use of alternative data sources to close information gaps in the SDGs.

Given the importance of the SDGs, it was surprising that only 64 companies indicated they support them. Almost all European companies expressed support, compared to just over 40% of Chinese companies (see Figure 5.3, right). While half of the North American companies said they support the SDGs, no evidence could be found regarding support by large IT services companies. This is consistent with the scoring at a global level, with only 46% of IT services companies supporting the SDGs, compared to 75% of telecommunications operators and 74% of hardware companies (see Figure 5.3, left). Some digital companies have incorporated the SDGs in their sustainability analysis, including identifying those they can have the greatest impact on.[63]

FIGURE 5.3: COMPANIES INDICATING SUPPORT FOR THE SDGS



I.4 The company applies inclusive and ethical research and development

Development of digital goods and services needs to be inclusive to meet the needs of diverse global users. Yet diversity within the tech industry is lagging, hindering innovation. One American study says, "Despite being one of the largest drivers of the United States economy, the technology ecosystem has remained stubbornly homogenous by race and gender, with women, Black, Latinx and Native American individuals vastly under-represented … Without a diverse workforce, the innovative potential of technology will be stymied."[64] Even in Scandinavia, the gender tech gap is an issue, with one study finding the more gender equal a country is, the larger the gender gap in STEM education and careers (see Box 5.2).[65]

BOX 5.2: GENDER TECH GAP IN SCANDINAVIA AND STEPS TO REDRESS IT

Telenor commissioned a study[66] to investigate the tech gender imbalance in Scandinavia. The study recommended four solutions: 1) disrupt gender stereotypes; 2) improve tech education in schools; 3) increase opportunities for girls to explore technology outside school; and 4) support young women's career paths into technology. These solutions link to two other measurement areas in the benchmark: access, which has an indicator for support for women and girls; and skills, which has an indicator for tech training.

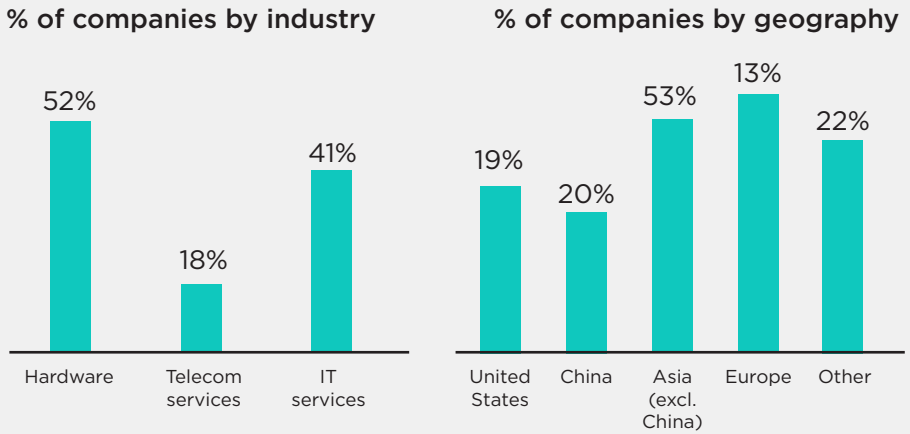
All Scandinavian companies in the benchmark had programs to encourage girls to pursue a STEM career. Both Telia and Telenor had mentorship programmes in which female staff members interacted with girls and young women in Sweden and Norway to challenge gender stereotypes about technology and inspire them to choose a STEM education. Ericsson worked with the Girl Scouts in the United States and Canada by introducing girls to STEM careers through internship opportunities, scholarships and co-developing virtual and immersive experiences. Ericsson and Telia also had technical skills initiatives, although these were not exclusively for women and girls.

Ironically, despite their support for encouraging girls to pursue a STEM career, none of the Scandinavian companies disclose how many of their women employees are engaged in technical roles.

Companies were asked about the proportion of women in technical, engineering or R&D roles. As a starting point, the total number of women in a company's workforce was investigated. Surprisingly, no evidence was found for almost one-quarter of the companies (23). Among the remaining companies, women made up about one-third of each company's workforce. The results in relation to women in technical roles were also surprising. Just 34 companies, mainly in North America, reported these numbers. The availability of this data was largely due to standardised government reporting requirements. There were fewer results from other regions. While this was sometimes due to opaqueness, it was also because of limitations in companies' human resource management systems. Eleven companies reported total R&D employment, but only two broke it down by gender. Telecom services providers ranked lowest, suggesting they may have difficulty identifying women working in technical areas.

Given the importance of achieving equity in tech roles, all companies should report on the number of women working in this area. It is also vital to standardise definitions to allow for more accurate comparisons. The International Labour Organization's occupational classification would be useful for this.[67]

FIGURE 5.4: COMPANIES REPORTING THE NUMBER OF WOMEN IN TECH ROLES



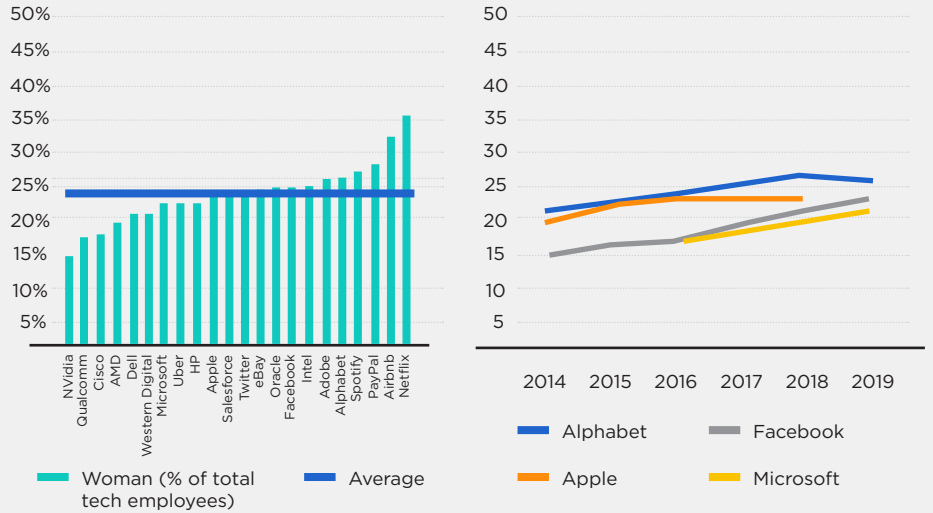
Note: Tech refers to technical, engineering or R&D.

BOX 5.3: UNITED STATES DIGITAL COMPANIES AND WOMEN IN TECH

The United States was the leading geography for reporting on the proportion of women employed in technical roles, with more than half of companies disclosing this detail. This is a recent phenomenon – in the past, many American digital companies considered diversity data to be a 'trade secret' and refused to publicly disclose it.[68] However, they did report disaggregated data on sex and ethnicity to the government's U.S. Equal Employment Opportunity Commission (EEOC).[69] After receiving a growing number of freedom of information requests for this data, many tech companies relented and began disclosing it, often through diversity reports. Like transparency reports, diversity data is an example of a herd reporting mentality among digital companies in the United States.

Among the 22 American companies reporting on the proportion of women employed in tech roles, the numbers ranged from 14% to 35%, with an average of 23%. In general, hardware companies reported the lowest proportion, while IT services firms had the highest number. Newer companies such as Airbnb, Netflix and Spotify had a higher proportion, which is probably due to them being unencumbered by legacy workforces. At the current growth rates – roughly one percentage point per year – it will be another 25 years before women achieve equity with men.

FIGURE 5.5: WOMEN EMPLOYEES AS A PERCENTAGE OF TOTAL TECH EMPLOYEES, UNITED STATES COMPANIES



Companies were also asked about their R&D facilities, including how many had centres that were not in the country where they were headquartered, to provide another perspective on diversity. It was assumed that all digital companies carry out some R&D. However, some companies reported not undertaking traditional R&D, and instead leveraging partnerships with technology vendors or using customers' R&D facilities. Forty companies reported having R&D facilities outside the country where they are headquartered.

The emergence of disruptive technologies, particularly AI, has immense potential for solving some of the world's greatest challenges, but it also presents many risks. These include reducing the need for human intervention, threatening job security, posing dangers to privacy and enhancing potential for discrimination.

Digital technologies affect jobs and increasingly rely on non-human decisions that can be based on flawed algorithms. For instance, in 2015 Amazon found that its hiring algorithm had been trained to favour men when screening job candidates.[71] So, it is critical to have ethical oversight of research into new technologies, particularly AI. Indeed, such a priori considerations can help to reduce the number of cases in which companies later realise the ethical implications of their product and have to withdraw it from sale or use. For instance, in the wake of racial injustice demonstrations in the United States, Amazon placed a one-year moratorium on police using its facial recognition technology.[72]

IBM discontinued sales of its facial recognition software noting the following:

"IBM no longer offers general purpose IBM facial recognition or analysis software. IBM firmly opposes and will not condone uses of any technology, including facial recognition technology offered by other vendors, for mass surveillance, racial profiling, violations of basic human rights and freedoms, or any purpose which is not consistent with our values and Principles of Trust and Transparency. We believe now is the time to begin a national dialogue on whether and how facial recognition technology should be employed by domestic law enforcement agencies.[73]

While there was evidence that 56 companies had a board committee or other executive body overseeing ethics, this needs to be put in context. Many companies' ethical considerations focused on behaviours such as corruption, bribery and harassment. They had not updated their policies to consider ethics in R&D activities. Evidence was found of only 30 companies considering ethics in R&D. Of those, just 16 have adopted ethical AI principles (see Table 5.1). Alphabet goes further and will not deploy AI for technologies that are likely to cause overall harm, for weapons or other technologies where the main purpose is to injure people, or for surveillance tools that violate international norms. IBM researchers have proposed a factsheet to accompany AI products. Like a list of ingredients, it would describe the data sets used to train algorithms, whether bias mitigation was performed and other factors.[75]

TABLE 5.1: COMPANIES FOLLOWING AI ETHICS GUIDELINES

	Company	Principles
1	Alphabet	Artificial Intelligence at Google: Our Principles
2	AT&T	Artificial Intelligence at AT&T: Our Guiding Principles
3	Deutsche Telekom	Guidelines for Artificial Intelligence
4	Ericsson	Endorses EU Ethics Guidelines for Trustworthy AI*
5	IBM	IBM's Principles for Trust and Transparency
6	Microsoft	Microsoft AI principles
7	Nokia	Endorses EU Ethics Guidelines for Trustworthy AI*
8	NTT	AI Guidelines
9	Orange	Endorses EU Ethics Guidelines for Trustworthy AI*
10	Samsung	Principles for AI Ethics
11	SAP	SAP's Guiding Principles for Artificial Intelligence
12	Telefónica	AI Principles of Telefónica
13	Telenor	Endorses EU Ethics Guidelines for Trustworthy AI*
14	Telia	Telia Company Guiding Principles on Trusted AI Ethics
15	Telstra	Working with government to pilot the Australian Framework for Ethical AI**
16	Vodafone	Vodafone Group's Artificial Intelligence (AI) Framework

* High-Level Expert Group on Artificial Intelligence. 2019. Ethics Guidelines for Trustworthy AI. https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai
** Government of Australia. 'AI Ethics Framework'. https://www.industry.gov.au/data-and-publications/building-australias-artificial-intelligence-capability/ai-ethics-framework

World Benchmarking Alliance

DIGITAL INCLUSION BENCHMARK RESULTS

Company	Industry	Headquarters	Geography	Access score	Skills score	Use score	Innovation score	Overall score	Rank
Adobe*	IT services	United States	United States	0.83	0.19	0.97	1.56	0.89	36
Airbnb*	IT services	United States	United States	0.35	0.38	0.25	0.16	0.29	83
Akamai	IT services	United States	United States	0.00	0.00	0.31	0.31	0.16	91
Alibaba	IT services	China	China	0.71	0.44	0.56	0.72	0.61	54
Alphabet	IT services	United States	United States	1.26	1.13	1.09	1.69	1.29	11
Amazon*	IT services	United States	United States	0.16	0.31	0.50	1.47	0.61	54
AMD*	Hardware	United States	United States	0.56	0.38	0.66	1.31	0.73	47
América Móvil*	Telecom services	Mexico	Other	1.10	1.00	0.94	0.97	1.00	28
Apple*	Hardware	United States	United States	0.90	1.38	1.44	1.19	1.23	14
AT&T	Telecom services	United States	United States	1.19	0.56	1.22	1.28	1.06	22
Axiata*	Telecom services	Malaysia	Asia (excl. China)	0.98	1.06	0.91	0.91	0.97	31
Baidu*	IT services	China	China	0.66	0.69	0.63	1.38	0.84	42
Bharti Airtel	Telecom services	India	Asia (excl. China)	0.36	0.56	0.28	0.53	0.43	65
Booking Holdings	IT services	United States	United States	0.69	0.00	0.34	0.41	0.36	77
Broadcom	Hardware	United States	United States	0.13	0.38	0.22	0.44	0.29	83
ByteDance	IT services	China	China	0.10	0.00	0.38	0.06	0.14	94
CenturyLink* †	Telecom services	United States	United States	0.59	0.50	0.41	0.13	0.41	71
China Mobile	Telecom services	China	China	0.73	0.38	0.50	0.72	0.58	58
China Satcom	Telecom services	China	China	0.00	0.00	0.00	0.13	0.03	99
China Telecom	Telecom services	China	China	0.25	0.00	0.31	0.22	0.20	88
China Unicom	Telecom services	China	China	0.54	0.19	0.13	0.31	0.29	83

World Benchmarking Alliance

Company	Industry	Headquarters	Geography	Access score	Skills score	Use score	Innovation score	Overall score	Rank
Cisco*	Hardware	United States	United States	0.84	1.56	1.59	1.88	1.47	6
Citrix	IT services	United States	United States	0.36	0.00	0.56	0.47	0.35	78
Cloudflare	IT services	United States	United States	0.00	0.00	0.31	0.31	0.16	91
Comcast*	Telecom services	United States	United States	1.19	1.38	0.88	0.97	1.11	20
Dell*	Hardware	United States	United States	1.08	1.00	0.66	1.50	1.06	22
Deutsche Telekom*	Telecom services	Germany	Europe	1.28	0.81	1.59	1.81	1.37	7
Digicel	Telecom services	Jamaica	Other	0.10	0.13	0.44	0.13	0.20	88
Digital Realty Trust*	IT services	United States	United States	0.06	0.00	0.94	0.28	0.32	81
eBay	IT services	United States	United States	0.43	0.31	1.00	1.00	0.69	49
EchoStar	Hardware	United States	United States	0.00	0.00	0.22	0.13	0.09	97
Equinix*	IT services	United States	United States	0.49	0.88	1.13	0.91	0.85	40
Ericsson*	Hardware	Sweden	Europe	0.36	0.88	0.94	1.81	1.00	28
Etisalat	Telecom services	United Arab Emirates	Other	0.16	0.19	0.75	0.53	0.41	71
Facebook	IT services	United States	United States	0.26	0.25	0.69	0.91	0.53	62
Foxconn	Hardware	Taiwan, China	Asia (excl. China)	0.11	0.00	0.88	0.69	0.42	67
Grab	IT services	Singapore	Asia (excl. China)	0.66	0.25	0.19	0.59	0.42	67
GTT	Telecom services	United States	United States	0.00	0.00	0.22	0.00	0.06	98
HCL	IT services	India	Asia (excl. China)	0.11	0.50	0.38	0.31	0.33	80
HP*	Hardware	United States	United States	1.00	1.38	1.25	1.63	1.32	8
Huawei	Hardware	China	China	0.51	1.00	1.16	1.22	0.97	31

Company	Industry	Headquarters	Geography	Access score	Skills score	Use score	Innovation score	Overall score	Rank
IBM	IT services	United States	United States	0.66	0.31	1.13	1.38	0.87	38
Infosys	IT services	India	Asia (excl. China)	0.36	0.31	0.91	0.66	0.56	59
Intel*	Hardware	United States	United States	0.74	1.06	0.94	1.44	1.05	26
JD.com*	IT services	China	China	0.00	0.31	0.06	0.84	0.30	82
Jio	Telecom services	India	Asia (excl. China)	0.06	0.31	0.13	0.59	0.27	86
Jumia	IT services	Nigeria	Other	0.19	0.00	0.13	0.31	0.16	91
KDDI	Telecom services	Japan	Asia (excl. China)	0.59	0.69	0.94	1.16	0.85	40
Lenovo	Hardware	China	China	1.33	0.31	0.78	0.81	0.81	43
Meituan	IT services	China	China	0.00	0.31	0.44	0.06	0.20	88
Mercado Libre	IT services	Argentina	Other	0.56	0.50	0.53	1.13	0.68	50
Microsoft*	IT services	United States	United States	1.09	0.56	1.09	1.94	1.17	17
Millicom*	Telecom services	Luxembourg	Europe	0.95	1.75	1.06	0.91	1.17	17
MTN*	Telecom services	South Africa	Other	0.76	0.56	0.97	0.91	0.80	45
MTS*	Telecom services	Russian Federation	Europe	0.45	0.69	0.28	1.28	0.68	50
Naspers*	IT services	South Africa	Other	0.05	0.69	0.88	1.22	0.71	48
NetEase	IT services	China	China	0.10	0.63	0.72	0.22	0.42	67
Netflix	IT services	United States	United States	0.15	0.00	0.50	0.34	0.25	87
Nokia*	Hardware	Finland	Europe	1.34	1.75	1.13	1.81	1.51	5
NTT*	Telecom services	Japan	Asia (excl. China)	1.69	0.69	1.16	1.75	1.32	8
Nvidia*	Hardware	United States	United States	0.75	0.69	1.09	1.69	1.06	22
Ola	IT services	India	Asia (excl. China)	0.10	0.00	0.09	0.34	0.13	95
Ooredoo	Telecom services	Qatar	Other	0.38	0.31	0.19	0.75	0.41	71

Company	Industry	Headquarters	Geography	Access score	Skills score	Use score	Innovation score	Overall score	Rank
Oracle*	IT services	United States	United States	0.89	0.81	0.56	1.56	0.96	33
Orange*	Telecom services	France	Europe	1.63	1.44	1.34	1.94	1.59	3
PayPal	IT services	United States	United States	0.45	0.00	0.94	1.31	0.68	50
PCCW	Telecom services	Hong Kong SAR, China	Asia (excl. China)	0.53	0.31	0.72	0.09	0.41	71
PLDT*	Telecom services	Philippines	Asia (excl. China)	1.43	1.75	1.44	1.47	1.52	4
Qualcomm*	Hardware	United States	United States	0.51	1.56	0.88	1.50	1.11	20
Rogers	Telecom services	Canada	Other	1.16	0.13	0.84	0.28	0.60	56
Safaricom*	Telecom services	Kenya	Other	1.09	0.81	0.97	1.03	0.98	30
Salesforce*	IT services	United States	United States	1.09	0.31	0.94	1.75	1.02	27
Samsung*	Hardware	Korea, Rep.	Asia (excl. China)	1.09	1.19	1.09	1.81	1.30	10
SAP*	IT services	Germany	Europe	0.50	0.75	0.66	1.81	0.93	34
Sina	IT services	China	China	0.00	0.00	0.06	0.00	0.02	100
Singtel*	Telecom services	Singapore	Asia (excl. China)	1.05	0.38	1.31	0.97	0.93	34
SK hynix*	Hardware	Korea, Rep.	Asia (excl. China)	0.48	0.44	0.47	0.75	0.54	60
SK Telecom	Telecom services	Korea, Rep.	Asia (excl. China)	0.80	0.38	0.63	1.34	0.79	46
SoftBank	Telecom services	Japan	Asia (excl. China)	0.84	0.75	0.63	1.03	0.81	43
SpaceX	Hardware	United States	United States	0.00	0.00	0.19	0.19	0.10	96
Spotify	IT services	Sweden	Europe	0.23	0.31	0.44	0.75	0.43	65
Tata Communications	Telecom services	India	Asia (excl. China)	0.81	1.19	1.00	0.53	0.88	37
Telecom Italia*	Telecom services	Italy	Europe	1.09	0.56	1.59	1.53	1.19	16
Telefonica*	Telecom services	Spain	Europe	1.63	1.31	1.72	1.81	1.62	2

Company	Industry	Headquarters	Geography	Access score	Skills score	Use score	Innovation score	Overall score	Rank
Telenor*	Telecom services	Norway	Europe	1.31	0.63	1.44	1.47	1.21	15
Telia*	Telecom services	Sweden	Europe	0.75	0.81	1.66	1.41	1.16	19
Telkom Indonesia	Telecom services	Indonesia	Asia (excl. China)	0.35	0.38	0.31	0.59	0.41	71
Telstra*	Telecom services	Australia	Other	1.81	1.75	1.59	1.75	1.73	1
Tencent*	IT services	China	China	0.30	0.13	0.53	1.00	0.49	64
Texas Instruments	Hardware	United States	United States	0.13	0.75	0.53	0.63	0.51	63
TSMC*	Hardware	Taiwan, China	Asia (excl. China)	0.53	0.69	0.63	0.56	0.60	56
Türk Telekom	Telecom services	Turkey	Europe	0.68	1.44	0.94	1.16	1.06	22
Twitter	IT services	United States	United States	0.00	0.19	0.72	0.78	0.42	67
Uber*	IT services	United States	United States	0.50	0.25	0.31	0.34	0.35	78
Veon	Telecom services	Netherlands	Europe	0.96	1.19	0.41	0.91	0.87	38
Verizon*	Telecom services	United States	United States	1.14	1.00	1.59	1.44	1.29	11
Vodafone*	Telecom services	United Kingdom	Europe	1.25	0.81	1.56	1.44	1.27	13
Western Digital	Hardware	United States	United States	0.00	0.00	0.84	0.63	0.37	76
Xiaomi	Hardware	China	China	0.89	0.38	0.75	0.66	0.67	53
ZTE	Hardware	China	China	0.13	0.00	0.94	1.09	0.54	60

* Company responded to the data request
† Rebranded as Lumen in September 2020

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