



Digital Inclusion Benchmark 2023

Insights Report March 2023

Table of contents

1	Intro	duction	1
	1.1 1.2 1.3 1.4 1.5	Overview Methodology Key findings Results Introduction to the rest of the report	1 2 4 6 7
2	The r	ights of children online	9
	2.1 2.2 2.3 2.4	Importance of child digital rights Company performance on child online safety Rethinking child digital rights Conclusions	9 9 11 15
3	Wom	en in tech	. 16
	3.1 3.2 2.5 3.3 2.6	Introduction Preparing women and girls for the STEM pipeline Technical skills for women Women's representation in digital companies Conclusion	16 16 20 21 27
4	Asses	ssing company performance on ethical artificial intelligence.	28
	4.1 4.2 4.3	AI benchmark elements AI framework assessment Going forward	28 31 34
5	Hum	an rights, climate change and supply chains	38
	2.7 2.8 2.9 5.1	Human rights and business Human rights and the environment Digital hardware companies' emissions and supply chain Conclusions	38 40 40 45
6	Econ	omic, social & environmental impacts of digital companies	47
	6.1 6.2 6.3 6.4	Measuring economic impacts of digital companies Community investment Environmental impact of digital companies An integrated approach to measure total value generated by digital companies	47 50 53 56
7	Anne	x tables	60



Tables

Table 1.1: Digital Inclusion indicators	1
Table 1.2: Core Social Indicators (CSI)	2
Table 1.3: Digital companies by industry and geography	2
Table 1.4: Digital Inclusion by industry and geography (0-2)	6
Table 1.5: Top 20 companies in the Digital Inclusion Benchmark	7
Table 2.1: Child online safety commitments grounded in human rights principles	9
Table 2.2: AT&T results on the digital child safety indicator	12
Table 2.3: Companies that have carried out child digital rights impact assessments	14
Table 3.1 Top ten companies by digital opportunities for women and girls indicator	19
Table 3.2: Companies reporting their financial contribution in support of digital inclusivity for women and girls	. 19
Table 3.3: Companies with at least 50% of women on the highest governing body	26
Table 4.1: Companies with AI ethics committees	30
Table 4.2: Companies with ethical AI principles (as of February 2023)	33
Table 4.3: Proposed AI Ethics indicator	37
Table 5.1: Digital companies linking human rights and the environment	41
Table 5.2: Typology of digital hardware companies	41
Table 5.3: Companies with absolute supply chain emissions reduction targets	44
Table 5.4: GHG emissions of selected digital hardware companies, 2021	46
Table 6.1: Companies disclosing economic value distribution (EVD), 2021	49
Table 6.2: Existing benchmark data for measuring company impact	57
Table 7.1: Digital Inclusion Benchmark (DIB) 2023 Companies	61
Table 7.2: Digital Inclusion Benchmark, 2023 Results	67
Table 7.3: Core Social Indicators (CSI) results	72
Table 7.4: Geographic indicators	78
Table 7.5: Gender indicators	85
Table 7.6: Community Investments, FY2021	91

Figures

Figure 1.1: Composition of Digital Inclusion Benchmark	4
Figure 2.1: Average scores on child online safety indicator	10
Figure 2.2: DIB child online safety elements	11
Figure 2.3: Child online safety value chain	13
Figure 2.4: Proposed child digital rights indicator	15
Figure 3.1: Companies with an initiative for digital inclusion of women and girls, 2021	18
Figure 3.2: Companies that support initiatives for digital inclusion of women and girls, DIB 100	20
Figure 3.3: Companies reporting share of women in tech roles, 2021	22
Figure 3.4: Companies reporting women employees in tech roles, 2019-2021	23
Figure 3.5: Number of companies by the percentage of women in the highest governing body, 2021	26
Figure 4.1: Ethical AI principles of companies	29
Figure 4.2: Companies with ethical AI frameworks by year of publication	31
Figure 4.3: Ethical AI assessment	34
Figure 5.1: Proportion of digital companies with a publicly available policy statement committing to respect	
human rights, approved by the highest governance body	39
Figure 5.2: Proportion of digital companies with a publicly available policy statement expecting their business	
relationships to commit to respecting the ILO fundamental labour rights	40
Figure 5.3: Ratio of supply chain to operational emissions of digital hardware companies, 2021	42
Figure 5.4: Proportion of supply chain emissions using data from suppliers, 2021	43
Figure 6.1: Revenue distribution by region and industry, DIB companies, 2021	47
Figure 6.2: Employee distribution by region and industry, DIB companies, 2021	48
Figure 6.3: Community investment: inputs, outputs and impacts	51
Figure 6.4: Relationship between community investment and digital inclusion CSR score	53
Figure 6.5: Distribution of operational GHG emissions, DIB200 companies, 2021	55



Figure 6.6: Global renewable power purchase agreement volumes by sector and top ten corporate purchaser	's of
renewable energy, 2021	55

Boxes

Box 4.1: Collective Impact Coalition (CIC) for Digital Inclusion	31
Box 4.2: Sony's ethical AI guidelines	35
Box 4.3: Ethical Al in eBay's Supplier Code of Conduct	35
Box 4.4: Other ethical AI considerations	36
Box 5.1: Greenpeace climate assessment of consumer electronics brands and their suppliers	44
Box 6.1: Calculating direct and indirect economic impacts: the case of Axiata	50
Box 6.2: Methodologies to calculate total value	57



1 Introduction

1.1 Overview

The World Benchmarking Alliance (WBA) initiated the Digital Inclusion Benchmark (DIB) four years ago, launching work on the transformation by identifying key topics and companies in the field. WBA's first DIB, covering 100 keystone¹ companies, was published in December 2020 and the second with 150 companies released in December 2021. The 2023 DIB includes 50 new companies and incorporates the WBA Social Transformation Framework (i.e. Core Social Indicators (CSI)).

Digital inclusion covers 16 indicators in four measurement areas: enhancing universal access to digital technologies; improving all levels of digital skills; fostering trustworthy use; and innovating openly, inclusively and ethically (Table 1.1).² These indicators map to one or several of the 17 Sustainable Development Goals (SDGs) agreed by all 193 United Nations (UN) members in 2015. In doing so, they provide a yardstick for measuring the performance of tech companies on digital inclusion, contributing to a more equitable world and sustainable future, bolstered by responsible and innovative use of technology.

Measurement	Indicator	Indicator
area	code	
Access A1 The company contributes to digital		The company contributes to digital technology access
	A2	The company supports digital inclusivity for women and girls
	A3	The company facilitates digital access for diverse users
	A4	The company discloses its direct economic contribution
Skills	S1	The company supports basic digital skills development
	S2	The company supports intermediate digital skills development
	S3	The company supports technical digital skills development
	S4	The company supports school connectivity
UseU1The company assigns accountability for cylU2The company monitors, remedies and report		The company assigns accountability for cybersecurity at a senior level
		The company monitors, remedies and reports cybersecurity incidents
	U3	The company applies responsible practices for personal data
U4 The company mitigates		The company mitigates digital risks and harms
Innovation I1 The company practices open innov		The company practices open innovation
I2The company supports technology innovI3The company supports sustainable development		The company supports technology innovation ecosystems
		The company supports sustainable development
	14	The company practices inclusive and ethical research and development

TABLE 1.1: DIGITAL INCLUSION INDICATORS

WBA's Social Transformation Framework sets out a series of high-level expectations that all companies should meet. These expectations are grounded in companies' responsibility to respect human rights, their role in providing and promoting decent work and their ethical conduct. A total of 1,000 companies across different industries have been assessed on the core social indicators (CSI), which are part of WBA's Social Transformation Framework to increase companies' accountability for their social impacts. CSI features 18 indicators across three pillars (Table 1.2).

² For more information on the background behind the indicators, see: World Benchmarking Alliance. 2020. *Digital Inclusion Benchmark: Methodology report*. <u>https://www.worldbenchmarkingalliance.org/research/methodology-digital-inclusion-benchmark-covers-four-critical-themes/</u>



¹ Keystone refers to organisations with disproportionate influence on the structure and function of the systems within which they operate. For more information on the principles used to identify keystone companies, see: <u>https://www.worldbenchmarkingalliance.org/research/sdg2000-methodology/</u>

TABLE 1.2: CORE SOCIAL INDICATORS (CSI)

Respect human	1	Commitment to respect human rights					
rights	2	Commitment to respect the human rights of workers					
	3	Identifying human rights risks and impacts					
	4	Assessing human rights risks and impacts					
	5	Integrating and acting on human rights risk and impact assessments					
	6	Engaging with affected and potentially affected stakeholders					
	7	Grievance mechanisms for workers					
	8	Grievance mechanisms for external individuals and communities					
Provide &	9	Health and safety fundamentals					
promote decent 10 Living wage fundamentals		Living wage fundamentals					
work	11	Working hours fundamentals					
	12	Collective bargaining fundamentals					
	13	Workforce diversity disclosure fundamentals					
	14	Gender equality and women's empowerment fundamentals					
Act ethically 15 Personal data protection fundamentals		Personal data protection fundamentals					
	16	Responsible tax fundamentals					
	17	Anti-bribery and anti-corruption fundamentals					
	18	Responsible lobbying and political engagement fundamentals					

1.2 Methodology

Digital companies vary widely in their activities. Some companies solely manufacture equipment, provide telecommunication services or offer information technology (IT) or digitally enabled services. Others such as Apple and Microsoft, carry out two or more of these activities. Given the significant functional differences between digital companies, these have been classified into three industries for the purpose of benchmarking: 1) hardware, consisting of the manufacture of digital goods such as end-user devices, network equipment and semiconductors; 2) telecommunication services; and 3) IT services, consisting of software applications, data centres, cloud computing and platform services.³ In cases where companies provide diverse products, they have been classified based on the industry category in which they had the highest revenue in the most recent accounting year.

The benchmarked companies have corporate headquarters spread across 51 different economies. Their footprint extends to almost the entire planet through their subsidiaries and supply chains, as well as through their worldwide markets. For analytical purposes, the companies have been classified into geographical regions (Table 1.3). Due to the large number of digital companies included from mainland China and the United States, these are grouped separately.

Headquarters	Hardware	Telecom services	IT software & services	Total (%)
United States	24	7	33	64 (32%)
Asia (excluding China)	18	19	9	46 (23%)
Europe	8	28	5	41 (21%)
China	8	4	13	25 (12%)
Other	0	21	3	24 (12%)

TABLE 1.3: DIGITAL COMPANIES BY INDUSTRY AND GEOGRAPHY

³ For more on the company classification process, see World Benchmarking Alliance. 2020. *Digital Inclusion Benchmark: Methodology report*. <u>https://www.worldbenchmarkingalliance.org/research/methodology-digital-inclusion-benchmark-covers-four-critical-themes/</u>



			IT	
		Telecom	software &	
Headquarters	Hardware	services	services	Total (%)
Total (%)	58 (29%)	79 (40%)	63 (31%)	200

Note: Figures in parenthesis refer to the proportion of companies in each grouping. 'Other' refers to the regions Latin America and the Caribbean, the Middle East, the Pacific, Sub-Saharan Africa and Canada. China includes companies headquartered in the mainland. For the regional classification of individual companies, see Table 7.4.

Data for the Benchmark was collected 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 collected information was shared with companies, enabling them to review the data, provide input and clarifications and send any additional information. Companies that did not have public information on an indicator element or that failed to send relevant information received a score of zero for the element.

The Benchmark has been revised this year with the incorporation of the core social indicators (CSIs), which constitute the social transformation assessment. The DIB consists of the four measurement areas in digital inclusion and the overall CSI score (Figure 1.1). The 16 digital inclusion indicators were scored on a scale of 0-2. Each of the four measurement areas were then scored as a simple average of the indicator scores. In addition, the overall score on the core social indicators (consisting of three pillars and 18 indicators) is counted as one measurement area. Companies that did not have public information on the indicators or that failed to send relevant information received a score of zero.

Finally, a company's overall score was calculated as the average of the scores that it received for each digital inclusion measurement area (80%) and its overall core social score (20%). More information about the composition of the indicators and how they were scored is available in the digital inclusion scoring guidelines⁴ and the social transformation framework. ⁵

⁴ World Benchmarking Alliance. 2021. Digital Inclusion Benchmark 2021 Scoring Guidelines.

⁵ World Benchmarking Alliance. 2021. *Social Transformation Framework*.

https://assets.worldbenchmarkingalliance.org/app/uploads/2021/02/WBA-Social-Transformation-Framework-FINAL.pdf



https://assets.worldbenchmarkingalliance.org/app/uploads/2021/12/Digital-Inclusion-Benchmark-2021-Scoring-Guidelines.pdf

FIGURE 1.1: COMPOSITION OF DIGITAL INCLUSION BENCHMARK



1.3 Key findings

The 2023 DIB shows that the majority of tech companies are still lagging in their responsibility to ensure that people are able to use digital technology in a way that benefits them. There are a handful of companies that are leading the way with robust child safety commitments, ethical principles for artificial intelligence and impactful initiatives to provide digital skills training. However, most companies still do not display the maturity needed to adequately support progress towards the SDGs.

1.3.1 Social transformation critical to achieving digital transformation

In a sector like tech which is largely unregulated, high-level commitments to human rights, decent work



essential for achieving digital transformation.

and ethical conduct are often the only canons holding companies socially accountable. A number of challenges for the tech sector - child digital rights, data privacy and ethical artificial intelligence (AI) - are core human rights issues. Encouraging companies to commit to human rights and assess their digital risks can have a significant impact on ameliorating some of the tech industry's biggest problems. The WBA Social Transformation indicators - the Core Social Indicators - have been integrated into this year's Digital Inclusion Benchmark (DIB). The Core Social Indicators add to giving a more comprehensive view of company performance by incorporating aspects such as human rights, decent work and ethical conduct into the benchmark. Notably, the top three companies on the Benchmark are also the top three in the Social Transformation assessment, which goes to show that a strong social transformation is



1.3.2 Minor improvement in performance but companies have far to go



For the 150 companies benchmarked last year, the average company score in digital inclusion went up by a mere 6.8% this year, from 33 to 36 (out of 100). Furthermore, only 26 out of the 200 assessed companies have a passing score of 50 or above on the benchmark, illustrating the huge progress needed in digital transformation by the remaining 174.

1.3.3 Global events influence companies' CSR performance

A number of companies initiated corporate social responsibility (CSR) activities in response to the COVID-19 pandemic as observed in the previous Benchmark (e.g. providing internet access or laptops to underprivileged students so they could continue lessons remotely or free access to education and

health websites). Many companies discontinued these initiatives in 2021, resulting in lower DIB scores. Out of the 38 companies identified with such initiatives in the last Benchmark, two dozen (63%) discontinued them, even though the initiatives were often aimed at vulnerable groups that continue to face social and economic challenges.

Companies continuing COVID-19 digital inclusion initiatives

The COVID-19 pandemic also brought with it a striking turn of events for the tech sector. With the lockdown and distancing measures, the world spent more time online and tech companies saw their businesses boom. However, the downturn in the global economy that followed is now affecting digital companies, as reflected by many announcing significant employee layoffs. This turn of fortune could impact outcomes in the next Benchmark with companies possibly cutting back on digital inclusion initiatives.

1.3.4 Mind the data gaps

While some digital companies are extremely transparent in their reporting, many are not.

Companies' opaqueness in reporting manifests itself in various ways.



For instance, some companies suggest that they provide a Global Reporting Initiative (GRI) disclosure but upon closer inspection, the response does not meet the requirement. Others appear to greenwash their emissions disclosures by listing the lower market-based figure and not their actual locationbased emissions, although guidelines call for both to be disclosed. Many use vague language to describe their commitments to topics such as artificial intelligence (AI) ethics, child online safety, cybersecurity and data privacy. Some report being compliant with national laws but do not go a step further, such as implementing a group privacy policy that treats all their stakeholders equally regardless of where in the world they are logging in from.

Fortunately, there is a group of companies leading the way with transparent reporting and going beyond



simple compliance, and in the process overturning the claim made by other companies that certain information is confidential.

1.3.5 Stakeholders can influence company behaviour

WBA Allies such as investors, civil society, think tanks, NGOs, international intergovernmental organisations



and others have been instrumental in supporting the Benchmark and driving forward impact. Their feedback has been significant particularly in the identification of priority topics such as women in tech, child online safety and ethical AI. The latter is notable as it is the focus of the Collective Impact Coalition (CIC) for Digital Inclusion. Investors and other stakeholders in the Digital CIC have been engaging with companies to encourage them to make a commitment to ethical AI. There has been notable progress coinciding with this collaborative engagement. Among the 100 digital companies from the first Digital Inclusion Benchmark (DIB), the number of companies with publicly available AI principles went up by only one between the first and second DIB (from 14 to 15 companies); it went up by 7 since the Digital CIC was formed at the start of

2022. In fact, 44 out of the 200 digital companies assessed this year now have publicly available ethical AI principles.

1.4 Results

The Benchmark results show room for improvement overall. The average score across all companies is 0.63, which is less than a third of the maximum possible score of 2 (Table 1.4). While telecommunication services companies have above average scores, IT services companies are lagging. When analysed by geography, companies with their headquarters in Europe take the lead in digital inclusion, while those headquartered in China show poorer performance. In fact, IT software and services companies and those with their headquarters in China perform below average in every measurement area (except innovation for IT software and services companies).

The Benchmark scores are not directly comparable to last year due to the incorporation of the Core Social Indicators and addition of 50 new companies. Using just the digital inclusion score and the 150 companies in the last Benchmark, the change between 2022 and 2023 was an increase of 0.07 points (or 10.8%) – showing companies are making some progress. However, at this rate of change, it will still take those 150 companies (which have higher scores than the 50 new companies) four years to reach a score of 1 out of 2 and ten years to reach a complete score of 2.

	Access	Skills	Use	Innovation	CSI	Total
All companies	0.53	0.48	0.73	0.83	0.57	0.63
By industry						
Hardware	0.46	0.43	0.66	0.92	0.66	0.62
Telecommunications	0.62	0.57	0.8	0.76	0.57	0.66
IT software & services	0.48	0.42	0.70	0.84	0.49	0.58
By geography						
Europe	0.61	0.62	0.86	0.94	0.72	0.75
Asia (excl. China)	0.61	0.53	0.81	0.86	0.62	0.68
Other	0.54	0.52	0.66	0.61	0.42	0.55
United States	0.50	0.44	0.72	0.95	0.64	0.65
China	0.32	0.24	0.44	0.50	0.19	0.34

TABLE 1.4: DIGITAL INCLUSION BY INDUSTRY AND GEOGRAPHY (0-2)

Note: Maximum score for each measurement area and for the total average is 2. For the full list of scores by company and indicator, see Tables 7.2 and 7.3.



The top 20 performing companies on the Benchmark are geographically diverse; eight are headquartered in the United States, seven in Europe and five in the Asia Pacific region (Table 1.5). Telecommunication services companies lead the list, followed by seven hardware companies and two IT software and services companies. One commonality between the top 20 companies is how long they have existed: the top 20 companies have a median age of 42 years compared to 30 for all 200 companies assessed. They also undertake robust reporting, with a strong focus on digital inclusion topics, and show greater engagement with the benchmark.

The incorporation of the core social indicators (CSIs) in this year's DIB impacts the results. While the majority of companies have a higher score on digital inclusion than CSI, four companies (AIS, Ericsson, HP and Telia) perform the other way around. It is also interesting to see which companies would not appear in the top 20 list if it were not for their CSI score: AIS, Ericsson and Vodafone. Conversely, Alphabet, Axiata, Huawei and Safaricom rank high in digital inclusion but score relatively low on the CSIs, leading to a fall in their overall DIB ranking.

In terms of industries, telecommunication services companies top the ranking – Telefónica (ranking 1st with a score of 85 out of 100), Orange (ranking 2nd with a score of 71) and Deutsche Telekom (ranking 3rd with a score of 68). One reason these telecommunications operators perform so well is that they are on the ground in the countries they operate in and thus in close proximity to the communities they serve. They continue to demonstrate leading practice in transparency, support for digital skills development and adoption of ethical artificial intelligence (AI). Notably, Thai-headquartered telecommunications operator AIS is the only company on the list not headquartered in a high-income economy and the only company that was not part of the original 100 assessed.

Of the 50 new companies benchmarked this year, the highest ranked were United States-headquartered IT software and services company HPE at 36th place (48 out of 100), French-headquartered IT software and services company Capgemini at 54th place (44 out of 100) and Dutch-headquartered semiconductor company NXP at 56th place (43 out of 100).

					Digital		
				Year	inclusion	CSI	DIB
Rank	Company	HQ	Industry	founded	score	Score	Score
1	Telefonica	Spain	Telecommunications	1924	89.0	70.0	85.2
2	Orange	France	Telecommunications	1941	72.3	67.5	71.3
3	Deutsche Telekom	Germany	Telecommunications	1995	67.5	67.5	67.5
4	Apple	United States	Hardware	1980	64.8	57.5	63.4
5	Microsoft	United States	IT Software & Services	1986	63.9	57.5	62.6
5	Cisco	United States	Hardware	1984	63.3	60.0	62.6
7	Samsung	Korea, Rep.	Hardware	1969	62.9	55.0	61.3
8	Dell	United States	Hardware	1984	62.7	55.0	61.2
9	Verizon	United States	Telecommunications	1983	61.3	60.0	61.1
9	HP	United States	Hardware	1947	60.1	65.0	61.1
11	Telstra	Australia	Telecommunications	1975	62.2	52.5	60.3
12	Telia	Sweden	Telecommunications	1853	57.9	67.5	59.8
13	Telenor	Norway	Telecommunications	1855	60.2	40.0	56.1
14	Singtel	Singapore	Telecommunications	1992	60.2	35.0	55.2
15	SK Telecom	Korea, Rep.	Telecommunications	1984	55.7	52.5	55.1
16	IBM	United States	IT Software & Services	1911	57.0	42.5	54.1
17	Qualcomm	United States	Hardware	1985	55.1	50.0	54.1
18	AIS	Thailand	Telecommunications	1986	52.4	57.5	53.4
19	Vodafone	United Kingdom	Telecommunications	1991	54.7	40.0	51.8
19	Ericsson	Sweden	Hardware	1876	48.4	65.0	51.8

TABLE 1.5: TOP 20 COMPANIES IN THE DIGITAL INCLUSION BENCHMARK

1.5 Introduction to the rest of the report

The rest of the report comprises five thematic chapters, selected based on high interest from stakeholders. They reflect the lessons learned over the three DIB iterations that have been conducted so far.



Chapter two looks at the assessment of online child safety in the Benchmark. It explores how the indicator may be modified to reflect a more holistic measure of child digital rights beyond just protection.

Chapter three explores women in tech. It discusses various gender-based elements used in the Benchmark, such as digital opportunities for women and girls and gender representation on the board and in tech roles. The chapter also analyses the challenge of a standard definition for women employed in technical roles in companies.

Chapter four builds on experiences of how companies should be assessed on ethical artificial intelligence (AI) and suggests how this can be enhanced for a more robust assessment.

Chapter five explores how the recent incorporation of a clean environment as a basic human right relates to digital hardware companies and their supply chains.

Chapter six looks at how economic, social and environmental impacts are measured by digital companies. It outlines current limitations as well as analyses how some companies integrate all three impacts into a single measure.

The list of the 200 digital companies is presented in the annex. More details, including company scorecards, are available on the benchmark website.⁶

⁶ https://www.worldbenchmarkingalliance.org/publication/digital-inclusion/



2 The rights of children online

2.1 Importance of child digital rights

Access to digital products and the knowledge to participate in online spaces can empower children. However, these opportunities need to be safe. Responsibility for ensuring that digital products and spaces are safe for children rests on digital companies. While parents, caregivers and teachers are also responsible for ensuring that children understand and navigate digital spaces safely, digital companies, through their actions and tools, are fundamental to safeguarding children's digital rights.

Child online safety is particularly important in terms of responsible business conduct. Just as child labour is of concern to most companies, so too should child digital rights be, as they are just as important. Childhood is a unique period of rapid development, and the negative impacts online manifest differently and more severely in children than adults. Unlike adults, children lack a public voice and are seldom consulted on issues that directly impact them. So, it is up to the builders and providers of these technologies to ensure that the products and spaces that children interact with and use are made with their safety in mind.

2.2 Company performance on child online safety

According to the United Nations Children's Fund (UNICEF), "Making a corporate commitment to respect and support children's rights is the first step of the ongoing journey to ensuring that a business complies with the law and respects children's rights wherever it operates. This commitment can be used to establish value through company policies and operations, products and services, and initiatives that promote the best interests of children."⁷

The benchmark assessed digital companies on whether they have made a high-level public commitment to child online safety. Only 13 out of the 200 companies have a high-level commitment, published in a policy document, on keeping children safe online, while 14 companies make some kind of statement either on a web page or their annual reports. Furthermore, only nine companies have strong commitments that go beyond just the company's products and are rooted in children's rights principles,⁸ taking the view that child safety is a fundamental human right and safety needs to be a collaborative process (Table 2.1).

	Company	Commitment text stated by the company	Source
1	Adobe	"Adobe is deeply committed to keeping children safe online"	Adobe's Commitment to
			Child Safety
2	América	"Contribute to the protection of children and teenagers online,	Human Rights Policy
	Móvil	and promote the responsible use of technology, so that children	
		can have access to information and knowledge without any risk	
		to their rights, personal data, privacy, physical or emotional	
		integrity, and/or online reputation."	
2	AT&T	"AT&T is committed to helping to safeguard children online,	AT&T's Human Rights
		including from the evolving risks of online predators and	<u>Policy</u>
		exploitation."	
3	Bharti	"We are also committed to function in a responsible manner to	Bharti Airtel Limited
	Airtel	protect minors"	Human Rights Policy
4	Elisa	"Elisa supports a common industry approach to child safety online	<u>Elisa Human Rights</u>
		and accepts that children require, due to their role in society,	<u>Policy</u>
		specific protection. () We support and are actively involved with	
		the development of the Rights of Children in Digital Services."	

TABLE 2.1: CHILD	ONLINE SAFETY	COMMITMENTS	GROUNDED IN	I HUMAN RIGHTS	PRINCIPLES
	•••••••	•••••••			

⁷ UNICEF. 2014. Children Are Everyone's Business: Workbook 2.0.

https://sites.unicef.org/csr/css/Workbook 2.0 Second Edition 29092014 LR.pdf ⁸ Save the Children, the UN Global Compact and UNICEF. n.d. *Children's Rights and Business Principles*. https://www.unicef.org/documents/childrens-rights-and-business-principles



	Company	Commitment text stated by the company	Source
5	MTN	"MTN has a zero-tolerance approach to the abuse and	MTN Transparency
		exploitation of children."	Report 2020
6	Singtel	"We take child online safety seriously and strongly support	<u>Human Rights</u>
		collective action to make the digital world a safer place for them."	<u>Statement</u>
7	Telefónica	"We are especially <i>committed</i> to protecting children and young	Telefonica Business
		people online."	<u>Principles</u>
8	Vodafone	"We are <i>committed</i> to upholding the rights of the child at all	Human Rights Policy
		stages of our business operations and seek to support children	<u>Statement</u>
		and their parents to become responsible digital citizens. () We	
		are a founding signatory of the GSMA Mobile Alliance Against	
		Child Sexual Abuse Content"	
9	Zain	"Zain is committed to actively promote and advocate for a safer	Zain Group Human
		internet environment for children and youth across its footprint."	Rights Policy Statement

Note: All links valid as of February 2023.

In respect to the overall results of the indicator on child online safety, ten companies received the highest possible score and they are all telecommunications operators. Telecommunications also has the highest average score compared to other industries (Figure 2.1, left). In terms of geography, European-headquartered companies have the highest average score (Figure 2.1, right). The Global Child Forum's (GCF) benchmark published last year assessed several sectors, including the tech and telecom sector, on their commitments and actions towards children's rights. While the electronics sector scored the highest on average, the telecommunications sector led on product safety, which the GCF attributes to "calls from consumers, legislators, and authorities, due to which the industry sees the value of mitigating risks with regards to children, and market opportunity with kids turning into online schooling."⁹



FIGURE 2.1: AVERAGE SCORES ON CHILD ONLINE SAFETY INDICATOR

Similarly, more can be expected from some other sectors, such as platform companies, where adolescents are active every day. Platforms like Instagram and TikTok both have a minimum age requirement for users (13 years). Engaging on these apps has become a daily habit for young people, and the concerning aspect is the impact on their mental health. While some studies have shown that engaging with friends on these

⁹ Global Child Forum. 2022. *The State of Children's Rights and Business: Technology & Telecommunications Sector*. <u>https://globalchildforum.org/wp-content/uploads/2022/02/GCF_TT_deep_dive_220225.pdf</u>



social media apps have led to a higher level of closeness, ¹⁰ studies from companies, like Meta, themselves have found that these apps may harm teens, especially teenage girls.¹¹

However, young people are not just interacting with close friends on these platforms; they can never be sure who they are interacting with when online. When the methodology for the first Digital Inclusion Benchmark (DIB) was developed in 2019, the number of reports of online child abuse in the United States alone was almost 17 million, including child sexual abuse material, child sex trafficking and online enticement. In 2021, the CyberTipline reported that they received around 29 million reports in the United States.¹² That is over ten million more reported cases within just two years, an 71% increase since 2019. And while these cases are reported in the United States, the problem is global, as most (93%) of those reports involve the upload of child sexual abuse material (CSAM) from outside of the United States. While these numbers show that there are more reports of CSAM today than two years ago, it also requires more explanation around whether this is due to increased reporting or whether in fact there is an exponential rise in online abuse, and whether companies' mitigation efforts in this area are insufficient.

2.3 Rethinking child digital rights

WBA's learnings over the last few years as well as engagement with allies active in child digital rights (e.g. Global Child Forum, UNICEF, etc.) has triggered a rethink of the way children's online safety should be assessed. The current eight elements for the indicator on child online safety are shown below. They can be classified into four categories: a policy commitment, protection measures, educational activities, and other.





¹⁰ Pouwels, J. L., Valkenburg, P. M., Beyens, I., van Driel, I. I., & Keijsers, L. 2021. "Social media use and friendship closeness in adolescents' daily lives: An experience sampling study." *Developmental Psychology*, 57(2), 309–323. <u>https://doi.org/10.1037/dev0001148</u>

 ¹¹ Zara Abrams. 2021. "How can we minimize Instagram's harmful effects?" *American Phycological Association News*, 2 December. <u>https://www.apa.org/monitor/2022/03/feature-minimize-instagram-effects</u>
¹² National Center for Missing & Exploited Children, "Our 2021 Impact" at: https://www.missingkids.org/content/ncmec/en/ourwork/impact.html#reduceexploitation



An example assessment is presented (Table 2.2) in order to provide more context to each element. The example presents the results for AT&T, one of the ten companies to obtain a perfect score on the indicator.

TABLE 2.2: AT&T	RESULTS ON	THE DIGITAL	CHILD SAFETY	INDICATOR
			CITED OVER ELL	

Element	Evidence
1.a High-level commitment to child digital safety	"AT&T is committed to helping to safeguard children online"
2.a Mechanism for reporting online harms to children	"If you witness content you believe to be child sexual abuse material, or if you observe any illegal activity involving children while using any AT&T service, please report it as soon as possible by emailing safeguardingYou also can make a report directly to the National Center for Missing and Exploited Children by visiting [] or by calling []"
2.b Cooperates with national and international authorities on reporting children online abuse	"AT&T is committed to cooperating with local, state and federal law enforcement in their efforts to protect children online and to pursue child predators and those engaged with online child sexual abuse material."
2.c Offers content control for its products	"To empower consumers to avoid some of the safety pitfalls of today's technology, we provide educational resources and services that help them personalize their internet experience and protect children and themselves from content they find inappropriate. The paid television services we offer, including HBO Max, also provide parental controls to help ensure viewers are watching programs appropriate for their age and maturity."
3.a Partners with third parties on child safety	"AT&T is a member of the WePROTECT Global Alliance, an international movement dedicated to ending child sexual exploitation and abuse online to make the digital world safer for children."
3.b Has a child safety website	"Our ScreenReady initiative shares tips and tools to help families manage their online experience, practice healthy digital habits and fully participate in today's connected world."
3.c Supports educational initiatives for child online safety	"The Family Online Safety Institute (FOSI) is an international non-profit working to make the online world safer for kids and families. With FOSI, we join leaders in the private, government and non-profit sectors to collaborate and develop solutions and policies in the field of online safety"
4.a Other initiatives related to child online safety	"In 2020, we established the AT&T Online Safety Committee In its first year, the Online Safety Committee launched an initiative to analyze companywide digital safety efforts and complete the UNICEF Mobile Operator Child Rights Self-Impact Assessment Tool."

The elements under the indicator tend to provide more scope for telecommunications or customer-facing companies in the tech sector to perform better than others. During engagement with companies in the benchmark that offer business-to-business (B2B) services, companies expressed the view that many of the indicator elements were not relevant to their type of business. Indeed, looking at the overall results for this indicator, more than half of the companies score zero. These are mainly hardware and business-oriented IT software and services companies.

While it is understandable that some of the indicator elements may not be relevant to some types of companies, their products are part of the value chain where children are interacting online (Figure 2.3). For instance, semiconductors are in mobile phones and computers that are used by children as well as those harming the rights of children; harmful content can be stored in data centres and on the cloud; and devices such as mice and storage devices are used by both children and those that would seek to do them harm. Hence all companies should, as a minimum, make a strong high-level commitment to children's digital rights, given that their products are part of the value chain that could cause harm, even if inadvertently. A number of companies report being against child exploitation in their environmental, social and governance (ESG) reports or on their web pages, but they do not make a high-level commitment to child digital rights



in a policy statement.¹³ A strong commitment reflects how seriously companies take the issue as well as whether they understand that child digital rights extend beyond protection.

FIGURE 2.3: CHILD ONLINE SAFETY VALUE CHAIN



The first two elements under 2. Protection are mechanisms for reporting child online abuse (2.a) and cooperating with authorities on the topic (2.b). Apart from the fact that these are mainly relevant to telecommunication operators, many countries have a national hotline to report online child abuse. Indeed, most of the telecom operators that received a score on these elements referred to a national hotline. The third element, content control, is relevant for all consumer-facing companies. This element had the highest number of positive responses at 72, including, besides telecommunication operators, most of the leading computer and smartphone vendors, and gaming and social media companies. Going forward, it is not clear whether the first two elements under the protection category are needed.

3. Education contains three elements related to informative actions for child safety. One element (3.a) asks companies if they partner with others on digital child. This can be relevant to achieving scale for raising awareness on the topic and implementing meaningful actions, particularly if companies do not have the resources to go it alone. The second element (3.b) asks whether the company has a child safety website. Experience has shown what is considered a child safety website varies. Some companies have a website about how to use their controls to protect children, while others disclose more educational information, such as on the steps parents can take to protect their children online. It is not clear how effective these websites are in enhancing child protection, particularly in the absence of impact metrics. The last element (3.c) under the education category asks if companies have educational initiatives for child online safety. Results on this varied, with some companies partnering with others, while other companies had their own programmes. Some reported metrics on participation. For example, Telenor's Bangladesh subsidiary partnered with UNICEF, training more than 250,000 children in 2021 in online protection and is working with the government and other stakeholders to integrate the programme content as part of the national school curriculum. Millicom reports that it trained 22,891 children, 112,737 teachers and 114,952 parents and caregivers in child online protection in 2021. It is useful to note that some of the companies support trainings in digital media literacy and safety features, which are covered under the basic digital skills indicator in the skills measurement area (Table 1.1).

¹³ A commitment in a policy document has different implications to a statement in company reporting, as policy documents are signed off a the highest level of the business and implemented through training, etc. See: Annabel Mulder. 2022. "Setting the tone at the top: the importance of policy commitments to human rights." *World Benchmarking Alliance Blog*, 27 July. <u>https://www.worldbenchmarkingalliance.org/news/setting-the-tone-at-the-top-the-importance-of-policy-commitments-to-human-rights</u>



There were a variety of actions classified in 4. Other: awareness raising through social media campaigns, having a child safety officer, working with regulators, etc. Two of the most relevant were child data privacy policy and impact assessments. Regarding child data privacy, some companies reported they did not collect personal information from children under 13 without parental consent. However, this is often to meet minimum regulatory compliance and not an adopted best practice since a number of jurisdictions already require this.¹⁴ Further, the age limit of 13 is questionable. In many countries, children cannot buy alcohol or tobacco until they are 16 or older, but their personal data can be processed at a younger age. Moreover, the age-verification method used by digital companies – simply providing an option to select if a user is of a certain age – may not be sufficiently robust.

The most relevant activity in the other category is conducting a child digital rights impact assessment. UNICEF's framework for integrating children's rights into core business practices considers carrying out an impact assessment as the second step after making a commitment.¹⁵ If companies conducted impact assessments specifically on the risks that their products and services pose to children, they might be more effective in mitigating them. UNICEF offers guidance to mobile operators on analysing and managing child rights risks as well as "how to build plans to enhance child rights management within the organization, including mitigating potential negative impacts both online and offline."¹⁶ Five telecommunications operators have used the framework for carrying out child rights assessments (Table 2.3).

Company	Assessment or mention of having carried out an assessment	Year
AT&T	Safeguarding Children	2020
Millicom	Assessing the Impact of Mobile Network Operators on Children's Rights: The Millicom Experience	2017
PLDT	Taking a stand on Online Child Protection (2021 Sustainability Report, p.45)	2021
Telia	Child Rights Impact Assessment	2022
Vodafone	Assessing our impact (Webpage)	2021

TABLE 2.3. COMPANIES	THAT HAVE CARRIED	OUT CHILD DIGITAL	RIGHTS IMPACT ASSESSMENTS

Child digital rights are viewed by many companies primarily as child online protection, and that being mainly from offensive and sexually oriented material created by others. However, the companies themselves have marketing and product practices that can infringe on child rights. A child rights impact assessment will help identify these practices and how to remediate them. One example is the way children's personal data is used. Apart from not collecting it without parental consent, the uses to which it is put can harm children. For instance, the use of personal data can facilitate the targeting of children through advertising. Websites and other digital services can be designed to intentionally encourage children to constant use. And in some cases, encouraging children to generate content might equate to a type of child labour.

Not only are many of these practices contrary to the UN Convention on the Rights of the Child, but they can also cause addiction, depression and other mental illnesses in children. Hence it is critical for digital companies to understand their impact on children and determine the actions they can take to remediate their practices that can cause harm as well as support children that have already been harmed. In short,

https://www.ftc.gov/business-guidance/privacy-security/childrens-privacy ¹⁵ UNICEF. 2014. *Children are Everyone's Business: Workbook 2.0.*

https://www.unicef.org/reports/mo-cria-child-rights-impact-self-assessment-tool-mobile-operators



¹⁴ Library of Congress. 2021. *Children's Online Privacy and Data Protection in Selected European Countries*. <u>https://iapp.org/media/pdf/resource center/us law library of congress childrens online privacy data protection</u> <u>in selected european countries.pdf</u> and Federal Trade Commission (US), "Children's Privacy" at:

https://sites.unicef.org/csr/css/Workbook 2.0 Second Edition 29092014 LR.pdf

¹⁶ UNICEF. 2021. MO-CRIA: Child Rights Impact Self-Assessment Tool for Mobile Operators.

companies should study how their digital practices affect children before they implement these processes and not after the damage has been done. ¹⁷

2.4 Conclusions

Assessment of child online safety needs to move to a broader level, from being viewed as just protecting children to a more holistic and positive message of ensuring their rights when they use digital technologies. A proposed revision to the indicator to reflect this perspective change is shown below (Figure 2.4). The indicator will be filtered so that while B2B companies will be expected to make a high-level commitment to child digital rights, they will not be scored on the other elements.

There is also an opportunity for the Digital Collective Impact Coalition (CIC) to engage with child digital rights, particularly given the lack of serious commitments by digital companies in this sphere.¹⁸ The impact that the multistakeholder Digital CIC has had on ethical AI has been impressive. It is particularly important to hold digital companies accountable through their high-level commitment, especially since relevant legislation in this area – apart from protection from offensive and sexual content and typically minimal regulations on child data privacy – are largely absent.



FIGURE 2.4: PROPOSED CHILD DIGITAL RIGHTS INDICATOR

¹⁸ See "Launch event for the Collective Impact Coalition for digital inclusion: Advancing ethical and responsible AI" at: <u>https://www.worldbenchmarkingalliance.org/news/ciclaunch-event</u>



¹⁷ Pedro Hartung. 2020. *The children's rights-by-design standard for data use by tech companies*. <u>https://www.unicef.org/globalinsight/media/1286/file/%20UNICEF-Global-Insight-DataGov-data-use-brief-2020.pdf</u>

3 Women in tech

3.1 Introduction

Digital inclusion supports the achievement of gender equality and the empowerment of women and girls. When women and girls equally access and skilfully use digital technologies, it opens them up to a new world of opportunities for learning and livelihood. As digital technologies increasingly underpin how we work and live, it becomes equally crucial for women to have a voice in shaping and creating these technologies, to ensure these do not perpetuate bias and discrimination. Digital companies, whether hardware, telecommunications, internet platforms or software services, are influential towards achieving digital inclusion of women and girls through the employment they provide, the research and development they undertake and the products and services they deliver globally.

There is still a notable digital gender divide. The International Telecommunication Union's Global Connectivity Report 2022 states that "the gender gap is narrowing in digital technology use, but a significant employment gap remains between men and women in technology occupations."¹⁹ According to the UN Women's Gender Snapshot 2022, women in science, technology, engineering and mathematics (STEM) count for only 35% of the global student population and just 3% of information and communications technology (ICT) studies, and professionally, they make up just 20% of the science and engineering workforce.²⁰ The World Economic Forum finds that there is a big difference between the number of women and men who have advanced technical skills, such as cloud computing and AI.²¹

Closing the digital gender divide requires changing social norms, as much of the bias against women in technology is perpetuated by societal expectations and stereotypes often reflected and reinforced by how the industry is portrayed today as a male-dominated one. It also requires digital companies to step up and contribute to preparing women and girls for the tech workforce, increasing the number of women in their tech teams and supporting women who are already in tech to remain and thrive in their roles.

3.2 Preparing women and girls for the STEM pipeline

Introducing girls and young women to STEM fields is a crucial step towards challenging sociocultural biases. Research has shown that cultural norms play an important role in explaining the gender gap in STEM fields.^{22,23} Although men are not always academically superior²⁴, the masculine culture prevalent in the sector makes women feel alienated despite their equal qualifications.²⁵ Children are often introduced to games, education and eventually careers that mirror and exacerbate societal biases early in their lives.²⁶ These differences become evident not only in unequal access to technology⁷ but also in the lack of a

²⁵ Cheryan, Sapna, John Oliver Siy, Marissa Vichayapai, Benjamin J. Drury, and Saenam Kim. 2011. *Do Female and Male Role Models Who Embody STEM Stereotypes Hinder Women's Anticipated Success in STEM?* Social *Psychological and Personality Science* 2, no. 6: 656–64. <u>https://doi.org/10.1177/1948550611405218</u>

²⁶ Ardies, Jan, Eva Dierickx, and Carisse Van Strydonck. 2021. *My Daughter a STEM-Career? "Rather Not" or "No Problem"? A Case Study*. European Journal of STEM Education 6, no. 1: 14. https://doi.org/10.20897/ejsteme/11355

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 ¹⁹ ITU. 2022. Global Connectivity Report <u>https://www.itu.int/hub/publication/d-ind-global-01-2022/</u>
²⁰UN Women. 2022. Progress on the Sustainable Development Goals: The Gender Snapshot 2022
<u>https://www.unwomen.org/sites/default/files/2022-09/Progress-on-the-sustainable-development-goals-</u>

the-gender-snapshot-2022-en 0.pdf

²¹ World Economic Forum. 2021. *Global Gender Gap Report 2021 Insight Report*. <u>https://www.weforum.org/reports/global-gender-gap-report-2021</u>

²² Delaney, Judith M., and Paul J. Devereux. 2022. *Gender Differences in STEM Persistence after Graduation*. Economica 89, no. 356: 862–83. <u>https://doi.org/10.1111/ecca.12437</u>

 ²³ Cheryan, Sapna, Sianna A. Ziegler, Amanda K. Montoya, and Lily Jiang. 2017. Why Are Some STEM Fields More Gender Balanced than Others? Psychological Bulletin 143: 1–35. <u>https://doi.org/10.1037/bul0000052</u>
²⁴ Delaney, Judith M., and Paul J. Devereux. 2019. Understanding Gender Differences in STEM: Evidence from College Applications. Economics of Education Review 72: 219–38. https://doi.org/10.1016/j.econedurev.2019.06.002

female tech workforce within digital companies today. The awareness of the need to encourage women and girls towards careers in STEM is evident in the programmes we see across the digital companies in the benchmark.

Approximately half (101) of the 200 digital companies in the benchmark have at least one initiative targeted towards providing digital access or teaching digital skills to women and girls (Figure 3.1). Of the 101 companies, 75 deliver the programme through or with external partners, usually non-profit organisations or sometimes other companies. The most common partnership was found to be with organisations that aim to close the gender gap in tech by exposing girls to STEM subjects through summer camps, clubs and mentoring. Moreover, the non-profits that companies were found to partner with in this year benchmark similar to the previous benchmark's findings as well.²⁷ Other programmes aim to provide digital literacy training for women and yet others train women on career breaks with advanced digital skills to enter or reenter the technical workforce. Of the 101 companies, 39 had more than one programme to support digital inclusion of women and girls.

The 200 companies benchmarked this year show a similar performance on the digital inclusion indicator compared to the previous years. The hardware industry continues to lead with the highest rate of companies having targeted digital inclusion initiatives for women and girls, while IT software and services companies lag behind (Figure 3.1). However, though hardware companies might have the most programmes, telecom companies are amongst the best performers when disclosure on participation and impact metrics is taken into consideration. In terms of overall performance, Tata Communications continues to hold first place with Jio following closely behind (Table 3.1). It is important to note that both of these companies belong to the telecom services sector and have been benchmarked since the first iteration of the Digital Inclusion Benchmark (DIB). However, VMWare, an IT software and services company assessed among the 50 new companies for the first time this year, comes in third. This is notable as a majority (31) of the 50 new benchmarked companies show no evidence of any programme related to this indicator.

Similarly, when looking at the geographical spread of the performance on the digital inclusion indicator this year, the United States continues to lead (with 70% of companies in the region having such initiatives) and Europe follows closely behind (with 63%). Asia (33%) and China (16%) continue to have the lowest proportion of companies with initiatives related to digital inclusion of women and girls. The United Nations Educational, Scientific and Cultural Organization (UNESCO) and the International Association for the Evaluation of Educational Achievement (IEA)²⁸ conducted a study in high- and middle-income countries on the differences between genders and their career aspirations in STEM and found that girls are mostly lacking encouragement and role models to confidently pursue careers in STEM. A strategy that prioritises STEM programmes for girls and then exposes them to tech careers through role models seems to work well in the context of Europe and the United States.

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 ²⁷ World Benchmarking Alliance (WBA). 2022. Digital Inclusion Benchmark 2021 Insight Report
²⁸ Hencke, J., Eck, M., Sass, J., Hastedt, D., & Mejia-Rodriguez, A. 2022. Missing out on half of the world's potential: Fewer female than male top achievers in mathematics and science want a career in these fields. IEA Compass: Briefs

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FIGURE 3.1: COMPANIES WITH AN INITIATIVE FOR DIGITAL INCLUSION OF WOMEN AND GIRLS, 2021



UNESCO also conducted a similar study on the gender barriers for girls pursuing STEM in Asia²⁹ (particularly in India, Indonesia, Kazakhstan, Lao, Malaysia, Singapore and Vietnam) and reached similar conclusions to the ones for the study in high- and middle-income countries; that sociocultural, psychological and pedagogical barriers are responsible for the lack of confidence in girls to take up STEM careers. While generalising these results for the entire region must be cautioned, the insights are helpful; they explain that girls everywhere face similar challenges in pursuing STEM education and careers. Therefore, STEM programmes that have proven to be impactful should be replicated around the world and not be concentrated only in some regions as this would exacerbate the digital gender divide.

The benchmark assessed companies not only on having a programme to support digital inclusion of women and girls, but also on tracking and disclosing metrics for programme participation and impact. STEM camps or Tech Days are common ways that companies have brought together women and girls to introduce them to the technology field. However, these programmes tend to last only a few days and their long-term objectives are often unclear. Tracking programme participation and conducting impact assessments helps evaluate whether the programmes are having the intended impact on the lives of the participating women and girls and consequently helps decide whether these programmes should be continued or not.

The benchmark also assessed companies according to the type of digital inclusion programme they had. Companies scored higher if they actively participated in their own programme and if it was an ongoing programme continuing throughout the year. On the other hand, companies with one-off programmes lasting a day or week or companies that provided funding to a programme without active participation were scored lower. Similarly, companies that provided programme details on when the programme started, whether it is delivered in multiple locations and whether it targets vulnerable groups among women and girls were also scored higher. Companies that score the highest on this indicator are the ones that disclose programme participation and impact metrics and have taken the additional step to conduct a third-party impact assessment. Only four companies conducted third-party impact assessments for their programmes for women and girls in this year's benchmark.

The table below lists the top ten performers in supporting inclusivity for women and girls. The top two are headquartered in India, seven in the US and one in Europe. These top companies have been operating their

²⁹ UNESCO. 2020. STEM Education for Girls and Women: Breaking Barriers and Exploring Gender Inequality in Asia <u>https://unesdoc.unesco.org/ark:/48223/pf0000375106</u>



programmes for several years, with the newest programme starting in 2020. Among these programmes, Qualcomm's programme *Aqriti* deserves a special mention. Aqriti is a community outreach programme that provides underserved girls in India access to STEM education and also addresses community perceptions on gender equality.³⁰ The programme provides STEM labs, learning tools and tech mentorship to girls in these communities, as well as scholarships to pursue higher education in STEM. Additionally, it creates awareness among families of the importance of education for girls.

TABLE 3.1 TOP TEN COMPANIES BY DIGITAL OPPORTUNITIES FOR WOM	EN
AND GIRLS INDICATOR	

Company	Programme	Year started	Score out of 2	Sector
Tata Communications	MPowered	2015	1.9	Telecommunications
Jio	Women Connect Challenge	2020	1.8	Telecommunications
VMWare	VMInclusion Taara	2018	1.6	IT Software & Services
Apple	Apple Entrepreneur Camp for Female Founders	2019	1.5	Hardware
Dell	Girls Who Game	2019	1.5	Hardware
НР	HP LIFE	2019	1.5	Hardware
IBM	STEM for Girls	2019	1.5	Telecommunications
Millicom	Conectadas	2017	1.5	IT Software & Services
Qualcomm	Aqriti	2017	1.5	Hardware
Telstra	Safe Connections	2016	1.5	Telecommunications

While there are companies in the benchmark like the ones above that are actively participating in delivering programmes directly or in partnership with non-profits, there are also several companies that donate money to organisations that are already running digital inclusion programmes, trusting them to make an impact in the lives of women and girls. Indeed, instead of trying to come up with a flagship programme internally, a more effective way to contribute to the digital inclusion of women and girls could be to fund existing programmes that are dedicated to this cause.

TABLE 3.2: COMPANIES REPORTING THEIR FINANCIAL CONTRIBUTION IN SUPPORT OF DIGITAL INCLUSIVITY FOR WOMEN AND GIRLS

Company	Non-profit supported	Financial contribution USD (year of donation)
Adobe	Reboot Representation	500,000 (since 2018)
Applied Materials	Generation Girl*	1,800,000 (since 2020)
AT&T	Girls Who Code	9,000,000 (since 2012)
ByteDance	Fundação Tide Setuba	240,000 (since 2021)
Equinix	World Pulse	240,000 (since 2015)
Logitech	Girls Who Code	300,000 - (in 2021)

*Generation Girl is an initiative of the Applied Materials Foundation that provides grants to non-profits like <u>Code2College</u>, <u>Girlstart</u>, <u>techbridge girls</u> and more.

https://www.qualcomm.com/company/corporate-responsibility/empowering-digital-transformation/stemeducation/community-partnerships



³⁰ Qualcomm. STEM Community Partnerships: Our STEM Giving programs support organizations that deliver effective STEM education to learners of all ages and backgrounds.

More than half of the companies (62 out of 100) that were assessed to have a programme for women and girls in this year's benchmark belong to the first batch of 100 companies assessed in the first DIB in 2020 (Figure 3.2). Between 2019 and 2020, progress among the 100 companies on their digital inclusion initiatives for women and girls was significant. Between 2020 and 2021, there is an increase in the number of companies with programmes for women and girls, but it is not as significant. Digicel, MTN, Telecom Italia and Western Digital were some of the companies that started new programmes in 2021, whereas Baidu, Jumia and PCCW were some that discontinued theirs. Nevertheless, there is a slight upward trend among the original 100 companies from the first DIB that is encouraging to see.

FIGURE 3.2: COMPANIES THAT SUPPORT INITIATIVES FOR DIGITAL INCLUSION OF WOMEN AND GIRLS, DIB 100



Note: The figure above shows the growing percentage of the 100 companies assessed in the benchmark since 2020 that support programmes for digital inclusion of women and girls.

2.5 Technical skills for women

While the majority of companies tend to have one-off initiatives that introduce young girls to STEM fields through exposure to STEM activities, careers or other women in STEM, there are a handful of programmes that are targeted towards building technical skills among women who are currently working. While we may not be able to see the results of the STEM-related programmes for girls immediately, equipping working women with advanced digital skills they can directly apply to their roles in tech teams has an immediate effect, helping them kick-start or further their professional journey as women in the current tech field. Some programmes assessed in the benchmark that stand out by offering such an opportunity to currently working women are Cisco's Laboratoria and VMWare's Taara.

Cisco partners with Laboratoria, a Latin American non-profit that offers soft and hard skills training for women interested in entering or upgrading their careers in the tech field. In the last four years, more than 1,000 women in Brazil, Chile, Mexico and Peru have graduated from the programme and 80% have found jobs in digital companies.³¹ The company also tracks and reports the number of female participants in its flagship programme Cisco Networking Academy, which is one of the earliest IT skills-to-job training programmes in the industry. The programme has reached 17.5 million students in 190 countries since 1997,

³¹ Cisco. CSR Community Partners: *Connecting Female Tech Talent From Latin America to the World*. <u>https://www.cisco.com/c/en/us/about/csr/community/partners/laboratoria.html</u>



and 26% of the students have been female.³² This year, Cisco reported that 26% of the instructors in the Networking Academy are female as well.

Another example is VMware, which has one of the largest upskilling programmes for women in India who used to work in the tech industry but are on a career break or who graduated at least six months ago and have not found employment. By the end of 2021, the VMInclusion Taara programme had 18,000 registrants and more than 3,500 candidates started or returned to their careers in tech.³³

Only a few of the programmes supported by the digital companies are focused on teaching technical digital skills like coding and programming to women to help them step into tech teams. These programmes are an important step in helping women transition into a career in tech. However, the journey does not stop there as staying and growing within these teams can be a challenge for women. With this in mind, the benchmark also tracked companies' disclosures of the number of women in their tech teams, and the story remains the same year this year as in the previous years: there are still not enough women in tech.

3.3 Women's representation in digital companies

2.5.1 Technical roles

Women's representation is important at all levels in a company. For a digital company, women's representation is even more important in the tech teams that build products and services. Increasing the number of women involved during the design process is more than a matter of representation; it also leads to more innovation in the development of digital products and services.^{8,9} The benchmark therefore assesses if companies disclose the number of women in their tech teams as well as in their research and development (R&D) teams.

In 2021, just over a third of the companies (78/200) in the benchmark reported the number of women in technical/engineering as well as R&D roles. Of the 78 companies, 70 reported the number of women in technical/engineering roles and only eight reported the number of women in R&D.³⁴ The average proportion of women in technical as well as R&D teams in the 78 companies that reported the figure was around 23%, similar to the benchmark's finding the previous year. This shows there is still a long way to go towards gender parity in tech teams in digital companies. Some companies include 'product development' in their count of technical roles, so R&D roles may be captured within the figures for technical roles. But it is still discouraging that most digital companies do not disclose the proportion of women in their technical and R&D teams.

³⁴ World Benchmarking Alliance (WBA). 2022. *Digital Inclusion Benchmark 2021 Insight Report* <u>https://assets.worldbenchmarkingalliance.org/app/uploads/2022/03/2021-Digital-Inclusion-Benchmark-Insights-Report-March-2022.pdf</u>



³² Cisco. 2022 Cisco Purpose Report. <u>https://www.cisco.com/c/dam/m/en_us/about/csr/esg-hub/_pdf/purpose-report-2022.pdf</u>

³³ VMWare. 2022. 2022 Diversity, Equity and Inclusion Report.

https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/company/vmw-annual-report-2022.pdf



FIGURE 3.3: COMPANIES REPORTING SHARE OF WOMEN IN TECH ROLES, 2021

Like previous years, the rate of companies disclosing the number of women in tech roles is by far the highest among companies headquartered in the United States. Moreover, 42 out of the 64 US-headquartered companies disclosing this figure reported an average of 24% of women employees in tech roles. China continues to lag behind other regions in disclosing this figure; two out of the 25 Chinese companies in the benchmark report the number of women employees in tech. While some digital companies are making slow but continuous progress in increasing the number of women in the overall workforce (AIS, Lumen, Netflix, Safaricom, Seagate and Western Digital report over 50% women employees), the same speed is lacking when it comes to the share of women in tech roles.

Industry trends in reporting of the number of women in tech roles also remains similar to last year, with hardware companies leading, even though the percentage of companies reporting this figure in the hardware industry decreased from last year; 58% of hardware companies reported this figure last year compared to 53% this year. This may be because many of the 50 new companies that were benchmarked for the first time this year belong to the hardware industry, and only 11 of them reported this figure. Disclosure of the number of women in tech increased among companies in the IT software and services industry; last year 37% of the companies in this industry reported the number of women in tech roles compared to 49% this year.

For the 70 companies that reported the proportion of women in tech roles, the average number of women tech employees shows no improvement from last year and stays still at 23%. It is also interesting to observe the trends in the reporting of this figure among the 100 companies benchmarked since the first DIB in 2020 (Figure 3.4). Disclosure of the number of women employees in tech roles has increased among the original 100 companies that were benchmarked. While only 34 of the 100 companies benchmarked in 2020 reported the number of women in tech roles, this number increased to 39 of the 100 companies reporting the figure last year and 43 companies disclosing the figure this year. Moreover, at least one of the companies directly attributed engagement with the DIB as the reason for disclosing this figure in their 2021 report. It is also notable that of the 43 companies (out of the original 100) that disclosed the figure this year, 32 engage with the benchmark.

Digital Inclusion

FIGURE 3.4: COMPANIES REPORTING WOMEN EMPLOYEES IN TECH ROLES, 2019-2021



Note: The figure shows the percentage of companies from the original 100 benchmarked companies that disclose the number of their women employees in tech roles.

The lack of disclosure of women in tech roles was a topic of discussion during engagement on the benchmark with companies in the Community of Practice (CoP). Companies expressed that a challenge they faced was the lack of a shared standard definition of 'technical roles', which makes it difficult to categorise employees using that term within the company, leading to scattered and incomparable disclosures of women in tech roles across the industry. Some companies also highlighted that the real challenge was retaining the women in those technical teams. A question to ask is whether women, once hired in tech teams, are provided enough support to retain them and help them grow in those teams. Research by McKinsey and the non-profit organisation Girls in Tech found that the trend of promoting women at a slower rate than men is more pronounced for women in tech teams.³⁵

However, despite the lack of a standardised definition for categorising technical roles, some companies have shown leading practices in not only defining technical roles, but also setting targets to increase the number of women in these roles in the company. Alphabet, for example, reports the number of women in technical roles and also reports attrition data for men and women by region for tech and non-tech employee categories.³⁶ It also reports gender disaggregated data on the number of people hired in tech and non-tech categories.

Yandex, an internet services company headquartered in Russia, discloses the number of women in their technical teams, but also reports the number of women who applied for a technical role in the company and the number of those women who were offered the job.³⁷ The transparency of this single company on the recruitment figures for women in technical roles already helps to explain how many women may be applying to tech jobs and how many are then able to secure one. The ability to observe this trend for more

https://static.googleusercontent.com/media/about.google/en//belonging/diversity-annual-

docs.s3.yandex.net/sustainability/2021%20Yandex%20Sustainability%20Progress%20Report%20ENG.pdf



³⁵ McKinsey & Company. 2022. *Repairing the Broken Rung on the Career Ladder for women in Technical Roles*. <u>https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/repairing-the-broken-rung-on-the-career-ladder-for-women-in-technical-roles</u>

³⁶ Google. 2022. *Google Diversity Annual Report*

report/2022/static/pdfs/google 2022 diversity annual report.pdf?cachebust=1093852#page=67 ³⁷ Yandex. 2021. *Yandex Sustainability Report.* <u>https://ir-</u>

digital companies will provide a deeper understanding of how many women are trying to enter the tech workforce.

Intel also shows leading practice as it tracks and sets targets to increase the proportion of women in technical positions in the company.³⁸ Currently, 24.9% of the technical roles at Intel are held by women and the company commits to advance women's representation in technical positions to 40% by 2030. To meet its goals, it plans to implement targeted programmes to increase the number of women hired and has set a goal to increase women hires for technical entry-level roles to at least 30%.

This level of disclosure by all companies will provide a clearer picture of the current status of women in tech roles and consequently a better idea of what must be done in order to increase women's representation in these teams. However, while there is no standard definition for technical roles, companies will continue to make up their own rules to define these roles and disclose the proportion of women employed in such roles. To create a standard practice in this area that can allow for benchmarking as well as enable companies to better understand their performance in relation to others, the DIB proposes to provide a definition and offer guidance on when to consider someone as working in a technical role.

3.3.1 Defining women in technical roles

Of the 200 companies benchmarked this year, 70 provide a gender breakdown of their technical workforce with 33 different definitions used to determine the number of women in tech roles. Some of the definitions used by the companies are based on those provided by organisations that work for gender equality, such as AnitaB,³⁹ while other companies adopted definitions established by national authorities. The most prevalent definitions were broad term categories such as 'tech staff' and STEM' without any further clarification of what those categories encompass. A regional trend can also be observed since companies headquartered in the United States use the category 'tech staff' more often, while other companies, particularly those headquartered in Asia, use 'STEM related positions' to describe their technical workforce.

Undoubtedly, legislation that requires gender disclosure of employment figures influences digital companies to report these numbers. Nevertheless, there are important differences when considering government definitions. Australia and the United States are both examples of countries with legislation regarding gender employment disclosure. Both countries provide standard definitions for people in tech roles; Australia defines this category as 'professionals, scientific and technical services' and the US defines it as 'technicians'. In the US, however, the methodology for categorising 'technicians' changed in 2018 and most tech-related occupations were reassigned to other professional categories (computer network support specialists, software developers, etc.).^{40,41}

Companies headquartered in the United States are increasingly revising their definitions of women in technical roles and disclosing these in their diversity and inclusion reports. These definitions therefore include all information technology (IT) roles. For instance, PayPal includes employees in engineering, IT and technology operations when reporting women in tech. Zoom has a wider understanding of women in tech, which includes employees whose primary duties include the application of systems analysis techniques and

⁴⁰ US Equal Employment Opportunity Commission. *EEO-1 Component 1 Job Classification Guide*. <u>https://www.eeoc.gov/sites/default/files/migrated_files/employers/eeo1/jobclassquide.pdf</u>

⁴¹ The EEO Commission defines technicians as 'occupations requiring a combination of basic scientific knowledge and manual skill which can be obtained through two years of post-high school education, such as is offered in many technical institutes and junior colleges, or through equivalent on-the-job training.' See: US Equal Employment Opportunity Commission. *Appendix 1 Glossary/Definitions*. <u>https://www.eeoc.gov/federal-</u> sector/reports/appendix-i-glossary-definitions-0



³⁸ Intel. 2022. Corporate Responsibility Report. <u>https://csrreportbuilder.intel.com/pdfbuilder/pdfs/CSR-2021-22-</u> <u>Full-Report.pdf</u>

³⁹ AnitaB's definition is: "...the technical workforce as all technical occupations in computing and information technology, all occupations that require deep technical specialization and knowledge, as well as managers, directors, and executives who oversee technical employees and the development and delivery of technical products. Additionally, the workforce is defined by position, not department." See: <u>https://anitab.org/research-and-impact/top-companies/instructions/definitions</u>

procedures, or the design, development, documentation, analysis, creation, testing or modification of applications, programs and software. Among US-headquartered companies, 15 define women in tech as 'tech roles', requiring more analysis to understand what the definition includes. One caveat of both PayPal's and Zoom's definitions is that they can be applied to women working in the sciences but in a field outside the scope of the digital sector. There is a real need for a sector-specific definition that allows monitoring progress around the goal of achieving gender equality in the tech sector specifically.

Other organisations have tried to tackle this same issue. The International Telecommunication Union (ITU) has an industrial approach to this definition, which includes women in STEM and ICT,⁴²but also includes women who use ICT.⁴³ The International Labour Organization (ILO) uses the definition proposed by the Organisation for Economic Co-operation and Development (OECD) for women in tech. The OECD definition includes women workers with a science and technology background, and women in computer science, engineering and technology-oriented jobs.⁴⁴ The non-profit organisation AnitaB.org has a thorough methodology to define women in technology, which considers dimensions of skills and career level. AnitaB also provides insights around performance of companies regarding this topic. AnitaB's framework gives a more flexible and comprehensive conceptualisation of tech roles. In the DIB, 16 out of the 33 unique definitions for women in tech provided by companies can be classified under the AnitaB framework.⁴⁵

The DIB proposes a sector-specific definition for women in tech that borrows from AnitaB.org while also considering the benchmark learnings from the past three years. The definition is based on the following considerations: First, the definition should not reinvent the wheel but allow for existing definitions used by companies for 'women in tech' to be easily incorporated. While 'STEM field' is still too broad a term to serve as a definition, our research showed that 19% of the reporting companies use the term 'STEM' to describe their technical workforce. Therefore, we see value in incorporating this category in our data collection while encouraging companies to elaborate on how they are categorising their teams in tech roles. Second, the definition should be specific enough to capture women that have a direct impact in the digital sector. This would exclude some government interpretations, for example, the one detailed by the US government that describes technicians since it also allows for the inclusion of a workforce unrelated to the digital sector. **Third**, the definition should allow for the inclusion of women in tech at all levels, including management and leadership.

The DIB proposal for defining women in tech is as follows:

A woman in (a) engineering, design, R&D; (b) IT engineering and support; and (c) management and leadership within technical teams.

3.3.2 Highest governance body

The ultimate objective of company initiatives for digital inclusion of women and girls is to prepare them not only for the current and future job market, but also to lead them to a career in tech companies. The integration of the core social indicators (CSIs) into the latest iteration of the DIB provides a different perspective to the representation of women in digital companies.

The data collected on the proportion of women in the highest governing body in digital companies – usually the board of directors – shows that only seven out of the 200 companies have at least 50% representation of women on the board (Table 3.3). Out of the companies with 50% or more women on the board, all except two are headquartered in Europe while 5 are telecommunications companies and 1 each from hardware and IT software and services.

⁴⁵ Most of the definitions used by companies fell under the categories of "Engineering R&D and Design" (7) or "IT Engineering and Support" (9).



 ⁴² ITU. Gender Equality Webpage. Mainstreaming a Gender Perspective in ITU and Promoting Gender Equality and the Empowerment of Women Through ICTs. <u>https://www.itu.int/en/action/gender-equality/Pages/default.aspx</u>
⁴³ ITU. 2022. *Bridging the Gender Divide*. <u>https://www.itu.int/en/mediacentre/backgrounders/Pages/bridging-the-gender-divide.aspx</u>

⁴⁴ OECD. 2008. Gender and Sustainable Development – Maximising the Economic, Social and Environmental Role of Women. <u>https://www.oecd.org/social/40881538.pdf</u>

Company	% of women on the board	Headquarters	Industry
Tele2	57%	Sweden	Telecommunications
Deutsche Telekom	50%	Germany	Telecommunications
KPN	50%	Netherlands	Telecommunications
Micron	50%	United States	Hardware
SAP	50%	Germany	IT Software & Services
Telenor	50%	Norway	Telecommunications
Telstra	50%	Australia	Telecommunications

TABLE 3.3: COMPANIES WITH AT LEAST 50% OF WOMEN ON THE HIGHEST GOVERNING BODY

192 of the companies disclose the gender representation of their highest governance body. The average figure across the group was 25%. Twenty companies have an all-male highest governance body. An interesting finding is that the most common reported figure was 33% reported by 24 companies (Figure 3.5). This may not be a coincidence, since there is a global campaign to increase women's representation in corporate leadership to a minimum of 30%: the 30% Club.⁴⁶ Since the campaign was started in 2010, there has been growing progress. It may now be time to set a more ambitious target and push for gender parity on boards.





Note: The figure above presents the number of companies grouped by the percentage of women they report having on their highest governance body. A total of 192 out of the 200 benchmarked companies disclose a gender breakdown of their highest governance body. The most often reported figure was 33% reported by 24 companies.

While there are several studies on the business case for having more women on the board, the case for gender diversity on the board should be simpler and more fundamental than that. Digital companies have significant power to influence lives around the world so it is critical that the people around the tables where decisions are being made also reflect the diversity of the world that we live in.

⁴⁶ 30% Club Webpage. *Where We Are*. <u>https://30percentclub.org/where-we-are/</u>



2.6 Conclusion

The finding that there are not enough women in tech has been a recurring one in the DIB over the last three years. The DIB attempts to assess digital companies' role in ensuring that the future of tech looks different for women, both for those inside the teams that build technology in these companies and also for those using and benefitting from these technologies to fully participate in an increasingly digital world.

Companies have an important role to play in narrowing the digital gender divide and the benchmark results are optimistic in showing that more companies have programmes to make digital technologies more accessible to women and girls today than they did three years ago. Similarly, while a standardised definition for reporting women in technical roles is seen as a challenge by companies, over the three years, more companies have disclosed the number of women in their technical teams.

The digital inclusion of women requires more than companies' corporate social responsibility programmes; it also requires them to make space for women to enter, stay and grow in the teams that design and build their digital products and services. Therefore, after three years of assessing companies on their efforts towards digital inclusion of women and girls through several indicators covered in different measurement areas in the DIB, a proposed revision to the methodology is suggested below. The revision will consolidate all the women-related elements into one indicator in a more targeted approach to assess companies' efforts towards digital inclusion:

- Digital access programmes for women:
 - Programmes currently found in A2 (The company supports digital inclusivity for women and girls) focused on women
- Digital skills programmes for women:
 - Programmes currently found in the area of skills development but focused on women.
- Representation of women in the company
 - Recruitment numbers for women employees overall and for women employees in tech roles
 - $\circ~$ Attrition numbers for women employees overall and for women employees in technical roles
 - Women in tech disclosures Disclosures on the number of women in technical roles currently at the company (additional points for a definition for this category)
 - Setting targets for women employees overall and for women employees in technical roles
- Support for women in tech
 - Internal programmes to help women in tech grow and remain in the company
 - External programmes company support for women-led start-ups and businesses



4 Assessing company performance on ethical artificial intelligence

Artificial intelligence (AI) can play an important role in achieving the United Nations Sustainable Development Goals (SDGs). But AI also carries huge human rights and other risks that can cause serious harms if developed without careful scrutiny, transparency and commitment to ethical principles. Concerns over the launch of ChatGPT in November 2022 has magnified existing concerns about the potential dangers of AI⁴⁷ resulting in a push by some to pause its development.⁴⁸ Holding companies accountable for the way they develop and use AI has become more critical than ever.

Assessment of company support for ethical AI has been a significant learning experience for WBA since the launch of the first Digital Inclusion Benchmark (DIB). This chapter explores elements related to ethical AI in the benchmark, current status of companies with ethical AI principles and progress over time and suggestions for strengthening the assessment.

4.1 AI benchmark elements

Al ethics is not in itself an indicator in the benchmark, but it comprises several elements within indicator 1.4 in the innovation measurement area (Table 1.1): 'The company applies inclusive and ethical research and development.' Four elements in indicator 1.4 are related to ethical Al (allocated score in parentheses):

- 1. Company has a publicly available ethical AI framework (0.25)
- 2. Al framework includes human rights considerations (0.25)
- 3. Company has a committee dedicated to ethics (0.10)
- 4. Committee explicitly considers ethics in R&D/AI (0.15)

Learnings from the first benchmark suggested enhancements that could be made to these ethical AI elements. However, it was just as important to keep the elements unchanged to enable tracking of year-onyear company performance. Nevertheless, after three benchmark iterations, feedback from various stakeholders has confirmed that there are other AI elements that need to be considered. Furthermore, subtleties have arisen in the reporting on AI ethics making comparisons between companies difficult with the current AI elements. It is important to note that during the benchmark assessment, additional elements relating to ethical AI are also collected, even though they are not in the scoring guidelines (e.g. date of AI principles and whether the principles are the company's own).

The following sections describe each of the four ethical AI elements that are currently part of the benchmark assessment. Learnings from companies' current reporting and from the assessment are discussed for each of these.

4.1.1 Company has a publicly available ethical AI framework

As part of the benchmark assessment, companies are asked if they have a publicly available framework for ethical AI. The AI frameworks typically relate to principles that companies report they follow. Beyond the standard FAT (fairness, accountability and transparency)⁴⁹, companies identified a range of other principles (Figure 4.1).

Several issues have affected assessment of this element. One has been whether the framework should be a standalone document. The benchmark has taken a lenient approach, accepting ESG reports or other company documents which, even though not they are not specifically about AI, contain the principles the

⁴⁹ https://www.fatml.org



⁴⁷ Gary Marcus. 2022. "AI Platforms like ChatGPT Are Easy to Use but Also Potentially Dangerous." *Scientific American*, 19 December. <u>https://www.scientificamerican.com/article/ai-platforms-like-chatgpt-are-easy-to-use-but-also-potentially-dangerous</u>

⁴⁸ See Future of Life Institute, "Pause Giant AI Experiments: An Open Letter" at: <u>https://futureoflife.org/open-letter/pause-giant-ai-experiments</u>

company follows. One challenge with this is that unless the company reproduces the same text about ethical AI each year, the relevant sections in the report or the relevant documents need to be located anew each year. Revisions to the text also become difficult to track.

Another issue is whether to accept if a company follows regional or national guidelines for ethical AI; here too the benchmark has been lenient and accepted if this is the case.⁵⁰ A third issue is whether the principles are followed at the group level. Some companies have provided ethical AI principles for a subsidiary on the grounds that it is the subsidiary carrying out AI research. This has also been accepted in the benchmark assessment so far. A fourth issue is consideration of a generic approach to ethical technology. This looks at whether the company applies ethics across all its tech product development. While AI is explicitly included in this, it is often not the only product to which a company applies ethics. This too has been accepted in the benchmark assessment as an indication of the company's support for ethical AI.



FIGURE 4.1: ETHICAL AI PRINCIPLES OF COMPANIES

4.1.2 AI framework includes human rights considerations

This element asks if the company's ethical AI framework considers human rights. The extent to which companies have reported considering human rights in their AI activities has varied, ranging from text such as "Embeds security, privacy, and human rights processes into AI design", to "...we will not design or deploy AI in the following application areas (...) technologies whose purpose contravenes widely accepted principles of international law and human rights."

⁵⁰ For instance, some companies have reported that they follow European Union guidelines (High-Level Expert Group on Artificial Intelligence. 2019. *Ethics Guidelines for Trustworthy AI*. <u>https://digitalstrategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai</u>) or those of the Australian Government (Department of Industries, Science and Resources, "Australia's AI Ethics Principles", <u>https://www.industry.gov.au/publications/australias-artificial-intelligence-ethics-framework/australias-ai-ethicsprinciples</u>).



Any mention of human rights in a company's ethical AI framework has been scored positively, regardless of the context or the strength of the statement or commitment.

4.1.3 Company has a committee dedicated to ethics

At the time the benchmark elements were designed, it was expected that if a company had a committee responsible for ethics, its activities would include consideration of the ethical impact of the company's products. It turned out that most companies' ethics committees have a very narrow view of ethics, basically covering corruption and compliance. However, about a dozen companies assessed in the benchmark do have specific committees for AI ethics.

Company	Committee	Company's Description of the Committee
Adobe	Ethics Committee	Includes experts from around the world with diverse professional backgrounds and life experiences.
Alphabet	Advanced Technology Review Council	Rotating committee of senior product, research, and business executives.
Cisco	Responsible Al Committee	Consists of senior executives across Cisco business units, sales, privacy, security, human rights, legal, government affairs, human resources, and other functions.
IBM	Al Ethics Board	Central, cross-disciplinary body to support a culture of ethical, responsible, and trustworthy AI whose mission is to support a centralized governance, review, and decision-making process for IBM ethics policies, practices, communications, research, products and services.
Microsoft	Office of Responsible AI	Puts principles into practice by setting the company-wide rules for responsible AI through the implementation of its governance and public policy work.
Nokia	Al Ethics and Governance Advisory Board	Aims to support innovation and enable the development of responsible and trustworthy AI by developing ethical AI principles and guidelines
Orange	Data and Al Ethics Council	Consisting of 11 independent recognized experts chaired by Chief Executive Officer, the role is to support the company's implementation of ethical principles governing the use of data and Artificial Intelligence technologies.
Panasonic	AI Ethics Committee	Comprises staff members in charge of AI ethics and members from other related departments like legal and information security, and provides the Group with systems and measures to be implemented in relation to AI Ethics Activities and provides Operational Companies with support for their AI Ethics Activities as well as understanding, reviewing, and formulating countermeasures against risks.
Salesforce	Ethical Use Advisory Council	Made up of a diverse group of external experts, internal executives, and frontline employees to receive critical feedback on policy decisions from various points of view.
Samsung	Al Ethics Council	Supports and trains development process/ tools for developers aligned with the Principles of AI Ethics and guidelines for ethical AI development. Comprised of experts from Samsung Research and the Compliance Team.
SAP	Artificial Intelligence (AI) Ethics Steering Committee	Comprises SAP executives from all Executive Board areas with supervision of topics relevant to guiding and implementing AI ethics. Also made up of experts from academia, industry, and public policy, our external AI Ethics Advisory Panel advises us on how to further develop and operationalize our guiding principles for AI.
Swisscom	Data Ethics Board	Set up to oversee all projects that process large amounts of data

TABLE 4.1: COMPANIES WITH AI ETHICS COMMITTEES



4.1.4 Explicitly considers ethics in R&D

The intent of this element was to look at ethics in product development in a broad sense. Beyond the direct harm AI could cause in areas such as human rights, AI products can have other societal impacts, such as a loss of jobs and autonomy. In practice, most companies' responses to this element revert back to their AI framework.

4.2 AI framework assessment

The number of companies assessed in the benchmark that have an ethical AI framework increased from 14 in 2019 to 44 by the end of 2022 (Figure 4.2). By 2022, 30 of the original 100 companies had an ethical AI framework – an increase of over 100%. Companies have shown notable growth since 2020 as a result of greater awareness of the benchmark and engagement with WBA Allies (Box 4.1).



FIGURE 4.2: COMPANIES WITH ETHICAL AI FRAMEWORKS BY YEAR OF PUBLICATION

BOX 4.1: COLLECTIVE IMPACT COALITION (CIC) FOR DIGITAL INCLUSION

The Digital Inclusion Benchmark has been engaging with stakeholders on how they can work together to raise awareness of the importance of digital inclusion, increase understanding of leading practices and improve digital companies' commitment.

Together with over 40 stakeholders, including investors, civil society, think tanks, academia and consulting groups, WBA launched the global Collective Impact Coalition (CIC) for Digital Inclusion in 2021 to raise awareness and engage with companies with the aim of improving their commitment to ethical AI.⁵¹ Following this collaborative engagement, there has been meaningful progress from the companies engaged directly with investors in the CIC. Some companies have commenced internal processes on setting up ethics committees to develop their own principles, while others who were not open to engaging on the topic before are now acknowledging that they should do more to improve. In September 2022, the Digital CIC was formally launched, although its work on engaging companies on ethical AI had been ongoing prior to the launch.⁵²

Throughout 2023, the Digital CIC will continue to engage with various stakeholders to raise awareness and drive behaviour change among the companies of their own accord without requiring public ethical

⁵² "Launch event for the Collective Impact Coalition for digital inclusion: Advancing ethical and responsible AI", https://www.worldbenchmarkingalliance.org/news/ciclaunch-event/



⁵¹ "Introducing WBA's Collective Impact Coalitions", https://www.worldbenchmarkingalliance.org/news/launch-collective-impact-coalitions/

Al principles. The Digital CIC will also hold peer learning sessions with the companies to encourage best practice sharing across the industry.


Company	AI Ethics reference	Year	Own principles ?	Mentions human rights?	Committee
Adobe	Adobe's Commitment to AL Ethics	2021	Yes	No	Yes
Alphabet	Artificial Intelligence at Google: Our Principles	2018	Yes	Yes	Yes
AT&T	Artificial Intelligence at AT&T: Our Guiding Principles	2019	Yes	Yes	
Baidu	Al for Social Good (ESG Report)	2021	Yes	No	
BT	Our responsible tech principles	2020	Yes	No	
Capgemini	Our Code of Ethics for Al	2021	Yes	Yes	
Cisco	The Cisco Responsible Al Framework	2022	Yes	Yes	Yes
Dell	Dell Technologies Principles for Ethical Artificial Intelligence	2022	Yes	No	
Deutsche Telekom	Guidelines for Artificial Intelligence	2018	Yes	No	
eBay	Third Party Code of Business Conduct and Ethics	2022	Yes	No	
Elisa	Ethical principles for Data and Artificial Intelligence	2019	Yes	Yes	
Ericsson	EU Ethics guidelines for trustworthy Al	2019	No	No	
HPE	AI Ethics and Principles	2021	Yes	Yes	
IBM	<u>Al Ethics</u>	2018	Yes	Yes	Yes
Intel	Responsible Al	2021	Yes	Yes	
Juniper	Al Innovation Principles	2021	Yes	No	
KDDI	AI R&D and Utilization Principles for KDDI Group	2021	Yes	Yes	
Meta	Facebook's five pillars of Responsible AI (Blog post)	2021	Yes	No	
Microsoft	Microsoft responsible AI principles	2016	Yes	Yes	Yes
Naspers	Approach to AI Ethics	2022	Yes	No	
Naver	Al Ethics Principles	2021	Yes	Yes	
NEC	NEC Group AI and Human Rights Principles	2019	Yes	Yes	
Nokia	Responsible AI	2022	Yes	No	Yes
NTT	Our Approach to the Use and R&D of AI	2021	Yes		
Nvidia	Trustworthy AI (CR Report)	2021	Yes	No	
NXP	Artificial Intelligence (Code of Conduct)	2021	Yes	No	
Orange	EU Ethics Guidelines for Trustworthy AI	2019	No	Yes	Yes
Panasonic	Panasonic Group's Efforts to Ensure Responsible AI-Utilizing Operations	2022	Yes	Yes	Yes
Salesforce	Trusted AI	2020	Yes	Yes	Yes
Samsung	Samsung AI principles	2019	Yes	No	Yes
SAP	SAP's Guiding Principles for Artificial Intelligence	2018	Yes	Yes	Yes
SK Telecom	Artificial Intelligence Human Rights Respect (HR Report)	2021	Yes	No	
SoftBank	SoftBank AI Ethics Policy	2022	Yes	No	
Sony	Al Engagement within Sony Group	2018	Yes	Yes	
Spark	Spark's Artificial Intelligence Principles	2022	Yes	No	
Swisscom	AI Ethics Principles	2020	Yes		Yes
Telefonica	Al Principles of Telefonica	2018	Yes	Yes	
Telenor	EU Ethics Guidelines for Trustworthy AI	2019	No	No	
Telia	Guiding Principles on Trusted AI Ethics	2019	Yes	Yes	
Telstra	Australian Government AI Ethics Principles	2019	No	No	
Tencent	AI for Good (ESG Report)	2021	Yes	No	
Vodafone	Vodafone Group's Artificial Intelligence (AI) Framework	2019	Yes	Yes	
Xiaomi	AI Technology (Privacy White Paper)	2022	Yes	Yes	
Yandex	Principles	2022	Yes	No	

TABLE 4.2: COMPANIES WITH ETHICAL AI PRINCIPLES (AS OF FEBRUARY 2023)

Though the ethical AI elements in the benchmark are scored, this is done within the context of the indicator (I.4) which includes other unrelated elements. Ethical AI elements account for only 38% of the total indicator score. Therefore, it is useful to benchmark companies' ethical AI practices separately, so that the score can provide a more explicit and nuanced perspective of company performance.

The assessment that follows is based on four elements 1) whether the company has an ethical AI framework, 2) whether it is the company's own framework, 3) whether the framework considers human rights, and 4) whether the company has an ethical AI advisory committee (Figure 4.3). Seven companies obtain the highest possible score on this assessment (Alphabet, Cisco, IBM, Microsoft, Panasonic, Salesforce



and SAP). Of these, five are headquartered in the United States, one in Europe and one in Asia; further, five are IT software and services companies and two are hardware companies.



FIGURE 4.3: ETHICAL AI ASSESSMENT

4.3 Going forward

Based on the experiences over the last few years, several revisions are proposed to strengthen the way ethical AI is assessed in the DIB going forward.



4.3.1 Indicator on its own

Given the critical importance of ethical AI and the additional elements needed for having a more robust understanding of company performance on the subject, a recommendation is made to create a standalone indicator. This will also allow ethical AI to be scored independently.

4.3.2 Commitment and principles

The assessment of whether the company has a publicly available ethical AI framework should be tightened to include strong commitment text and a list of the principles the company follows. Moreover, given the importance of AI, the commitment principles should be in a standalone governance document where they can be easily located and should cover the entire group. A strong commitment is particularly important for credibility given the contradictory position of some companies that have ethical AI principles but then lay off key staff. For instance Alphabet reportedly fired an ethical AI researcher following the publication of a critical paper while Microsoft laid off key ethical AI staff in March 2023.⁵³

The framework should be the company's own and not regional or national guidelines. Sony demonstrates best practice in this area, with its ethical AI guidelines presented in a standalone document, making a clear reference to the entire group and a commitment that goes beyond by stating that the guidelines "(...) must be followed by all officers and employees" (Box 4.2).

BOX 4.2: SONY'S ETHICAL AI GUIDELINES

Sony demonstrates best practice in the disclosure of its AI ethics principles. It clearly states that the principles apply to the group and should be followed by all employees. Moreover, Sony mentions that the principles will be revised as needed; in fact, there have been two revisions since the guidelines were first issued in 2018. The guidelines respect human rights and Sony provides its definition for what the company means by the term AI.

- The Sony Group AI Ethics Guidelines (Guidelines) set forth the guidelines that **must be followed** by all officers and employees of Sony when utilizing AI and/or conducting AI-related R&D...
- 'Sony' means Sony Group Corporation and any company where more than 50% of voting rights are directly or indirectly owned by Sony Group Corporation.
- Sony **will review and evolve the Guidelines** as needed based on national and regional Al-related guidelines, changes in people's lifestyles and environments, accumulation of practices in the relevant industry, and information exchanged with its various stakeholders.
- In its utilization of AI, Sony **will respect diversity and human rights of its customers and other stakeholders** without any discrimination while striving to contribute to the resolution of social problems through its activities in its own and related industries.
- 'Al' means any functionality or its enabling technology that performs information processing for various purposes that people perceive as intelligent, and that is embodied by machine learning based on data, or by rules or knowledge extracted in some methods.

Al Engagement within Sony Group, 25th September 2018. Amended: 1st March 2019; 1st April 2021

A number of companies in the benchmark mentioned that ethical AI was not relevant for them because they do not develop products using AI. Regardless, most companies purchase products that use AI for their operations. In that case, a filter could be applied asking whether the company requires suppliers to have ethical AI principles. For instance, eBay requires suppliers to commit to ethical AI principles in its supplier code of conduct (Box 4.3).

BOX 4.3: ETHICAL AI IN EBAY'S SUPPLIER CODE OF CONDUCT

Artificial Intelligence and Automated Decision Making. Third Parties will commit to using and developing artificial intelligence (AI) in a manner that aligns with eBay's accountable AI principles, which include:

⁵³ Zoe Schiffer and Casey Newton, 2023. "Microsoft lays off team that taught employees how to make AI tools responsibly." *The Verge*, March 14. <u>https://www.theverge.com/2023/3/13/23638823/microsoft-ethics-society-team-responsible-ai-layoffs</u>



- Transparency / explain-ability, meaning humans interacting with AI should be able to understand why a certain model made a certain decision;
- Avoiding unfair bias;
- Protecting privacy and security; and
- Impacting the economy in a positive and inclusive way, meaning fostering healthy competition, inclusion, and innovation, including for consumers and smaller business.

Source: eBay. "Third Party Code of Business Conduct and Ethics." https://www.ebayinc.com/company/supplier-code-of-conduct/

4.3.3 Operational considerations

One of the current AI elements assessed in the benchmark asks whether the company has a committee responsible for ethics. Given that in many cases committees responsible for ethics only cover issues such as corruption, the element should be modified to specifically ask for a committee responsible for ethical AI. Currently, a dozen companies have established dedicated committees to advise on ethical AI.

Beyond the existence of AI ethics principles and an advisory committee, it is critical to understand how the principles are put into practice. This adds another perspective to how dedicated companies are to their AI principles and increases transparency. For example, Alphabet issues annual progress reports discussing how its ethical AI principles are put into practice.⁵⁴

Given that many of the potential harms from AI relate to human rights, it is important for companies to carry out impact assessments. Impact assessments should be carried out before the introduction of the product featuring AI⁵⁵ and should be sufficiently robust to catch potential risks to the "right to privacy and other rights, including the rights to health, education, freedom of movement, freedom of peaceful assembly and association, and freedom of expression."⁵⁶ Microsoft has developed a template and guidance for AI human rights impact assessments, although as of now it has yet to release the results publicly.⁵⁷ The company does issue so-called Transparency Notes with information about the intended uses, capabilities and limitations of its AI products.

BOX 4.4: OTHER ETHICAL AI CONSIDERATIONS

Some companies put forth other considerations for ethical AI:

Right of redress: "Anyone who feels they have been unfairly treated as a result of a decision made by an AI system deployed by Vodafone will have the opportunity to escalate their concerns under the published process for Vodafone complaints in their country of operation." (Vodafone)

Shut off: "We are able to deactivate and stop AI systems at any time (kill switch)." (Deutsche Telekom)

Non-uses: "1. Technologies that cause or are likely to <u>cause overall harm</u>. Where there is a material risk of harm, we will proceed only where we believe that the benefits substantially outweigh the risks, and will incorporate appropriate safety constraints. 2. <u>Weapons</u> or other technologies whose principal purpose or implementation is to cause or directly facilitate injury to people. 3. Technologies that gather or use information for <u>surveillance</u> violating internationally accepted norms. 4. Technologies whose purpose <u>contravenes widely accepted principles of international law and human rights</u>." (Alphabet)

⁵⁷ Microsoft. 2022. *Responsible AI Impact Assessment Guide*. <u>https://www.microsoft.com/en-us/ai/responsible-ai?activetab=pivot1%3aprimaryr6</u>



⁵⁴ Google. 2022. AI Principles Progress Update. <u>https://ai.google/static/documents/ai-principles-2022-progress-update.pdf</u>

⁵⁵ Mark Latonero and Aaina Agarwal. 2021. *Human Rights Impact Assessments for AI: Learning from Facebook's Failure in Myanmar. Carr Center Discussion Paper*. <u>https://carrcenter.hks.harvard.edu/files/cchr/files/210318-facebook-failure-in-myanmar.pdf</u>

⁵⁶ United Nations. 2021. "Urgent action needed over artificial intelligence risks to human rights." *Press Release*, 15 September. <u>https://news.un.org/en/story/2021/09/1099972</u>

TABLE 4.3: PROPOSED AI ETHICS INDICATOR

Element	Remarks	Score (out of 2)			
1. Does the company have its own publicly available ethical AI principles?	 Make a change to the current text replacing 'framework' with 'principles'. It is also proposed that the principles: be the company's own, be applied at the group level, and be disclosed in a standalone document. Moreover, the company should clearly commit to these principles. 	0.75			
2. Does the ethical AI framework include respect for human rights?	Existing element	0.25			
3. Does the company have a committee with oversight of ethical AI?	Existing element	0.50			
4. Does the company describe how its ethical Al principles are operationalised?	New element	0.25			
5. Does the company carry out AI human rights impact assessments?	New element	0.25			
Filter: If the company does not develop its own AI products, does it require suppliers to abide by ethical AI principles?					



5 Human rights, climate change and supply chains

Companies are responsible for respecting human rights and providing remedies to people whose human rights have been affected by their operations and by their value chain. Companies' responsibility for human rights include subjects like labour rights, child labour, gender equality and paying fair wages. In October 2021, the United Nations (UN) Human Rights Council recognised access to a clean, healthy and sustainable environment as a human right. Following the recognition of this right, companies are also expected to address, prevent and mitigate adverse impacts of climate change. This chapter looks at the relevance of the environment as a human right for digital companies, especially companies in the hardware industry which have large supply chains. This is particularly critical given that production is often outsourced to countries that are more at risk from the negative impacts of climate change, and where environmental laws are often weaker and poorly enforced.

2.7 Human rights and business

In 1948, the UN General Assembly adopted the *Universal Declaration of Human Rights* (UDHR). In December 1966, the UN General Assembly adopted two international treaties that would further shape international human rights: the International Covenant on Economic Social and Cultural Rights (ICESCR), and the International Covenant on Civil and Political Rights (ICCPR). The UDHR and the two covenants are collectively known as the *International Bill of Human Rights*.⁵⁸

Another relevant human rights document is the International Labour Organization (ILO) *Declaration on Fundamental Principles and Rights at Work*, adopted in 1998, outlining commitments by governments, employers' and workers' organisations to uphold human rights at work.⁵⁹

In addition, the UN Guiding Principles on Business and Human Rights (UNGPs)⁶⁰ and OECD Guidelines for Multinational Enterprises⁶¹ are particularly relevant as they address human rights implications specifically for companies.

These human rights documents underlie WBA's social transformation assessments of companies. Social transformation sits at the heart of the WBA model and facilitates the other six transformations. WBA's core social indicators (CSIs) assess the expectations placed on businesses regarding respect for human rights, at a minimum those articulated in the International Bill of Human Rights and the ILO Declaration on Fundamental Principles and Rights at Work.

CSI 1 looks at whether a company publicly commits to respecting all internationally recognised human rights (Figure 5.1). Among digital companies, 78% of those headquartered in Europe and 67% headquartered in Asia (excluding mainland China) publicly commit to respecting human rights. Digital companies headquartered in China, however, do not perform well on this indicator; only 12% disclose a commitment to respect human rights. In terms of industry breakdown, hardware companies perform the best with 74% publicly committing to respect human rights. IT software and services companies perform poorly with less than half committing to respect human rights.

⁶¹ OECD. 2011. Guidelines for Multinational Enterprises. <u>http://mneguidelines.oecd.org/guidelines/#d.en.217301</u>



⁵⁸ UN. "International Bill of Human Rights." <u>https://www.ohchr.org/en/what-are-human-rights/international-bill-human-rights</u>

⁵⁹ ILO. 2022. *ILO Declaration on Fundamental Principles and Rights at Work and its Follow-up*. <u>https://www.ilo.org/wcmsp5/groups/public/---ed_norm/---</u>

declaration/documents/normativeinstrument/wcms 716594.pdf

⁶⁰ United Nations. 2011. *Guiding Principles on Business and Human Rights*.

https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf

FIGURE 5.1: PROPORTION OF DIGITAL COMPANIES WITH A PUBLICLY AVAILABLE POLICY STATEMENT COMMITTING TO RESPECT HUMAN RIGHTS, APPROVED BY THE HIGHEST GOVERNANCE BODY





Among the CSIs, the only human rights indicator relating to supply chains is CSI 2b (The company has a publicly available statement of policy that expects its business relationships to commit to respecting the human rights that the ILO has declared to be fundamental rights at work.).⁶² However, assessing company performance using CSI 2b poses limitations. CSI 2b only looks at whether the company places expectations on its suppliers to respect the fundamental rights at work described by ILO; it does not require the company to ask its suppliers to respect all of the internationally recognised human rights.

A requirement to respect the ILO fundamental labour rights is taken as a starting point to analyse companies' approaches towards their supply chain in the context of human rights. However, less than a third of digital companies expect their supply chains to commit to the ILO fundamental labour rights (Figure 5.2, left). Ironically, hardware companies, which have the most tangible supply chains among the digital industries, perform the worst with only 26% expecting their suppliers to commit to the ILO fundamental labour rights. In terms of region, Europe performs best by far, with almost half the digital companies headquartered in the region expecting suppliers to commit to the ILO fundamental labour rights (Figure 5.2, right).

⁶² The 2022 Corporate Human Rights Benchmark (CHRB) has indicators that look at not just what portion of ICT companies expect suppliers to respect human rights (48%), but also what portion work with suppliers on human rights issues (11%) and what portion monitor the scope of human rights issues in their supply chains (6%). However CHRB does not cover all 200 of the Digital Inclusion Benchmark companies. See: WBA. 2022. "Companies are taking a hands-off approach to human rights in their supply chains." https://www.worldbenchmarkingalliance.org/publication/chrb/findings/companies-are-taking-a-hands-off-approach-to-human-rights-in-their-supply-chains/



FIGURE 5.2: PROPORTION OF DIGITAL COMPANIES WITH A PUBLICLY AVAILABLE POLICY STATEMENT EXPECTING THEIR BUSINESS RELATIONSHIPS TO COMMIT TO RESPECTING THE ILO FUNDAMENTAL LABOUR RIGHTS



Note: Asia* excluding mainland China.

2.8 Human rights and the environment

In October 2021, the UN Human Rights Council adopted resolution 48/13 recognising access to a clean environment as a human right.⁶³ Several human rights are directly and indirectly affected by climate change, including the right to life, right to safe drinking water, right to sanitation, right to self-determination, right to food, right to development and the right to adequate housing. Since the UN has recognised an internationally binding right to a healthy environment, it has become a prominent topic within human rights.

Among the responsibilities of companies under the UN Guiding Principles on Business and Human Rights, is to establish human rights due diligence processes to identify, prevent, mitigate and account for their impact on human rights. A company's entire value chain is included in this expectation. In February 2022, the relation between climate change and human rights was articulated in the corporate due diligence context. Article 18 in Annex 1 of the European Parliament and Council's proposal on Corporate Sustainability Due Diligence states that causing any measurable environmental degradation, including harmful emissions, is considered as a violation. ⁶⁴

2.9 Digital hardware companies' emissions and supply chain

While the digital transformation has many benefits for sustainable development, the production of digital goods can harm the environment, affecting human rights. This section looks at 28 digital hardware companies and one aspect of environmental harm, their greenhouse gas (GHG) emissions. All of these companies commit to respecting human rights. However, only 11 expect their suppliers to commit to respecting human rights and the ILO fundamental labour rights. Notably, a few companies have already established the link between the environment and human rights (Table 5.1).

⁶⁴ European Commission. 2022. Directive of the European Parliament and of the Council on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937. <u>https://commission.europa.eu/system/files/2022-</u> 02/1 2 183888 annex dir susta en.pdf



⁶³ UN Human Rights Council. 2021. *The human right to a clean, healthy and sustainable environment*. <u>https://digitallibrary.un.org/record/3945636?ln=en</u>

Company	Human rights and the environment position	Source
Apple	the impacts of climate change pose a threat to fundamental human rights — life,	Environmental
	health, food, and adequate standard of living — and are experienced	Progress Report
	disproportionately in low-income and historically marginalized communities."	<u>2021</u>
Cisco	Through our ongoing assessment of risks, we have identified salient human rights	Human rights at
	issues associated with Cisco's business to include those related to pollution	<u>Cisco</u>
	prevention and environmental sustainability	
HP	Each of our goals, including those on Climate Action will have a profound and	2020 Human Rights
	lasting impact on our ability to respect the human rights of broader communities and	<u>Update</u>
	people associated with our value chain.	

TABLE 5.1: DIGITAL COMPANIES LINKING HUMAN RIGHTS AND THE ENVIRONMENT

Most digital hardware companies disclose their full scope of emissions based on the GHG Protocol (i.e. scope 1, scope 2 and scope 3 emissions).⁶⁵ Digital hardware companies with significant supply chain emissions (i.e. scope 3 category 1: Purchased goods and services) as well as leading component and semiconductor companies were identified for further analysis. The 28 companies reviewed include most of the largest branded personal computer, smartphone and network equipment vendors of final products, as well as semiconductor and component manufacturers (Table 5.2). These companies reflect the geographic concentration of digital goods manufacturing, with their headquarters spread across just nine economies in three regions: Asia (mainland China, Hong Kong, Japan, Republic of Korea, Taiwan), Europe (Finland, Netherlands, Sweden) and the United States.

TABLE 5.2: TYPOLOGY OF DIGITAL HARDWARE COMPANIES

Brands	Mixed	Semiconductors	Components
Acer	Canon	ASML	Corning
Apple	Samsung	Intel	Kyocera
ASUS	SONY	Micron	Murata
Cisco	Western Digital	Nvidia	TE
Dell		Qualcomm	
Ericsson		SK Hynix	
НР		Tokyo Electron	
Lenovo		TSMC	
Nintendo			
Nokia			
Panasonic			
ZTE			

CDP found that globally, GHG emissions in a company's supply chain (scope 3 emissions) are, on average, 11 times higher than its operational emissions (scope 1 and 2 emissions).⁶⁶ For the digital hardware companies, the average ratio of supply chain to operational emissions is 2, though the ratio ranges from over 500 times for gaming console vendor Nintendo to less than one for semiconductor and component companies (Figure 5.3). Supply chain emissions exceeded operational emissions in 23 of the 28 companies.

 ⁶⁵ World Resources Institute and World Business Council for Sustainable Development. 2004. GHG Protocol Corporate Accounting and Reporting Standard. <u>https://ghgprotocol.org/corporate-standard</u>
 ⁶⁶ CDP. 2022. CDP Global Supply Chain Report 2021. <u>https://cdn.cdp.net/cdp-</u> production/cms/reports/documents/000/006/106/original/CDP_SC_Report_2021.pdf?1644513297





FIGURE 5.3: RATIO OF SUPPLY CHAIN TO OPERATIONAL EMISSIONS OF DIGITAL HARDWARE COMPANIES, 2021

Note: Supply chain emissions refer to scope 3 category 1 (Purchased goods and services). Operational emissions refer to scope 1 and scope 2 (location based).

The size and scope of GHG emissions often illustrates how companies differ depending on where they are in the value chain. For instance, companies that directly sell their branded products to consumers and organisations (e.g. Nintendo, HP, Apple) tend to have low operational emissions (i.e., scope 1 and 2 location based) but large supply chain emissions (i.e. scope 3 category 1) due to a high degree of outsourcing; they also have relatively large product use emissions (i.e. scope 3 category 11).

While most of the companies with a large supply chain footprint are vendors of branded digital products, ASML and Nvidia also have relatively large supply chain emissions. The former manufactures equipment to make semiconductors whereas the latter, also a semiconductor company, outsources its fabrication (fabless). Component suppliers (e.g. Intel, SK hynix, TSMC) tend to have large operational emissions and low or even zero product use emissions. Semiconductor manufacturers tend to have very high scope 1 emissions due to the various gases used in chip production.

There are three main areas digital hardware companies are interacting with their supply chains to reduce GHG emissions: 1) obligating supply chains to compile their GHG emissions; 2) establishing GHG emissions reduction targets, including for supply chain emissions; and 3) engaging with supply chains to assist them in reducing their emissions.

2.9.1 GHG emissions inventories

Several digital hardware companies are working with their suppliers in different ways to encourage them to reduce their emissions. Supply chain emissions are often fully or partly estimated since companies do not know the exact figure unless the supplier provides it to them. Companies need to work with their suppliers in order to obtain an accurate calculation of their purchased goods and services emissions.

All but five of the 28 digital hardware companies are members of the Responsible Business Alliance (RBA) dedicated to promoting responsible behaviour in supply chains. RBA's Code of Conduct is a set of social, environmental and ethical standards which were originally developed for the electronics industry. The RBA's Code of Conduct explicitly requires suppliers to compile their GHG emissions:

"... establish a corporate-wide greenhouse gas reduction goal. Energy consumption and all relevant Scopes 1 and 2 greenhouse gas emissions are to be tracked, documented, and publicly reported against the greenhouse gas reduction goal. Participants are to look for



methods to improve energy efficiency and to minimize their energy consumption and greenhouse gas emissions.⁶⁷"

Most of the digital hardware companies that are members of RBA have included similar text in their Supplier Code of Conduct. RBA also has a portal (RBA-Online) to share environmental data.⁶⁸ Similarly, the CDP Supply Chain programme allows companies to obtain their suppliers' emissions data in order to improve their estimate of purchased goods and services emissions.⁶⁹ Despite this, the share of supply chain emissions data obtained from suppliers is zero in a number of cases among the companies that make this information publicly available. One reason is that some companies have developed sophisticated modelling techniques to estimate their supply chain emissions, using the spend-based accounting method from the GHG Protocol Scope 3 Calculation Guidance.⁷⁰



FIGURE 5.4: PROPORTION OF SUPPLY CHAIN EMISSIONS USING DATA FROM SUPPLIERS, 2021

2.9.2 Targets

All but four of the companies have time-bound targets to reduce GHG emissions. Companies' targets vary in ambition and scope. For instance, some only have targets covering their operational emissions (scopes 1 and 2) and not their supply chain (scope 3, category 1), despite the fact that if a company's relevant scope 3 emissions are 40% or more than their total scope 1, 2, and 3 emissions, a scope 3 target is required (this applies to ten of the companies).⁷¹ Further, some companies have near-term net zero goals, while others set this goal far out into the future. Some set intensity-based targets which make it impossible to forecast absolute reductions. Although almost all of the companies claim they are making their supply chains greener, only five have near-term absolute scope 3 (including supply chain) emissions reduction targets.

 ⁷⁰ World Resources Institute and World Business Council for Sustainable Development. 2013. *Technical Guidance for Calculating Scope 3 Emissions (version 1.0)*. <u>https://ghgprotocol.org/scope-3-technical-calculation-guidance</u>
 ⁷¹ SBTi. 2021. *Criteria and Recommendations*. <u>https://sciencebasedtargets.org/resources/files/SBTi-criteria.pdf</u>



Source: Companies publicly disclosed CDP questionnaire.

⁶⁷ Responsible Business Alliance Code of Conduct, Version 7.0 (2021).

https://www.responsiblebusiness.org/media/docs/RBACodeofConduct7.0 English.pdf

⁶⁸ See "RBA-Online" at: https://www.responsiblebusiness.org/tools/rbaonline

⁶⁹ See "Supply Chain" at: <u>https://www.cdp.net/en/supply-chain</u>

Company	Target	2019 supply chain emissions (tCO2e)	Reduction by 2030 (%)	2030 supply chain emissions (tCO2e)	Reduction from 2019 (tCO2e)
Apple	Commits to reduce absolute combined scope 1, 2 and 3 GHG emissions 62% by FY2030 from a FY2019 base year.	18,900,000	-62%	7,182,000	(11,718,000)
Cisco	Commits to reduce absolute scope 1 and 2 GHG emissions 90% by FY2030 from a FY2019 base year. Commits to reduce absolute scope 3 GHG emissions from purchased goods and services30% by FY2030 from a FY2019 base year.	6,786,890	-30%	4,750,823	(2,036,067)
Kyocera	Commits to reduce absolute scope 1 and 2 GHG emissions 46.2% by FY2030/31 from a FY2019/20 base year. Also commits to reduce absolute scope 3 GHG emissions 46.2% within the same timeframe	3,451,644	-46%	1,856,984	(1,594,660)
Murata	Commits to reduce absolute scope 1 and 2 GHG emissions 46% by FY2030 from a FY2019 base year. Also commits to reduce absolute scope 3 GHG emissions 28% within the same timeframe.	3,262,000	-28%	2,348,640	(913,360)
Nokia	Commits to reduce absolute scope 1, 2 and 3 GHG emissions 50% by 2030 from a 2019 base year.	3,063,000	-50%	1,531,500	(1,531,500)
		35,463,534	-50%	17,669,947	(17,793,587)

TABLE 5.3: COMPANIES WITH ABSOLUTE SUPPLY CHAIN EMISSIONS REDUCTION TARGETS

2.9.3 Other supply chain emissions reduction initiatives

Several companies have created dedicated initiatives for their suppliers to reduce GHG emissions or have joined industry initiatives. These initiatives include training suppliers to improve their emissions disclosures, providing technical and legal advice on scaling clean energy purchases, collaborative advocacy efforts with governments on renewables and financing construction of renewable power plants for suppliers.

Apple's Supplier Clean Energy Program encourages its suppliers to reduce their emissions.⁷² It covers over 100 of its leading suppliers that have committed to producing Apple's products using 100% renewable energy by 2030. Ericsson is a co-founder of the 1.5°C Supply Chain Leaders initiative.⁷³ The initiative aims to align global supply chains around a common goal of halving emissions by 2030 and becoming net zero by 2050. Tokyo Electron (TEL) recently introduced its E-COMPASS (Environmental Co-Creation by Material, Process and Subcomponent Solutions) sustainable supply chain initiative. Its activities include surveying suppliers' environmental sound production processes and compliance with environmental laws and regulations.⁷⁴ Samsung works with suppliers to incentivise them to establish emissions reduction targets.⁷⁵

BOX 5.1: GREENPEACE CLIMATE ASSESSMENT OF CONSUMER ELECTRONICS BRANDS AND THEIR SUPPLIERS

Greenpeace has assessed 22 leading consumer electronics brands and suppliers on their climate performance across four areas: commitment, action, transparency and advocacy.⁷⁶ It looks at emissions reduction and renewable energy targets, renewable energy sourcing, helping suppliers source renewables, energy efficiency, data transparency and advocacy. Greenpeace found that most of the companies are not performing well with Apple scoring the highest with a B while six scored an F.

https://images.samsung.com/is/content/samsung/assets/global/ir/docs/sustainability report 2022 en.pdf ⁷⁶ Greenpeace. 2022. *Supply Change*. <u>https://www.greenpeace.org/static/planet4-eastasia-</u> stateless/2022/10/89382b33-supplychange.pdf



⁷² Apple. 2022. Supplier Clean Energy.

https://www.apple.com/environment/pdf/Apple Supplier Clean Energy Program Update 2022.pdf ⁷³ See :Driving Climate Action Throughout Global Supply Chains" at: <u>https://exponentialroadmap.org/supply-</u> <u>chain-leaders</u>

⁷⁴ See "Environment" at: <u>https://www.tel.com/sustainability/management-</u>

foundation/environment/index.html#anc-10

⁷⁵ Samsung. 2022. Sustainability Report 2022.

Reasons for the poor performance include rising emissions, targets set way out into the future, lack of support for supply chains and low rates of renewable energy.

5.1 Conclusions

A number of digital hardware companies already had a strong commitment to the environment prior to the UN recognition of the right to a clean, healthy and sustainable environment as a human right. Many also have strong commitments to promoting responsible supply chains. Most companies already obligate suppliers to meet some type of environmental obligation, particularly for GHG emissions (e.g. reporting emissions inventories, moving to renewables, establishing an emissions reduction target), a critical activity since supply chain emissions far outnumber operational emissions for vendors of branded digital hardware products.

Now that having a healthy environment is formally recognised as a human right, it might force other digital hardware companies to be more proactive, starting with establishing near-term absolute emissions reduction targets for their supply chain. One notable observation is that companies rather than other stakeholders are engaging suppliers to reduce their environmental footprint.

While well-known brands and tier 1 suppliers are working to reduce emissions, this needs to extend further down value chains to lower-tier suppliers. Given the globalisation of digital goods supply chains, the impact could be significant. Raw materials used for digital goods are often extracted from developing countries where environmental regulations may be less severe or non-existent.⁷⁷ Pressure from higher-tier suppliers on extractive suppliers can help mitigate the negative externalities of the digital goods industry in developing nations.⁷⁸

⁷⁸ Schilling-Vacaflor, Almut. 2021. "Integrating Human Rights and the Environment in Supply Chain Regulations" Sustainability 13, no. 17: 9666. <u>https://doi.org/10.3390/su13179666</u>



⁷⁷ World Economic Forum. 21 January 2021. "Supply chains can be a climate game-changer. Here's why." <u>https://www.weforum.org/agenda/2021/01/tackling-supply-chain-emissions-is-a-game-changer-for-climate-action</u>

						tCO2e				
Company	HQ	Туре	Scope 1	Scope 2 Location based	Operationa I emissions Scope 1+Scope 2	Scope 3	Total footprint (S1+S2LB+S3)	Scope 3 Cat 1 Purchase d goods and services	S3 C1 / S1&2L B	Scope 3 (% of footprint)
TOTAL			21M	48M	69M	646M*	714M*	137M*	2.0	19%
Acer	TWN	Brand	4,551	14,817	19,368	2,099,472	2,118,840	360,247	18.6	17%
Apple	USA	Brand	55,200	1,003,246	1,058,446	23,130,000	24,188,446	16,200,000	15.3	67%
ASML	NLD	SC	19,300	165,100	184,400	8,800,000	8,984,400	2,900,000	15.7	32%
ASUS	TWN	Brand	85	15,568	15,653	1,324,592	1,340,245	1,076,291	68.8	80%
Canon	JPN	Mixed	114,456	875,482	989,938	6,626,000	7,615,938	2,987,000	3.0	39%
Cisco	USA	Brand	26,694	579,445	606,139	23,025,124	23,631,263	5,363,781	8.8	23%
Corning	USA	Component	694,000	2,128,000	2,822,000	6,629,504	9,451,504	3,749,225	1.3	40%
Dell	USA	Brand	45,600	337,600	383,200	17,658,700	18,041,900	3,497,500	9.1	19%
Ericsson	SWE	Brand	407,724	139,000	546,724	34,637,000	35,183,724	2,313,000	4.2	7%
HP	USA	Brand	48,700	198,200	246,900	28,300,000	28,546,900	18,300,000	74.1	64%
Intel	USA	SC	2,181,000	3,820,000	6,001,000	28,863,000	34,864,000	4,924,000	0.8	14%
Kyocera	JPN	Component	134,942	935,454	1,070,396	4,772,013	5,842,409	3,457,988	3.2	59%
Lenovo	HKG	Brand	6,069	191,778	197,847	12,324,408	12,522,255	2,701,300	13.7	22%
Micron	USA	SC	3,459,483	3,448,513	6,907,996	3,977,616	10,885,612	2,155,135	0.3	20%
Murata	JPN	Component	260,000	1,102,000	1,362,000	4,362,000	5,724,000	2,530,000	1.9	44%
Nintendo	JPN	Brand	346	4,740	5,086	3,227,899	3,232,985	2,799,619	550.5	87%
Nokia	FIN	Brand	114,456	377,300	491,756	40,634,700	41,126,456	1,571,600	3.2	4%
Nvidia	USA	SC	4,612	133,569	138,181	2,701,477	2,839,658	2,506,722	18.1	88%
Panasonic	JPN	Brand	338,000	1,813,500	2,151,500	98,050,000	100,201,500	14,110,000	6.6	14%
Qualcomm	USA	SC	106,659	264,521	371,180	4,179,987	4,551,167	2,139,566	5.8	47%
Samsung	KOR	Mixed	7,604,000	12,566,000	20,170,000	123,234,900	143,404,900	16,153,000	0.8	11%
SK Hynix	KOR	SC	2,628,921	5,302,908	7,931,829	3,432,777	11,364,606	3,092,433	0.4	27%
SONY	JPN	Mixed	211,000	1,051,836	1,262,836	16,160,000	17,422,836	3,810,000	3.0	22%
TE	CHN	Component	71,479	460,536	532,015	3,799,670	4,331,685	3,410,695	6.4	79%
TEL	JPN	SC	12,000	74,000	86,000	29,020,000	29,106,000	282,000	3.3	1%
TSMC	TWN	SC	2,151,937	9,196,964	11,348,901	6,049,256	17,398,157	4,395,879	0.4	25%
Western Digital	USA	Mixed	46,152	998,989	1,045,141	9,865,889	10,911,030	1,683,478	1.6	15%
ZTE	CHN	Brand	79,182	725,424	804,607	98,683,525	99,488,132	8,976,005	11.2	9%

TABLE 5.4: GHG EMISSIONS OF SELECTED DIGITAL HARDWARE COMPANIES, 2021

Note: <u>Type</u>: Brand refers to companies selling final products (e.g. PCs, smartphones, network equipment), SC refers to semiconductors, Component refers to intermediate products excluding semiconductors and Mixed refers to companies that sell both branded products as well as semiconductors and/or components. *Part of the operational emissions of some of the companies listed would be the supply chain emissions of others.



6 Economic, social & environmental impacts of digital companies

With their headquarters spread across 51 locations and operations in 175 economies worldwide, the 200 companies in the Digital Inclusion Benchmark (DIB) have tremendous economic influence as well as social and environmental impacts. This chapter examines the various ways these impacts are quantified.

6.1 Measuring economic impacts of digital companies

Historically, the main impact of companies that was of interest was the economic value created for just one stakeholder – shareholders – in the form of profits, share price and dividends. The net income of companies in the benchmark was over USD 840 billion for the fiscal year 2021, which is about 14% of their total revenue generated. Not all of these companies made a profit; in fact, 21 companies incurred a loss to the value of USD 45 billion in total.

Beyond profits, digital companies have immense potential to contribute to value creation in economies worldwide by virtue of their expansive operational footprint across the globe and the pervasiveness of digital products and services in our daily lives. In the fiscal year 2021, total revenue of the 200 companies in the benchmark USD 6 trillion, 6.2% of global GDP.⁷⁹ Almost half (46%) of this revenue came from US-headquartered companies, even though they only accounted for 31% of the companies in the benchmark (Figure 6.1, left). Indeed, the top three companies in respect to the highest revenue are all well-known global brands: Amazon, Apple and Alphabet (Google parent). Further, the most revenue was generated by hardware companies (38%), followed by IT software and service companies (34%), while telecommunications contributed 28% of the total revenue (Figure 6.1, right).



FIGURE 6.1: REVENUE DISTRIBUTION BY REGION AND INDUSTRY, DIB COMPANIES, 2021

Note: 'Other' refers to the regions Latin America and the Caribbean, the Middle East, the Pacific, sub-Saharan Africa and Canada. Asia* excludes mainland China, which is shown separately.

The total number of employees across all 200 companies in the benchmark was over 13 million in the fiscal year 2021. Almost half (46%) of these employees are those of Asian-headquartered companies (accounting for 36% of the companies in the benchmark) followed by those headquartered in the United States. Amazon has the most employees (1.6 million) accounting for 12% of the total employees for the 200

⁷⁹ The World Bank estimates global GDP in 2021 to be USD 96.51 trillion. https://data.worldbank.org/indicator/NY.GDP.MKTP.CD



companies. Amazon reports that it is the second largest private sector employer in the United States and has created more jobs than any other US company over the last decade.⁸⁰

Classification of the total number of employees by industry indicates that the IT software and services industry has the most employees (39% of total) followed by hardware (32%) and telecommunications (29%). The IT software and services industry leads because it includes e-commerce companies with a lot of warehouse workers as well as business process outsourcers who employ many software developers.



FIGURE 6.2: EMPLOYEE DISTRIBUTION BY REGION AND INDUSTRY, DIB COMPANIES, 2021

Note: 'Other' refers to the regions Latin America and the Caribbean, the Middle East, the Pacific, sub-Saharan Africa and Canada. Asia* excludes mainland China, which is shown separately. Note that the employee distribution by region refers to the total employees of companies headquartered in that region and not the actual location of the employees.

Over the past quarter century, in addition to economic impacts there has been increasing focus on the social and governance performance of companies by a wider group of stakeholders and other parties. The Global Reporting Initiative (GRI) was founded in 1997 after the Exxon Valdez oil spill. In 2000, the first GRI sustainability reporting guidelines were published.⁸¹

Disclosure 201-1 of *GRI 201: Economic Performance* provides reporting guidelines for how companies should report the distribution of their revenues among their stakeholders.⁸² Similar to the GDP income approach, GRI 201-1 looks at the company's direct economic value generated and distributed (EVG&D). It is divided into three components: (i) Revenues, which constitute the direct economic value generated; (ii) Economic value distributed, which comprises operating costs, employee wages and benefits, payments to providers of capital, payments to governments and community investments; and (iii) Economic value retained, which is the direct economic value generated less economic value distributed.

Of the 200 companies in the benchmark, 96 include Disclosure 201-1 in their GRI index. However, many companies pay lip service to the disclosure, pointing to different reports where all the needed elements are often not available. Even though most of this data can be easily compiled by companies, they do not make it available in one table. In fact, companies headquartered in the United States that imply they report GRI 201-1 rarely even disclose their wages and benefit payments to employees.

⁸² GRI 201: Economic Performance at: <u>https://www.globalreporting.org/standards/media/1039/gri-201-economic-performance-2016.pdf</u>



⁸⁰ "Amazon is investing in American jobs, workers, and communities." *Amazon News*, 4 February 2022. <u>https://www.aboutamazon.com/news/policy-news-views/amazon-is-investing-in-american-jobs-workers-and-communities</u>

⁸¹ <u>https://www.globalreporting.org/about-gri/mission-history</u>

Only 21 companies out of the 200 actually report the data in one table; most of these companies are headquartered in Asia (62%). By industry, telecommunications leads in the reporting of EVG&D, comprising 62% of the total companies that disclosed this figure.

				Economic value distribution (EVD) among stakeholders (%)				
	EVD in	Revenue	EVD (%					
	million	in million	of	Operating		Providers		Community
Company	USD	USD	revenue)	costs	Employees	of capital	Government	Investment
Acer	\$1,586	\$11,385	14%	52%	34%	5%	9%	0.12%
AIS	\$5,966	\$5,670	105%	64%	5%	15%	16%	0.01%
Axiata	\$8,892	\$6,256	142%	39%	52%	7%	2%	0.31%
Chunghwa Telecom	\$7,941	\$7,512	106%	61%	20%	15%	4%	0.52%
Elisa	\$2,548	\$2,350	108%	43%	17%	15%	25%	0.001%
Ericsson	\$25,589	\$27,076	95%	58%	35%	4%	3%	0.05%
HCL	\$11,342	\$11,587	98%	28%	55%	14%	4%	0.26%
Infosys	\$18,178	\$16,456	110%	22%	47%	16%	15%	0.33%
Inmarsat	\$1,543	\$1,352	114%	62%	20%	8%	11%	0.03%
KT	\$18,237	\$21,765	84%	73%	20%	3%	4%	0.05%
LG	\$28,129	\$65,319	43%	85%	14%	1%	0%	0.08%
MTN	\$13,114	\$12,290	107%	64%	6%	7%	23%	0.08%
Naver	\$4,222	\$5,960	71%	51%	32%	3%	13%	1.09%
Nokia	\$25,271	\$26,118	97%	62%	35%	1%	1%	0.03%
Orange	\$43,204	\$50,026	86%	53%	27%	9%	10%	0.06%
Rogers	\$9,274	\$11,724	79%	54%	18%	16%	12%	0.60%
Samsung	\$220,289	\$244,416	90%	76%	14%	4%	6%	0.16%
Singtel	\$13,006	\$11,447	114%	51%	16%	29%	4%	0.19%
SK Telecom	\$15,129	\$14,641	103%	50%	13%	32%	5%	0.08%
Tata								
Communications	\$2,146	\$2,263	95%	72%	19%	5%	4%	0.09%
Zain	\$2,938	\$5,067	58%	48%	14%	34%	2%	1.16%
Mean			91%	56%	24%	11%	8%	0.3%
Median			97%	54%	20%	8%	5%	0.1%

TABLE 6.1: COMPANIES	DISCLOSING FCONOMIC	VALUE DISTRIBUTION (EVD)	2021
		c value distribution (cvd),	LOLI

Reference: GRI 201-1.

On average, just over half of the economic value generated by the companies disclosing GRI 201-1 was distributed towards operating costs, the expenses that a business incurs through its day-to-day business operations (i.e. payments to suppliers). Depending on the averaging method, between one fifth to one quarter was distributed to employees. IT software and services companies had relatively high employee payments given that most of their input is labour. Payments to providers of capital (i.e. dividends and interest expenses) averaged between 8-11%, with Zain providing the highest share at 34% followed by Singtel and Telenor at 29% each. Payments to governments in the form of taxes and other fees averaged between 5-8%, with Elisa and MTN, both telecommunication operators, distributing the highest share (23% and 25% respectively). At the other extreme, LG paid less than 1% of its economic value generated to government. Community investment was less than 1% of the economic value distribution for the benchmarked companies on average. This is not surprising since apart from companies headquartered in India, company philanthropic activities are optional.

It is relevant noting what proportion of company revenue was distributed to stakeholders. On average, most company revenue was distributed (91-97%). However, there were some noteworthy exceptions. Acer distributed just 14% of its revenue to stakeholders; the low figure is due to accounting practices.⁸³ In some cases, companies distributed more than the revenue they generated. This is explained by the fact that companies had other sources of income besides revenue for stakeholder distribution.

While value added is an important metric, it is limited in its ability to measure performance across companies, except for maybe year-on-year percentage changes. Labour productivity could also be analysed

https://static.acer.com/up/Resource/AcerGroup/Investor Relations/Annual Reports/20220523/2021 Acer Annual Reports/2020523/2021 Acer Annual Reports/2020523/20204 Acer Annual Reports/2020524 Ace



⁸³ For instance, Acer reports 'Cost of Revenues' in its income statement accounting for 88% of revenue but none of this seems to be distributed to stakeholders. Acer. 2022. *Annual Report 2021*.

(i.e. value added per employee); however, given that purchasing power varies among countries it might be a misleading comparison.

Availability of companies' data for EVG&D at the country level would allow for a comparison of a company's value added to the GDP of the country. Axiata is one of the few companies that provides a country breakdown (some of the other companies reporting value added operate largely in one country, where it would be possible to take value added as a proportion of GDP).

BOX 6.1: CALCULATING DIRECT AND INDIRECT ECONOMIC IMPACTS: THE CASE OF AXIATA

Axiata, the Malaysian-headquartered telecommunications group, provides a framework for analysing its direct and indirect economic impacts in the six developing countries it operates in.⁸⁴ By breaking down its impacts (e.g. direct and indirect employment, taxes paid) at the country level, it is able to calculate its contribution to GDP in each of the countries it operates in. Axiata also calculates its indirect economic impacts; for instance, in addition to its own employees it calculates downstream employment triggered by its activities.

	Malaysia	Indonesia	🕼 Sri Lanka	Bangladesh	Cambodia	😪 Nepal
	celcom	🗦 xL axiata	Dialog	robi	Smart	Ncell
	Total	Total	Total	Total	Total	Total
	2,444 Staff	1,594 Staff	2,733 Staff	1,371 Staff	823 Staff	545 Staff
0,824	Malaysian:	Indonesian:	Sri Lankan:	Bangladeshi:	Cambodian:	Nepali:
Direct	99.5%	99%	99.6%	99.9%	97%	98.0%
ployees	Female:	Female:	Female:	Female:	Female:	Female:
	46%	30%	23%	13%	36%	24%
	46,766 Jobs4	229,075 Jobs	85,564 Jobs ³⁴⁴	117,412 Jobs4	55,868 Jobs*	35,604 Jobs
	Directly Employed:	Directly Employed:	Directly Employed:	Directly Employed:	Directly Employed:	Directly Employed:
	2,444	1,594	2,733	1,371	823	545
mately 000 ported egion ²	Operational Indirectly Supported: 34,223	Operational Indirectly Supported: 113,260	Operational Indirectly Supported: 33,538	Operational Indirectly Supported: 71,129	Operational Indirectly Supported: 34,119	Operational Indirectly Supported: 20,245
	Supported by	Supported by	Supported by	Supported by	Supported by	Supported by
	Capital Investment:	Capital Investment:	Capital Investment:	Capital Investment:	Capital Investment:	Capital Investment:
	10,098	114,221	48,616	44,912	20,925	14,815
o1.3 lion c paid	(0.3% of total tax revenue of the Malaysian Federal Government)	(0.2% of total tax revenue of the Indonesian Government)	(1.2% of total tax revenue of the Sri Lankan Government)	(1.1% of total tax revenue of the Bangladeshi Government)	(2.1% of total tax revenue of the Cambodian Government, excluding regulatory related fees, levice and payments)	(4.3% of total tax revenue of the Nepal Government)

6.2 Community investment

Companies have economic impact through the creation of wealth and employment and through driving innovation. Apart from this, companies can have social impacts in the communities they operate in. Community investment measures a company's social impact by quantifying the amount it spends on its corporate social responsibility (CSR) activities. This expenditure is intended to have measurable social impacts (Figure 6.3).

⁸⁴ Axiata. 2022. Sustainability & National Contribution Report 2021. <u>https://sustainability.axiata.com/wp-content/uploads/2022/04/Axiata-SNCR2021.pdf</u>



FIGURE 6.3: COMMUNITY INVESTMENT: INPUTS, OUTPUTS AND IMPACTS

Inputs: What's contributed?	Outputs: What happens?	Impacts: What changes?		
How (form of contribution)	Communityoutputs	Community impacts		
Cash Time In-kind (including pro bono) Management costs Why (driver for contribution)	Individuals reached/supported Type of beneficiary Organizations supported Other company-specific output measure (e.g. environment)	On people i: Depth of impact Made a connection Made an improvement Made a transformation On people ii: Type of impact Behavior or attitude change Skills or personal effectiveness		
Charitable gifts Community investment	Business outputs	Quality of life/well-being		
Commercial initiatives in the community What (issue addressed) Education Health Economic development Environment Arts and Culture	Employees involved in the activity Media coverage achieved Customers/consumers reached Suppliers/distributors reached Other influential stakeholders reached	On organizations Improved or new services Reached more people or spent more time with clients Improved management processes Increased their profile Taken on more staff or volunteers		
Social welfare Emergency Relief Where (location of activity)	Leverage (additonal resources from other sources) Total leverage split by: Payroll giving Other sensitive constraint times	On the environment Impact on the environment Impact on environmental behavior		
Europe Middle East & Africa Asia Pacific North America South America	Customers Other organizations / sources Employees involved in own time Hours contributed in own time Foregone Income	Business impacts On employee volunteers Job-related skills Personal well-being Behavior change On the business Human resource benefits Stakeholder relations/perceptions Business generated Operational improvement delivered Uplift in brand awareness		

Source: Corporate Citizenship Limited. 2019. Business for Societal Impact Guidance Manual: Corporate Community Investment. <u>https://b4si.net/wp-content/uploads/2020/12/B4SI-Guidance-Manual-2020-Public.pdf</u>

The definition of community investment is quite broad.⁸⁵ Apart from voluntary donations to non-profits, it can also include contributions to companies' own social programmes as well as to certain infrastructure investments or even donations to political parties. The GRI definition of community investment refers to actual expenditures on such causes and provides no guidance on in-kind giving or monetary values for employee volunteer time. Yet a number of digital companies include both these contributions in their reporting. Others count foregone value where a company provides a good or service at a discount or for free and subtracts that from the actual price to calculate how much they would have made if they did not provide the product.⁸⁶ A few companies calculate the indirect impact of the donation; in other words, a value relating to how much recipients are better off due to the donation. Others include money raised for philanthropic activities through their platform or the amount their staff contributed. Given this broad definition of community investment and what companies report, comparability is limited, especially when breakdowns of the different payments and contributions are not available.

Just over half of the digital companies included in the in the benchmark reported some form of community investment. Some provide only a single figure whereas others provide a breakdown of their total community investment. Some companies have foundations through which their charitable donations are

⁸⁶ For instance, Australian telecommunications operator Telstra reported that revenue foregone (social contribution in the form of missed earnings to assist the community, non-profit organisations or customers in time of need) accounted for 69% of its community and social investments in the year ending June 2021. Telstra 2021 Data Pack. <u>https://www.telstra.com.au/aboutus/community-environment/reports#2021</u>



⁸⁵ GRI 201: ECONOMIC PERFORMANCE 2016. <u>https://www.globalreporting.org/standards/media/1039/gri-</u> 201-economic-performance-2016.pdf

funnelled, or they report a mixture of direct giving and foundation support. The total amount of community investment for reporting companies was USD 6.4 billion in the fiscal year 2021.

There are six indicators in the benchmark related to CSR initiatives for digital inclusion that are presumably receiving some form of company charitable funding.⁸⁷ Having at least one of these initiatives implies that companies are making community investments in digital inclusion. An example is Cisco's Networking Academy, the largest and longest-running CSR education initiative in the world, which accounted for over three quarters of Cisco's community investment in its 2021 fiscal year. Launched in 1997, the Cisco Academy has trained over 17.5 million students in networking skills in 190 countries. Notably, over 170 companies report at least one such CSR initiative, which is far greater than the number of companies reporting community investment where no evidence could be found that they have digital inclusion CSR initiatives (Digital Realty Trust, eBay, TCL, Tokyo Electron and Xiaomi).

The scores for the six indicators can be used as a measure of the degree of CSR initiatives for digital inclusion that companies support. Yet companies such as Alphabet and Capgemini, which have initiatives across most of these indicators, do not report their community investment. In the case of Alphabet, shareholders introduced a resolution in 2021 for the company to disclose its charitable contributions. Alphabet recommended voting against the resolution with one reason being:

"...The political and social events which triggered these commitments are potentially highly divisive, and carry with them significant potential for misapplication of well-intentioned contributions to activities fraught with risk to the Company's reputation..."⁸⁸

Given that over 100 digital companies do disclose such information, it can be assumed that they feel that the benefit of reporting their community investment outweighs the possible risk to reputation, and indeed might even enhance their reputation as caring companies.

Though the data on companies' community investments is not comparable, it is useful to normalise it to identify anomalies and outliers. Community investment as a proportion of profit is used as the normalising factor. This metric is used by a few of the companies in the benchmark (e.g. HP) and can be calculated for the others as well. India is one of the few countries in the world where companies have to make social contributions equivalent to 2% of their profit over the last three years. The Indian government has a dedicated website on corporate CSR funding, including each item the funding is used for.⁸⁹ Notably, out of over 18,000 companies reporting their CSR funding to the Indian government, Infosys, a digital company included in the benchmark, ranks eighth. All of the companies in the benchmark headquartered in India report community investment.

All six of the companies in the benchmark headquartered in the Republic of Korea report community investment. Though not required by law, companies in South Korea consider CSR important for business sustainability. Of the 200 largest companies in the country, 86% report CSR activities.⁹⁰

Furthermore, three of the companies in the benchmark, all headquartered in the United States, are members of Pledge 1% (Adobe, Salesforce and Twilio). Pledge 1% is a non-profit organisation seeking companies to make charitable donations of at least 1% of their profit, time, equity or product.⁹¹ Salesforce has the highest community investment of all the digital companies that report it, amounting to over USD 2

⁹¹ https://pledge1percent.org



⁸⁷ The six CSR related indicators are A1 The company contributes to digital technology access; A2 The company supports digital inclusivity for women and girls; S1 The company supports basic digital skills development; S2 The company supports intermediate digital skills development, S3 The company supports technical digital skills development, and S4 The company supports school connectivity.

⁸⁸ Alphabet. 2021. SCHEDULE 14A - Proxy Statement Pursuant to Section 14(A) of the Securities Exchange Act of 1934 (Amendment No.).

https://www.sec.gov/Archives/edgar/data/1652044/000130817921000256/lgoog2021_def14a.htm

⁸⁹ https://www.csr.gov.in/content/csr/global/master/home/home.html

⁹⁰ https://www.mdpi.com/2071-1050/11/9/2676

billion, or 140% of its net income.⁹² However, the vast majority of these contributions are product donations with cash accounting for just 5% of the total, but even the pure monetary contribution is nevertheless an impressive 6% of Salesforce's net income.

One challenge with normalising community investment as a proportion of profit is that it cannot be calculated for companies that incur losses. Also, some companies can have higher than expected profits due to the sale of a major subsidiary.

As expected, due to the wide differences in what is reported as community investment, there is little correlation between the digital inclusion CSR score and the proportion of community investment in net income (i.e. profit) (Figure 6.4). The median community investment as a proportion of net income was 0.5%.



FIGURE 6.4: RELATIONSHIP BETWEEN COMMUNITY INVESTMENT AND DIGITAL INCLUSION CSR SCORE

These results emphasise the need for more comparability and transparency on community investment. One way could be to provide breakdowns of community investment by cash donations, in-kind contributions, staff time volunteered and any CSR programme management costs. A second way is tying the CSR initiatives identified in the benchmark back to the source of funding. Though the benchmark looks at financial contributions made by companies for these initiatives, very few companies report this figure. For instance, while 98 companies report having or funding an initiative supporting digital opportunities for women and girls, only 14 report metrics on their financial and/or staff contributions disclosure by listing each initiative and the amount is contributes to it.⁹³ The government of India's CSR portal is also relevant since it provides details of the total CSR funding for each company. Digital inclusion CSR funding can also be aggregated, as is done by AT&T, which specifically reports its contributions to 'Digital Divide initiatives'.⁹⁴

6.3 Environmental impact of digital companies

Besides generating economic and social value, digital companies also have notable impact on the environment (e.g. extraction of raw materials, e-waste, greenhouse gas emissions, water use). In relation to

https://www.logitech.com/content/dam/logitech/en/sustainability/pdf/resources/fy22-impact-report-portrait.pdf 94 See AT&T Issue Brief. "Community Engagement" at: <u>https://about.att.com/csr/home/reporting/issue-</u> brief/community-engagement.html



⁹² Salesforce. 2022. Schedules of Selected Environmental, Equality and Social Value Metrics.

https://s23.q4cdn.com/574569502/files/doc_governance/2022/Salesforce-ES-Schedules-FY22-EYReport.pdf ⁹³ Logitech. 2022. Designing A Positive Future: FY22 Impact Report.

climate, digital companies can have negative impacts in terms of their carbon footprint, as well as positive impacts due to large-scale purchases of renewable energy and enabling other sectors to reduce emissions through use of digital products.

GRI 305: Emissions provides a reporting framework for companies to disclose their emissions.⁹⁵ While the digital sector does not report as much greenhouse gas (GHG) emission as other sectors such as agriculture, energy, forestry, industry and land use, it still incurs substantial environmental costs. In 2021, the 200 companies in the DIB collectively had scope 1 and 2 operational emissions of 223 million tonnes of carbon dioxide equivalent (tCO₂e), amounting to 0.7% of global emissions from energy use. The International Monetary Fund (IMF) reckons that the price per ton of carbon should be USD 75 to limit global warming.⁹⁶ Applying this number to digital companies' GHG emissions results in a negative environmental impact of around USD 17 billion, which is more than the GDP of almost 90 of the world's countries. Given the high environmental costs incurred from both their operational and upstream and downstream emissions, it is crucial for digital companies to reduce their climate impact.

Amongst the 200 companies in the benchmark, telecommunication service providers contribute the most to scope 1 and 2 location-based emissions, accounting for close to half (Figure 6.5, left) of the total GHG operational emissions of the digital companies. This is attributable to the fact that telecommunication operators have extensive network equipment and, in many cases, data centres which require significant electricity to operate. In regions where electricity is scarce, operators have to rely on diesel wireless base stations that are emissions-intensive.

Contributing almost 40% of total emissions, hardware companies are the second major emitters in the tech sector. Notably, semiconductor manufacturers emit significant scope 1 emissions (as well as using a significant amount of water). It is also important to consider that the supply chain emissions of branded hardware companies are far larger than their operational emissions (see Chapter 5). IT software and services companies are the third largest source of operational emissions. Many IT software and services companies have relatively less emissions, with those providing cloud and data centre services accounting for the bulk of emissions in this group.

Regionally, companies headquartered in Asia accounted for almost half of the digital companies' emissions (Figure 6.5, right). Chinese-headquartered companies alone account for one third of the total. The region has been slow to adapt to climate change mitigation, with the emissions reduction targets of Asian digital companies still being relatively unambitious compared to companies' targets in Europe and the United States.⁹⁷

⁹⁷ Greenpeace Asia. 2021. *Race to green*. <u>https://www.greenpeace.org/static/planet4-eastasia-stateless/2021/12/a29b3a1d-race-to-green-report.pdf</u>



⁹⁵ https://www.globalreporting.org/standards/media/1012/gri-305-emissions-2016.pdf

⁹⁶ Simon Black, Ian Parry and Karlygash Zhunussova. 2021. More Countries Are Pricing Carbon, but Emissions Are Still Too Cheap." *IMF Blog*, 21 July. <u>https://www.imf.org/en/Blogs/Articles/2022/07/21/blog-more-countries-are-pricing-carbon-but-emissions-are-still-too-cheap</u>



FIGURE 6.5: DISTRIBUTION OF OPERATIONAL GHG EMISSIONS, DIB200 COMPANIES, 2021

Aside from their carbon footprint, digital companies do contribute positively to the environment through other channels. This includes purchasing renewable energy and carbon offsets as well as enabling emissions reduction through use of their products and services.

Digital companies are leaders in green energy procurement. In 2021, the ICT sector accounted for 60% of total global renewable energy purchases (Figure 6.6, left). Amazon, Alphabet (Google), Meta and Microsoft were among the world's top corporate buyers of clean energy in 2021 (Figure 6.6, right). The procurement of renewable energy by digital companies is pivotal not only because it contributes to the sectors' emissions reduction but also because it helps to scale the renewable energy market.





Source: International Energy Agency (IEA), <u>https://www.iea.org/data-and-statistics/charts/global-renewable-energy-power-purchase-agreements-by-sector-2010-2021</u> and "Corporate Clean Energy Buying Tops 30GW Mark in Record Year." BloombergNEF, 31 January 2022. <u>https://about.bnef.com/blog/corporate-clean-energy-buying-tops-30gw-mark-in-record-year</u>

Some digital companies also use carbon offsets to reduce their emissions. Carbon offsets work by companies purchasing voluntary credits for projects that reduce emissions or remove carbon from the atmosphere. Due to concerns surrounding the lack of verifiability and credibility of certain carbon offset projects, as well as the potentiality of larger corporate emitters choosing to purchase offsets instead of

cutting down unnecessary emissions, the purchase of carbon offsets can be contentious. For this reason, some digital companies are moving to carbon removal in their quest to be carbon zero and not just carbon neutral.

In addition to purchasing renewable energy, digital companies have immense potential to contribute to decarbonisation through what is known as 'enablement.' The 'enablement impact' arises when the use of digital services contributes to avoidance of emissions beyond upstream and downstream emissions. ⁹⁸ For instance, the provision of video conferencing as well as access to online shopping and government e-services enables people to work from home, reducing emissions from commuting. The use of smart metering helps conserve energy for heating and cooling. Several digital companies calculate their enablement effect.⁹⁹

Whereas the benefits attributed to companies' procurement of green energy and purchase of carbon offsets can be quantified with the associated spending, it is not so straightforward to calculate the impact associated with the use of digital companies' products and services. Among the 200 benchmarked companies, only four companies (Safaricom, SK hynix, SK Telecom and Telefonica) disclosed their environmental impact as part of their wider attempt to capture their total value generated. Even so, the companies did not, in all cases, provide the full methodology as to how the resultant environmental value was generated.

6.4 An integrated approach to measure total value generated by digital companies

Digital companies generate value in three key areas, namely:

- 1. **Economic impact** through job creation, capital mobilisation and tax contributions
- 2. Social value generated through community investment, staff volunteering, etc.
- 3. Environmental costs and/or benefits of operations

While there is consensus on the importance of and the need to capture the overall value generated by digital companies, there is no commonly agreed upon methodology that fully captures value creation across all three areas. It is critical to have a standardised method to capture the total value, to fully reflect the impact of companies, prevent instances where companies misrepresent their impacts and to ensure compatibility across companies to promote a 'race to the top' in generating value for society.

As shown in Section 6.1 there is a standard for calculating direct economic impact (GRI 201-1), derived from classical economics, measuring elements such as capital, labour and taxes. Existing literature has also suggested a few approaches, such as the social return on investment model¹⁰⁰, to calculate social value. However, companies still grapple with quantifying social impact and choose to report their community investment as a starting point. In terms of environmental impact, elements such as emissions, waste and water usage are critical to consider. While there is a trend of companies disclosing their environmental data, the methods companies use for the monetary quantification of their environmental impacts vary.

Ironically, though economic impact is the easiest to compile, more companies report their community investment and emissions impact (Table 6.2). Of the 200 companies in the benchmark, only 25 reported their economic value generated and distributed (EVG&D) in accordance with GRI 201-2. However, over 100 companies chose to report their community investment and 120 companies disclosed their scope 1 and 2 (location-based emissions).

D/Environment/Pages/Toolbox/Greening-Digital-Companies.aspx

https://static1.squarespace.com/static/60dc51e3c58aef413ae5c975/t/60f7fa286b9c6a47815bc3b2/162686419699 8/The-SROI-Guide-2012.pdf



⁹⁸ GSMA. 2018. The Enablement Effect: The impact of mobile communications technologies on carbon emission reductions. <u>https://www.gsma.com/betterfuture/enablement-effect</u>

⁹⁹ ITU and WBA. 2022. *Greening digital companies*. <u>https://www.itu.int/en/ITU-</u>

¹⁰⁰ The SROI Network. 2012. A guide to Social Return on Investment.

Economic GRI 201-1	Social GRI 201-1	Environmental GRI 305		
EmploymentDividendTax payments	Community investments	 Scope 1 and 2 (location- based) emissions 		
Reported by 25 companies	Reported by 106 companies	 Reported by 120 companies 		

TABLE 6.2: EXISTING BENCHMARK DATA FOR MEASURING COMPANY IMPACT

Companies use various methodologies in a bid to capture their value creation (Box 6.2). Both SK hynix and SK Telecom adopt the 'Social Value Creation' model, whereas Safaricom uses the 'True Value Methodology' and Telefonica uses its 'Value Analysis Model.' All these companies provide a breakdown of the elements included in their value creation in the form of charts, among which common elements can be identified (Table 2). However, in general, it is unclear how the value for each element is calculated. Where companies disclose the underlying calculation methodologies, the reference values they use for converting social and environmental variables to monetary values tends to be outdated. There is scope for companies to disclose the underlying calculations for each element of value creation and use the most recently available reference values (e.g. social cost of carbon), just like how Axiata has disclosed its full methodology for calculating direct and indirect economic impact (Box 6.1).

BOX 6.2: METHODOLOGIES TO CALCULATE TOTAL VALUE

SK hynix and SK Telecom's Social Value Creation model

SK hynix and SK Telecom¹⁰¹, both part of the Republic of Korea SK Group, measure value across three key pillars, namely economic, social and environmental. Aligned with GRI 201-2, the indirect contribution to economy includes employment, dividends and tax payments. As a measure of social performance of business activity, both companies consider benefits arising from their products and services, contributions to labour and growth of the innovation ecosystem and social contributions. For instance, SK Telecom considers the value of accident prevention through its products. In relation to the environmental performance of business activity, both companies calculate the environmental benefits of the company's products and services and costs due to resource consumption. As an example, SK hynix factors in the amount of resources consumed in its production of semiconductors and the resultant emissions. Neither company normalises the value, but instead they show the change from the previous year. In the case of SK hynix, social value created by the company increased by 93% between 2020 and 2021.

¹⁰¹ "SK hynix Generates 9.4T Won in Social Value in 2021." *Press Release*, 29 May 2022. <u>https://news.skhynix.com/sk-hynix-generates-9-4t-won-in-social-value-in-2021</u>





Safaricom's True Value Methodology

Kenyan-headquartered Safaricom uses KPMG's True Value Methodology¹⁰², which focuses on three aspects: economic value added, social externalities and environmental externalities. To calculate economic value, Safaricom considers value added in its operations and capital expenditure as well as the erosion of economic value due to corruption, where it references Transparency International's Corruption Index at 9.5%.¹⁰³ In terms of social externalities, it factors in elements such as health and safety (value of statistical life applied to health and safety incidents), the impact of its products and services (valuation of impact of financial mobile services on Kenyan people based on social return on investment principles) and community investments. To determine environmental value, the social cost of carbon (USD 9 per tonne of CO2)¹⁰⁴ and water (USD 5.4 per m3)¹⁰⁵ is applied to Safaricom's carbon emissions and water consumption respectively. After calculating the economic, social and environmental value, Safaricom also compares its total earnings to derive what it calls 'True Earnings.' In 2021, the company estimated its True Earnings to be 10 times its profits.

 ¹⁰⁴ The social cost of carbon was derived from the US Environmental Protection Agency (EPA) 2007 baseline data.
 ¹⁰⁵ Water externality price is based on scarcity level, of which the scarcity price is derived from a 2013 Trucost study on behalf of the TEEB Business Coalition.



¹⁰² KPMG. 2015. "Safaricom measures the value it creates for society in Kenya."

https://www.safaricom.co.ke/images/Downloads/Resources_Downloads/Safaricom_True_Value_brochure.pdf ¹⁰³ The cost of corruption was derived from Transparency International's 2014 Corruption Perceptions Index for Kenya combined with OECD and the Asian Development bank research on GDP loss due to corruption.

Telefonica's True Value Analysis

Telefonica's True Value Analysis, which draws upon various evaluation frameworks and methodologies¹⁰⁶, adopts a two-pronged approach, which consists of the Value Analysis Model and the Product and Service Assessment Model. The Value Analysis Model monetises the impact on 25 material topics classified into three key areas (environmental, social and governance) whereas the Product and Service Assessment Model performs specific evaluations of the impact of main projects or commercial solutions on society or the environment.

The lack of a standard way of quantifying value creation, including a recommended set of elements as well as suitable calculation methodologies, is a major barrier to comparing companies' economic, social and environmental impacts in a holistic way. Disclosure is also a major issue; of the 200 companies in the benchmark only 13 reported all of the elements needed to calculate their impacts based on existing GRI standards related to economic, social and environmental impacts. More digital companies should compile the data for their value creation using existing GRI standards and provide country-by-country breakdowns of the elements that their value creation comprises. To this end, it will be beneficial to work with relevant stakeholders, going forward, to develop a methodology for calculating value creation by digital companies.

¹⁰⁶ This includes the Impact Management Program (IMP) evaluation Model, Harvard University's Impact Weighted Account Initiative (IWAI) and KPMG's True Value methodology. See: Telefónica. 2022. *Consolidated Annual Report 2021*. <u>https://www.telefonica.com/en/wp-content/uploads/sites/5/2022/03/consolidated-</u> <u>management-report-2021.pdf</u>



7 Annex tables

The annex tables provide additional information on the 2023 Digital Inclusion Benchmark, including the list of companies and their headquarters, region and income group classifications. The tables present the values for certain indicator criteria where they are available, which also shows whether the company discloses that piece of information. Note that the benchmark results including the digital inclusion and core social indicators are available as a spreadsheet and can be downloaded at: <u>https://www.worldbenchmarkingalliance.org/publication/digital-inclusion/methodology/#detailed-company-scores-per-indicator</u>

All numerical data refers to the 2021 reporting year. As companies have different reporting periods, the period that covers the most months in 2021 is used. For companies whose fiscal year ends on 30 June, the year ending 2021 is used. The table titled 'DIB 2023 Companies' shows the reporting period for each company. Conversions to United States dollars are based on the annual average exchange rate from the International Monetary Fund (IMF).¹⁰⁷

DIB 2023 Companies. This table presents the full corporate name of the company, location of headquarters, the broad industry it is classified in, reporting period, year the company was founded and 2021 revenue and employees.

DIB 2023 Results. This table presents the digital inclusion results by indicator and company.

CSI results. This table presents the core social indicator results by indicator and company.

Geographic indicators. This table shows the World Bank income group and region¹⁰⁸ of the company's headquarters as well as the geographic regions used in the Insights Report. It also shows the number of countries where each company has employees.

Gender indicators. This table shows the results of all the gender-related indicators in the digital inclusion and core social indicators.

Community investments. This table list the USD amount of community investments by companies as well as the definition of what it includes.

https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups



¹⁰⁷ https://data.imf.org/regular.aspx?key=61545850

¹⁰⁸ See "World Bank Country and Lending Groups" at:

TABLE 7.1: DIGITAL INCLUSION BENCHMARK (DIB) 2023 COMPANIES

						Revenue	
				Voor		FY2021	Employees
Company	Corporate name	Headquarters	Industry	founded	Fiscal year	millions)	thousands)
Acer	Acer Incorporated	Taiwan	Hardware	1976	Ending 31 12	11 385	8
Activision Blizzard	Activision Blizzard, Inc.	United States	IT Software & Services	2008	Ending 31.12	8,803	10
Adobe	Adobe, Inc.	United States	IT Software & Services	1982	Ending on Friday nearest 30 Nov.	15.790	26
Airbnb	Airbnb. Inc.	United States	IT Software & Services	2008	Ending 31.12	5.992	6
AIS	Advanced Info Service Plc	Thailand	Telecommunications	1986	Ending 31.12	5,670	13
Akamai	Akamai Technologies Inc	United States	IT Software & Services	1998	Ending 31.12	3,461	9
Alibaba	Alibaba Group Holding Ltd	China	IT Software & Services	1999	Beginning 01.04	132,258	255
Alphabet	Alphabet Inc.	United States	IT Software & Services	1998	Ending 31.12	257,637	157
Altice	Altice France Holding SA	France	Telecommunications	2001	Ending 31.12	13,060	39
Amazon	Amazon.Com, Inc.	United States	IT Software & Services	1994	Ending 31.12	469,822	1,608
AMD	Advanced Micro Devices, Inc.	United States	Hardware	1969	Ending last Saturday in Dec.	16,434	22
América Móvil	América Móvil, S.A.B. De C.V.	Mexico	Telecommunications	2000	Ending 31.12	35,237	181
American Tower	American Tower Corporation	United States	IT Software & Services	1995	Ending 31.12	9,357	6
Amphenol	Amphenol Corporation	United States	Hardware	1932	Ending 31.12	10,876	90
Analog Devices	Analog Devices, Inc.	United States	Hardware	1965	Ending 30.10	7,318	25
Ant	Ant Group Co., Ltd.	China	IT Software & Services	2014	Ending 31.12		25
Apple	Apple Inc.	United States	Hardware	1980	Ending last Saturday in Sep.	365,817	154
Applied Materials	Applied Materials, Inc.	United States	Hardware	1967	Ending 31.10	23,063	30
ASML	ASML Holding NV	Netherlands	Hardware	1984	Ending 31.12	21,895	32
ASUS	AsusTek Computer Inc.	Taiwan	Hardware	1990	Ending 31.12	19,102	15
AT&T	AT&T Inc.	United States	Telecommunications	1889	Ending 31.12	168,864	203
ATH	Amalgamated Telecom Holdings Ltd	Fiji	Telecommunications	1998	Beginning 01.04	309	-
Axiata	Axiata Group Berhad	Malaysia	Telecommunications	1992	Ending 31.12	6,256	13
Baidu	Baidu, Inc.	China	IT Software & Services	2000	Ending 31.12	19,301	46
BBK Electronics		China	Hardware	1995			
BCE	BCE Inc.	Canada	Telecommunications	1983	Ending 31.12	18,759	50
Bezeq	Bezeq The Israeli Telecom. Corp Ltd	Israel	Telecommunications	1982	Ending 31.12	27,310	10
Bharti Airtel	Bharti Airtel Limited	India	Telecommunications	1995	Beginning 01.04	15,767	15
Block	Block, Inc.	United States	IT Software & Services	2009	Ending 31.12	17,661	9
BOE	BOE Technology Group Co Ltd	China	Hardware	1993	Ending 31.12	34,002	79
Booking Holdings	Booking Holdings Inc.	United States	IT Software & Services	1997	Ending 31.12	10,958	20
Broadcom	Broadcom Inc.	United States	Hardware	1961	Ending on Sunday closest to Oct. 31	27,450	20



						Revenue	Employees
				Voar		(115D in	Employees
Company	Corporate name	Headquarters	Industry	founded	Fiscal vear	millions)	thousands)
BT	BT Group plc	United Kingdom	Telecommunications	1980	Beginning 01.04	28.562	100
ByteDance	ByteDance Ltd	China	IT Software & Services	2012			
Canon	Canon Inc.	Japan	Hardware	1937	Ending 31.12	32,012	184
Capgemini	Capgemini SE	France	IT Software & Services	1967	Ending 31.12	21,365	325
China Mobile	China Mobile Limited	China	Telecommunications	1997	Ending 31.12	131,513	450
China Satellite	China Satellite Communications Co., Ltd.	China	Telecommunications	2001			
China Telecom	China Telecom Corporation Limited	China	Telecommunications	1995	Ending 31.12	68,148	279
China Unicom	China Unicom (Hong Kong) Limited	China	Telecommunications	2000	Ending 31.12	50,830	243
Chunghwa Telecom	Chunghwa Telecom Co., Ltd.	Taiwan	Telecommunications	1996	Ending 31.12	7,512	20
Cisco	Cisco Systems, Inc.	United States	Hardware	1984	Ending last Saturday in July	49,818	79
Citrix	Citrix Systems, Inc.	United States	IT Software & Services	1989	Ending 31.12	3,217	10
Cloudflare	Cloudflare, Inc.	United States	IT Software & Services	2009	Ending 31.12	656	2
Cogent	Cogent Communications Holdings, Inc.	United States	Telecommunications	1999	Ending 31.12	590	1
Cognizant	Cognizant Technology Solutions Corporation	United States	IT Software & Services	1994	Ending 31.12	18,507	331
Comcast	Comcast	United States	Telecommunications	2001	Ending 31.12	116,385	189
Corning	Corning Incorporated	United States	Hardware	1851	Ending 31.12	14,082	61
Delivery Hero	Delivery Hero Group	Germany	IT Software & Services	2011	Ending 31.12	6,889	52
Dell	Dell Technologies Inc.	United States	Hardware	1984	Beginning after last Friday in Jan.	101,197	133
Deutsche Telekom	Deutsche Telekom AG	Germany	Telecommunications	1995	Ending 31.12	127,993	217
DiDi	DiDi Global Inc.	China	IT Software & Services	2012	Ending 31.12	26,950	24
Digicel	Digicel Group Ltd.	Jamaica	Telecommunications	2001	Beginning 01.04	1,500	5
Digital Realty Trust	Digital Realty Trust, Inc.	United States	IT Software & Services	2004	Ending 31.12	4,428	3
еВау	eBay Inc.	United States	IT Software & Services	1998	Ending 31.12	10,420	11
EchoStar	EchoStar Corporation	United States	Hardware	2007	Ending 31.12	1,986	2
Elisa	Elisa Corporation	Finland	Telecommunications	1882	Ending 31.12	2,350	6
Equinix	Equinix, Inc.	United States	IT Software & Services	1998	Ending 31.12	6,636	11
Ericsson	Telefonaktiebolaget LM Ericsson	Sweden	Hardware	1876	Ending 31.12	27,076	101
Ethio Telecom		Ethiopia	Telecommunications	2010	Ending 30.06	1,264	-
Etisalat	Emirates Telecom. Group Company PJSC	United Arab Emirates	Telecommunications	1976	Ending 31.12	1,456	5
Eutelsat	Eutelsat Communications	France	Telecommunications	1977	Ending 30.06	1,355	1
Far EasTone	Far EasTone Telecommunications Co Ltd	Taiwan	Telecommunications	1997	Ending 31.12	3,045	6
Foxconn	Hon Hai Precision Industry Co., Ltd	Taiwan	Hardware	1974	Ending 31.12	213,922	946
GlobalFoundries	GLOBALFOUNDRIES, Inc.	United States	Hardware	2009	Ending 31.12	6,585	15
Globe	Globe Telecom, Inc.	Philippines	Telecommunications	1934	Ending 31.12	3,406	8



						Revenue FY2021	Employees
				Year		(USD in	FY2021 (in
Company	Corporate name	Headquarters	Industry	founded	Fiscal year	millions)	thousands)
GoTo	PT GoTo Gojek Tokopedia	Indonesia	IT Software & Services	2010	Ending 31.12	317	9
Grab	Grab Holdings Inc.	Singapore	IT Software & Services	2012	Ending 31.12	675	9
GTT	GTT Communications, Inc.	United States	Telecommunications	2005	Ending 31.12		2
HCL	HCL Technologies Ltd.	India	IT Software & Services	1991	Beginning 01.04	11,587	209
НР	HP Inc.	United States	Hardware	1947	Ending 31.10	63,487	51
HPE	Hewlett Packard Enterprise Company	United States	IT Software & Services	2015	Ending 31.10	27,784	59
Huawei	Huawei Investment & Holding Co., Ltd.	China	Hardware	1987	Ending 31.12	98,730	195
IBM	International Business Machines Corp.	United States	IT Software & Services	1911	Ending 31.12	57,350	54
iFlytek	Iflytek Co., Ltd.	China	IT Software & Services	1999	Ending 31.12	2,839	14
Iliad	iliad S.A.	France	Telecommunications	1991	Ending 31.12	8,926	15
Infineon	Infineon Technologies AG	Germany	Hardware	1999	Ending 30.09	13,012	50
Infosys	Infosys Limited	India	IT Software & Services	1981	Beginning 01.04	16,456	314
Inmarsat	Inmarsat Global Limited	United Kingdom	Telecommunications	1979	Ending 31.12	1,352	2
Intel	Intel Corporation	United States	Hardware	1968	Ending last Saturday in Dec.	79,000	121
Iridium	Iridium Communications Inc.	United States	Telecommunications	1991	Ending 31.12	615	1
JD.com	JD.com, Inc.	China	IT Software & Services	2004	Ending 31.12	147,589	385
Jio	Reliance Jio Infocomm Limited	India	Telecommunications	2016	Beginning 01.04	10,496	83
JOYY	JOYY Inc	China	IT Software & Services	2005	Ending 31.12	2,619	7
Jumia	Jumia Technologies AG	Nigeria	IT Software & Services	2012	Ending 31.12	178	4
Juniper Networks	Juniper Networks, Inc.	United States	Hardware	1996	Ending 31.12	4,735	10
KDDI	KDDI Corporation	Japan	Telecommunications	1953	Beginning 01.04	49,628	49
KEYENCE	Keyence Corp	Japan	Hardware	1974	Beginning 01.04	6,881	9
KPN	Koninklijke KPN N.V.	Netherlands	Telecommunications	1989	Ending 31.12	7,202	10
КТ	KT Corporation	Korea, Rep.	Telecommunications	1885	Ending 31.12	21,765	22
Kyocera	Kyocera Corp	Japan	Hardware	1959	Beginning 01.04	16,756	83
Lam Research	Lam Research Corporation	United States	Hardware	1980	Beginning after last Sunday in June	17,227	18
Largan Precision	Largan Precision Co Ltd	Taiwan	Hardware	1987	Ending 31.12	1,676	7
Lenovo	Lenovo Group Limited	Hong Kong	Hardware	1984	Beginning 01.04	71,618	75
LG	LG Electronics, Inc.	Korea, Rep.	Hardware	1958	Ending 31.12	65,319	74
Liberty Global	Liberty Global plc	United Kingdom	Telecommunications	2005	Ending 31.12	10,311	23
Liquid	Liquid Intelligent Technologies	United Kingdom	Telecommunications	1997			
Logitech	Logitech International S.A.	Switzerland	Hardware	1981	Beginning 01.04	5,481	7
Lumen	Lumen Technologies, Inc.	United States	Telecommunications	1968	Ending 31.12	19,687	36
Lyft	Lyft Inc	United States	IT Software & Services	2012	Ending 31.12	3,208	4



						Revenue	Employees
				Vear		(USD in	Ellipioyees
Company	Corporate name	Headquarters	Industry	founded	Fiscal vear	millions)	thousands)
MediaTek	MediaTek Inc	Taiwan	Hardware	1997	Ending 31.12	17,609	18
MegaFon	JSC MegaFon	Russian Federation	Telecommunications	1993	Ending 31.12	4,809	
Meituan	Meituan Dianping	China	IT Software & Services	2010	Ending 31.12	27,772	101
Mercado Libre	Mercado Libre, Inc.	Argentina	IT Software & Services	1999	Ending 31.12	7,069	30
Meta	Meta Platforms, Inc.	United States	IT Software & Services	2004	Ending 31.12	117,929	72
Microchip	Microchip Technology Inc	United States	Hardware	1987	Beginning 01.04	6,821	21
Micron Technology	Micron Technology, Inc.	United States	Hardware	1978	Ending on the Thursday closest to Aug. 31	27,705	43
Microsoft	Microsoft Corporation	United States	IT Software & Services	1986	Ending 30.06	168,088	181
Millicom	Millicom International Cellular S.A.	Luxembourg	Telecommunications	1990	Ending 31.12	4,617	21
MTN	MTN Group Limited	South Africa	Telecommunications	1994	Ending 31.12	12,290	16
MTS	Mobile Telesystems Public Joint Stock Company	Russian Federation	Telecommunications	1993	Ending 31.12	7,256	57
Murata	Murata Manufacturing Co Ltd	Japan	Hardware	1950	Beginning 01.04	16,515	78
Naspers	Naspers Limited	South Africa	IT Software & Services	1915	915 Beginning 01.04		35
NAVER	NAVER Corporation	Korea, Rep.	IT Software & Services	1999	Ending 31.12	5,960	5
NEC	NEC Corporation	Japan	IT Software & Services	1899 Beginning 01.04		27,463	115
Nepal Telecom	Nepal Doorsanchar Company Ltd.	Nepal	Telecommunications	2004	Ending around mid-June/July	357	
NetApp	Netapp, Inc.	United States	Hardware	1992	Beginning after last Friday in Apr.	6,318	11
NetEase	NETEASE, INC.	China	IT Software & Services	1997	Ending 31.12	13,582	32
Netflix	Netflix, Inc.	United States	IT Software & Services	2002	Ending 31.12	29,698	11
Nintendo	Nintendo Co., Ltd.	Japan	Hardware	1947	Beginning 01.04	15,447	7
Nokia	Nokia Corporation	Finland	Hardware	1865	Ending 31.12	26,118	86
NTT	Nippon Telegraph and Telephone Corp.	Japan	Telecommunications	1869	Beginning 01.04	110,764	334
NVIDIA	Nvidia Corporation	United States	Hardware	1993	Beginning after last Sunday in Jan.	26,914	22
NXP	Nxp Semiconductors NV	Netherlands	Hardware	2006	Ending 31.12	11,063	36
Ola	ANI Technologies Private Limited	India	IT Software & Services	2010			
Omantel	Oman Telecommunications Company (S.A.O.G)	Oman	Telecommunications	1996	Ending 31.12	6,608	2
Ooredoo	Ooredoo Q.P.S.C.	Qatar	Telecommunications	1987	Ending 31.12	8,214	15
Oracle	Oracle Corporation	United States	IT Software & Services	1977	Beginning 01.06	42,440	144
Orange	Orange SA	France	Telecommunications	1941	Ending 31.12	50,026	140
OTE	Hellenic Telecommunications Organization S.A.	Greece	Telecommunications	1949	Ending 31.12	3,963	11
Palantir	Palantir Technologies Inc.	United States	IT Software & Services	2003	Ending 31.12	1,542	3
PalTel	Palestine Telecommunications Company P.L.C.	Palestine	Telecommunications	1995	Ending 31.12	484	3
Panasonic	Panasonic Corp	Japan	Hardware	1918	Beginning 01.04	67,324	240
PayPal	PayPal Holdings, Inc.	United States	IT Software & Services	1998	Ending 31.12	25,371	31



						Revenue FY2021	Employees
				Year		(USD in	FY2021 (in
Company	Corporate name	Headquarters	Industry	founded	Fiscal year	millions)	thousands)
PCCW	PCCW Limited	Hong Kong	Telecommunications	1925	Ending 31.12	4,975	21
Pinduoduo	Pinduoduo Inc.	China	IT Software & Services	2015	Ending 31.12	14,566	10
PLDT	PLDT Inc.	Philippines	Telecommunications	1928	Ending 31.12	3,924	17
Proximus	Proximus Group	Belgium	Telecommunications	1994	Ending 31.12	6,514	12
Qualcomm	QUALCOMM Incorporated	United States	Hardware	1985	Ending last Sunday in Sep.	33,566	46
Rakuten	Rakuten, Inc.	Japan	IT Software & Services	1997	Ending 31.12	15,324	10
Rogers	Rogers Communications Inc.	Canada	Telecommunications	1960	Ending 31.12	11,724	23
Rostelecom	Rostelecom PJSC	Russian Federation	Telecommunications	1993	Ending 31.12	7,876	130
Safaricom	Safaricom PLC	Kenya	Telecommunications	1997	Beginning 01.04	2,719	6
Salesforce	salesforce.com, inc.	United States	IT Software & Services	1999	Beginning 02.01	26,492	74
Samsung	Samsung Electronics Co., Ltd.	Korea, Rep.	Hardware	1969	Ending 31.12	244,416	267
SAP	SAP SE	Germany	IT Software & Services	1972	Ending 31.12	32,755	107
Seagate	Seagate Technology Public Limited Company	Ireland	Hardware	1978	Typically from end of June	10,681	40
ServiceNow	ServiceNow, Inc.	United States	IT Software & Services	2004	Ending 31.12	5,896	17
SES	SES S.A.	Luxembourg	Telecommunications	1985	Ending 31.12	2,096	2
Sina	SINA Corporation	China	IT Software & Services	1999	Ending 31.12		
Singtel	Singapore Telecommunications Limited	Singapore	Telecommunications	1992	Beginning 01.04	11,447	19
SK hynix	SK hynix Inc.	Korea, Rep.	Hardware	1983	Ending 31.12	37,587	38
SK Telecom	SK Telecom Co., Ltd.	Korea, Rep.	Telecommunications	1984	Ending 31.12	14,641	5
Skyworks	Skyworks Solutions, Inc.	United States	Hardware	2002	Ending Friday closest to 30 Sep.	5,109	11
Snap	Snap Inc.	United States	IT Software & Services	2011	Ending 31.12	4,117	6
SoftBank	SoftBank Group Corp.	Japan	Telecommunications	1981	Beginning 01.04	56,688	55
Sonatel	Groupe Sonatel	Senegal	Telecommunications	1985	Ending 31.12	2,045	2
Sony	Sony Corporation	Japan	Hardware	1946	Beginning 01.04	90,401	109
SpaceX	Space Exploration Technologies Corp.	United States	Hardware	2002			
Spark	Spark New Zealand Limited	New Zealand	Telecommunications	1987	Ending 30.06	2,548	5
Spotify	Spotify Technology S.A.	Sweden	IT Software & Services	2006	Ending 31.12	11,374	7
stc	Saudi Telecom Company	Saudi Arabia	Telecommunications	1998	Ending 31.12	16,911	13
Stripe		United States	IT Software & Services	2010			
Sudatel	Sudatel Telecommunications Group Ltd	Sudan	Telecommunications	1993			
Swisscom	Swisscom Ltd	Switzerland	Telecommunications	1997	Ending 31.12	12,289	19
Tata Communications	Tata Communications Limited	India	Telecommunications	1986	Beginning 01.04	2,263	18
TCL	TCL Electronics Holdings Limited	China	Hardware	1999	Ending 31.12	9,633	31
TE	TE Connectivity Ltd	Switzerland	Hardware	1941	Ending last Friday in September	14,923	89



						Revenue	F
				Veer			Employees
Company	Corporate name	Headquarters	Industry	founded	Fiscal year	(USD IN millions)	thousands)
Tele2		Sweden	Telecommunications	1993	Ending 31 12	3 122	4 Liiousanus)
Telecom Egypt	Telecom Egypt Company SAE	Fgynt	Telecommunications	1998	Ending 30.06	2 371	-
Telecom Italia	Telecom Italia S P A	Italy	Telecommunications	1994	Ending 31 12	18 019	52
Telefonica		Snain	Telecommunications	1924	Ending 31 12	46 208	104
Telenor	Telenor ASA	Norway	Telecommunications	1855	Ending 31.12	12,834	16
Telia	Telia Company AB	Sweden	Telecommunications	1853	Ending 31.12	10.296	20
Telkom	Telkom SA SOC Ltd	South Africa	Telecommunications	1991	Beginning 01.04	2.893	12
Telkom Indonesia	Telecommunications Indonesia	Indonesia	Telecommunications	1991	Ending 31.12	10.009	9
Telstra	Telstra Corporation Limited	Australia	Telecommunications	1975	Ending 30.06	16,209	29
Tencent	Tencent Holdings Limited	China	IT Software & Services	1998	Ending 31.12	86,840	68
Texas Instruments	Texas Instruments Incorporated	United States	Hardware	1930	Ending 31.12	18,340	31
Tokyo Electron	Tokyo Electron Ltd	Japan	Hardware	1963	Beginning 01.04	18,258	15
Toshiba TEC	Toshiba TEC Corp	Japan	Hardware	1950	Beginning 01.04	4,058	19
Transsion	Shenzhen Transsion Holdings Co Ltd	China	Hardware	2006	Ending 31.12	7,661	16
TSMC	Taiwan Semiconductor Manufacturing Company Ltd	Taiwan	Hardware	1987	Ending 31.12	56,653	65
Türk Telekom	Turk Telekomunikasyon AS	Türkiye	Telecommunications	1994	Ending 31.12	3,873	36
Twilio	Twilio Inc.	United States	IT Software & Services	2008	Ending 31.12	2,842	8
Twitter	Twitter, Inc.	United States	IT Software & Services	2006	Ending 31.12	5,077	8
Uber	Uber Technologies, Inc.	United States	IT Software & Services	2009	Ending 31.12	17,455	29
United Internet	United Internet AG	Germany	Telecommunications	1988	Ending 31.12	6,643	10
VEON	VEON Ltd.	Netherlands	Telecommunications	1992	Ending 31.12	7,788	45
Verizon	Verizon Communications Inc	United States	Telecommunications	1983	Ending 31.12	133,613	118
Viettel	Viettel Group	Vietnam	Telecommunications	1989	Ending 31.12	11,831	50
VMWare	Vmware, Inc.	United States	IT Software & Services	1998	Beginning Saturday nearest 31 Jan.	12,851	38
Vodafone	Vodafone Group Plc	United Kingdom	Telecommunications	1991	Beginning 01.04	53,624	104
Western Digital	Western Digital Corporation	United States	Hardware	1970	Ending on Friday nearest 30 June	16,922	65
Xiaomi	Xiaomi Corporation	China	Hardware	2010	Ending 31.12	50,901	33
Yandex	Yandex NV	Russian Federation	IT Software & Services	2000	Ending 31.12	4,836	21
Yunji	Yunji Inc.	China	IT Software & Services	2015	Ending 31.12	334	1
Zain	Mobile Telecommunications Company K.S.C.P.	Kuwait	Telecommunications	1983	Ending 31.12	5,067	9
Zoom	Zoom Video Communications, Inc.	United States	IT Software & Services	2011	Beginning 01.02	4,100	7
ZTE	ZTE Corporation	China	Hardware	1985	Ending 31.12	17,755	73

TABLE 7.2: DIGITAL INCLUSION BENCHMARK, 2023 RESULTS

	DIB																							
	Score	DIB																						
	(0-	Score	DIB				Inno-																	1
Company	100)	(0-2)	Rank	Access	Skills	Use	vation	CSI	A1	A2	A3	A4	S1	S2	S3	S4	U1	U2	U3	U4	11	12	13	14
Acer	41	0.83	64	0.78	0.75	0.94	0.97	0.70	0.50	0.75	0.60	1.25	1.25	0.75	0.00	1.00	0.75	2.00	0.75	0.25	0.50	0.75	2.00	0.63
Activision Blizzard	16	0.31	165	0.26	0.22	0.31	0.31	0.45	0.00	0.25	0.80	0.00	0.75	0.00	0.00	0.13	0.75	0.00	0.25	0.25	0.50	0.00	0.50	0.23
Adobe	50	0.99	31	0.76	0.78	1.50	1.31	0.60	0.00	1.00	1.80	0.25	0.75	0.75	1.13	0.50	1.00	1.75	1.75	1.50	2.00	0.50	1.00	1.75
Airbnb	23	0.46	129	0.30	0.41	0.60	0.59	0.40	0.00	0.00	1.20	0.00	0.00	1.63	0.00	0.00	0.50	0.65	1.00	0.25	1.00	0.25	0.50	0.63
AIS	53	1.07	18	0.89	0.56	1.63	1.12	1.15	1.00	0.00	0.80	1.75	1.25	0.00	0.00	1.00	2.00	1.75	1.75	1.00	1.00	1.00	1.75	0.73
Akamai	23	0.46	130	0.13	0.13	0.81	0.68	0.55	0.00	0.25	0.00	0.25	0.25	0.00	0.00	0.25	1.75	1.00	0.50	0.00	1.50	0.25	0.25	0.73
Alibaba	41	0.82	66	0.81	0.78	0.85	1.24	0.40	0.00	1.25	2.00	0.00	1.50	0.00	1.00	0.63	1.75	1.40	0.25	0.00	2.00	1.25	1.50	0.23
Alphabet	50	1.01	26	1.03	0.66	1.23	1.78	0.35	1.00	1.25	1.60	0.25	1.13	1.00	0.00	0.50	1.25	1.40	0.75	1.50	2.00	2.00	1.25	1.85
Altice	21	0.42	144	0.89	0.25	0.19	0.59	0.20	1.25	1.25	0.80	0.25	1.00	0.00	0.00	0.00	0.00	0.50	0.00	0.25	0.00	0.75	1.50	0.13
Amazon	45	0.90	49	0.54	0.69	1.04	1.18	1.05	0.50	1.00	0.40	0.25	1.50	0.00	1.25	0.00	0.25	1.40	1.00	1.50	1.50	2.00	1.00	0.23
AMD	33	0.66	95	0.28	0.63	0.48	1.24	0.65	0.38	0.50	0.00	0.25	1.00	0.50	0.00	1.00	1.00	0.65	0.25	0.00	2.00	0.25	2.00	0.73
América Móvil	39	0.78	72	0.24	0.63	1.31	0.81	0.90	0.00	0.00	0.20	0.75	1.50	1.00	0.00	0.00	1.00	1.75	1.75	0.75	0.50	0.25	1.75	0.73
American Tower	35	0.69	86	0.72	0.41	0.71	0.87	0.75	1.38	1.25	0.00	0.25	0.00	1.63	0.00	0.00	0.75	1.60	0.50	0.00	1.00	0.50	1.75	0.23
Amphenol	15	0.31	166	0.00	0.00	0.40	0.59	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.60	0.25	0.00	0.50	0.00	1.75	0.13
Analog Devices	29	0.58	105	0.22	0.41	0.90	0.78	0.60	0.38	0.00	0.00	0.50	1.25	0.00	0.00	0.38	1.00	1.60	1.00	0.00	1.00	0.25	1.25	0.63
Ant	23	0.45	131	0.44	0.44	0.31	0.72	0.35	0.00	0.75	1.00	0.00	1.00	0.75	0.00	0.00	0.00	1.00	0.25	0.00	1.50	0.50	0.75	0.13
Apple	63	1.27	4	0.93	1.28	1.48	1.51	1.15	0.50	1.50	1.20	0.50	1.50	0.00	1.63	2.00	1.25	1.40	2.00	1.25	2.00	2.00	1.25	0.78
Applied Materials	32	0.64	99	0.48	0.31	0.69	1.00	0.70	0.00	1.25	0.40	0.25	0.75	0.00	0.00	0.50	1.75	0.75	0.25	0.00	0.50	0.50	1.75	1.25
ASML	35	0.69	85	0.44	0.44	0.48	0.96	1.15	0.00	1.00	0.00	0.75	1.00	0.75	0.00	0.00	0.50	1.15	0.25	0.00	0.50	0.50	1.50	1.35
ASUS	37	0.74	75	0.84	0.56	1.13	0.91	0.25	1.50	1.00	0.60	0.25	1.50	0.00	0.00	0.75	0.75	2.00	1.50	0.25	1.50	0.00	1.50	0.63
AT&T	46	0.92	42	0.96	0.88	1.16	1.16	0.45	1.00	1.00	1.60	0.25	1.00	0.75	1.00	0.75	0.75	1.15	0.75	2.00	2.00	0.75	1.25	0.63
ATH	5	0.10	187	0.32	0.00	0.13	0.06	0.00	0.13	0.75	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.25	0.00
Axiata	51	1.03	22	1.20	1.00	1.31	0.93	0.70	1.25	1.00	0.80	1.75	1.50	0.75	0.75	1.00	1.75	2.00	1.25	0.25	1.00	1.50	1.00	0.23
Baidu	44	0.88	53	0.66	0.38	1.23	1.56	0.55	0.75	0.00	1.40	0.50	0.75	0.00	0.50	0.25	1.75	1.15	0.75	1.25	2.00	0.50	1.75	2.00
BBK Electronics	0	0.00	198	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
BCE	47	0.94	39	0.89	0.88	1.35	0.91	0.70	1.00	0.50	1.80	0.25	0.75	1.25	0.00	1.50	2.00	0.65	1.00	1.75	1.00	0.50	2.00	0.13
Bezeq	22	0.45	134	0.69	0.25	0.44	0.31	0.55	1.50	0.00	1.00	0.25	1.00	0.00	0.00	0.00	0.25	0.00	0.75	0.75	0.50	0.00	0.50	0.23
Bharti Airtel	36	0.73	77	0.68	0.38	0.94	0.84	0.80	1.00	1.00	0.20	0.50	0.50	0.00	0.00	1.00	0.75	1.75	0.25	1.00	0.50	0.25	1.75	0.85
Block	17	0.35	158	0.19	0.13	0.38	0.66	0.40	0.75	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.75	0.75	0.00	0.00	1.00	0.25	0.75	0.63
BOE	13	0.25	172	0.00	0.38	0.21	0.53	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.00	0.60	0.25	0.00	0.50	0.00	0.75	0.85
Booking Holdings	18	0.36	154	0.26	0.00	0.50	0.37	0.65	0.00	0.25	0.80	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.25	0.00	0.00	0.00	0.75	0.73
Broadcom	32	0.63	101	0.45	0.59	0.85	0.72	0.55	0.00	0.75	0.80	0.25	1.00	0.38	0.00	1.00	1.50	1.40	0.50	0.00	1.00	0.50	0.75	0.63
BT	50	1.00	30	1.06	0.94	1.10	1.13	0.75	0.75	1.00	2.00	0.50	1.00	1.50	0.00	1.25	0.75	1.15	0.75	1.75	1.00	0.25	2.00	1.25
ByteDance	18	0.37	152	0.55	0.00	0.81	0.31	0.15	0.00	1.00	1.20	0.00	0.00	0.00	0.00	0.00	0.25	0.50	0.50	2.00	0.50	0.75	0.00	0.00
Canon	29	0.57	108	0.48	0.41	0.35	0.84	0.80	0.00	0.00	1.40	0.50	0.00	1.63	0.00	0.00	0.25	1.15	0.00	0.00	1.00	0.00	2.00	0.35
Capgemini	44	0.87	54	0.93	0.94	0.91	1.03	0.55	1.50	1.00	1.20	0.00	0.75	0.00	1.50	1.50	1.75	1.65	0.25	0.00	0.50	0.50	1.75	1.38
China Mobile	22	0.45	135	0.58	0.44	0.50	0.56	0.15	1.00	0.00	0.80	0.50	0.00	0.00	0.00	1.75	0.50	1.25	0.25	0.00	0.50	0.25	1.25	0.25
China Satellite	1	0.03	195	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
China Telecom	10	0.20	178	0.50	0.00	0.06	0.34	0.10	1.50	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	1.00	0.00	0.25	0.13
China Unicom	16	0.32	163	0.68	0.50	0.00	0.34	0.10	1.00	0.00	1.20	0.50	0.75	0.00	0.00	1.25	0.00	0.00	0.00	0.00	1.00	0.00	0.25	0.13
Chunghwa Telecom	48	0.97	35	0.94	0.44	1.50	0.97	1.00	1.25	0.00	1.00	1.50	0.75	0.00	0.00	1.00	2.00	2.00	1.75	0.25	1.00	0.50	1.75	0.63
Cisco	63	1.26	5	1.01	1.03	1.19	1.84	1.25	1.00	1.38	1.40	0.25	1.00	0.50	1.63	1.00	0.75	2.00	1.25	0.75	2.00	2.00	2.00	1.35



	DIB																							
	Score	DIB																						
	(0-	Score	DIB				Inno-																	
Company	100)	(0-2)	Rank	Access	Skills	Use	vation	CSI	A1	A2	A3	A4	\$1	S2	S3	S4	U1	U2	U3	U4	11	12	13	14
Citrix	22	0.44	141	0.23	0.00	1.00	0.75	0.20	0.00	0.25	0.40	0.25	0.00	0.00	0.00	0.00	1.75	1.25	1.00	0.00	1.50	0.00	0.75	0.75
Cloudflare	22	0.44	138	0.23	0.00	0.71	0.72	0.55	0.50	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.25	1.50	0.50	0.75	1.00	0.63
Cogent	5	0.09	188	0.10	0.00	0.13	0.03	0.20	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.13
Cognizant	29	0.58	107	0.53	0.63	0.50	0.49	0.75	0.75	0.75	0.60	0.00	1.00	0.50	0.00	1.00	0.75	1.00	0.25	0.00	0.50	0.00	1.25	0.23
Comcast	40	0.80	68	1.16	0.69	0.66	0.96	0.50	2.00	1.00	1.40	0.25	1.00	0.00	1.00	0.75	0.75	0.65	0.50	0.75	1.50	1.50	0.50	0.35
Corning	39	0.79	70	0.48	0.31	0.65	1.19	1.30	0.75	0.50	0.40	0.25	0.50	0.00	0.00	0.75	0.75	0.60	1.25	0.00	1.00	0.50	2.00	1.25
Delivery Hero	13	0.27	171	0.05	0.00	0.31	0.31	0.65	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.25	0.00	0.00	0.25	1.00	0.00
Dell	61	1.22	8	1.33	1.34	0.79	1.56	1.10	1.75	1.50	1.80	0.25	1.75	1.63	1.00	1.00	0.75	1.40	0.75	0.25	1.50	1.50	1.75	1.50
Deutsche Telekom	68	1.35	3	0.90	1.13	1.88	1.50	1.35	0.75	1.00	1.60	0.25	1.00	1.25	1.00	1.25	2.00	2.00	1.75	1.75	2.00	1.00	2.00	1.00
DiDi	6	0.11	184	0.00	0.00	0.38	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	1.00	0.25	0.00	0.50	0.00	0.00	0.23
Digicel	16	0.33	162	0.44	0.44	0.44	0.22	0.10	0.25	0.50	1.00	0.00	1.00	0.00	0.00	0.75	0.25	0.50	0.75	0.25	0.50	0.00	0.25	0.13
Digital Realty Trust	21	0.43	142	0.06	0.00	0.84	0.84	0.40	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.50	1.60	1.00	0.25	0.50	1.00	1.75	0.13
eBay	25	0.51	119	0.43	0.00	0.40	1.15	0.55	0.00	0.00	1.20	0.50	0.00	0.00	0.00	0.00	0.50	0.60	0.50	0.00	1.00	0.50	1.50	1.60
EchoStar	5	0.11	186	0.06	0.00	0.34	0.13	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.75	0.60	0.00	0.00	0.50	0.00	0.00	0.00
Elisa	42	0.84	58	0.93	0.44	1.16	1.13	0.55	0.75	0.00	1.20	1.75	1.25	0.50	0.00	0.00	1.00	1.15	1.00	1.50	1.00	0.75	2.00	0.78
Equinix	33	0.66	93	0.38	0.63	0.69	1.03	0.60	0.00	1.25	0.00	0.25	1.50	0.00	0.00	1.00	0.50	1.50	0.75	0.00	1.50	0.25	1.75	0.63
Ericsson	52	1.04	19	0.53	1.06	0.79	1.49	1.30	0.00	0.88	0.00	1.25	1.00	1.25	0.75	1.25	1.00	1.90	0.25	0.00	2.00	1.00	2.00	0.98
Ethio Telecom	0	0.00	198	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Etisalat	19	0.39	148	0.20	0.25	0.63	0.56	0.30	0.00	0.00	0.80	0.00	0.00	0.00	0.13	0.88	0.50	1.25	0.25	0.50	0.50	0.50	1.00	0.23
Eutelsat	22	0.44	138	0.54	0.25	0.25	0.47	0.70	1.00	0.50	0.40	0.25	0.00	0.00	0.00	1.00	0.25	0.50	0.25	0.00	0.50	0.00	1.25	0.13
Far EasTone	36	0.72	79	0.56	0.50	0.84	0.53	1.15	1.00	0.00	1.00	0.25	1.00	0.00	0.00	1.00	0.75	1.10	1.50	0.00	0.00	0.00	1.50	0.63
Foxconn	23	0.47	126	0.11	0.50	0.56	0.81	0.35	0.00	0.00	0.20	0.25	1.00	1.00	0.00	0.00	0.50	1.00	0.75	0.00	1.00	0.25	1.25	0.75
GlobalFoundries	27	0.54	113	0.19	0.47	0.38	0.90	0.75	0.00	0.75	0.00	0.00	0.75	0.75	0.00	0.38	0.50	0.75	0.25	0.00	1.00	0.00	1.25	1.35
Globe	46	0.92	43	0.30	1.13	1.69	0.78	0.70	1.00	0.00	0.20	0.00	1.50	1.25	0.00	1.75	0.75	2.00	2.00	2.00	1.00	1.00	1.00	0.13
GoTo	35	0.70	82	0.96	0.66	0.84	0.78	0.25	1.25	0.75	1.60	0.25	0.00	0.00	1.25	1.38	1.25	1.85	0.25	0.00	1.00	0.25	1.75	0.13
Grab	32	0.63	102	0.46	0.50	0.84	0.90	0.45	0.00	0.00	1.60	0.25	1.00	1.00	0.00	0.00	1.25	1.10	1.00	0.00	0.50	0.00	1.75	1.35
GTT	9	0.18	180	0.00	0.00	0.40	0.09	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	1.10	0.00	0.00	0.00	0.00	0.25	0.13
HCL	42	0.83	62	0.88	0.94	0.75	1.15	0.45	0.00	0.00	2.00	1.50	0.00	1.25	1.00	1.50	0.50	1.75	0.50	0.25	2.00	0.25	2.00	0.35
HP	61	1.22	9	1.09	1.22	1.16	1.34	1.30	0.75	1.50	1.60	0.50	1.38	1.25	1.25	1.00	1.75	1.90	1.00	0.00	1.00	1.00	2.00	1.35
HPE	48	0.96	36	0.70	0.50	0.88	1.63	1.10	0.75	1.00	0.80	0.25	0.00	1.00	1.00	0.00	0.75	1.25	1.25	0.25	1.50	1.50	2.00	1.50
Huawei	50	0.99	32	0.90	1.13	1.23	1.40	0.30	1.00	1.00	1.60	0.00	1.50	1.00	1.00	1.00	2.00	1.40	0.50	1.00	2.00	0.75	2.00	0.85
IBM	54	1.08	16	0.84	0.88	1.10	1.75	0.85	0.00	1.50	1.60	0.25	1.00	1.25	1.25	0.00	0.50	1.40	2.00	0.50	2.00	1.00	2.00	2.00
iFlytek	11	0.22	177	0.41	0.25	0.13	0.31	0.00	1.00	0.00	0.40	0.25	0.00	0.00	0.00	1.00	0.00	0.00	0.50	0.00	1.00	0.00	0.25	0.00
Iliad	19	0.38	150	0.26	0.25	0.44	0.62	0.35	0.00	0.00	0.80	0.25	0.50	0.00	0.00	0.50	0.00	0.50	0.75	0.50	0.50	0.50	1.25	0.23
Infineon	33	0.65	96	0.27	0.31	1.19	0.75	0.75	0.63	0.00	0.20	0.25	0.50	0.00	0.13	0.63	1.75	2.00	1.00	0.00	0.50	0.25	1.50	0.75
Infosys	50	1.00	29	0.86	1.06	1.15	1.16	0.75	1.00	0.00	1.20	1.25	1.50	1.00	0.75	1.00	2.00	1.60	1.00	0.00	2.00	1.00	1.50	0.13
Inmarsat	24	0.48	123	0.65	0.00	0.69	0.41	0.65	0.50	0.00	0.60	1.50	0.00	0.00	0.00	0.00	0.00	1.75	1.00	0.00	0.50	0.25	0.75	0.13
Intel	52	1.03	21	1.03	0.56	0.79	1.69	1.10	0.50	1.50	1.60	0.50	1.00	0.50	0.75	0.00	1.75	0.65	0.25	0.50	2.00	1.50	2.00	1.25
Iridium	12	0.25	174	0.13	0.00	0.28	0.53	0.30	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.60	0.00	0.00	0.50	0.00	1.50	0.13
JD.com	14	0.28	169	0.30	0.19	0.25	0.56	0.10	0.75	0.00	0.20	0.25	0.75	0.00	0.00	0.00	0.25	0.50	0.25	0.00	0.00	0.25	1.25	0.75
Jio	19	0.39	147	0.44	0.13	0.66	0.46	0.25	0.00	1.75	0.00	0.00	0.50	0.00	0.00	0.00	0.50	1.15	1.00	0.00	0.50	0.50	0.50	0.35
JOYY	1	0.02	196	0.00	0.00	0.06	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
Jumia	13	0.25	173	0.00	0.13	0.46	0.31	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	1.00	0.60	0.25	0.00	0.50	0.25	0.25	0.25
Juniper Networks	23	0.46	128	0.16	0.00	0.41	0.93	0.80	0.00	0.25	0.40	0.00	0.00	0.00	0.00	0.00	0.75	0.65	0.25	0.00	2.00	0.25	1.00	0.48


	DIB																							
	Score	DIB																						
	(0-	Score	DIB				Inno-																	
Company	100)	(0-2)	Rank	Access	Skills	Use	vation	CSI	A1	A2	A3	A4	S1	S2	S3	S4	01	02	03	04	11	12	13	14
KDDI	50	0.99	33	0.68	0.69	1.38	1.21	1.00	1.00	0.00	1.20	0.50	1.50	0.00	1.00	0.25	1.75	1.75	0.25	1.75	1.00	1.00	1.50	1.35
KEYENCE	6	0.11	183	0.10	0.00	0.00	0.06	0.40	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00
KPN	45	0.91	47	0.65	0.63	1.48	1.09	0.70	1.00	0.50	0.60	0.50	1.25	0.00	0.00	1.25	2.00	1.65	1.00	1.25	1.50	1.00	1.75	0.13
КТ	41	0.81	67	0.78	0.56	0.65	0.97	1.10	1.25	0.00	0.60	1.25	1.50	0.75	0.00	0.00	0.00	1.60	0.75	0.25	1.00	1.00	1.75	0.13
Kyocera	26	0.53	116	0.31	0.31	0.79	0.78	0.45	0.00	0.00	1.00	0.25	1.25	0.00	0.00	0.00	1.75	1.40	0.00	0.00	0.50	0.00	1.25	1.35
Lam Research	34	0.68	90	0.31	0.44	0.75	1.09	0.80	0.00	1.00	0.00	0.25	1.00	0.00	0.00	0.75	0.75	1.75	0.50	0.00	0.50	0.50	2.00	1.35
Largan Precision	6	0.12	182	0.05	0.00	0.28	0.16	0.10	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.25	0.60	0.25	0.00	0.00	0.00	0.00	0.63
Lenovo	41	0.82	65	0.90	0.59	0.79	1.28	0.55	0.75	1.00	1.60	0.25	0.00	0.88	0.75	0.75	0.75	1.40	0.25	0.75	1.50	0.75	2.00	0.85
LG	41	0.83	63	1.13	0.72	0.96	0.78	0.55	1.25	0.00	2.00	1.25	1.00	1.25	0.00	0.63	1.00	1.60	0.25	1.00	2.00	0.25	0.75	0.13
Liberty Global	33	0.65	98	0.58	0.34	0.88	0.72	0.75	1.25	0.00	0.80	0.25	0.75	0.00	0.00	0.63	0.50	0.75	0.25	2.00	0.00	1.00	1.75	0.13
Liquid	11	0.23	176	0.25	0.31	0.25	0.13	0.20	0.00	1.00	0.00	0.00	0.00	0.00	1.25	0.00	0.25	0.50	0.25	0.00	0.50	0.00	0.00	0.00
Logitech	39	0.78	71	0.68	0.25	0.90	1.38	0.70	0.25	1.00	1.20	0.25	1.00	0.00	0.00	0.00	1.75	1.60	0.25	0.00	1.50	1.25	1.50	1.25
Lumen	34	0.68	92	0.51	0.69	0.75	0.78	0.65	1.00	0.00	0.80	0.25	1.25	0.00	0.75	0.75	1.75	1.00	0.25	0.00	0.50	0.50	1.50	0.60
Lyft	17	0.35	158	0.65	0.00	0.23	0.37	0.50	1.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.50	0.15	0.25	0.00	0.50	0.00	0.75	0.23
MediaTek	19	0.39	149	0.11	0.19	0.44	0.94	0.25	0.00	0.00	0.20	0.25	0.00	0.00	0.75	0.00	0.75	0.50	0.50	0.00	1.00	0.25	1.25	1.25
MegaFon	18	0.36	153	0.16	0.63	0.19	0.47	0.35	0.00	0.00	0.40	0.25	1.00	0.00	1.50	0.00	0.00	0.50	0.25	0.00	0.50	0.25	1.00	0.13
Meituan	17	0.34	160	0.28	0.25	0.54	0.44	0.20	0.88	0.00	0.00	0.25	0.00	1.00	0.00	0.00	0.50	1.15	0.50	0.00	0.50	0.25	0.25	0.75
Mercado Libre	29	0.57	109	0.68	0.69	0.44	0.56	0.50	0.00	1.00	0.20	1.50	0.00	1.50	1.25	0.00	0.00	0.50	1.25	0.00	0.00	1.00	0.50	0.73
Meta	50	1.01	27	0.98	0.81	0.98	1.16	1.10	0.63	1.25	1.80	0.25	1.00	1.50	0.75	0.00	0.50	0.65	1.00	1.75	1.50	0.25	2.00	0.88
Microchip	22	0.44	136	0.00	0.31	0.44	0.81	0.65	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.75	1.00	0.00	0.00	1.00	0.00	1.00	1.25
Micron Technology	35	0.70	83	0.51	0.38	0.84	1.00	0.75	0.00	1.00	0.80	0.25	0.50	1.00	0.00	0.00	1.75	0.60	1.00	0.00	1.50	0.25	1.00	1.25
Microsoft	63	1.25	6	0.83	1.00	1.41	1.88	1.15	0.00	1.50	1.80	0.00	1.00	1.25	1.25	0.50	0.75	1.15	2.00	1.75	2.00	2.00	2.00	1.50
Millicom	42	0.85	57	0.72	0.94	1.13	0.49	0.95	0.88	1.50	0.00	0.50	1.25	1.25	0.00	1.25	2.00	0.00	0.75	1.75	0.50	0.00	1.25	0.23
MTN	47	0.94	41	1.09	0.97	1.13	0.81	0.70	1.25	1.00	0.60	1.50	1.25	0.75	0.63	1.25	0.00	0.50	2.00	2.00	1.00	1.25	0.25	0.73
MTS	29	0.58	105	0.33	0.50	0.56	0.87	0.65	0.00	0.00	0.80	0.50	1.25	0.00	0.00	0.75	0.00	0.75	0.25	1.25	0.50	1.50	1.25	0.23
Murata	21	0.41	145	0.21	0.13	0.13	0.75	0.85	0.00	0.00	0.60	0.25	0.50	0.00	0.00	0.00	0.50	0.00	0.00	0.00	1.00	0.25	1.00	0.75
Naspers	42	0.84	60	0.33	0.91	1.06	1.16	0.75	0.00	0.00	0.80	0.50	1.00	1.00	1.63	0.00	2.00	1.00	1.25	0.00	0.50	2.00	1.75	0.38
NAVER	49	0.98	34	0.59	1.25	1.06	1.31	0.70	0.13	0.00	1.00	1.25	1.50	1.50	1.00	1.00	1.00	1.75	0.75	0.75	1.50	0.75	1.50	1.50
NEC	40	0.79	69	0.46	0.38	1.06	1.16	0.90	0.00	0.00	1.60	0.25	1.25	0.00	0.13	0.13	2.00	1.75	0.25	0.25	0.50	0.75	1.50	1.90
Nepal Telecom	3	0.05	191	0.00	0.00	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.50	0.00	0.00	0.00
NetApp	20	0.41	146	0.33	0.25	0.60	0.31	0.55	0.00	0.00	0.80	0.50	1.00	0.00	0.00	0.00	0.00	1.40	1.00	0.00	0.50	0.50	0.00	0.25
NetEase	22	0.44	140	0.20	0.53	0.63	0.49	0.35	0.00	0.00	0.80	0.00	1.00	0.00	0.00	1.13	0.25	0.50	0.75	1.00	1.00	0.00	0.25	0.73
Netflix	18	0.36	154	0.20	0.19	0.29	0.91	0.20	0.00	0.00	0.80	0.00	0.00	0.00	0.75	0.00	0.25	0.65	0.00	0.25	2.00	0.00	1.00	0.63
Nintendo	26	0.52	117	0.64	0.19	0.98	0.46	0.35	1.00	0.50	0.80	0.25	0.75	0.00	0.00	0.00	1.50	0.65	0.25	1.50	0.50	0.00	0.50	0.85
Nokia	51	1.02	24	1.08	0.88	0.75	1.50	0.90	1.63	1.00	0.20	1.50	0.00	1.00	1.00	1.50	0.50	1.75	0.75	0.00	2.00	0.50	2.00	1.50
NTT	44	0.89	52	0.79	0.63	1.10	1.21	0.70	0.50	1.25	1.40	0.00	1.25	0.00	0.00	1.25	1.75	1.40	0.25	1.00	1.50	0.50	1.50	1.35
NVIDIA	36	0.73	76	0.37	0.50	0.81	1.31	0.65	0.75	0.13	0.60	0.00	1.00	0.00	0.75	0.25	0.75	2.00	0.25	0.25	1.50	0.50	1.50	1.75
NXP	43	0.85	56	0.41	0.28	1.21	1.24	1.10	0.75	0.50	0.40	0.00	0.00	0.50	0.63	0.00	1.75	1.85	1.25	0.00	1.50	0.75	1.75	0.98
Ola	0	0.00	198	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Omantel	24	0.47	125	0.36	0.66	0.46	0.72	0.15	0.75	0.00	0.20	0.50	1.25	0.75	0.00	0.63	0.25	1.10	0.25	0.25	1.00	0.50	1.25	0.13
Ooredoo	25	0.49	121	0.44	0.44	0.63	0.56	0.40	0.50	1.00	0.00	0.25	0.75	1.00	0.00	0.00	0.25	1.00	0.75	0.50	0.50	0.50	1.25	0.00
Oracle	36	0.72	78	0.55	0.44	0.73	1.19	0.70	0.00	0.75	1.20	0.25	1.00	0.25	0.50	0.00	1.00	1.15	0.75	0.00	2.00	1.00	1.00	0.75
Orange	71	1.43	2	1.31	1.38	1.16	1.94	1.35	1.13	1.00	1.60	1.50	1.50	1.50	1.00	1.50	1.25	1.15	0.50	1.75	2.00	2.00	1.75	2.00
OTE	42	0.84	59	0.59	0.81	1.34	0.72	0.75	1.00	0.00	0.60	0.75	1.50	1.00	0.00	0.75	1.50	1.60	0.50	1.75	1.50	0.00	1.25	0.13



	DIB																							
	Score	DIB																						
	(0-	Score	DIB				Inno-																	
Company	100)	(0-2)	Rank	Access	Skills	Use	vation	CSI	A1	A2	A3	A4	S1	S2	S3	S4	U1	U2	U3	U4	11	12	13	14
Palantir	15	0.29	168	0.19	0.00	0.75	0.41	0.10	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.25	0.00	0.25	1.00	0.00	0.50	0.15
PalTel	10	0.20	179	0.06	0.31	0.13	0.38	0.10	0.25	0.00	0.00	0.00	0.00	0.00	0.75	0.50	0.00	0.50	0.00	0.00	0.50	0.25	0.75	0.00
Panasonic	42	0.84	60	0.81	1.00	0.69	1.25	0.45	1.00	0.00	2.00	0.25	1.00	1.50	0.00	1.50	0.25	2.00	0.25	0.25	1.50	1.00	1.50	1.00
PayPal	51	1.02	25	0.73	0.88	0.98	1.63	0.90	0.00	1.25	1.40	0.25	0.75	1.25	1.25	0.25	2.00	1.15	0.25	0.50	1.50	2.00	1.75	1.25
PCCW	22	0.44	136	0.56	0.28	0.65	0.22	0.50	0.75	0.00	1.00	0.50	0.38	0.13	0.00	0.63	0.50	1.60	0.25	0.25	0.00	0.25	0.50	0.13
Pinduoduo	12	0.23	175	0.31	0.31	0.13	0.31	0.10	1.25	0.00	0.00	0.00	0.00	1.25	0.00	0.00	0.00	0.50	0.00	0.00	0.50	0.25	0.25	0.23
PLDT	46	0.91	45	0.71	1.34	1.41	0.74	0.35	0.75	1.25	0.60	0.25	1.50	1.63	1.00	1.25	1.00	1.65	1.25	1.75	0.50	0.50	1.75	0.23
Proximus	36	0.71	80	0.51	0.72	0.66	0.97	0.70	0.75	0.00	0.80	0.50	0.00	1.00	1.38	0.50	0.25	1.15	0.25	1.00	1.50	0.25	2.00	0.13
Qualcomm	54	1.08	17	0.79	1.09	0.94	1.59	1.00	1.00	1.50	0.40	0.25	1.75	0.00	1.00	1.63	1.50	1.25	1.00	0.00	2.00	1.00	2.00	1.35
Rakuten	38	0.76	74	0.46	0.25	0.91	1.19	1.00	0.00	0.00	1.60	0.25	1.00	0.00	0.00	0.00	1.75	1.15	0.50	0.25	1.50	1.00	1.50	0.75
Rogers	35	0.69	84	1.01	0.31	0.88	0.62	0.65	1.25	0.00	0.80	2.00	0.00	0.00	1.00	0.25	1.75	0.00	0.75	1.00	0.50	0.00	1.75	0.23
Rostelecom	33	0.65	96	0.43	1.06	0.63	0.81	0.35	1.00	0.00	0.20	0.50	1.75	1.00	0.75	0.75	1.00	1.25	0.25	0.00	0.50	1.00	1.50	0.23
Safaricom	48	0.95	37	1.04	1.06	1.13	1.18	0.35	1.00	1.00	1.40	0.75	1.00	1.00	1.00	1.25	1.25	1.00	1.00	1.25	0.50	1.00	2.00	1.23
Salesforce	46	0.92	44	1.00	0.25	1.04	1.75	0.55	0.50	1.25	2.00	0.25	0.00	0.00	0.00	1.00	2.00	1.15	1.00	0.00	1.50	1.50	2.00	2.00
Samsung	61	1.23	7	1.09	1.34	1.16	1.44	1.10	0.00	1.25	1.60	1.50	1.25	1.25	1.63	1.25	1.50	1.40	0.25	1.50	2.00	0.50	1.50	1.75
SAP	45	0.90	48	0.66	1.06	0.75	1.25	0.80	0.00	1.38	1.00	0.25	1.50	1.00	0.75	1.00	0.50	2.00	0.25	0.25	1.00	1.50	1.50	1.00
Seagate	19	0.37	151	0.00	0.00	0.38	0.88	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.75	0.25	0.00	1.00	0.00	1.25	1.25
ServiceNow	34	0.69	87	0.55	0.66	0.63	1.06	0.55	0.00	0.75	1.20	0.25	0.00	1.63	1.00	0.00	0.75	0.75	1.00	0.00	0.50	1.00	2.00	0.73
SES	18	0.35	156	0.00	0.00	0.71	0.66	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.10	0.25	0.00	1.00	0.00	1.00	0.63
Sina	1	0.01	197	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00
Singtel	55	1.10	14	1.35	0.59	1.56	1.31	0.70	1.50	0.75	1.40	1.75	1.75	0.00	0.00	0.63	1.75	1.75	1.00	1.75	1.00	1.00	2.00	1.25
SK hynix	31	0.62	104	0.75	0.25	0.19	0.75	1.15	1.00	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	0.50	0.25	0.00	0.00	0.00	1.75	1.25
SK Telecom	55	1.10	15	1.19	1.06	0.59	1.62	1.05	1.25	0.50	1.00	2.00	1.50	0.75	1.25	0.75	0.75	0.60	0.50	0.50	2.00	1.50	2.00	0.98
Skyworks	16	0.33	161	0.13	0.13	0.50	0.34	0.55	0.00	0.50	0.00	0.00	0.00	0.00	0.50	0.00	1.75	0.00	0.25	0.00	0.50	0.00	0.75	0.13
Snap	33	0.66	93	0.85	0.69	0.69	0.59	0.50	0.00	1.50	1.40	0.50	0.00	0.75	1.25	0.75	0.25	0.50	1.00	1.00	0.50	0.25	1.00	0.63
SoftBank	47	0.94	40	0.68	0.81	1.29	1.28	0.65	1.00	0.00	1.20	0.50	1.25	0.00	1.00	1.00	2.00	1.40	1.00	0.75	1.00	2.00	1.25	0.88
Sonatel	24	0.47	124	0.56	0.94	0.25	0.62	0.00	0.75	0.75	0.00	0.75	0.75	1.00	1.00	1.00	0.00	0.50	0.25	0.25	0.50	0.75	1.00	0.23
Sony	43	0.86	55	0.94	0.38	0.73	1.44	0.80	0.63	0.88	2.00	0.25	1.50	0.00	0.00	0.00	1.75	0.65	0.25	0.25	1.50	1.00	1.75	1.50
SpaceX	3	0.06	190	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.25	0.00
Spark	46	0.91	46	0.73	1.09	1.48	0.66	0.60	1.50	0.50	0.40	0.50	1.50	0.38	0.75	1.75	0.75	1.65	2.00	1.50	0.50	1.25	0.75	0.13
Spotify	26	0.51	118	0.60	0.41	0.38	0.78	0.40	0.00	0.75	1.40	0.25	0.00	1.63	0.00	0.00	0.00	0.50	0.25	0.75	2.00	0.25	0.25	0.63
stc	25	0.49	122	0.49	0.00	0.73	0.94	0.30	0.88	0.00	0.60	0.50	0.00	0.00	0.00	0.00	1.25	0.65	0.25	0.75	1.00	1.00	1.50	0.25
Stripe	5	0.11	185	0.10	0.00	0.00	0.34	0.10	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.25	0.00	0.63
Sudatel	2	0.04	193	0.06	0.00	0.00	0.13	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Swisscom	44	0.89	51	1.03	0.94	0.88	1.16	0.45	0.00	1.00	1.60	1.50	1.50	0.75	0.00	1.50	0.25	2.00	0.25	1.00	1.50	0.50	2.00	0.63
Tata																								
Communications	45	0.89	50	0.91	0.94	0.78	0.84	1.00	0.00	2.00	0.40	1.25	0.75	1.75	0.00	1.25	0.50	1.60	1.00	0.00	1.00	0.50	1.75	0.13
TCL	9	0.17	181	0.16	0.00	0.25	0.25	0.20	0.00	0.00	0.40	0.25	0.00	0.00	0.00	0.00	0.25	0.50	0.25	0.00	0.50	0.00	0.25	0.25
TE	22	0.45	133	0.29	0.13	0.34	0.84	0.65	0.00	0.50	0.40	0.25	0.00	0.50	0.00	0.00	0.50	0.60	0.25	0.00	0.50	0.50	1.75	0.63
Tele2	25	0.50	120	0.29	0.06	0.69	0.84	0.60	0.50	0.00	0.40	0.25	0.00	0.00	0.25	0.00	0.00	0.50	0.25	2.00	0.50	0.75	2.00	0.13
Telecom Egypt	4	0.08	189	0.28	0.00	0.00	0.13	0.00	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Telecom Italia	48	0.95	38	1.21	0.69	0.96	0.94	0.95	0.75	1.00	1.60	1.50	1.25	0.00	0.75	0.75	1.00	1.10	0.25	1.50	1.50	0.50	1.50	0.25
Telefonica	85	1.70	1	1.49	1.75	2.00	1.88	1.40	1.38	1.00	1.60	2.00	1.50	1.88	1.63	2.00	2.00	2.00	2.00	2.00	1.50	2.00	2.00	2.00
Telenor	56	1.12	13	1.04	1.03	1.69	1.06	0.80	1.50	1.00	0.40	1.25	1.50	1.38	0.00	1.25	1.50	2.00	1.25	2.00	1.50	0.50	1.75	0.48
	55			2.54	1.55	1.00	1.00	0.00	1.00	1.00	55	1.25	1.00	1.00	5.55	1.20	1.55	2.00	1.1.5	2.00	1.55	0.00		



	DIB																							
	(0-	Score	DIB				Inno-																	
Company	100)	(0-2)	Rank	Access	Skills	Use	vation	CSI	A1	A2	A3	A4	S1	S2	S 3	S4	U1	U2	U3	U4	11	12	13	14
Telia	60	1.20	12	0.69	0.94	1.54	1.47	1.35	0.00	1.25	1.00	0.50	1.75	1.00	1.00	0.00	1.00	1.65	1.50	2.00	2.00	1.00	2.00	0.88
Telkom	32	0.63	100	0.55	0.56	0.53	0.93	0.60	0.75	1.00	0.20	0.25	0.00	1.00	0.00	1.25	0.50	1.35	0.25	0.00	1.00	1.50	1.00	0.23
Telkom Indonesia	18	0.35	157	0.54	0.09	0.34	0.59	0.20	1.25	0.00	0.40	0.50	0.00	0.00	0.00	0.38	0.00	1.10	0.25	0.00	0.50	0.50	1.25	0.13
Telstra	60	1.21	11	1.19	1.13	1.10	1.56	1.05	1.50	1.50	1.00	0.75	1.50	0.75	0.75	1.50	0.25	1.90	0.25	2.00	1.50	1.00	1.75	2.00
Tencent	31	0.63	103	0.47	0.38	0.98	1.06	0.25	0.38	0.00	1.00	0.50	0.50	0.00	1.00	0.00	1.25	1.15	0.25	1.25	2.00	0.75	1.00	0.48
Texas Instruments	28	0.55	112	0.35	0.50	0.41	1.15	0.35	0.00	0.75	0.40	0.25	0.00	1.25	0.00	0.75	0.75	0.65	0.25	0.00	2.00	0.50	0.75	1.35
Tokyo Electron	23	0.47	127	0.11	0.00	0.44	0.93	0.85	0.00	0.00	0.20	0.25	0.00	0.00	0.00	0.00	1.00	0.50	0.25	0.00	1.00	0.25	1.75	0.73
Toshiba TEC	14	0.27	170	0.05	0.00	0.60	0.47	0.25	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00	1.00	1.15	0.25	0.00	0.50	0.25	1.00	0.13
Transsion	15	0.31	167	0.26	0.25	0.46	0.46	0.10	0.38	0.00	0.40	0.25	0.00	0.00	0.00	1.00	0.25	1.35	0.25	0.00	1.00	0.25	0.25	0.35
TSMC	35	0.70	81	0.48	0.44	0.78	0.78	1.05	0.50	0.50	0.40	0.50	0.00	0.00	0.75	1.00	1.75	1.10	0.25	0.00	1.00	0.00	1.25	0.85
Türk Telekom	34	0.68	89	0.61	0.56	0.79	0.90	0.55	0.00	1.25	1.20	0.00	0.00	1.00	0.00	1.25	0.75	1.15	0.75	0.50	1.50	0.50	1.25	0.35
Twilio	28	0.57	110	0.39	0.50	0.75	0.66	0.55	0.00	0.50	0.80	0.25	0.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00	1.50	0.00	0.13
Twitter	23	0.45	132	0.39	0.25	0.56	0.84	0.20	0.00	0.38	1.20	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.75	1.50	1.50	1.25	0.00	0.63
Uber	28	0.55	111	0.46	0.00	0.75	1.06	0.50	0.00	0.00	1.60	0.25	0.00	0.00	0.00	0.00	0.75	1.75	0.50	0.00	1.50	0.00	2.00	0.73
United Internet	16	0.32	164	0.06	0.28	0.63	0.41	0.20	0.00	0.00	0.00	0.25	0.00	1.13	0.00	0.00	0.50	1.00	0.25	0.75	1.00	0.00	0.50	0.13
VEON	27	0.54	115	0.41	1.00	0.31	0.40	0.55	0.00	1.00	0.40	0.25	1.00	0.75	1.00	1.25	0.25	0.50	0.50	0.00	0.50	1.00	0.00	0.10
Verizon	61	1.22	9	0.96	1.09	1.48	1.38	1.20	1.25	1.00	1.60	0.00	1.63	1.00	0.00	1.75	2.00	1.15	0.75	2.00	2.00	1.00	1.75	0.75
Viettel	2	0.03	194	0.00	0.00	0.04	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.50	0.00	0.00	0.00
VMWare	39	0.77	73	0.87	0.44	0.98	0.97	0.60	0.00	1.63	1.60	0.25	0.00	0.75	1.00	0.00	1.75	1.40	0.75	0.00	1.50	0.00	1.75	0.63
Vodafone	52	1.04	19	0.94	0.72	1.50	1.22	0.80	1.00	1.25	1.00	0.50	1.25	0.00	0.00	1.63	2.00	2.00	0.25	1.75	1.50	0.75	2.00	0.63
Western Digital	34	0.69	87	0.56	0.31	0.56	0.90	1.10	1.00	1.25	0.00	0.00	0.00	0.00	1.25	0.00	0.75	1.25	0.25	0.00	1.00	0.50	0.75	1.35
Xiaomi	21	0.43	142	0.43	0.00	0.81	0.76	0.15	0.00	0.00	1.20	0.50	0.00	0.00	0.00	0.00	0.50	1.25	1.50	0.00	1.50	0.00	0.75	0.78
Yandex	50	1.00	28	0.73	1.16	1.34	1.12	0.65	1.00	0.00	1.40	0.50	1.25	0.75	1.63	1.00	1.75	1.85	1.00	0.75	1.50	0.50	1.50	0.98
Yunji	3	0.05	191	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Zain	51	1.03	23	1.35	0.91	1.13	0.66	1.10	1.25	1.25	1.40	1.50	1.25	1.00	1.00	0.38	1.00	1.25	0.25	2.00	0.50	1.00	0.50	0.63
Zoom	34	0.68	91	0.74	0.47	1.04	0.59	0.55	1.50	0.00	1.20	0.25	0.75	0.00	0.25	0.88	0.75	1.15	1.00	1.25	1.00	0.25	0.25	0.85
ZTE	27	0.54	114	0.32	0.00	1.04	0.72	0.60	0.63	0.00	0.40	0.25	0.00	0.00	0.00	0.00	1.75	1.90	0.25	0.25	1.50	0.00	1.25	0.13



TABLE 7.3: CORE SOCIAL INDICATORS (CSI) RESULTS

			Provide																		1	
			&																		1	
		Respect	promote																		1	
	CSI	Human	decent	Act																	1	
	Score	Rights	work	Ethically																		
Compony	(0-		(out of							c	7			10		12	12				17	10
Acor	20)	10)	20	4)	10	2	3	4	3	10	10	o	9	10	11	12	13	14	15	10	1/	10
Acei	7.0	3.5	2.0	1.5	1.0	0.5	0.0	0.0	0.0	1.0	1.0	0.0	0.5	1.0	0.0	0.0	0.5	0.0	0.5	0.5	0.5	0.0
Adobe	4.5	2.0	1.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.5
Airbnb	4.0	2.5	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
AIS	11 5	7.5	1.5	2.5	1.0	1.0	1.0	2.0	2.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	1.0	0.0	0.5	0.0
Akamai	5.5	2.5	1.5	1.5	0.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
Alibaba	4.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.0
Alphabet	3.5	2.0	1.0	0.5	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Altice	2.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0
Amazon	10.5	8.0	1.5	1.0	1.0	0.5	1.0	2.0	2.0	0.5	1.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	1.0	0.0
AMD	6.5	3.5	2.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0
América Móvil	9.0	4.0	2.5	2.5	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.5	0.0	0.5	0.5	0.5	1.0	0.5	0.5	0.5
American Tower	7.5	3.5	2.0	2.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	1.0	0.5
Amphenol	5.5	2.5	1.5	1.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5
Analog Devices	6.0	2.5	1.5	2.0	0.0	0.0	0.0	0.0	0.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Ant	3.5	2.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Apple	11.5	7.5	2.5	1.5	1.0	1.0	1.0	0.0	2.0	0.5	1.0	1.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5
Applied Materials	7.0	3.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	1.0	0.0
ASML	11.5	6.5	3.0	2.0	1.0	0.0	0.0	2.0	2.0	0.5	1.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ASUS	2.5	1.0	1.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
AT&T	4.5	1.5	1.5	1.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.5
ATH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Axiata	7.0	3.0	1.5	2.5	0.0	0.5	0.0	0.0	0.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	1.0	0.5
Baidu	5.5	3.5	1.5	0.5	1.0	1.0	0.0	0.0	0.0	0.5	1.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.5	0.0
BBK Electronics	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BCE	7.0	3.0	2.5	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Bezeq	5.5	2.0	2.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.5
Bharti Airtel	8.0	4.5	2.0	1.5	1.0	0.5	1.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Block	4.0	2.5	1.0	0.5	0.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
BOE	1.5	0.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Booking Holdings	6.5	4.0	1.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0
Broadcom	5.5	3.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0
ВТ	7.5	4.0	2.0	1.5	1.0	0.5	0.0	0.0	0.0	0.5	1.0	1.0	0.5	0.0	0.5	0.0	0.5	0.5	0.0	1.0	0.5	0.0
ByteDance	1.5	0.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0



		Despect	Provide &																			
	CSI Score	Respect Human Rights	decent work	Act Ethically																		
	(0-	(out of	(out of	(out of	CSI																	
Company	20)	10)	6)	4)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Canon	8.0	5.5	1.5	1.0	1.0	0.0	0.0	2.0	0.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	1.0	0.0
Capgemini	5.5	2.5	1.5	1.5	1.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	1.0	0.5
China Mobile	1.5	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.0	0.0	0.0
China Satellite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
China Telecom	1.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
	1.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Ciungilwa Telecom	10.0	0.5	2.0	1.5	0.0	0.0	1.0	2.0	2.0	0.5	1.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5	0.5
Cisco	12.5	9.5	1.5	1.5	1.0	1.0	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
Cloudflaro	2.0	2.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.5	0.0
Cogent	2.0	3.5	1.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Cognizant	2.0	4.0	2.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Comcast	5.0	3.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Corning	13.0	9.0	2.0	2.0	1.0	1.0	1.0	2.0	2.0	0.0	1.0	1.0	0.5	0.5	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5
Delivery Hero	6.5	3.5	2.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0
Dell	11.0	8.0	1.5	1.5	1.0	0.5	0.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.5
Deutsche Telekom	13.5	9.5	2.0	2.0	1.0	1.0	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	1.0	0.5
DiDi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Digicel	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Digital Realty Trust	4.0	1.0	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.5	0.5
eBay	5.5	2.5	1.5	1.5	0.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
EchoStar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Elisa	5.5	2.0	2.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	1.0	0.0	0.5	0.0
Equinix	6.0	3.5	1.5	1.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Ericsson	13.0	9.5	3.0	0.5	1.0	1.0	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.5	0.0
Ethio Telecom	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Etisalat	3.0	0.0	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	1.0	0.0
Eutelsat	7.0	3.5	1.5	2.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	1.0	0.5
Far EasTone	11.5	7.0	2.5	2.0	1.0	0.5	1.0	2.0	2.0	0.5	0.0	0.0	1.0	0.0	0.0	0.5	0.5	0.5	0.0	1.0	0.5	0.5
Foxconn	3.5	1.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.0
GlobalFoundries	7.5	3.5	2.5	1.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.0	1.0	0.0
Globe	7.0	3.5	2.0	1.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5	0.5
GoTo	2.5	1.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Grab	4.5	2.0	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.0	0.5	0.0
GTT	4.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.5	0.0
HCL	4.5	1.5	1.5	1.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5



			Provide &																			
		Respect	promote																			
	CSI	Human	decent	Act																		
	Score	Rights	work (out of	Ethically	6	6	C SI	6	C SI	6	6	C SI	6	C SI								
Company	20)	(OUL OI 10)	(OUL OI 6)	(out of 4)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
НР	13.0	9.5	2.0	1.5	1.0	1.0	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.5	0.0	0.5	0.5	0.0	0.5	1.0	0.0
НРЕ	11.0	7.5	2.5	1.0	1.0	1.0	1.0	2.0	2.0	0.5	0.0	0.0	0.5	0.0	0.0	0.5	1.0	0.5	0.0	0.5	0.5	0.0
Huawei	3.0	0.5	1.5	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.5	0.0	0.0	0.0	0.5	0.5
IBM	8.5	4.0	2.5	2.0	1.0	0.0	0.0	2.0	0.0	0.0	1.0	0.0	1.0	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
iFlytek	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iliad	3.5	1.5	1.5	0.5	0.0	0.5	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Infineon	7.5	3.5	2.0	2.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	1.0	0.0
Infosys	7.5	3.5	2.0	2.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Inmarsat	6.5	4.0	1.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5
Intel	11.0	8.5	1.5	1.0	1.0	0.0	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.5
Iridium	3.0	1.0	1.5	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.5	0.0
JD.com	1.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Jio	2.5	1.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0
JOYY	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
Jumia	3.5	0.5	2.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0
Juniper Networks	8.0	3.5	2.5	2.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
KDDI	10.0	7.0	2.0	1.0	1.0	0.0	1.0	2.0	2.0	0.0	1.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0
KEYENCE	4.0	3.0	0.5	0.5	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
KPN	7.0	3.5	2.5	1.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.0
KI	11.0	9.0	1.0	1.0	1.0	0.5	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0
Kyöcera	4.5	1.5	1.5	1.5	1.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.5
Lam Research	8.0	4.5	2.0	1.5	0.0	0.0	0.5	0.0	2.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.5
Largan Precision	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Lenovo	5.5	3.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0
Liberty Global	75	3.5	1.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.0
Liquid	2.0	4.0	0.5	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.5	0.5
Logitech	7.0	3.0	2.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.5	0.0	1.0	0.0	0.0	0.5	0.5	0.0
Lumen	6.5	3.5	2.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0
Lvft	5.0	2.0	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5
MediaTek	2.5	0.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.0
MegaFon	3.5	2.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5
Meituan	2.0	0.0	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Mercado Libre	5.0	3.0	1.5	0.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.5	0.0
Meta	11.0	8.5	1.5	1.0	1.0	0.5	0.5	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Microchip	6.5	4.0	1.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.5	0.0	0.5	0.0	0.0	0.5	0.5	0.0



			Provide &																			
		Respect	promote																			
	CSI	Human	decent	Act Ethically																		
	(0-	(out of	(out of	(out of	CSI																	
Company	20)	10)	6)	4)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Micron Technology	7.5	3.0	2.5	2.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.5	0.5	0.5	0.5	1.0	0.5	0.5	0.0
Microsoft	11.5	7.5	2.0	2.0	1.0	1.0	0.5	2.0	0.0	1.0	1.0	1.0	0.5	0.0	0.5	0.0	0.5	0.5	1.0	0.0	1.0	0.0
Millicom	9.5	5.5	2.0	2.0	0.0	0.0	1.0	2.0	0.0	0.5	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
MTN	7.0	3.5	2.0	1.5	1.0	0.0	0.5	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0
MTS	6.5	3.0	1.5	2.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0	1.0	0.5
Murata	8.5	7.0	1.0	0.5	1.0	0.5	0.5	2.0	2.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Naspers	7.5	4.0	1.5	2.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	1.0	0.5	0.5	0.0
NAVER	7.0	5.5	0.5	1.0	0.0	0.0	0.5	2.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.5	0.0
NEC	9.0	6.5	1.5	1.0	1.0	0.0	1.0	2.0	2.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Nepal Telecom	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NetApp	5.5	2.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.5
NetEase	3.5	2.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Netflix	2.0	1.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5
Nintendo	3.5	2.0	1.0	0.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Nokia	9.0	5.5	1.5	2.0	1.0	0.5	0.0	2.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	1.0	0.5
NTT	7.0	4.5	1.5	1.0	1.0	0.5	1.0	2.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0
NVIDIA	6.5	4.0	1.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.5	0.5
NXP	11.0	7.5	2.5	1.0	0.0	0.0	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.5	0.5	0.5	0.5	0.0	0.0	0.5	0.5
Ola	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Omantel	1.5	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Ooredoo	4.0	2.0	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Oracle	7.0	4.0	1.5	1.5	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	1.0	0.0
Orange	13.5	9.0	2.0	2.5	1.0	0.5	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.0	1.0	1.0	0.5
UIE Delentin	7.5	4.0	2.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0
Palantir	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0
Parrecenia	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0
Panasonic	4.5	3.0	0.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0
	9.0	2.0	1.5	1.5	1.0	0.0	0.5	2.0	0.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
Pinduoduo	1.0	2.0	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
	3.5	1.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Proximus	7.0	4.0	2.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5	0.5
Qualcomm	10.0	-4.0	2.0	2.5	1.0	0.5	0.0	2.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	1.0	0.5
Rakuten	10.0	75	1.0	1 5	1.0	1.0	1.0	2.0	2.0	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.5	0.0
Rogers	6.5	3.0	2.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.0
Rostelecom	3.5	1.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.0	0.5	0.5



	CSI Score	Respect Human Rights	Provide & promote decent work	Act Ethically																		
	(0-	(out of	(out of	(out of	CSI																	
Company	20)	10)	6)	4)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Safaricom	3.5	1.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Salesforce	5.5	2.0	2.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	1.0	0.0	0.5	0.0
Samsung	11.0	9.0	1.5	0.5	1.0	1.0	1.0	2.0	2.0	0.0	1.0	1.0	0.5	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
SAP	8.0	4.0	1.5	2.5	1.0	0.5	0.5	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	1.0	0.5
Seagate	6.0	3.0	1.5	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.5
ServiceNow	5.5	3.0	1.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.5	0.0
SES	4.0	2.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0
Sina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Singtel	7.0	3.5	2.0	1.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.5
SK hynix	11.5	8.5	2.0	1.0	1.0	0.5	1.0	2.0	2.0	0.0	1.0	1.0	0.5	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.5	0.0
SK Telecom	10.5	6.5	2.0	2.0	1.0	0.0	1.0	2.0	0.0	0.5	1.0	1.0	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Skyworks	5.5	3.0	1.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.5	0.0
Snap	5.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.5	0.0
SoftBank	6.5	3.5	1.5	1.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
Sonatel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sony	8.0	5.0	1.5	1.5	1.0	0.0	1.0	2.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
SpaceX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spark	6.0	2.5	2.0	1.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	0.0	1.0	0.5	0.0
Spotify	4.0	2.0	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
stc	3.0	0.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0
Stripe	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0
Sudatel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Swisscom	4.5	3.0	1.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0
Tata																						
Communications	10.0	5.5	2.0	2.5	1.0	1.0	1.0	0.0	0.0	0.5	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	1.0	0.5
TCL	2.0	1.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
TE	6.5	3.5	1.5	1.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
Tele2	6.0	3.0	1.5	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.5
Telecom Egypt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Telecom Italia	9.5	4.5	2.0	3.0	1.0	0.5	0.5	0.0	0.0	0.5	1.0	1.0	1.0	0.0	0.0	0.0	0.5	0.5	0.5	1.0	1.0	0.5
Telefonica	14.0	9.5	2.5	2.0	1.0	1.0	1.0	2.0	2.0	0.5	1.0	1.0	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Telenor	8.0	5.0	1.5	1.5	1.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5
Telia	13.5	8.5	2.5	2.5	1.0	1.0	0.5	2.0	2.0	0.0	1.0	1.0	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	1.0	0.5
Telkom	6.0	3.5	1.5	1.0	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0
Telkom Indonesia	2.0	0.0	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.0	0.5	0.0
Telstra	10.5	7.5	2.0	1.0	1.0	0.5	0.0	2.0	2.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.0

		Respect	Provide & promote																			
	CSI	Human	decent	Act																		
	Score	Rights	work	Ethically																		
	(0-	(out of	(out of	(out of	CSI	CSI	CSI	CSI	CSI	CSI		CSI										
Company	20)	10)	6)	4)	1	2	3	4	5	6	1	8	9	10	11	12	13	14	15	16	1/	18
	2.5	1.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0
Texas Instruments	3.5	1.0	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Tokyo Electron	8.5	5.5	1.0	2.0	1.0	0.5	0.0	2.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5
	2.5	1.0	1.0	0.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.0
	1.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
	10.5	8.0	2.0	0.5	1.0	1.0	0.0	2.0	2.0	0.0	1.0	1.0	0.5	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Тигк тејекот	5.5	2.0	2.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.0	0.5	0.5
Twitter	5.5	3.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0
Iwitter	2.0	0.0	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0
Uper	5.0	2.0	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
	2.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0
VEUN	5.5	3.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.5	0.5
Verizon	12.0	8.0	1.5	2.5	1.0	0.0	1.0	2.0	2.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	1.0	0.5	0.5	0.5
Vietter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vivivvare	0.0	3.0	1.5	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.0
Voualone Western Digital	8.0	3.5	2.0	2.5	1.0	0.5	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.5	0.5	0.5	1.0	0.5
Visemi	11.0	8.0	2.0	1.0	1.0	0.0	1.0	2.0	2.0	0.0	1.0	1.0	1.0	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.0
XidOffii	1.5	0.0	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Yunii	0.5	4.0	1.5	1.0	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.0
Tuliji Zaja	11.0	0.0	0.0	0.0	1.0	1.0	0.0	2.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Zaam	11.0	8.0	1.5	1.5	1.0	1.0	0.5	2.0	2.0	0.5	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.0	0.5	0.5
200111	5.5	3.0	1.0	1.5	1.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.5	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.5	0.0



TABLE 7.4: GEOGRAPHIC INDICATORS

					Number of
					countries
					where
					company
					has
Company	Headquarters	Income group	Region	DIB Region	employees
Acer	Taiwan	High income	East Asia & Pacific	Asia	34
Activision Blizzard	United States	High income	North America	United States	16
Adobe	United States	High income	North America	United States	26
Airbnb	United States	High income	North America	United States	18
AIS	Thailand	Upper middle income	East Asia & Pacific	Asia	1
Akamai	United States	High income	North America	United States	30
Alibaba	China	Upper middle income	East Asia & Pacific	China	17
Alphabet	United States	High income	North America	United States	53
Altice	France	High income	Europe & Central Asia	Europe	2
Amazon	United States	High income	North America	United States	42
AMD	United States	High income	North America	United States	27
América Móvil	Mexico	Upper middle income	Latin America & Caribbean	Other	25
American Tower	United States	High income	North America	United States	24
Amphenol	United States	High income	North America	United States	38
Analog Devices	United States	High income	North America	United States	5
Ant	China	Upper middle income	East Asia & Pacific	China	16
Apple	United States	High income	North America	United States	32
Applied Materials	United States	High income	North America	United States	18
ASML	Netherlands	High income	Europe & Central Asia	Europe	16
ASUS	Taiwan	High income	East Asia & Pacific	Asia	31
AT&T	United States	High income	North America	United States	57
ATH	Fiji	Upper middle income	East Asia & Pacific	Other	10
Axiata	Malaysia	Upper middle income	East Asia & Pacific	Asia	11
Baidu	China	Upper middle income	East Asia & Pacific	China	7
BBK Electronics	China	Upper middle income	East Asia & Pacific	China	2
BCE	Canada	High income	North America	Other	2
Bezeq	Israel	High income	Middle East & North Africa	Other	1



					Number of
					countries
					where
					company
					has
Company	Headquarters	Income group	Region	DIB Region	employees
Bharti Airtel	India	Lower middle income	South Asia	Asia	18
Block	United States	High income	North America	United States	8
BOE	China	Upper middle income	East Asia & Pacific	China	18
Booking Holdings	United States	High income	North America	United States	6
Broadcom	United States	High income	North America	United States	26
ВТ	United Kingdom	High income	Europe & Central Asia	Europe	30
ByteDance	China	Upper middle income	East Asia & Pacific	China	27
Canon	Japan	High income	East Asia & Pacific	Asia	52
Capgemini	France	High income	Europe & Central Asia	Europe	45
China Mobile	China	Upper middle income	East Asia & Pacific	China	27
China Satellite	China	Upper middle income	East Asia & Pacific	China	1
China Telecom	China	Upper middle income	East Asia & Pacific	China	14
China Unicom	China	Upper middle income	East Asia & Pacific	China	22
Chunghwa Telecom	Taiwan	High income	East Asia & Pacific	Asia	11
Cisco	United States	High income	North America	United States	87
Citrix	United States	High income	North America	United States	41
Cloudflare	United States	High income	North America	United States	13
Cogent	United States	High income	North America	United States	10
Cognizant	United States	High income	North America	United States	39
Comcast	United States	High income	North America	United States	12
Corning	United States	High income	North America	United States	24
Delivery Hero	Germany	High income	Europe & Central Asia	Europe	49
Dell	United States	High income	North America	United States	68
Deutsche Telekom	Germany	High income	Europe & Central Asia	Europe	45
DiDi	China	Upper middle income	East Asia & Pacific	China	18
Digicel	Jamaica	Upper middle income	Latin America & Caribbean	Other	31
Digital Realty Trust	United States	High income	North America	United States	26
еВау	United States	High income	North America	United States	25
EchoStar	United States	High income	North America	United States	9



					Number of
					countries
					where
					company
					has
Company	Headquarters	Income group	Region	DIB Region	employees
Elisa	Finland	High income	Europe & Central Asia	Europe	9
Equinix	United States	High income	North America	United States	34
Ericsson	Sweden	High income	Europe & Central Asia	Europe	114
Ethio Telecom	Ethiopia	Low income	Sub-Saharan Africa	Other	1
Etisalat	United Arab Emirates	High income	Middle East & North Africa	Other	16
Eutelsat	France	High income	Europe & Central Asia	Europe	13
Far EasTone	Taiwan	High income	East Asia & Pacific	Asia	1
Foxconn	Taiwan	High income	East Asia & Pacific	Asia	10
GlobalFoundries	United States	High income	North America	United States	20
Globe	Philippines	Lower middle income	East Asia & Pacific	Asia	1
GoTo	Indonesia	Lower middle income	East Asia & Pacific	Asia	4
Grab	Singapore	High income	East Asia & Pacific	Asia	13
GTT	United States	High income	North America	United States	17
HCL	India	Lower middle income	South Asia	Asia	50
HP	United States	High income	North America	United States	53
HPE	United States	High income	North America	United States	55
Huawei	China	Upper middle income	East Asia & Pacific	China	30
IBM	United States	High income	North America	United States	60
iFlytek	China	Upper middle income	East Asia & Pacific	China	1
lliad	France	High income	Europe & Central Asia	Europe	4
Infineon	Germany	High income	Europe & Central Asia	Europe	37
Infosys	India	Lower middle income	South Asia	Asia	51
Inmarsat	United Kingdom	High income	Europe & Central Asia	Europe	22
Intel	United States	High income	North America	United States	47
Iridium	United States	High income	North America	United States	6
JD.com	China	Upper middle income	East Asia & Pacific	China	3
Jio	India	Lower middle income	South Asia	Asia	1
JOYY	China	Upper middle income	East Asia & Pacific	China	8
Jumia	Nigeria	Lower middle income	Sub-Saharan Africa	Other	12



					Number of
					countries
					where
					company
					has
Company	Headquarters	Income group	Region	DIB Region	employees
Juniper Networks	United States	High income	North America	United States	35
KDDI	Japan	High income	East Asia & Pacific	Asia	27
KEYENCE	Japan	High income	East Asia & Pacific	China	45
KPN	Netherlands	High income	Europe & Central Asia	Europe	5
КТ	Korea, Rep.	High income	East Asia & Pacific	Asia	14
Kyocera	Japan	High income	East Asia & Pacific	Asia	34
Lam Research	United States	High income	North America	United States	18
Largan Precision	Taiwan	High income	East Asia & Pacific	Asia	3
Lenovo	Hong Kong	High income	East Asia & Pacific	Asia	48
LG	Korea, Rep.	High income	East Asia & Pacific	Asia	58
Liberty Global	United Kingdom	High income	Europe & Central Asia	Europe	7
Liquid	United Kingdom	High income	Europe & Central Asia	Europe	14
Logitech	Switzerland	High income	Europe & Central Asia	Europe	37
Lumen	United States	High income	North America	United States	22
Lyft	United States	High income	North America	United States	4
MediaTek	Taiwan	High income	East Asia & Pacific	Asia	11
MegaFon	Russian Federation	Upper middle income	Europe & Central Asia	Europe	2
Meituan	China	Upper middle income	East Asia & Pacific	China	1
Mercado Libre	Argentina	Upper middle income	Latin America & Caribbean	Other	9
Meta	United States	High income	North America	United States	37
Microchip	United States	High income	North America	United States	22
Micron Technology	United States	High income	North America	United States	13
Microsoft	United States	High income	North America	United States	195
Millicom	Luxembourg	High income	Europe & Central Asia	Europe	13
MTN	South Africa	Upper middle income	Sub-Saharan Africa	Other	21
MTS	Russian Federation	Upper middle income	Europe & Central Asia	Europe	7
Murata	Japan	High income	East Asia & Pacific	Asia	23
Naspers	South Africa	Upper middle income	Sub-Saharan Africa	Other	19
NAVER	Korea, Rep.	High income	East Asia & Pacific	Asia	16



					Number of
					countries
					where
					company
					has
Company	Headquarters	Income group	Region	DIB Region	employees
NEC	Japan	High income	East Asia & Pacific	Asia	53
Nepal Telecom	Nepal	Lower middle income	South Asia	Asia	1
NetApp	United States	High income	North America	United States	29
NetEase	China	Upper middle income	East Asia & Pacific	China	5
Netflix	United States	High income	North America	United States	26
Nintendo	Japan	High income	East Asia & Pacific	Asia	12
Nokia	Finland	High income	Europe & Central Asia	Europe	70
NTT	Japan	High income	East Asia & Pacific	Asia	41
NVIDIA	United States	High income	North America	United States	27
NXP	Netherlands	High income	Europe & Central Asia	Europe	20
Ola	India	Lower middle income	South Asia	Asia	4
Omantel	Oman	High income	Middle East & North Africa	Other	3
Ooredoo	Qatar	High income	Middle East & North Africa	Other	10
Oracle	United States	High income	North America	United States	89
Orange	France	High income	Europe & Central Asia	Europe	27
OTE	Greece	High income	Europe & Central Asia	Europe	6
Palantir	United States	High income	North America	United States	25
PalTel	Palestine	Lower middle income	Middle East & North Africa	Other	1
Panasonic	Japan	High income	East Asia & Pacific	Asia	47
PayPal	United States	High income	North America	United States	27
PCCW	Hong Kong	High income	East Asia & Pacific	Asia	17
Pinduoduo	China	Upper middle income	East Asia & Pacific	Asia	2
PLDT	Philippines	Lower middle income	East Asia & Pacific	Asia	1
Proximus	Belgium	High income	Europe & Central Asia	Europe	26
Qualcomm	United States	High income	North America	United States	28
Rakuten	Japan	High income	East Asia & Pacific	Asia	10
Rogers	Canada	High income	North America	Other	1
Rostelecom	Russian Federation	Upper middle income	Europe & Central Asia	Europe	1
Safaricom	Kenya	Lower middle income	Sub-Saharan Africa	Other	2



					Number of
					countries
					where
					company
					has
Company	Headquarters	Income group	Region	DIB Region	employees
Salesforce	United States	High income	North America	United States	21
Samsung	Korea, Rep.	High income	East Asia & Pacific	Asia	35
SAP	Germany	High income	Europe & Central Asia	Europe	82
Seagate	Ireland	High income	Europe & Central Asia	Europe	23
ServiceNow	United States	High income	North America	United States	28
SES	Luxembourg	High income	Europe & Central Asia	Europe	22
Sina	China	Upper middle income	East Asia & Pacific	China	4
Singtel	Singapore	High income	East Asia & Pacific	Asia	12
SK hynix	Korea, Rep.	High income	East Asia & Pacific	Asia	16
SK Telecom	Korea, Rep.	High income	East Asia & Pacific	Asia	5
Skyworks	United States	High income	North America	United States	16
Snap	United States	High income	North America	United States	17
SoftBank	Japan	High income	East Asia & Pacific	Asia	22
Sonatel	Senegal	Lower middle income	Sub-Saharan Africa	Other	1
Sony	Japan	High income	East Asia & Pacific	Asia	30
SpaceX	United States	High income	North America	United States	1
Spark	New Zealand	High income	East Asia & Pacific	Other	1
Spotify	Sweden	High income	Europe & Central Asia	Europe	22
stc	Saudi Arabia	High income	Middle East & North Africa	Other	3
Stripe	United States	High income	North America	United States	21
Sudatel	Sudan	Low income	Sub-Saharan Africa	Other	4
Swisscom	Switzerland	High income	Europe & Central Asia	Europe	2
Tata Communications	India	Lower middle income	South Asia	Asia	15
TCL	China	Upper middle income	East Asia & Pacific	China	8
TE	Switzerland	High income	Europe & Central Asia	Europe	18
Tele2	Sweden	High income	Europe & Central Asia	Europe	5
Telecom Egypt	Egypt	Lower middle income	Middle East & North Africa	Other	6
Telecom Italia	Italy	High income	Europe & Central Asia	Europe	27
Telefonica	Spain	High income	Europe & Central Asia	Europe	33



					Number of
					countries
					where
					company
					has
Company	Headquarters	Income group	Region	DIB Region	employees
Telenor	Norway	High income	Europe & Central Asia	Europe	9
Telia	Sweden	High income	Europe & Central Asia	Europe	21
Telkom	South Africa	Upper middle income	Sub-Saharan Africa	Other	1
Telkom Indonesia	Indonesia	Lower middle income	East Asia & Pacific	Asia	11
Telstra	Australia	High income	East Asia & Pacific	Other	25
Tencent	China	Upper middle income	East Asia & Pacific	China	19
Texas Instruments	United States	High income	North America	United States	29
Tokyo Electron	Japan	High income	East Asia & Pacific	Asia	18
Toshiba TEC	Japan	High income	East Asia & Pacific	Asia	31
Transsion	China	Upper middle income	East Asia & Pacific	China	2
TSMC	Taiwan	High income	East Asia & Pacific	Asia	8
Türk Telekom	Türkiye	Upper middle income	Europe & Central Asia	Europe	15
Twilio	United States	High income	North America	United States	18
Twitter	United States	High income	North America	United States	23
Uber	United States	High income	North America	United States	40
United Internet	Germany	High income	Europe & Central Asia	Europe	9
VEON	Netherlands	High income	Europe & Central Asia	Europe	13
Verizon	United States	High income	North America	United States	21
Viettel	Vietnam	Lower middle income	East Asia & Pacific	Asia	11
VMWare	United States	High income	North America	United States	38
Vodafone	United Kingdom	High income	Europe & Central Asia	Europe	24
Western Digital	United States	High income	North America	United States	34
Xiaomi	China	Upper middle income	East Asia & Pacific	China	21
Yandex	Russian Federation	Upper middle income	Europe & Central Asia	Europe	23
Yunji	China	Upper middle income	East Asia & Pacific	China	2
Zain	Kuwait	High income	Middle East & North Africa	Other	7
Zoom	United States	High income	North America	United States	9
ZTE	China	Upper middle income	East Asia & Pacific	China	91



TABLE 7.5: GENDER INDICATORS

					Women in Tech						Gender
		DIB	CSI	DIB			CSI	CSI	CSI	CSI	score
Company	Iteration	(A2)	(14c)	(14)	2021	Definition used by company	(13b)	(14a)	(14b)	(14d)	(0-2)
Acer		Yes	40	37	27	Technical Staff	Yes	No	No	Yes	1.5
Activision Blizzard	2022	Yes	40	24			Yes	Yes	Yes	No	1.5
Adobe	2020	Yes	33	34	26	Technical occupations in computing and information technology are those that require deep technical	Yes	Yes	Yes	No	1.75
						specialization and knowledge, as well as managers, directors, and executives who oversee technical					
						employees and the development and delivery of technical products. Reference AnitaB.org					
Airbnb	2020	No	33	48	28	Technical includes employees in Engineering, Data Science (Analytics) and Information Technology	Yes	No	Yes	No	1.25
						teams, not including Executive Assistants and Team Coordinators.					
AIS	2021	No	18	61	30	STEM related positions	Yes	No	No	No	0.75
Akamai	2020	Yes	30	27	22	Technical roles cover jobs directly linked to delivering our technological services e.g., Developer,	Yes	No	No	No	1.25
						Network Designer and Solution Engineer.					
Alibaba	2020	Yes	30	50			NO	NO	NO	NO	0.75
Alphabet	2020	Yes	27	34	26	lech roles	NO	Yes	Yes	NO	1.25
Altice	2021	Yes	25	36			NO	NO	NO	NO	0.5
Amazon	2020	Yes	45	45			Yes	Yes	No	No	1.25
AMD	2020	Yes	30	24	20		Yes	No	No	No	1.25
América Móvil	2020	No	21	39	16	STEM related positions	Yes	Yes	Yes	No	1.25
American Tower	2022	Yes	38	28			Yes	Yes	No	No	1.25
Amphenol	2022	No	33	48			Yes	No	No	No	0.75
Analog Devices	2022	No	31	40	17	Engineering	Yes	No	Yes	No	1.25
Ant	2021	Yes	38	34			Yes	No	No	No	1
Apple	2020	Yes	33	35	24	Tech roles are based on U.S. Federal Employer Information Report EEO-1	Yes	No	No	No	1.25
Applied Materials	2022	Yes	40	18	14	Engineering	Yes	No	Yes	No	1.5
ASML	2022	Yes	44	18			Yes	Yes	Yes	Yes	1.75
ASUS	2021	Yes	0	39	15	Technical/ engineering roles	Yes	No	No	No	1
AT&T	2020	Yes	20	33			Yes	Yes	No	No	1
ATH	2022	Yes	25				No	No	No	No	0.25
Axiata	2020	Yes	22	32			Yes	Yes	No	No	1
Baidu	2020	No	0	39	31	Technology/ engineering roles	Yes	No	No	No	0.75
BBK Electronics	2022	No					No	No	No	No	0
BCE	2021	Yes	38	34			Yes	Yes	Yes	No	1.5
Bezeq	2022	No	22	34			Yes	No	Yes	No	0.75
Bharti Airtel	2020	Yes	23	10	16	STEM related positions	Yes	No	Yes	No	1.25
Block	2022	No	27	42	26	Technical Staff	Yes	No	No	No	0.75
BOE	2022	No	8	70			Yes	No	No	No	0.5
Booking Holdings	2020	Yes	36	50	23	Tech roles		No	No	No	1.25
Broadcom	2020	Yes	33	21				No	No	No	1
BT	2021	Yes	33	26			Yes	No	Yes	No	1.25
ByteDance	2020	Yes	1				No	No	No	No	0.25



					Women in Tech						Gender
		DIB	CSI	DIB			CSI	CSI	CSI	CSI	score
Company	Iteration	(A2)	(14c)	(14)	2021	Definition used by company	(13b)	(14a)	(14b)	(14d)	(0-2)
Canon	2022	No	0	17			Yes	Yes	Yes	No	1
Capgemini	2022	Yes	40	36	33	STEM related positions	Yes	Yes	Yes	No	1.75
China Mobile	2020	No	13	53			Yes	Yes	No	No	0.75
China Satellite	2020	No					No	No	No	No	0
China Telecom	2020	No	9	32			Yes	No	No	No	0.5
China Unicom	2020	No	25	38			Yes	No	No	No	0.5
Chunghwa Telecom	2021	No	23	29			Yes	No	Yes	Yes	1
Cisco	2020	Yes	36	28	17	Technical workforce	Yes	Yes	No	No	1.5
Citrix	2020	Yes	18	27			Yes	No	No	No	0.75
Cloudflare	2020	No	38	32	20	All technical roles in engineering, network and information technology, all roles that require deep	Yes	No	No	No	1
						technical specialization and knowledge, as well as managers and leaders who oversee technical					
						employees and the development and delivery of technical products.					
Cogent	2021	No	33	26			Yes	No	No	No	0.75
Cognizant	2022	Yes	36	38			Yes	No	No	No	1
Comcast	2020	Yes	22	36			Yes	No	No	No	0.75
Corning	2022	Yes	27	40	36	Administrative/Technical	Yes	No	No	No	1
Delivery Hero	2021	No	33				Yes	No	Yes	No	0.75
Dell	2020	Yes	25	34	23	Tech roles	Yes	Yes	Yes	No	1.5
Deutsche Telekom	2020	Yes	50	36			Yes	Yes	Yes	No	1.5
DiDi	2022	No	29	37			No	No	No	No	0.25
Digicel	2020	Yes	25	51			Yes	No	No	No	0.75
Digital Realty Trust	2020	No	27	25			Yes	No	No	No	0.5
еВау	2020	No	33	41	26	Tech roles	Yes	No	No	No	1
EchoStar	2020	No	13				No	No	No	No	0
Elisa	2021	No	44	31			Yes	Yes	No	No	1
Equinix	2020	Yes	36	25	41	Tech roles	Yes	No	No	No	1.25
Ericsson	2020	Yes	36	25	20	Non managerial employees in job roles within the fields of STEM	Yes	No	Yes	No	1.5
Ethio Telecom	2022	No					No	No	No	No	0
Etisalat	2020	No	8	24			Yes	Yes	No	No	0.75
Eutelsat	2021	Yes	40	34			Yes	Yes	Yes	No	1.5
Far EasTone	2022	No	9	50	28	STEM related positions	Yes	No	Yes	Yes	1.25
Foxconn	2020	No	22	37			Yes	No	No	No	0.5
GlobalFoundries	2021	Yes	18	24	23	Engineering	Yes	Yes	No	No	1.25
Globe	2021	No	9	45			Yes	No	Yes	No	0.75
GoTo	2021	Yes	33	36			Yes	Yes	No	No	1.25
Grab	2020	No	33	42	24	Technical staff are those who work in the technology end of the business, and are determined based	Yes	Yes	Yes	No	1.5
						on the employee's finance category, which is based on the cost centre, product, vertical and location.					
						These figures include leadership.					
GTT	2020	No	11	37			Yes	No	No	No	0.5
HCL	2020	No	29	28			Yes	Yes	Yes	No	1



					Women in Tech						Gender
		DIB	CSI	DIB				CSI	CSI	CSI	score
Company	Iteration	(A2)	(14c)	(14)	2021	Definition used by company	(13b)	(14a)	(14b)	(14d)	(0-2)
HP	2020	Yes	46	37	23	IT and Engineering	Yes	Yes	Yes	No	1.75
HPE	2022	Yes	36	33	18	Technical Staff	Yes	Yes	Yes	No	1.75
Huawei	2020	Yes	15	21			Yes	No	No	No	0.75
IBM	2020	Yes	17	38	31	"Technical" includes Distinguished Engineers, Designers, IBM Fellows,	Yes	Yes	No	No	1.25
iFlytek	2021	No	35				No	No	No	No	0.25
Iliad	2021	No	36	29			Yes	No	Yes	No	1
Infineon	2022	No	44	36			Yes	No	Yes	No	1
Infosys	2020	No	25	40			Yes	Yes	Yes	No	1
Inmarsat	2021	No	0	30			Yes	No	No	No	0.5
Intel	2020	Yes	40	28	24	Based on Intel's internal job codes and reflects technical job requirements	Yes	Yes	Yes	No	1.75
Iridium	2022	Yes	23	24			Yes	No	No	No	0.75
JD.com	2020	No	17	25			Yes	No	No	No	0.5
Jio	2020	Yes	17	18			No	No	No	No	0.5
JOYY	2022	No	0				No	No	No	No	0
Jumia	2020	No	38	35			Yes	No	Yes	No	1
Juniper Networks	2022	Yes	27	23			Yes	Yes	No	No	1
KDDI	2020	No	17	25			Yes	Yes	Yes	No	1
KEYENCE	2022	No	13				No	No	No	No	0
KPN	2021	Yes	50	22			Yes	No	Yes	No	1.25
КТ	2021	No	10	18			Yes	No	No	No	0.5
Kyocera	2022	No	8	38			Yes	No	Yes	No	0.75
Lam Research	2022	Yes	40	20	12	Technical Staff	Yes	No	No	No	1.25
Largan Precision	2022	No	11	47			Yes	No	No	No	0.5
Lenovo	2020	Yes	18	37			Yes	Yes	Yes	No	1.25
LG	2021	No	14	21			No	No	Yes	No	0.5
Liberty Global	2021	No	18	32			Yes	No	No	No	0.5
Liquid Telecom	2022	Yes	23				No	No	No	No	0.25
Logitech	2021	Yes	36	37	21	STEM related positions	Yes	No	No	No	1.25
Lumen	2020	No	27		20	Mapped to global job titles that correlated to U.S. job titles/OFCCP Code	Yes	Yes	No	No	0.75
Lyft	2022	No	33	39			Yes	No	No	No	0.75
MediaTek	2022	No	0	20			Yes	No	No	No	0.5
MegaFon	2021	No	17	54			Yes	No	No	No	0.5
Meituan	2020	No	0	37			No	No	Yes	No	0.5
Mercado Libre	2020	Yes	22	41	19	Technical staff	Yes	No	No	No	1
Meta	2020	Yes	44	37	26	Roles are positions that require specialization and knowledge needed to accomplish mathematical,		Yes	Yes	No	1.75
						engineering, or scientific related duties.					
Microchip	2022	No	29	40	30	Technical position Yes N		No	No	No	0.75
Micron	2022	Yes	50	30	23	23 Technology/ engineering roles Yes Yes		No	No	1.5	
Microsoft	2020	Yes	42	31	25	Engineering, research, hardware engineering, hardware manufacturing engineering, evangelism, IT operations or services		Yes	No	No	1.5



					Women in Tech		1				Gender
		DIB	CSI	DIB			CSI	CSI	CSI	CSI	score
Company	Iteration	(A2)	(14c)	(14)	2021	Definition used by company	(13b)	(14a)	(14b)	(14d)	(0-2)
Millicom	2020	Yes	22	41			Yes	Yes	Yes	No	1.25
MTN	2020	Yes	31	39	17	Tech staff	Yes	Yes	Yes	No	1.75
MTS	2020	No	22	46			Yes	No	No	No	0.5
Murata	2022	No	20	47			No	No	Yes	No	0.5
Manufacturing											
Naspers	2020	No	38	44			Yes	No	No	No	0.75
NAVER	2021	No	29	37	19	Technical Roles	Yes	No	No	No	0.75
NEC	2021	No	20	20	12	STEM related positions	Yes	No	Yes	No	1
Nepal Telecom	2022	No	0				No	No	No	No	0
NetApp	2022	No	33	24			Yes	No	No	No	0.75
NetEase	2020	No	33	37	37	IT employees	Yes	No	No	No	1
Netflix	2020	No	25	52	37	Tech roles	Yes	No	No	No	0.75
Nintendo	2021	Yes	10	29			No	No	Yes	No	0.75
Nokia	2020	Yes	40	22			Yes	Yes	Yes	No	1.5
NTT	2020	Yes	31	19			Yes	Yes	Yes	No	1.5
NVIDIA	2020	Yes	23	19	14	Tech roles	Yes	No	No	No	1
NXP	2022	Yes	40	37			Yes	No	Yes	No	1.25
Ola	2020	No					No	No	No	No	0
Omantel	2021	No	0	24			Yes	No	No	No	0.5
Ooredoo	2020	Yes	0				Yes	Yes	No	No	0.75
Oracle	2020	Yes	33	30			Yes	Yes	No	No	1.25
Orange	2020	Yes	43	36	21	Tech roles	Yes	Yes	Yes	No	1.75
OTE	2021	No	30	40			Yes	No	Yes	No	1
Palantir	2021	Yes	29				No	No	No	No	0.25
PalTel	2022	No	0				Yes	Yes	No	No	0.5
Panasonic	2022	No	18	20			No	No	No	No	0.25
PayPal	2020	Yes	33	44	27		Yes	Yes	Yes	No	1.75
PCCW	2020	No	36	42			Yes	No	No	No	0.75
Pinduoduo	2021	No	0				Yes	No	No	No	0.25
PLDT	2020	Yes	23	35			Yes	No	No	Yes	1
Proximus	2021	No	40	32		Include employees in engineering, information technology and technology operations.	Yes	No	Yes	No	1
Qualcomm	2020	Yes	33	23	18	Tech roles	Yes	Yes	Yes	No	1.75
Rakuten	2021	No	8	40			Yes	No	No	No	0.5
Rogers	2020	No	27	39				No	Yes	No	0.75
Rostelecom	2022	No	21	44				No	Yes	No	0.75
Safaricom	2020	Yes	38	50	22	Technology		Yes	No	No	1.5
Salesforce	2020	Yes	31	36	27	7 Tech staff Yes		Yes	No	No	1.5
Samsung	2020	Yes	11	36	19	9 Employees in product development Yes No No		No	No	1	
SAP	2020	Yes	50	34		Yes Yes Yes		No	1.5		
Seagate	2021	No	27	59	19	Technical		No	No	No	0.75



					Women in Tech						Gender
		DIB	CSI	DIB			CSI	CSI	CSI	CSI	score
Company	Iteration	(A2)	(14c)	(14)	2021	Definition used by company	(13b)	(14a)	(14b)	(14d)	(0-2)
ServiceNow	2021	Yes	25	31	24	Technical	Yes	No	No	No	1
SES	2021	No	45	24	13	Technology	Yes	No	Yes	No	1.25
Sina	2020	No						No	No	No	0
Singtel	2020	Yes	31	34	29	Functions like IT and Networks	Yes	Yes	Yes	Yes	2
SK hynix	2020	No	11	37	15	STEM related positions	No	No	Yes	No	0.75
SK Telecom	2020	Yes	13	23	24	STEM related positions	Yes	No	Yes	No	1.25
Skyworks	2022	Yes	25	35			Yes	No	No	No	0.75
Snap	2022	Yes	40	35	19	Tech roles	Yes	No	No	No	1.25
SoftBank	2020	No	8	42	17	STEM related positions	Yes	No	Yes	No	1
Sonatel	2021	Yes	0	39			No	No	No	No	0.5
Sony	2021	Yes	40	35			Yes	Yes	Yes	No	1.5
SpaceX	2020	No					No	No	No	No	0
Spark	2021	Yes	44	35			Yes	No	Yes	Yes	1.5
Spotify	2020	Yes	36	45			Yes	No	No	No	1
stc	2021	No	18	6			Yes	Yes	No	No	0.75
Stripe	2022	No	33	36	24	Tech roles	Yes	No	No	No	1
Sudatel	2022	No	0				No	No	No	No	0
Swisscom	2021	Yes	33	22			No	No	Yes	No	1
Tata	2020	Yes	17	22			Yes	No	Yes	No	1
Communications											
TCL	2022	No	11	40			Yes	No	No	No	0.5
TE Connectivity	2022	Yes	33	42	15	STEM related positions	Yes	No	No	No	1.25
Tele2	2021	No	57	45			Yes	Yes	Yes	No	1.25
Telecom Egypt	2021	No	8				No	No	No	No	0
Telecom Italia	2020	Yes	38	38			Yes	Yes	Yes	Yes	1.75
Telefonica	2020	Yes	29	38	20	Technology/ engineering roles	Yes	Yes	Yes	Yes	1.75
Telenor	2020	Yes	50	38			Yes	Yes	Yes	No	1.5
Telia	2020	Yes	33	38			Yes	Yes	Yes	No	1.5
Telkom	2021	Yes	35	32			Yes	No	No	No	1
Telkom Indonesia	2020	No	13	32			Yes	Yes	No	No	0.75
Telstra	2020	Yes	50	34	8	Defined by the Australian Workforce Gender Equality Agency	Yes	Yes	No	No	1.5
Tencent	2020	No	13	29			Yes	No	No	No	0.5
Texas Instruments	2020	Yes	33	37	18	Tech roles	Yes	No	No	No	1.25
Tokyo Electron	2022	No	12				No	No	Yes	No	0.25
Toshiba TEC	2022	No		14				No	Yes	No	0.5
Transsion	2022	No	0	30				No	No	No	0.5
TSMC	2020	Yes	10	35				No	Yes	Yes	1.25
Türk Telekom	2020	Yes	0	19		Yes		No	Yes	No	1
Twilio	2021	Yes	33	40		Yes		No	No	No	1
Twitter	2020	Yes	20	46	32	Tech roles	Yes	Yes	Yes	No	1.5



					Womer	Women in Tech					Gender
Company	Iteration	DIB (A2)	CSI (14c)	DIB (I4)	2021	Definition used by company	CSI (13b)	CSI (14a)	CSI (14b)	CSI (14d)	score (0-2)
Uber	2020	No	36	43	24	Excludes executives and senior management and includes all other employees on the technical job ladder	Yes	Yes	Yes	No	1.5
United Internet	2022	No	33	32			Yes	No	No	No	0.75
VEON	2020	Yes	18				Yes	No	No	No	0.5
Verizon	2020	Yes	36	33			Yes	No	No	No	1
Viettel	2021	No	0				No	No	No	No	0
VMWare	2022	Yes	30	29	28	Tech roles	Yes	Yes	Yes	No	1.75
Vodafone	2020	Yes	46	40			Yes	Yes	Yes	No	1.5
Western Digital	2020	Yes	44	58	22	Technical staff	Yes	No	No	No	1.25
Xiaomi	2020	No	0	34			Yes	No	No	No	0.5
Yandex	2021	No	0	36	23	STEM related positions	Yes	No	No	No	0.75
Yunji	2021	No	20				No	No	No	No	0
Zain	2021	Yes	0	25	14	Technology	Yes	Yes	Yes	Yes	1.75
Zoom	2021	No	11	31	24	Employees whose primary duties include the application of systems analysis, techniques and procedures, or the design, development, documentation, analysis, creation, testing or modification of applications, programs and software.	Yes	No	No	No	0.75
ZTE	2020	No	22	24			Yes	No	No	No	0.5

Note: The Gender Score allocates 0.25 points for either every gender related numerical element disclosed by the company or meeting a gender related CSI element.

Iteration represents the year when the company was first benchmarked

DIB A2 indicates which companies had a digital opportunity initiative for women and/or girls

DIB I4 indicates the overall percentage of women employees in the company

CSI (14a) indicates which companies have a public commitment to gender equality and women's empowerment

CSI (14b) indicates the companies that have one or more time-bound target on gender equality and women's empowerment

CSI (14c) indicates the companies that have at least 30% women in their highest governance body

CSI (14d) indicates companies that disclose ratio of the basic salary and remuneration of women to men in its total direct operations workforce for each employee category by location of operation



TABLE 7.6: COMMUNITY INVESTMENTS, FY2021

	Community		Community	Digital	
	investment	Cash	Investment		
Company	USD	%	(% of het income)	(0-2) *	Note
Acer	1.83	39%	0.5%	0.48	Time investment, monetary donations, products or other material donations
Adobe	95.50		2.0%	0.40	Cash and in kind
AIS	0.84			0.38	Community investment
Akamai	1.86			0.09	Akamai Foundation
Altice	1.18		loss	0.85	Amount of financial sponsorship
AMD	1.85			0.34	AMD Foundation and cash and In-kind giving
América Móvil	12.60	59%	0.1%	0.04	Corporate citizenship & philanthropic contribution including donation of services.
American Tower	6.00		0.2%	0.91	Workplace giving and matching program, volunteer events, philanthropic programs, donations and financial contributions from the American Tower Foundation
Analog Devices	1.80			0.16	Community grants
Apple	250.00	100%	0.3%	0.77	Corporate donations
Applied Materials	13.73		0.2%	0.44	Corporate contributions & foundation grants
ASML	12.24		0.2%	0.37	Cash commitments and in-kind support of ASML and the ASML Foundation
Asus	7.14		0.4%	0.88	Charity and in-kind donations
AT&T	202.05		3.7%	0.73	Corporate and AT&T Foundation
Baidu	30.70	89%	2.6%	0.28	Charitable and material donations
BCE	17.36		0.8%	0.57	Cash donations, in-kind donations and program management costs
Bezeq	3.60			0.52	Cash, services and telecom infrastructure, employee volunteer time
Bharti Airtel	0.22		0.02%	0.70	Contributions to CSR and social development activities
Broadcom	4.00			0.30	Broadcom Foundation grants
Canon	15.49		0.8%	0.03	Social contribution
China Mobile	5.07			0.37	
China Unicom	0.32			0.38	Charitable donations
Chunghwa Telecom	41.15		3.1%	0.45	Universal access services, telecom services sponsorship, charity advertising sponsorship, venue rental, contributions in cash and in-kind, corporate volunteers
Cisco	477.00		4.5%	0.54	Cash and in-kind contributions by Cisco and the Cisco Foundation
Citrix	4.03			0.08	Total donations
Comcast	503.00		3.6%	1.06	Cash/in-kind donations
Corning	3.40		0.2%	0.44	Corning Incorporated Foundation grants
Dell	60.90		1.1%	0.85	Cash & in-kind
Digital Realty Trust	1.32		0.1%	0.00	Donations to multiple organizations
eBay	14.00		0.1%	0.00	eBay Foundation grants including employee matching gifts



	Community investment		Community investment	Digital Inclusion	
	in million	Cash	(% of net	CSR Score	
Company	USD	%	income)	(0-2) *	Note
Elisa	0.04			0.20	Local community CSR costs
Equinix	2.05		0.4%	0.47	Employee donations and corporate matching and grants
Ericsson	13.17		0.5%	0.38	Community investments
Far EasTone	0.16		0.0%	0.38	Community investments
Foxconn	4.60		0.1%	0.04	Social welfare project contributions
HCL	30.00		1.6%	0.08	CSR expenditure
HP	29.06	60%	0.4%	0.84	Cash & employee volunteer hours from HP & HP Foundation to other organizations
HPE	12.06	62%		0.63	Monetary donations provided to philanthropic causes
IBM	470.60	9%	8.2%	0.57	Contributions in technology, services & cash
Infineon	1.55		0.1%	0.23	Cash, sponsoring and in-kind giving
Infosys	60.00		2.1%	0.42	Community investments
Inmarsat	0.40			0.17	Community investments
Intel	76.00		0.4%	0.63	Total giving (cash and in-kind) from Intel Corporation and the Intel Foundation
JD.com	18.60		loss	0.27	Charitable donations
KDDI	207.74		3.1%	0.38	Social contribution activity expense
КТ	9.60		0.8%	0.46	Local community donation
Kyocera	2.45			0.03	Charitable donations & in-kind donations
Lam Research	1.00			0.37	Donations
Lenovo	24.00		1.1%	0.63	Community investment
LG	23.90		1.9%	0.48	Community investment
Liberty Global	12.40	79%	0.1%	0.45	Cash, time and in-kind
Logitech	4.58		0.7%	0.44	Charitable donations, community investments & commercial initiatives
Lumen	0.50			0.39	Lumen Foundation
MediaTek	0.00		0.0%	0.02	Donation expenses
MegaFon	5.83		0.7%	0.05	Charity expenses
Micron Technology	2.70			0.36	Community investment
Millicom	11.82	8%	2.2%	0.87	Cash contributions and in-kind giving (at cost)
MTN	10.76		0.9%	0.83	Corporate social investment
MTS	8.51		1.0%	0.04	Social investments
Murata	5.36			0.01	Donations, advertising, administrative expenses and volunteering
Naver	45.89		3.6%	0.15	Public service platform value of the Fountain Fund
NetApp	2.50			0.02	Total donations
Nokia	8.24		0.4%	0.91	Community investments



	Community investment		Community investment	Digital Inclusion	
	in million	Cash	(% of net	CSR Score	
Company	USD	%	income)	(0-2) *	Note
Oracle	20.00		0.3%	0.29	Total donations (grants, sponsorships, employee giving)
Orange	27.65		3.0%	0.82	Orange Foundation
OTE	3.41			0.40	
Panasonic	18.25	46%	0.8%	0.03	Spending on corporate citizenship activities
PayPal	38.30		0.9%	0.47	Community investment
PCCW	2.57			0.27	Monetary donations and in-kind sponsorships
PLDT	13.20			0.77	Community investments
Proximus	0.51		0.1%	0.31	Community investment
Qualcomm	39.11		0.3%	1.00	Annual corporate citizenship contribution
Rogers	55.76	13%	4.5%	0.44	Community investment including cash and in-kind
Rostelecom	2.50		0.6%	0.42	Charitable investments
Salesforce	2,017.00	5%	139.7%	0.60	Donated & discounted product; grants & gifts; value of employee volunteering
Samsung	349.67		1.0%	0.53	[Local communities] CSR costs
ServiceNow	10.00			0.47	Social investments and charitable donations
Singtel	24.93		1.7%	0.80	Direct financial support, in-kind charitable sponsorship and staff volunteering hours
SK Hynix	96.68		1.2%	0.35	Social contribution
SK Telecom	11.36		0.5%	0.67	Pure donations to local communities
Snap	10.70	100%	loss	0.56	Corporate and Snap Foundation giving
SoftBank	31.37	14%	loss	0.40	Cash, hours, in-kind, management costs & community investment
Sonatel	1.26			0.58	COVID-19 relief support
Sony	31.89		0.4%	0.53	Donations, sponsorships, in-kind and program expenses
Spark	1.22		0.5%	0.75	Cash, subsidised broadband services & employee volunteering time
STC	8.53			0.29	Contributions towards community initiatives
Tata Communications	1.92		1.2%	0.70	Total CSR expensed amount
TCL	0.05			0.00	Charitable donations
TE Connectivity	5.57		0.2%	0.18	Total giving (Foundation, Corporate, TE Matches)
Telefonica	74.75		0.6%	0.67	Total spent on projects by the Telefonica Foundation
Telkom	5.20			0.63	Foundation investments
Telkom Indonesia	15.61		0.7%	0.42	Community development and other donations
Telstra	95.71	8%	6.7%	1.08	Social & Community Investment
Tencent	234.57		0.7%	0.16	Donations in cash and materials to Tencent Charity Foundation
Texas Instruments	61.00		0.8%	0.29	Donation in partnership with the TI Foundation, TI employees and retirees
Tokyo Electron	0.68			0.00	Community investment



	Community investment	Cash	Community investment	Digital Inclusion	
Company	USD	%	(% of field	(0-2) *	Note
Transsion	0.62	70	0.1%	0.15	External donations and investment in rural revitalization
TSMC	9.56		0.0%	0.37	Community investments
Twilio	66.00		loss	0.21	Grants, donations, product credits and discounts
VMWare	11.14		0.6%	0.56	VMware Foundation grants
Vodafone	31.27		1.0%	0.81	Vodafone Foundation expenditures
Xiaomi	3.49			0.00	Charitable donations
Yandex	12.71		11.7%	0.43	Free access to services and digital products for non-profits; cash donations
Zain	34.00		5.5%	0.91	Kuwait Foundation for Advancement of Sciences Paid and National Labor Support Tax and Zakat Paid.
Zoom	11.38		0.8%	0.54	Grants
ZTE	2.04	93%	0.2%	0.21	Contribution of funds & item donations

Note: * Average score of the six digital CSR initiatives included in the benchmark.





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The report was written by the 2023 Digital Inclusion Benchmark research team led by Michael Minges (Research Lead) and consisting of Samita Thapa, Tapiwa Chinembiri, Ilayda Eren, Maria Patricia Gonzalez, and Chin Shian. Special thanks to Kriti Toshniwal (editor) for her invaluable assistance. All hyperlinks in the report valid as of 20 March 2023.

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