Women in Tech Across the Globe: A Good Practice Guide for Companies

A study by eco – Association of the Internet Industry

Author:

Eilín Geraghty

ASSOCIATION OF THE INTERNET INDUSTRY

WE ARE SHAPING THE INTERNET.

YESTERDAY. TODAY. BEYOND TOMORROW.

Imprint

Author
Eilín Geraghty,
Project Manager, eco International Communications

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Hansen Kommunikation Collier GmbH,
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Contact:
eco – Association of the Internet Industry
Tel.: +49 221 - 70 00 48-0
Email: english@eco.de

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Oliver J. Süme,
Chair of eco – Association of the Internet Industry

Lucia Falkenberg,
Chief People Officer,
eco – Association of the Internet Industry

Foreword

Dear Readers,

The digital industry is booming, with new digital business models entering the market on a daily basis, creating lucrative and future-oriented jobs. The Internet industry needs specialists – not only in development and programming, but also in fields such as digital marketing, data protection, and controlling. Companies wanting to prevail in the competition for talent should be setting their sights on one target group in particular: female specialists and managers. However, the reality still looks different. In the US, just one of every four tech specialists are women; in the EU, this drops to one in every six. Homing in on Germany: here, companies advertising for programmers and IT specialists are faced with the dilemma that only 10 to 20 percent of all applicants are women. Yet the truth is, no employer can afford to do without female specialists. What's more, talented women themselves shouldn't be missing out on the enormously diverse career opportunities offered by the Internet industry.

In order to better leverage the potential of gender diversity, eco has conducted the present study, "Women in Tech Across the Globe: A Good Practice Guide for Companies". This serves as a complement to a second study commissioned by eco from the Institut für Innovation und Technik (iit), entitled "Framework and Work Conditions for Women in the Internet Industry", which focuses specifically on the German Internet industry. The two studies have been published back-to-back because, in order to fully harness the potential of female talent for the entire industry, we need to adopt not just a national focus, but also to learn from and work alongside other countries.

The tech world may still be largely male-dominated, but the call for more female colleagues is becoming ever louder, a fact which we at eco are witnessing first-hand. At our subsidiary DE-CIX, the leading operator of Internet exchanges, we not only have colleagues from more than twenty different countries, but also an increasing number of female IT specialists. Throughout the industry, there is a growing recognition that teams are better able to promote innovation and increase quality and performance when men and women are more evenly represented.

The present study provides a comprehensive insight into the status of gender diversity in the Internet industry on the one hand, and on the other hand offers companies concrete recommendations for action on how to get more women involved in this great industry. As this study shows, this doesn't always require radical changes: simply viewing recruitment and working practices beyond a male lens and creating a more inclusive working culture can set the right conditions for the future. Show-casing role models of female careers in the Internet industry is also essential – which is why we not only include a number of testimonial quotes in this study, but also offer a regular Women in Tech interview series.

Where we currently stand in the area of gender diversity, what lies behind it, and the challenges that have to be tackled now: these are the questions we pose and provide concrete answers to in this study. In this way, we are doing our part to make the Internet industry across the globe even more diverse, innovative, and powerful.

We wish you an exciting and insightful read!

Oliver J. Süme,
Chair of eco – Association of the Internet Industry

Lucia Falkenberg,
Chief People Officer,
eco – Association of the Internet Industry

Management Summary

There's no question about it: this is a momentous time to be working in the Internet industry. With the Internet as their backbone, digital technologies are already underpinning countless advances in critical fields: for remote working, in healthcare, in digital education, in services, in manufacturing, in transport, in communications – the list goes on. The whole of society is party to this digital transformation – and none more so than those working within the Internet sector.

However, as we have been taught not just by history, but also by present-day turbulence, the trajectory that any period of major societal transformation takes cannot be left to chance. Instead, it needs to be proactively shaped and – crucially – it must be based on our democratic values. This is spelt out in the UN's 2030 Agenda for Sustainable Development, which highlights a keystone for a prosperous modern digital society: gender equality. The benefits arising from digitalization must accrue equally to both women and men, girls and boys. At the same time, an equal input of male and female talents is required to jointly shape the new digital age and to properly tackle any challenges that might accompany it.

But here we're faced with a quandary: **For every one woman specialist working in the Internet industry, globally there are currently three men – and in Europe, there are five.** If we don't move fast, age-old gender stereotypes could get bedded down in what should essentially be the most innovative and progressive of all industries. Which is why eco, as Europe's largest association of the Internet industry, has chosen to produce this study: "Women in Tech Across the Globe: A Good Practice Guide for Companies".

Gender Equality is in Our Deepest Interest

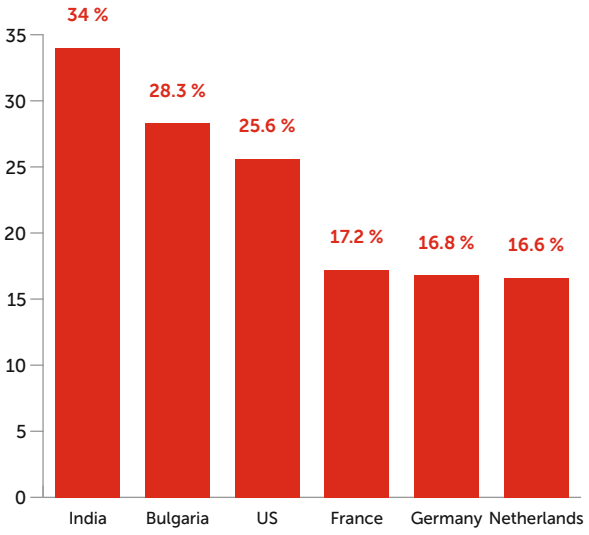
The ethical rationale for ensuring that women do not lose further ground in the world's fastest-growing and best-paid occupational sector can be taken as read. But gender equality is also in the deepest economic interest of companies. As this study highlights, organizations with high levels of gender diversity are not only proven to have higher-than-average financial returns; they also gain a serious edge over their competitors through accessing the world's greatest untapped pool of talent. Essentially, promoting women in tech is no longer a task which can be put on hold: In 2025, for example, the labor shortage of tech workers in Germany is forecast to be 625,000, and 520,000 in France.[1] Now is the time for every company to act.

The Aim of this Study

To support tech companies in their pursuit of gender equality, the core aim of this study is to offer companies of all sizes a concrete set of recommendations for action. The basis for these recommendations are facts and figures from the global industry, with a particular focus applied to 6 countries: **Germany, the Netherlands, France, Bulgaria, the United States, and India.** To take just one illustrative example of statistics from the study:

1 Empirica, 2019

Women as % of Tech Specialists, 2018



Sources: European statistics: Eurostat 2019a;
US statistics: the US Department of Labor's Current Population Survey 2019;
Indian statistics: Open University's Women and IT Scorecard - India

The various facts and figures give rise to a multitude of questions which this study subsequently explores, such as:

- Why is the share of women working as tech specialists twice as high in India as in Germany, the Netherlands, and France?
- Why is it that, in industrialized countries, by the time teenagers have reached 15 years of age, 10 times more boys than girls would like to become tech professionals? [2]

To get to the bottom of such issues, this study draws on extensive international and regional research. The five main contributory factors for the gender gap in the tech industry are found to be:

1. **Stereotypes in education & upbringing**, with an imbalance in tech skills and aspirations starting to take shape in childhood.
2. **A shortage of female role models and of women in leadership**, with this serving to reinforce these stereotypes.
3. **A male work culture** associated with teams comprising of a majority of men, which can have an alienating effect on women.
4. **Digital skepticism**, which is far higher among women than men in Western industrialized countries.
5. **A media & pop culture** which repeatedly presents technology as being a boy's club, triggering a chain reaction when it comes to digital skepticism.

Recommendations for Action

Bearing in mind the complexities underlying the gender gap in the Internet industry, this study goes on to pose the question: How can a company set about addressing what is essentially not just an individual challenge, but also a broad societal one?

Here it is advocated that a company's Number One step should be to prepare a Gender Equality Strategy, a process which needs to be led by company management. Four policies are recommended as the pillars of such a strategy:

- **Policy One:** Recruitment & On-Ramping of Women
- **Policy Two:** Retention of Women through New Work Culture
- **Policy Three:** Supporting Women to Rise up the Ranks
- **Policy Four:** Collaboration with Education Providers to Build the Pipeline of Female Talent

For each policy, this study recommends a range of good practice actions for companies of all shapes and sizes. Some organizations may already have experienced the value of some of these actions – such as remote and flexible working models, or assignment of sponsors. Other actions may provide new food for thought – e.g. undertaking unconscious bias training, re-thinking job profiles, implementing systems of face-to-face feedback, or encouraging men to also act as role models. In all cases, the rationale underpinning each action is spelt out in the study's appendix, in order to assist companies in setting concrete goals.

This Guide is for You

The facts and figures presented in this study should act as a red alert system for all companies with regard to the need to act now to address the deficit of women in tech. As the stakeholders at the front-line of the digital world, companies in the Internet industry play a key role in bridging the gender divide and promoting democratic values, and have an unparalleled motivation to do so.

Whether you are a start-up, a small or medium-sized business, or a larger company or corporation – this good practice guide is intended for you.

2 OECD, 2018

1. Introduction

1.1 Why Gender Equality is in Companies' Deepest Interest: Facts & Figures

There is no single tech company for whom the promotion of gender equality does not make sense. Decades of research findings show that diversity of thought leads to better problem-solving and innovation.[3] From an economic perspective, the bottom line is that having more women working in your company will enhance competitiveness and increase revenues. This is a fact backed up by a multitude of international studies, with three of the most prominent research findings singled out below.

Impact of Diversity on Revenues – Facts & Figures

"Highly inclusive organizations are 1.7 times more likely to be innovation leaders in their market." (Deloitte - Bersin, 2019)

"Companies with above-average diversity generate both 19% higher innovation revenues and 9% higher EBIT margins." (Harvard Business Review - Lorenzo & Reeves, 2018)[4]

"Companies with high levels of gender diversity, in particular, are 15% more likely to have financial returns above their national industry medians." (McKinsey - Hunt et al., 2015)

It has also been found that B2C tech companies with a more equal gender mix have a far greater capacity to tap into the largest single economic force in the world: women. As 2018 Catalyst research points out, women across the globe drive between 70-80% of all consumer purchasing, controlling about $40 trillion in consumer spending.

But increased innovation and market reach aren't the end of the story. Employers across the globe (and particularly in developed economies) urgently need more talent in order to address an ever-widening skills gap – and the greatest untapped pool of talent is that of women. As digitalization increasingly permeates all sectors of the labor market, if this pool is not accessed, the shortage of Information and Communication Technology (ICT) specialists is forecast to grow steadily and to impact all industries.

ICT Skills Gaps – Facts & Figures

"In 2018, ICT staff ranked third in Germany and sixth across the globe among the top 10 jobs that employers were having difficulty filling." (ManpowerGroup, 2018)

"In 2018, 43.6% of European manufacturers and 28.2% of service firms already said they expected labor shortages to limit their production." (European Commission, 2018)

"By 2019 and into 2020, the greatest labor shortages in Germany and the United States were those of software developers, IT and cyber security specialists, IT consultants, and data analysts/scientists." (Hays Index, 2020)

"In the next 15 years, the demand for advanced IT and programming skills is expected to rocket by 90%." (McKinsey – Bughin, 2018)*"By 2025, the labor shortage of ICT workers is forecast to be 625,000 in Germany, and 520,000 in France."* (Empirica 2019)

Such figures should act as a red alert system for all societal players – policy-makers, educationalists, industry, and civil society – concerning the need to act now to address the deficit of women in tech. And naturally, as the stakeholders at the front-line of the digital world, companies in the Internet industry play a key role in bridging the gender divide, and have an unparalleled motivation to do so.

3 For more on this, see, for example, Phillips, Katherine W. "How Diversity Makes Us Smarter." Scientific American, Scientific American, 1 Oct. 2014. Available at: www.scientificamerican.com/article/how-diversity-makes-us-smarter/

4 Finding derived from research undertaken amongst more than 1,700 companies across eight countries (the U.S., France, Germany, China, Brazil, India, Switzerland, and Austria). Available at: https://hbr.org/2018/01/how-and-where-diversity-drives-financial-performance

"Women are still one of – if not THE – largest marginalized groups worldwide. Leveraging the potential of digital technologies for women and girls is therefore of particular importance."

Inger Paus
Managing Director
Vodafone Institute for Society & Communication

"The tech industry offers a dynamic environment in which there are many opportunities for women to help shape the future. Digitalization and demographic change will lead to even more diverse jobs and an increased demand for highly qualified specialists in the coming years. Well-trained women are needed to fill these jobs."

Sabrina Waltz
Community & Partner Manager, Agency Business
1&1 IONOS SE

"The greatest potential that Germany has so far left untapped is girls and women in IT and the digital industry."

Alexander Rabe
Managing Director
eco – Association of the Internet Industry

"We need a diverse world in which men and women complement each other and work together as a team. We should use all our individual and gender-specific strengths, because together we can achieve so much. I myself work at GoDaddy in a diverse team – with colleagues from all over the world. The different perspectives and cultures are what bring us forward. This is exactly what makes the cooperation so fruitful and makes us successful as a team."

Melanie Buck
Chief of Staff Office of the SVP Head of GoDaddy EMEA
GoDaddy

1.2 Who is this Guide for?

Some companies are already making strong strides forward in moving closer to gender parity, with an increasing recognition of the benefits of remote working playing a key role in this regard. Across Europe and the globe, eco, as Europe's largest Internet industry association, is accompanying the substantial efforts being made by its member companies in this regard. In their endeavors, companies are recognizing that such parity will not come about just by chance, and are looking both inwards and outwards to seek optimal solutions. This is where learning between countries can offer invaluable insights: both into what actions can work for companies, and most importantly, into how to tackle factors that might be more resistant to change.

This good practice guide extracts and shares such learning with a view to supporting employers in the Internet industry. The aim of the guide is two-fold:

- To help companies gain a distilled insight into both the realities and causes of today's gender gap in the Internet industry; and
- To offer companies a concrete set of recommendations for tackling the gender gap in their organizations.

This guide is likely to be of particular relevance to management, HR departments, and recruitment personnel within Internet companies. It contains material of relevance to companies of all shapes and sizes. Whether you are a start-up, a small or medium-sized business, or a larger company or corporation – this paper is intended for you.

1.3 Content of the Guide

The preparation of this guide forms just one part of an ongoing eco Association campaign to promote women in the tech industry. In addition to the recent publication of a German-language study on women in the industry on a German national level (eco/iit 2020), as well as eco's Women in Tech interview series,[5] eco is playing a continuous role in advocating at policy level for appropriate framework conditions – for example, in the key fields of New Work and digital education, as well as in other areas such as support for female-led tech start-ups.

In this guide, however, we deliberately retain a clear focus on how companies as employers can themselves act going forward.

The content informing the guide is drawn from both extensive secondary research and first-hand experience from eco Association member companies around the globe. Arising from this research, the paper is structured as follows:

- Section 1 starts by adopting a broad lens and providing an international overview of women in tech. To allow for a more tangible insight into the gender gap, a more in-depth focus is then applied to a representative cross-section of countries: Germany, the Netherlands, France, Bulgaria, the United States, and India;
- Section 2 drills down on the core causes of the gender gap in the Internet industry;
- Section 3 provides recommendations for action for all companies – start-ups, SMEs, and larger enterprises – and highlights how a Gender Equality Strategy should be a company's Number One step;
- Section 4 sets out four policy areas and associated actions which are recommended for inclusion in a Gender Equality Strategy. For those wishing to delve deeper into the recommended actions, the logic and research underpinning each action can be found in Appendix 1.

5 See: https://international.eco.de/topics/new-work/

2. Women in Tech: An International Overview

In 2017, the UN celebrated International Women's Day under the banner of "Women in the Changing World of Work: Planet 50-50 by 2030". On the one hand, this target of perfect parity is ambitious, given that, as recent World Bank statistics reveal, there is still a significant gender gap in the overall rate of participation in the global labor force (39% women vs 61% men in 2019). On the other hand, as a 2017 OECD policy briefing highlights, the potential that digitalization offers to achieving gender equality in the world of work is enormous, particularly given the degree of flexibility that it offers all workers, and the multiple new job opportunities that it is opening up. Indeed, as a Forbes article points out, society is looking to the Internet industry to use the innovation skills they put into their products to help narrow the global gender gap (Davis 2018).

Further good news for women and girls: Globally, the pipeline of global female talent in STEM (science, technology, engineering, and maths) is becoming richer and deeper. 2018 proved to be a landmark year for females in science, with women winning the Nobel Prizes in both physics and chemistry. This reflects the fact that women now comprise a significant share of science and engineering college graduates in many key geographies; in fact, as the landmark 2018 OECD Report "Bridging the Digital Gender Divide" reveals, in G20 countries, more than half (52%) of all such graduates are now women. So too are 40% of such graduates in the EU, according to 2018 Eurostat statistics – an increase of 20% from a decade before.

However, a major paradox appears to prevail when it comes to the future-oriented field of ICT skills and employment.[6] Across the globe, in spite of its vast potential and penetration of numerous other industries, the tech sector is actually still further away from achieving gender equality than the wider economy. As the aforementioned 2018 OECD report notes, for example, men are on average four times more likely than women to be ICT specialists in G20 countries (OECD, 2018), while in the EU, they are six times more likely to be so (Eurostat, 2019). Even one of the most traditional of male-dominated sectors, the automotive manufacturing industry, has a higher percentage (24.7%) of women employees than the tech sector in the EU (European Sector Skills Council, 2016).

Why Working in the Internet Industry is in Women's Deepest Interest: Facts & Figures

It is not just in the best interests of companies to attract considerably higher numbers of women to work in the industry; it is also clearly in the best interest of women themselves.

For women, it is imperative to stop losing ground in the world's fastest growing occupational sector. In the EU, for example, the number of persons employed as ICT specialists grew by 41% during the period from 2008 to 2018, which was more than 12 times as high as the corresponding increase (3.4 %) for total employment. However, this growth was enjoyed by an overwhelming majority of men, with Eurostat statistics showing that the increase in the number of male ICT specialists registered as a massive 10 times higher than that experienced amongst women (51.6 % vs 5.1 %, 2019). A 2018 report from the European Institute for Gender Equality (EIGE) attributes this in part to the higher status that technology now enjoys, which is drawing more men to the field.

The net effect is that women – who were actually those who pioneered computer programming[7] – are falling behind in what is a highly lucrative professional domain. A US-based study undertaken by CNBC, for example, attests to the fact that specialist IT jobs are among the best-paying jobs for women (Hess, 2018). But earnings are naturally only one part of the picture – a lower level of participation in the Internet industry means that women are missing out in the most exciting, creative, and influential of all branches.

Looking to the future, there is room for optimism. The fact that many digital professions now require a blend of both technical expertise and other competencies is attracting more women to become tech specialists in certain sectors. Here, the media industry stands out – as revealed by eco's German study into women in tech, more than a third of all students of media informatics in Germany are now women (Wittpahl et al, 2020). In addition, the fact that all parts of the industry are waking up to the need to recruit and retain women should also help to shift the balance. To take just two examples: At the annual RIPE

6 According to the OECD, ICT employment is defined as the people working in the Information and Communication Technology (ICT) sector. The indicator is measured as a percentage of business sector employment. The sector represents a broad category, including professional profiles as diverse as systems analysts, software developers, telecommunication engineers, ICT sales professionals, and graphic and multimedia designers. As this definition indicates, the employment of ICT specialists is therefore not confined to "traditional" IT companies, but traverses many industry branches.

7 For more on this topic, read for example "The Forgotten Female Programmers Who Created Modern Tech" (Sydell 2014). Retrieved from: https://www.npr.org/sections/alltechconsidered/2014/10/06/345799830/the-forgotten-female-programmers-who-created-modern-tech?t=1580380749533

meeting, a five-day event where Internet Service Providers and network operators gather to discuss issues of interest to the Internet community, a Women in Tech session is making some important inroads;[8] while at the largest annual domains conference in the world, NamesCon Global, 2020 saw a celebration of the 10th anniversary of Women in Domaining.[9]

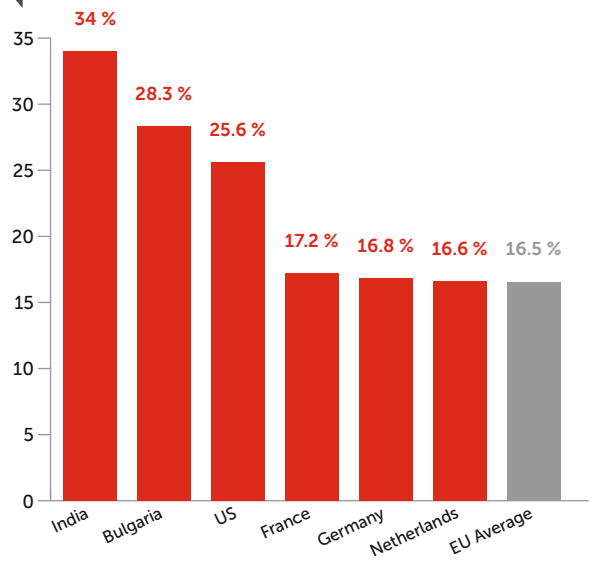
That being said, there is still no leeway for a "laissez-faire" attitude. As the 2018 European Commission study "Women in the Digital Age" highlights, in some extremely influential tech sectors, women's participation as tech specialists is exceptionally low – such as in cyber security, where they comprise only 7% of the European workforce. Moreoever, when it comes to what is recognized as the most critical and in-demand skillset of the future, artificial intelligence, it can be seen that this field is already being significantly deprived of female input. Globally, for every one female AI specialist, the World Economic Forum reported in 2018 that there are four male counterparts. If this disparity is not rectified, it could give rise to a vicious circle where gender inequalities in many areas of life will be reinforced.

"It's very exciting to see the different life and career paths and to realize that you don't have to know how to programme to end up in the digital industry – but that you have to understand the mechanism behind programming, and you have to understand its language. There are incredible opportunities offered by digitalization, and completely new job profiles are emerging. It is time for women to seize these opportunities."

Tijen Onaran,
CEO & Founder
GDW Global Digital Women Gmbh

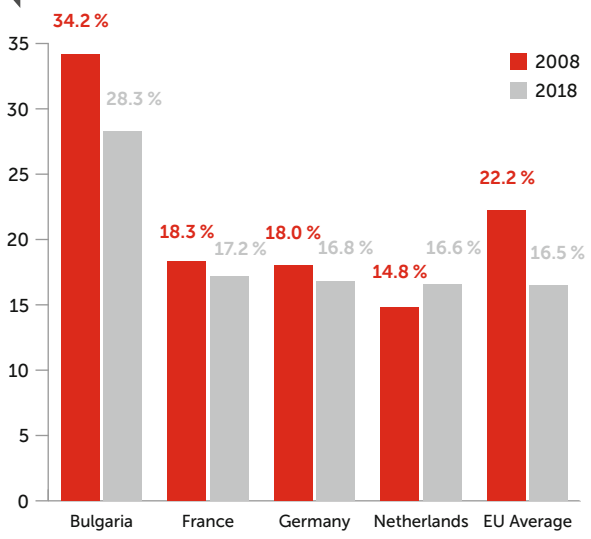
8 See: https://ripe78.ripe.net/diversity/women-in-tech-session/
9 See: https://namescon.com/news/recap-of-namescon-global-2020/

Fig. 1 Women as % of ICT Specialist Workforce, 2018*



Sources: European statistics: Eurostat 2019a;
US statistics: the US Department of Labor Current Population Survey 2019;
Indian statistics: Open University's Women and IT Scorecard - India
* While EU and US figures stem from 2018,
the most recent comparable figures available for India are from 2017.

Fig. 2 Women as % of ICT Specialists in EU: Decline/Growth 2008–2018



Source: Eurostat 2019b

To gain a more tangible insight into the world's gender divergence in the tech sector, what follows is a closer examination of a compact cross-section of 6 countries. Fig. 1 above shows the proportion of female ICT specialists in the following countries: Germany, the United States, France, the Netherlands, Bulgaria, and India.

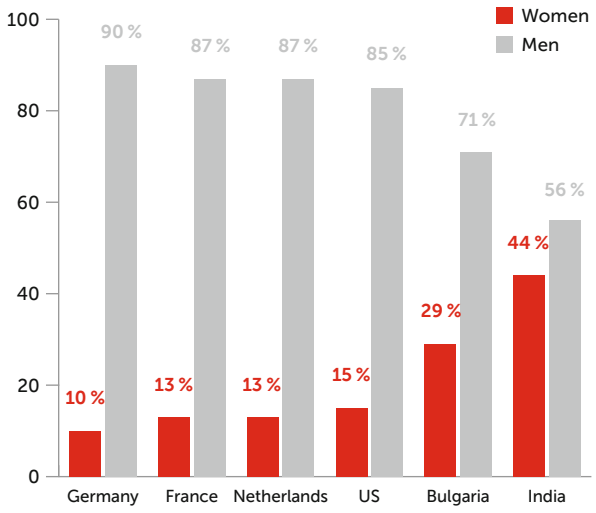
As Fig. 1 reveals, internationally, stand-out countries for female participation in the ICT sector tend to be what are described as "middle-income" or "emerging" economies. In India, one in three specialists are women, while of all EU countries, Bulgaria has the highest proportion of female ICT specialists. In contrast, the majority of "industrialized" or "developed" economies actually have a far lower proportion of women than men working as ICT experts. In the US, just one in four of all ICT specialist employees are women. In the EU, this dips to a mere one out of every six.

Ultimately, no country in the world is yet coming close to the 50-50 distribution which the world is striving to achieve by 2030. On the contrary: in the US and Europe, as the status of the tech industry continues to ascend, the trend for women's employment in the industry is veering in the other direction. If we look at Fig. 2, for example, we find that, in the EU, there has actually been a backslide of 5.6% in the female proportion of the ICT specialist workforce in the past 10 years (here, Netherlands is an exception – but its starting point was conspicuously low).

The US has also witnessed a continual decline in the proportion of women vs. men working in its ICT sector. Based on figures collated by the US-based National Center for Women and Information Technology (Aschcraft et al., 2016), we learn that the percentage of women in the sector has dropped significantly in the past decades, from 36% in 1991 to the current 25.6%.

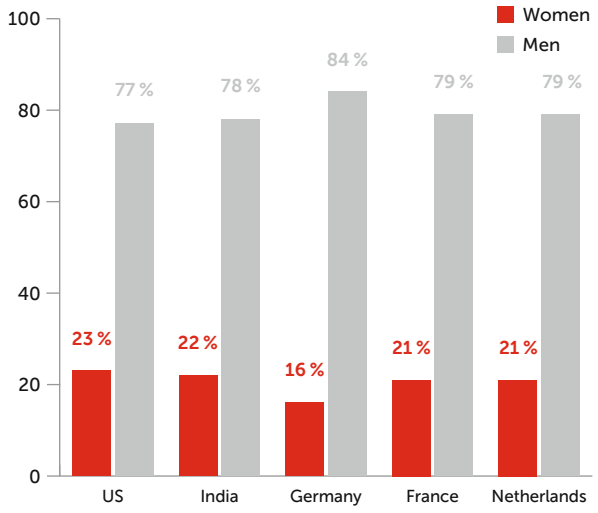
While a specific qualification in ICT is not the sole route to becoming an ICT specialist, there is nonetheless a clear correlation between the percentage of women studying ICT and the subsequent proportion of women occupying specialist roles. Here, as Fig. 3 shows, India has by far the highest proportion of female ICT graduates, followed by Bulgaria, while Germany has the lowest (although here it is worth noting that apprenticeships are more common in Germany than in other countries).

Fig. 3 Women and Men as % of ICT Graduates, 2018



Source: World Economic Forum, Global Gender Gap Report 2018

Fig. 4 Women and Men as % of Professionals with AI Skills, 2018



Source: World Economic Forum Global Gender Gap Report 2018
(figures are not available for Bulgaria)

In many countries, the numbers of women opting to study ICT has also dropped substantially. Looking at the world leader in the ICT sector, the US, we see a rather sobering storyline unfold when it comes to the proportion of female graduates. The late 1970s and early 1980s looked promising, with a peak in 1983, when 37% of all computer science (CS) degrees were conferred on women. But 1984 saw fewer women graduating with a CS degree, and the trend has followed a downward spiral ever since, plummeting to 15% of graduates in 2018.

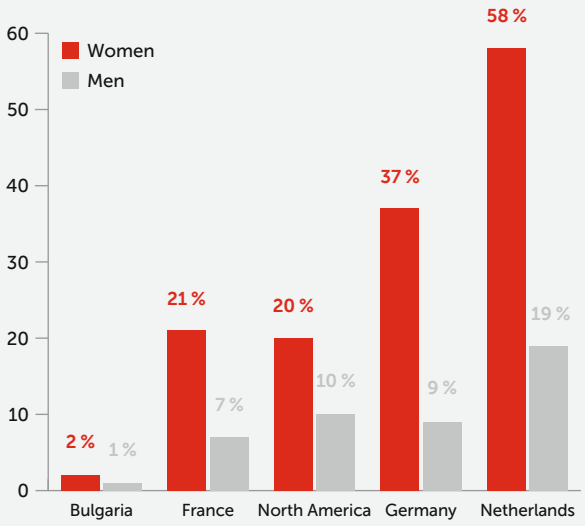
If we home in on one of the world's more advanced technologies – artificial intelligence – we also find a significant gender gap in terms of specialist skills (see Fig. 4). As the WEF Global Gender Gap Report 2018 identifies, less than one in four of professionals with AI skills are women. In Germany, which is ranked globally as the country with the third highest proportion of AI skills (after the US and India), a mere 16% of the AI talent pool is female. As the WEF report also notes, the gap in AI skills has remained constant over the past four years, even as the overall number of professionals with AI skills has risen, seeing the share of female AI talent oscillate between 21% and 23%.

The Gender Gap in 6 Countries – A Brief Analysis

The United States is ranked as Number One in the IMD World Digital Competitive Ranking 2018, and has traditionally been regarded as being on top of the game when it comes to digital innovation. However, in 2018, barely over a quarter (25.6%) of the US ICT workforce comprised of women. The implications of this gender gap are not being under-estimated, with the US Internet industry engaging increasingly with the urgent need to increase female participation. This is not just a question of equality, but also one of maintaining competitive advantage. The US's position as the world leader is wavering: the Harvard Business Review (HBR) 2017 Digital Evolution Index identifies it as being on the edge of becoming a "Stall Out" country, with a further HBR article alerting the US to the fact that countries such as China (the world's largest market for e-commerce) and India (the average age of whose population is amongst the world's youngest) are closing in (Chakravorti, 2018). A critical issue for the US industry is its growing skills deficit, with the 2019/2020 Hays Index showing that the number of advertised job openings in the US is now up to its highest level since 2000. More women in tech are urgently needed. In this regard, multiple studies from the US suggest that stereotypes and a lack of role models are hindering gender parity in the tech sector, with these factors strongly reinforced by the US's outlier status in the area of statutory paid parental leave (there is none).

Across the EU, the pool of female ICT specialists is even lower than in the US, with the share of women accounting for less than 1 in 6 (16.5%) of all such workers. The proportion in two adjoining EU countries – Germany and the Netherlands – hovers just above the EU average (16.8% and 16.6% respectively). Here, cultural factors also have a substantial influence on the gender imbalance. Norms and stereotypes concerning women in STEM fields in general are more pronounced in both countries than in other regions, particularly in Germany (where, as a 2018 Eurostat article reports, just 33% of German scientists and engineers are women, compared to 55% in Bulgaria). In both Germany and the Netherlands, there is also a higher than average expectation on women to assume a greater level of domestic responsibility – with this leading to exceptionally high levels of female part-time work (see Fig. 5). Of the EU countries under review, OECD stats reveal that German women undertake the highest proportion of

Fig. 5 Percentage of Women and Men Working Part-Zime



Source: OECD.Stat 2020b (figures for Europe derived from European Labour Survey, equivalent figures only available for North America, and not for full US).

unpaid work per day, and 4 times as many women as men are working part-time (OECD.Stat 2020a). In the Netherlands, women undertake twice as much unpaid work per day (55%) as their male counterparts (27%), and almost 3 times as many women as men are in part-time employment. As a 2017 report by the German Institute for Economics and Social Research (WSI) notes: "Many couples wish to have a split of responsibilities in a partnership. But the reality looks different," adding that: "As long as this remains so, equality in the workplace and in society is not achievable."

France is one of the countries globally which previously had a far higher share of women in the tech industry than are working there nowadays. A 2016 French study entitled "Digital Sector: Where Are the Women?" carried out by Syntec Numérique/Opiiec points out that, between 1972 and 1985, computer science was the second most common field of study for French women in all fields of engineering. Indeed, in 1982, 34% of all French CS graduates were women (Collet and Mosconi, 2010). However, women now represent just 13% of such graduates, meaning that they are now far more present in support functions and under-represented

in the tech industry's core businesses. This is attributed by a variety of studies to tech professions seeing a massive influx of men as jobs gained in prestige and as "IT" came to be synonymous with "Future" (EIGE, 2018; Collet and Mosconi, 2010). Once again, the Syntec Numérique/Opiiec study identifies the key ingredient missing in France for evening out the gender gap in tech specialist roles: the absence of female role models. As the report states, "In a sector where few women work, young girls may get the impression that this profession is not for them."

Interestingly, the two countries in this study that are classified by the World Bank as middle-income[10] (India and Bulgaria) feature amongst those globally with the highest rate of female ICT specialists. Bulgaria is the country with the greatest share of women ICT specialists in the EU (at 28.3%). This is credited by some (e.g. Davies, 2019) to socialism's history of placing gender equality at the heart of state ideology and thus engendering fewer stereotypes concerning women in STEM, but also has much to do with a societal embracing of digitalization, industry initiatives, and governmental policies.

India in turn stands out globally as having one of the highest rates of female ICT specialists internationally (34%). Here, fewer stereotypes exist concerning who undertakes careers in tech. Furthermore, research from the Open University indicates that, in India, there is a greater encouragement from parents for young women to pursue careers in the country's most booming industry, and strong collaboration exists between the industry and education providers (McDonald, 2018).

Learning can certainly be gained from these middle-income countries. However, it should be noted that, in Bulgaria in the last decade, as the status of the tech sector has gained in prominence, there has been a shooting up of the numbers of men in the Internet industry and a corresponding drop in the proportion of female tech specialists. In turn, in India, women are far more likely to be employed at "entry-level" rather than in senior roles, while there is a particularly high level of drop-out of women in tech due to cultural expectations concerning early marriage and child and eldercare.

10 See World Bank's classifications here: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

"I was recently in Vietnam due to work with an offshore partner. 50 employees were working for us there and I was so happy that 30 percent of them were women. I immediately posted a picture with these young ambitious STEM ladies who are real coders, programming... they're managing projects or are Scrum Masters. In these countries it is far easier to ask: Why shouldn't a woman do the same work as a man?"

Stefanie Kemp
Head of Business Transformation, Innovation and Digital
Lowell Financial Service GmbH, Part of Lowell Group

Each of the sources referenced in the statistical overview provided offers a far more granular analysis of the existing and widening gender gap in the area of ICT skills. For the purposes of this paper, it suffices to note the critical importance of reversing the trajectories presented, and of striving to ensure that the Internet industry in general, and particularly innovative fields such as AI, are fully inclusive. In particular, a clear message emerges for Europe and the US as digital business locations: now is the time to get to grips with the causes of the Internet industry's gender gap.

3. What's Causing the Gender Gap?

In order to gain a clear understanding of what actions companies can undertake to attract more women into the tech sector, we first need to get down to the core question: Just what is it that is causing the disparity when it comes to female tech specialists? As recently as a decade ago, researchers still tended to weight their evidence towards the view that spatial sex differences favored boys and men in STEM subjects (e.g. Gur and Gur, 2007). However, more recent research findings have finally put paid to this age-old myth and show no gender difference in brain function or math ability (e.g. Ganley, 2018). The truth is, as the 2018 OECD "Bridging the Digital Gender Divide" report relays, girls are now outperforming boys in many STEM subjects and have a similar level of performance in maths in elementary school. The OECD ABC of Gender Equality (2015a) report confirms that differences in performance in scientific and ICT-related fields do not stem from innate differences in aptitudes, but rather from students' attitudes and confidence in their own capabilities.

However, the fact is, by the time girls have reached 15 years of age, a startling 10 times more boys than girls would like to become ICT professionals (OECD, 2018). Young women are therefore not aspiring to tech careers. The problem is – why not? The answer to this question is complex and multi-faceted, with demotivation stemming more from society in general than from the Internet industry in particular. However the findings of key studies help us to pin down the primary causes, and can help companies to understand how they can help to bridge the gender gap, with specific recommendations for addressing each of these causes spelt out in Section 4. But we begin here by initially gaining an understanding of the main sources of the gender disparity:

1. **Stereotypes in Education & Upbringing:** OECD data, collected within the framework of the PISA test, shows that career expectations are moulded at a very early stage. The imbalance in tech skills and aspirations starts to take shape in childhood and is largely fuelled by gender stereotypes. The European Institute for Gender Equality (2018) points to girls and boys already being exposed to the highly segregated world of work in terms of gender bias in school curriculum and a female-dominated educational workforce. A UK survey conducted by Accenture (2018) confirms that more than half of teachers have developed an unconscious gender stereotype when it comes to STEM-based subjects. On top of that, the same survey found that cues from parents can exacerbate small differences between boys and girls that can snowball into gender-skewed educational and career paths. The end effect is that girls and women are more likely to suffer from a tech or math anxiety (Pyschological Bulletin, 2010) and, as a 2017 study from the German Federal Ministry of Economic Cooperation and Development reports, are more likely to engage in self-censorship – particularly when it comes to digital skills such as coding or use of ICT for their own entrepreneurial activities.

2. **Role Models & Leadership:** These stereotypes are copper-fastened by the lack of female role models in the Internet industry, and particularly by the absence of women in leadership roles: Across the globe, women account for just 3.2% of CEOs in IT companies, which is half as low again as the already very meagre percentage across all Fortune 500 companies; meanwhile, as the 2018 MSCI Index discloses, the Internet industry has the lowest representation of women on boards across all industries. This dearth of leadership is having a direct impact on women and their aspirations to work in the industry. In a 2018 survey undertaken by Microsoft among females aged 11 to 30, those with role models were far more likely to imagine working in STEM fields. In turn, a 2015 KPMG study found that 67% of women want more support in building confidence to feel like they can be leaders – and that role models play a critical role in such confidence-building. To quote the civil rights activist Marian Wright Edelman, **"You can't be what you can't see."**

3. **Male Work Culture:** Teams which are predominantly male can (generally unintentionally) contribute to a masculine or even a macho organizational culture, and one which is regarded as being more alienating to women. A US Catalyst study reports that 73% of women in tech jobs "feel like an outsider" in their companies, compared to just 17% of men (Beninger, 2014). In particular, an internal organizational culture that lends weight to societal biases concerning women and caring responsibilities can have a particularly insidious effect on gender equality in the workplace.

4. **Digital Skepticism vs Optimism:** An additional and often overlooked issue influencing women's aspirations is their greater degree of skepticism in some regions regarding the future value of digitalization. A 2018 study by the Vodafone Institute for Society and Communications shows that the levels of optimism are around twice as high in India as in Germany, due presumably to a heightened sense of empowerment and social mobility opportunities in India. It is no coincidence that countries where

women are far more optimistic about the potential of digitalization have a far higher level of women entering ICT professions.

5. Media & Pop Culture: The media and marketing branches play a critical role in shaping women's view of digitalization and their aspirations to enter the tech industry. As sociologist Niklas Luhmann points out, "Everything we know about our society, we know through the mass media" – in other words, media discourse often forms opinion, whether positive or negative, in a country. Combined with gender-specific marketing of clothes, toys, and job possibilities, this is contributing to a "pinkification" of girls and a greater aversion when it comes to the acquisition of tech skills, with technology presented more as a boy's club where girls don't fit in (Next Generation, 2018).

Given the deep-seated cultural influences described above, closing the gender gap in the tech industry is clearly a task for the whole of society, with policy-makers, educationalists, and the media having critical roles to play. But tech companies themselves can make a significant difference, first and foremost through internal actions undertaken within their own firms and for their customers – but also through collaboration with actors such as schools and universities.

"The image of computer science remains until today dominated by men. This can also be seen in the figures for dual work and study programs or university education. There is no reason for this to be the case. The gender gap first appears when children are 12 years old – until then, boys and girls are equally motivated and empowered to test digital logic and offer solutions."

Alexander Rabe
Managing Director
eco – Association of the Internet Industry

"Our 2018 Vodafone Institute study 'The Tech Divide: Contrasting Attitudes Towards Digitisation in Europe, Asia and the USA' showed a pattern, namely that citizens in Western industrial states are generally far more skeptical about digitalization compared to citizens in India and China – and that, in these Western states, women are more skeptical than men. Here there is no 'one-size-fits-all' solution. But what is clearly essential is, firstly, a heightened awareness of the benefits and the positive potential of technologies and, secondly, education, which must be placed center stage. Equipping children (girls and boys) with competencies, beginning at school age, is essential to make sure that we get the most out of digitalization and that nobody gets left behind in the digital age."

Inger Paus
Managing Director
Vodafone Institute for Society & Communication

4. Recommendations for Action: Where to Begin?

Having more women working in teams and management is in every company's interest. But how can a company set about addressing what is essentially not just an individual challenge, but also a broad societal one?

Luckily, there are strong research findings which show how companies can make a significant difference; initially, for themselves, but also – slowly, but surely – for the industry as a whole.

Start with a Plan

Ultimately, the degree to which companies talk about diversity and gender equality matters little compared with how they act. But clearly, this should not involve acting on a whim. A key to success for tech companies is a carefully-developed gender equality plan overseen by top management. In this guide, we refer to this as a Gender Equality Strategy. What is crucial is that such a plan is understood as being core to a company's business success (and is not regarded as being a peripheral activity to indulge women) and that it is clearly aligned with the company's overall business strategy.

Five Key Steps to Devising a Gender Equality Strategy

Step 1: Designate a Senior Executive Sponsor

Studies such as that by Ernst and Young (2016) show that top management are regarded as being the most important drivers for the realization of diversity. A Gender Equality Strategy should thus be overseen by a designated senior executive sponsor, a step strongly endorsed by McKinsey & Company in a 2018 study. This does not imply that a manager needs to be assigned exclusively to this role – in fact, this could backfire, insofar as it might compartmentalize the work to be undertaken. However, it is essential that a manager with the appropriate position, mindset, and competencies oversees the strategy's design and rollout. In order to ensure that this manager is not isolated in her/his role, a worthwhile starting point here is "unconscious bias training" for a broader management team.

What is Unconscious Bias Training?

Almost all of the big tech firms now offer unconscious bias training, including Facebook, Salesforce, VMware, and GoDaddy. Unconscious bias training programs are designed to help people become aware of their innate biases, provide tools to adjust automatic patterns of thinking, and ultimately eliminate discriminatory behaviors. This type of program needs to be distinguished from more conventional diversity training, which has been found to sometimes increase tension between groups, as an underlying theme of "them vs. us" can result in backlash once participants are outside of the training environment. Unconscious bias training, on the other hand, intentionally doesn't cast blame, a point expanded upon in a Cook Ross article (Ross, 2017). For a further insight into unconscious bias training, you can watch a McKinsey video,[11] while free online materials are in the meantime available (also in the German language) from Microsoft.[12] Facebook has also released a suite of videos and resources called Managing Unconscious Bias, which addresses everything from job postings, to in-person meetings, to on-the-job interactions.[13]

11 See https://www.youtube.com/watch?v=JFW2cfzevio
12 See https://www.mslearning.microsoft.com/course/72169/launch
13 See https://managingbias.fb.com

Step 2: Convey a Core Message

A Gender Equality Strategy should impart a core corporate message concerning Women in Tech. In this respect, the 2018 McKinsey study proffers the following statement: "As a tech company, we not only benefit from strengthening pathways for women into tech, but we are also uniquely situated to do so."

Step 3: Identify Priority Policies

Bearing in mind the chief causes of the gender disparity identified in Section 2, the following represents a logical set of policy pillars to include in a Gender Equality Strategy:

- Policy One: Recruitment & On-Ramping of Women
- Policy Two: Retention of Women through New Work Culture
- Policy Three: Supporting Women to Rise up the Ranks
- Policy Four: Collaboration with Education Providers to Build the Pipeline of Female Talent

Step 4: Set Goals & Select Associated Actions

For each policy agreed upon, a quantifiable goal should be set and related actions selected. A range of potential actions for each policy are offered in Section 4, with the research and rationale for each of these actions elaborated upon in the appendix.

Step 5: Set Key Performance Indicators

A Gender Equality Strategy should include concrete KPIs for all related activities. Keeping track of performance will motivate teams towards continuous development. Short-term performance management and long-term impact evaluation should be implemented for the strategy, e.g. for recruitment:

- % of females who participated in programs funded or run by company
- % of women applicants for tech roles
- % of new hires for technical roles who are women

A Gender Equality Strategy Makes Sense for All Companies

...for start-ups: Initially, gender equality may not seem like a priority for a company still in the early stages of development. However, setting the foundations for diversity from Day One is not only an investment for the future but also a safeguard against issues which many more established companies are facing. Start-up companies are in an optimal position to build gender equality into their broader development plans right from the beginning. This helps to prevent any institutionalisation of stereotyped attitudes – and helps to position the start-up from the beginning as a progressive company.

...for SMEs: Advancing gender equality must not necessarily be resource-intensive, but can focus on reviewing workplace policies to ensure inclusivity. Where management teams comprise of just a handful of people or perhaps even one person at the top, management participation in actions such as unconscious bias training or their role-modelling of flexible working arrangements can have a massive impact on the company. While some smaller companies may not be in a position themselves to offer some of the recommended actions (e.g. assignment of in-house mentors), they can choose to link to broader networks in the delivery of such actions.

...for large companies: Larger and established employers are likely to already have myriad gender equality policies in place. However, it is worth engaging with a diverse group of employees and reviewing which policies are working and which might need to be revamped or reconfigured. Through incorporating a Gender Equality Strategy into a broader corporate digital responsibility strategy, large employers in particular can convey important messages which have an influence on the overall Internet industry.

CASE STUDY, United States & International

Interview with Erica Varlese,
Policy & Compliance Officer, Automattic

- Automattic, global remote company behind WordPress.com & others
- 1,167 employees in 75 countries

It wasn't until we started setting actual goals that we really began to make solid progress. Setting goals allows you to break down these larger ideals into smaller, achievable victories.

Could you briefly describe some actions that Automattic is taking to promote gender equality?
Automattic has a group of volunteer members who focus on diversity matters within the company, including setting annual goals around diversity, training, and awareness. In 2014 we started to work as a company on facilitating spaces for discussions around diversity. And in the past five years, we've focused specifically on recruiting employees from either diverse backgrounds or who are typically underrepresented in tech, through actions such as workshops and courses.

Automattic is 100% distributed, meaning we have no central office and everyone is able to work remotely. This means that carers and others who might be disadvantaged in a traditional office setting often benefit from the flexibility offered by working from home – it's not uncommon to see carers adjusting their schedules, within reason, for daycare, school pickup, and the like. In addition, we have a very generous parental leave policy and health benefits.

What have been the key reasons for taking these actions?
As a whole, we have a commitment to diversity that very clearly ties in with our philosophies around open source software and general transparency online. Many changes have been driven by the passion of a few specific employees, and we're fortunate that the leadership of the company also values diversity and inclusion, which is why we've been able to garner support for these efforts over the years.

What has been the impact of these actions to date, and what is the expected longer-term impact?
The company has more and more women in leadership positions and has developed a lot more concrete actions to help promote diversity and inclusion over the years. This helps make the company culture a lot more inclusive, where people know they will be protected and supported if there are any concerns around non-inclusive behavior at any time.

Based on Automattic's experiences, what advice might you give to other companies?
Make a commitment. For many years, we had some efforts internally to promote gender equality and inclusion within the company, but it wasn't until we started setting actual goals that we really began to make solid progress. Such a commitment also shows existing employees that this truly is a value for the company and that it's something we're willing to put effort into, rather than having people work on it in their spare time (whereby there never is any spare time!).

Setting goals allows you to break down these larger ideals into smaller, achievable victories. It gives you clear markers on progress and items to evaluate so you can improve next year. It's also helpful to make these goals and commitments public, both to show the community that it's something you're committed to, but to also act as an example others can follow (see our website https://automattic.com/diversity-and-inclusion/). It's a Big Thing to work on diversity and inclusion and it can feel overwhelming to start. Bringing transparency to your process can have a ripple effect.

In summary: Being transparent and making public commitments to diversity helps push the whole industry forward. Empowering employees to come together and create groups within the industry as a whole is another great way to shine a light on the problem. Knowing that your employer supports these efforts makes a big difference in the amount of time and commitment you can make to groups working to enact change.

5. Recommendations for Action - Policies & Associated Actions

As outlined in Section 4, the four policies which are at the heart of any company's Gender Equality Strategy are recommended to be:

- Policy One: Recruitment & On-Ramping of Women
- Policy Two: Retention of Women through New Work Culture
- Policy Three: Supporting Women to Rise up the Ranks
- Policy Four: Collaboration with Education Providers to Build the Pipeline of Female Talent

This section now sets out a brief rationale for these policies and an overview of associated recommended actions. For those wishing to delve deeper into the thinking behind the recommended actions, or who need material to strengthen a case for such actions, Appendix 1 provides a table detailing the logic behind each recommendation.

Policy One: Recruitment & On-Ramping

The share of women applying for positions in the tech world needs to be significantly enhanced. In Germany, for example, a 2017 study by Weitzel et al. revealed that just 17% of applicants for ICT positions were women, while in SMEs, just 14.4% of applicants for such positions were female. An overhaul of a company's recruitment policy is one logical approach towards addressing such gender gaps, with this extending the whole way from the design of recruitment campaigns to initial on-ramps for starters and returners.

Setting gender-specific goals and targets for a recruitment campaign is important. However, this does not equate with a need to exclusively target women, which can have a counter-productive effect of women feeling like a "sub-class" and men feeling aggrieved; rather, it can be approached using language and methods which even out levels of motivation between women and men. To take just two examples: Research undertaken by Hewlett Packard shows that women are unlikely to apply for a position unless they meet 100% of requirements in job descriptions, while men will apply if they meet 60% of the requirements.[14] Therefore, if you frame a job description to focus primarily on essential skills, you are not likely to lose out on the number of male candidates, but you are far more likely to attract female applicants. Secondly, choosing to state salaries in job offers or indicating possibilities for negotiation can close the gender gap in job applications. As a Management Science study found, men are significantly more likely to engage in salary negotiations than women. The gender gap in job applications and subsequent negotiations is much more pronounced for jobs that leave the negotiation of wage ambiguous (Leibbrandt and List, 2014).

Actions for Recruitment & On-Ramping

See APPENDIX, Policy 1 for a more in-depth insight into the research & rationale underpinning each of these recommended actions.

1. Commission unconscious bias training for all recruiters and hiring managers.
2. Establish clear and consistent evaluation criteria before review processes begin.
3. In recruiting campaigns, tell your story, including factors such as a creative and collaborative workplace, an inclusive culture, commitments to elevating workers etc.
4. Champion female colleagues as role models in your recruiting campaigns.
5. Formulate job advertisements using gender-neutral phrasing, replacing terms such as "competition" with "collaboration" or job titles such as "engineer" with "developer". Avail of technologies such as Textio[15] or, for German-speakers, geschicktgendern,[16] in order to remove any gender bias from job descriptions. For more tips on this, read the article, Hire More Women in Tech.[17]
6. Refer in job advertisements to the wider social impact of the role, e.g. "You will contribute to the better use of our systems and support our client base which includes large national companies and small community based employers."
7. In job descriptions, separate "required/essential skills" from "nice to have" skills.
8. Anonymize applications for the first selection round in order to remove any possibility of unconscious bias.
9. In job advertisements, either transparently state the fixed salary on offer, or indicate that employees can negotiate their salaries.
10. Make sure men and women with equivalent credentials start out at equal levels, and are paid equally and at a competitive rate with others in the industry.
11. Redesign job profiles to focus on skills matching and the prioritization of potential rather than technical qualifications. e.g. use the European e-Competence Framework (e-CF) which identifies 40 competences as applied at the ICT workplace.[18]

14 This research finding is quoted in numerous articles, including one from HBR, 2014

15 See: https://textio.com/team/
16 See: https://www.geschicktgendern.de/
17 See: https://www.hiremorewomenintech.com
18 See: http://www.ecompetences.eu/

12. Engage in more diverse sourcing and target women aside from ICT graduates with a willingness to learn.
13. Support the creation of a talent pool by reaching out to hubs for aspiring and established women in tech, and feed job adverts into their portals, such as:
    - Global Digital Women[19]
    - Women in Tech, Ruhr area, Germany[20]
    - geekettes.io[21] (NYC, Berlin, Hamburg, Munich, Maastricht etc.)
    - shecancode.io[22] (worldwide)
    - Girls Who Code[23] (US)
    - Women Who Code[24] (US, worldwide)
14. Endeavor to have mixed-gender interview panels.
15. Position your firm as a training company, offering apprenticeships, on-ramps, and training programs for beginners (with a defined minimum number of women – e.g. 40%).
16. Consider introducing "returnship" programs for women and men who have taken a career break of at least two years. Structure such programs like internships, ranging from 2 to 6 months.
17. Sponsor or co-sponsor career-switchers from non-traditional backgrounds
    - e.g. digital starter weekends for girls/women[25]
    - e.g. coding boot camps, with a minimum quota of women, such as the Adobe Digital Academy (3-month boot camps, with minimum of 50% women, followed by internships)[26]
18. Build an internal inclusive culture in your organization (see Policy 2) and, crucially, ensure that your marketing messages reflect the reality of your internal culture.

19 See: https://global-digital-women.com
20 See: http://wit-ruhr.de
21 See: http://www.geekettes.io
22 See: http://shecancode.io
23 See: https://girlswhocode.com
24 See: https://www.womenwhocode.com
25 See, for example: https://www.womensbusinessinitiative.net/current-events/female-digital-starter-weekend/
26 See: https://www.adobe.com/corporate-responsibility/youth-creativity/digital-academy.html

CASE STUDY, Netherlands

Interview with Wido Potters,
Manager for Support & Sales, BIT BV

- BIT BV, Data Center & ISP, 36 employees

"We've learnt that even minor changes can have a major impact on how attractive we are for women to apply for jobs within our company."

In our Dutch company, BIT BV, we've recently proactively raised awareness internally, particularly amongst management, concerning our need to promote diversity. In the tech industry in the Netherlands – as in Germany and in the greater part of Europe – we all know that finding good staff can be difficult. So disqualifying 50% of the population can naturally really hurt.

Inspired by our own enhanced awareness – as well as by a diversity presentation made at a conference organized by the Network Operators Group – we've recently made some changes to our methods of recruiting employees.

As we have a relatively low turnover, we've the good fortune to rarely have job openings. But for the last job opening we had, we decided to completely change the text for the job description. It was a very simple task – but it helped to dramatically increase the number of women applying for the job.

The change here is that we chose not to insert a long list of things that we'd like to see in a candidate. Although the job opening in question related to a partially technical role, we no longer said, 'We want you to have knowledge of a, b, and c protocols, and x, y, and z Internet technologies, and of this and that hardware and software'. We completely scrapped these as prerequisites. Now we just asked for somebody who has some knowledge about IT, or at least is very interested in it.

When we last had similar job openings a number of years ago, the percentage of women applicants was between 0 and 10%. But just by changing the way we described the job, it has now increased to 45%.

And as we've seen, not only has this increased the number of women applying for this job, but also the quality of the male applicants. Below is an excerpt from our most recent job description:[27]

Vacancy: Support & Sales Engineer

Is informing and supporting professionals 'entirely your thing'? Do you find it exciting to experience at close quarters how the Internet is developing? Are you skilled in IT and do you want to learn a lot more about it? Then we have the perfect job for you!

As part of a team of nine other Internet fanatics, you will help our professional IT customers find the best solution for the challenge or problem they face. You will be supported by our data center, network and system specialists, making you the hub of our services. You don't need to bring bucket-loads of knowledge and experience with you, just bucket-loads of enthusiasm for the possibilities the Internet offers. We provide an environment in which you will automatically gain that knowledge and experience. We are looking for someone with communication skills, but a fast-paced, smooth-talking salesperson isn't our style. Our customers expect a clear and honest story and the best technical solutions from us.

27 See: https://www.bit.nl/nl/over-bit/werken-bij-bit (in Dutch)

Policy Two: Retention Through New Work Culture

Just how important a company's culture is when it comes to areas such as recruitment is shown not least by the increasing importance of company appraisals on various platforms, a point highlighted in the 2020 German eco/iit study. Particularly in the Internet industry, online company appraisals on sites such as "kununu" are likely to have a significant influence on the application situation. These platforms serve applicants as a source of information on the inner workings of companies and thus provide important clues as to whether diversity is already lived out in the company at different levels or whether there is a discrepancy between the promise and the reality of corporate culture.

Culture therefore already plays a significant role in a company's recruitment policy. But hiring women is one thing; retaining them as employees is another. Research from the Center for Talent Innovation showed that US women who are working in STEM fields are 45% more likely than their male peers to leave the industry within the year (Hewlett et al, 2014). A Catalyst study from the same year showed that more than half of all women in tech with an MBA left the sector after their first post-MBA job (Beninger, 2014). Other regions of the world are also showing a low level of female retention: In Germany, the GEWINN project reports that just 20% of women with an IT qualification are still working in the sector at the age of 30, with this dropping to 9% among 45-year-old women. In turn, in India, in spite of the pronounced interest of women in the tech field, nearly 50% women drop out of the corporate employment pipeline between junior and mid-levels (Rao, 2015).

Unequal levels of pay and promotion prospects are significant contributory factors to women's leaving, a topic which is expanded upon in Policy 3. But a further key factor in encouraging women to stay is that of organizational culture, which can be the "make or break" in terms of women deciding to leave or stay with the company – and the industry. The highly-lauded 2016 publication, "The Internet of Women: Accelerating Cultural Change" found that workplace culture is a significant factor for the attrition of women in tech (Anid et al). Specific barriers cited in research by the American Psychological Association include a hostile climate, inadequate training and development opportunities, and a lack of advancement opportunities (Fouad, 2008). An attractive organizational culture goes beyond a company's policies and legal obligations. New Work principles provide the key to an organizational culture which not just encourages, but also facilitates retention of both women and men. The two New Work principles that carry the greatest weight for women are: an inclusive culture, and a flexible work culture.

An Inclusive Culture

Inclusivity is about far more than just demographics in terms of how many women and other diverse groups are employed in a company. Employees who are genuinely listened to, recognized, and motivated, are far more likely to join and stay with a company. According to a 2017 Gallup poll, if an employer engages its employees, they are 87% less likely to resign, with positive motivation accorded far higher priority than pay levels when it comes to staying in jobs. For those who are in a minority in an organization, this holds particular weight. A 2015 PWC survey of female millennials across the globe found that inclusion was viewed as particularly important by 86% of respondents – however, 71% felt that their expectations in this regard were not being met. Focusing particularly on the Internet industry: A 2014 US study reported that 73% of women in tech jobs "feel like an outsider" in their companies, compared to just 17% of men (Beninger). For a further insight into what contributes to such feelings, see the section "Avoiding A Work Culture Which Isolates Women" on page 22.

Allowing staff to bring their "whole self" to work is central to an inclusive culture. Here, a sense of belonging provides the foundation for the realization of employees' potential. This potential is then far more likely to be realized if it is teamed with:

a) Mentoring for both women and men – which has been long recognized as a core factor in not just retention, but promotion of women;
b) A system of face-to-face feedback – as a PWC study shows, this is one of the strongest expectations amongst female millennials who, despite an affinity for the digital world, wish for regular feedback discussions on a personalized basis (Flood, 2014). The 2015 KPMG study on women in leadership found that more than half of working women (53%) indicate receiving praise from colleagues, leaders and mentors most influences their perception of themselves in the workplace, vs. traditional rewards of raises (39%) and promotions (37%);

c) Collaboration in the workplace – which goes a step further than teamwork and can be the 'glue' that best aligns employees to the company mission, as it encourages people to think together, as well as to work together;

d) A culture of employee development through further education. As a 2016 Deloitte report states, "learning opportunities are among the largest drivers of employee engagement and strong workplace culture – they are part of the entire employee value proposition, not merely a way to build skills" (Schwartz et al). As talent research undertaken by LinkedIn shows, half of today's most in-demand skills (both hard skills, such as data mining, and soft skills, such as collaboration) were not on the list three years ago. This continual shift in in-demand skills is fuelling the need for employers to help employees to grow quickly and adapt skills to remain employable in years to come (Petrone, 2018).

"A good manager is set apart by his or her engaging with team members and giving them feedback. A good manager asks: What are your strengths? Are you actually happy with what you do every day? Another important factor is facilitating employees to try out different projects, to get to know a broader range of tasks and face new challenges."

Stefanie Kemp
Head of Business Transformation, Innovation and Digital
Lowell Financial Service GmbH, Part of Lowell Group

Actions for an Inclusive Culture

See APPENDIX, Policy 2a for a more in-depth insight into the research & rationale underpinning each of these recommended actions.

1. Encourage inclusive behavior through unconscious bias training for all teams.
2. Don't just seek to change mindsets, which can be a lifelong task – change behavior through including goal-setting as part of unconscious bias training.
3. Undertake employee surveys and analyze these by gender, including questions:
   - asking employees what they expect and hope from the company – and for themselves
   - measuring perceptions of inclusion
4. If a finding emerges where clear distinctions between men and women are apparent, follow up with a targeted survey or focus group and subsequent actions.
5. Monitor turnover – on a gender-specific basis – and if this reveals a higher level of female than male turnover, then take action based on employee surveys.
6. Promote relationship building through a workplace wellness program, involving measures such as:
   - Creation of social spots
   - Celebration of events, goal attainment etc.
   - Team building exercises
   - Social outings
   - Connection of departments
   - Positive messaging
   - Linking to women's networks, such as the eco Association's "Ladies in Tech"[28]
7. Set up a mentoring pool and ensure that women are assigned with mentors – internal or external, female or male.

28 See: https://www.eco.de/event/lit-ladies-in-tech-3/

8. Build confidence in employees' abilities through environment of constructive, positive feedback:
   - Provide feedback training, emphasizing a mix of positive and critical feedback, as well as openness and trust
   - Institute continuous rather than periodic feedback sessions – monthly, rather than yearly
9. Foster a collaborative environment, which accords a higher value to teamwork than individualized work, which might for example include:
   - ideas workshops
   - regularly switching teams
   - embedded use of collaborative tools (desktop sharing, meeting tools, video conferencing, performance management tools etc.)
   - hot-desking
10. Offer in-house learning and subsidize further education as an integral part of organizational culture. Provide chances to grow skillsets in everyday work and do not limit career trajectories to the proverbial "career ladder."

Avoiding a Work Culture Which Isolates Women

An "old" work culture which does not recognize and deal with inequalities, particularly in industries that are male-dominated, can naturally result in female employees feeling isolated. In this context, a 2016 study from Digital Scotland defines "micro inequalities" as those which single out, overlook, or ignore an individual's contribution and the inclusion of this individual based on aspects such as gender or race. As cited in the 2016 book, "The Internet of Women: Accelerating Cultural Change," several studies conclude that gender provides the strongest basis of classifying people, trumping race, age, and occupation in the speed and ubiquity of categorizing others. While male traits are associated with leadership and professional authority, for example, female traits are not. These associations often occur without people being even aware of them.

Associated micro inequalities can include:

- Women being interrupted or silenced in meetings. Here, according to one study from the George Washington University, men were found to interrupt 33% more often when they speak with women than when they speak with other men (Hancock & Rubin, 2014);
- Having gender stereotyped presumptions made about women's roles (such as women being assumed to be the minute-taker);
- Employers taking more points or questions from men than women in a meeting;
- All meetings being chaired by men;
- A culture of allowing jokes or remarks based on gender, but these being dismissed as workplace "banter";
- Being excluded from social activities, or social activities being male-focused.

An additional micro inequality which can have a significant effect on work culture stems from an expectation that women should be "nice", an expectation which is not equally placed on men. Where women don't conform to this stereotype, there is a tendency for them to be more negatively evaluated. A Fortune study of performance reviews from companies in the tech space found that nearly 88% of women received critical (negative) feedback in comparison to 59% of men (Snyder, 2014). The study noted the frequent use of the word "abrasive" on women's reviews, while this formulation did not appear in those of men. These findings illustrate a well-documented phenomenon: The Double Bind. The double bind is the idea that if a woman is too "nice" at work, she will be seen as soft and will not be taken seriously, particularly as leadership material. On the flip side, if a woman is assertive, this behavior will often be perceived as brusque – both by men and by other women.

This leads to an important point: unconscious biases affect and stem from us all, irrespective of gender. Recommendation: **Support inclusive behavior through unconscious bias training for all teams.**

CASE STUDY, Netherlands

Interview with Jeroen van de Lagemaat, Managing Director, NDIX B.V.

- NDIX B.V., Internet Exchange, 44 employees

In our Internet Exchange company, 31% of our employees are women, which is significantly higher than the Dutch average of 16.6%. This has much to do with how we promote an open and transparent working culture. This makes utter sense, given that the products we deliver in the market are also open and transparent. So we're open to all types of ideas and influences – not just from women, but also, for example, from young people, with a relatively large amount of young students coming here to work part-time. Embracing as many influences as possible is really part of our culture.

I think such a culture has to come 'from the top'. I've always been convinced of the equality of men and women. From my childhood onwards, I've applied the logic: If we replaced men with women, or vice versa, would that make sense? The point is, we need both. There is no logic to thinking that women's and men's roles should be different. So it's part of our working environment to ensure that we're really treating people equally. A second motivation for our culture is that I'm absolutely convinced that, if you want to innovate or develop in any way, you always benefit from getting as many different insights on the table as possible: that's the best guarantee. Alone at your desktop, you don't develop a lot of new ideas.

To take a concrete example of how our inclusive culture plays out in practice: Three months ago we employed a woman who, after a month-and-a-half, went on maternity leave. It was clear from the outset that there would be a break in continuity, but that simply wasn't an issue: she was the best candidate. Our company just organizes around employees' needs. Here, flexibility is key: whether you're a man or a woman, if you have young children, you need flexible arrangements. As a growing organization, we are working on a formal policy around such arrangements. We already have some explicitly defined regulations – and are at this point following a CAO (collective labour agreement) developed by one of Netherland's universities.

Our open culture has had a notable impact – for example, on our work with our customers, where we have a reputation for being very customer-oriented. Having a diverse innovation team comprised of both men and women also helps us to look at development or ideas in a different way and to innovate better and more directly than we would with only male technicians.

A Flexible Work Culture

In 2018, the International Labour Organization reported that, across the globe, women were still performing more than three-quarters of the time spent in unpaid care work (Addati et al.). On its part, the 2018 WEF Global Gender Gap report found that, on average across the globe, women work 50 minutes a day more than men, with this encompassing both paid and unpaid work. Such disparities continue to have a marked impact on career choices and expectations, manifesting themselves (as another 2018 ILO paper "Trends for Women" puts it) as "labor market inequalities in terms of the types of jobs which women can both access and in which they can enjoy sustained employment." A 2019 UK report from the Health and Safety Executive found that women – particularly those aged between 25 and 54 – are signficantly more likely to suffer from work-related stress, depression or anxiety than men, largely as a result of the pressures of familial responsibilities. There are therefore clear repercussions for any industry with an unwritten tendency to expect longer than average working hours from their employees. This can certainly have a bearing on the Internet industry, where a 2015 survey by the Spiceworks Community, for example, found that ICT specialists in the US were working around 52 hours per week on average.

Given such figures, it is not surprising to learn that, after the primary essential of an attractive salary, the most important attribute that women are seeking from employers across the globe is work-life balance (see the 2017 Randstad Employment Brand Research report). Similarly, a 2017 German study undertaken

by IDG Research Services found that the freedom that work-life balance brings is the Number One perceived opportunity of the workplace of the future amongst employees.

With the right framework conditions, the flexibility afforded by digital tools is center stage as a work-life balance solution and as a means towards the sustained employment of women. Such flexibility not only meets the needs of mothers, but also of fathers wishing to reduce working hours or make them more flexible in order to have more time for family. As a Pew survey found, almost half of fathers (46%) are concerned that they are not spending enough time with their children.

While some work-life balance actions may require initial or up-front expenditure, they can be cost-efficient in the long term when taking into account staff retention rates, increased productivity, and status as an employer of choice. If in doubt, trialling new flexible work arrangements may be a useful way of determining whether it suits both employees and the company.

For parents, a crucial adjunct to flexible working arrangements is that of a parental leave policy. In a study reported upon in Fortune, 85% of 716 women surveyed who left the tech industry cited maternity leave policy as a major factor in their decision to drop out of the sector (Snyder, 2014). In countries such as the US, where there is no federal law requiring paid family leave, tech companies are strongly advised to lobby for change and to consider introducing their own parental leave systems.

Actions for a Flexible Work Culture

See APPENDIX, Policy 2b for a more in-depth insight into the research & rationale underpinning each of these recommended actions.

1. Institute flexible mobile and home office models:
   e.g. a minimum one day a week mobile/home-based work
2. Within teams, "unbundle" standard projects and identify chunks that can be done by telecommuting or shorts stints in the office.
3. Establish flexitime as the norm: that is, allowing for working hours around agreed core times, self-rostering, compressed hours etc.
   - The Australian Gender Equality Agency provides a particularly useful set of guidelines for organizations wanting to create a flexible working arrangements policy[29]
4. Create a clear written policy for how flexible working arrangements can be requested and implemented in the company.
5. Normalize different work models (part-time/job-sharing/tandem jobs).
6. Set targets for balancing out the percentage of women and men working part-time.
7. Encourage senior management (particularly men) to act as role models in their uptake of flexible work arrangements.
8. Provide support for child and elder care – for example:
   - on-site childcare
   - help in finding child and elder care
   - parents' networks
   - subsidies for emergency child or elder care

In countries with poor parental leave programs, companies can:

- Participate in lobbying and advocacy campaigns for improved parental leave programs for both women and men
- Consider introducing their own parental leave policies – where a company is in a position to do so

(See "Specific Recommendations on Parental Leave" in Appendix)

29 See: https://www.wgea.gov.au/topics/workplace-flexibility/developing-a-flexible-working-arrangements-policy

CASE STUDY, Germany

- **Deutsche Telekom, present in more than 50 countries with more than 200,000 employees worldwide.**

In 2009, Deutsche Telekom initiated a work-life@telekom program[30] To date, in order to achieve the goals of its work-life balance policy, the company has implemented the following measures:

- Remote working options – To be able to better coordinate their professional and private lives, employees are free to work from home or on the move. With their manager's permission, employees whose position allows for flexibility can work from a suitable location of their choice.
- Provision for childcare – In some locations, Deutsche Telekom provides daycare for its employees' children.
- Parents' network – This network provides practical advice on balancing career and family, as well as contact information and discussion forums.
- Children's holiday program – This program involves organizing holiday activities for employees' children.
- Family holiday offers.
- Youth exchange programmes.
- Free emergency childcare.
- Free help to find local childcare facilities.
- Advisory and placement services for employees with elderly family members who need care.
- Leave of absence for family emergencies.

30 See: https://www.telekom.com/en/careers/telekom-as-an-employer/work-life

"My most pressing wish would be to generally make work possible which is more flexible and independent of location, and especially to have the possibility for women who work part-time to have management careers. This also includes a job-sharing or top-sharing model in which a (top) job is divided in such a way that two people can carry it out. This can be done 50/50 or in any other ratio. This type of co-leadership can also be a win-win situation if experienced managers who are going into part-time retirement share positions with a young manager or a returning parent and thus establish a new management culture."

Sabrina Waltz,
Community & Partner Manager, Agency Business
1&1 IONOS SE

CASE STUDY, Germany

Lucia Falkenberg
Chief People Officer, eco Association

- eco – Association of the Internet Industry
- Number of Employees: 66 (33 men, 33 women)

In the eco Association, our policy of offering all employees various part-time models, and not just the classic 40-hour full-time or 20-hour part-time week, is possibly the most effective of all our actions when it comes to promoting gender equality. We don't just offer this type of flexibility when people start to work with us – they can also switch between models when required. The key point here is: At all times, you need to listen to your employees and respond to their needs, while also taking the needs of their broader team into consideration. This applies to both women and men, and is of particular value to mothers and fathers.

Flexibility is key: this also extends to all employees having the right to do home office, at a minimum of one day per week, without this requiring a specific "justification", although the choice of home office days must naturally be agreed in advance with the respective line manager.

A good complement to these normalized flexible work models is our recently-introduced Family Service. Here, we avail of the services of a professional local agency called pmefamilienservice,[31] which offers not only consultancy and mediation in the areas of childcare and eldercare, but also lifestyle coaching.

We also place a strong emphasis on ensuring that women employees are visible. For us, having women as role models – for example, through presenting at events – is of high relevance.

For eco, all of these measures taken together contribute to a highly inclusive culture and play a strong role in retaining women, and – of particular importance – in helping them to rise up the ranks.

31 See: https://www.familienservice.de/web/koeln

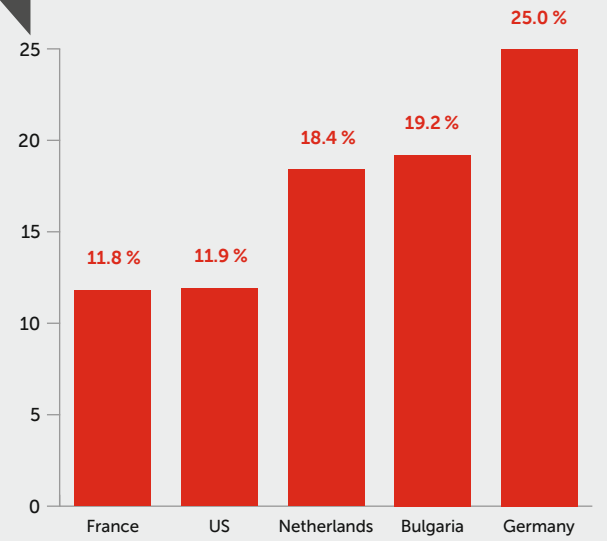
Policy Three: Supporting Women to Rise up the Ranks

According to the World Economic Forum's 2018 Gender Gap Report, across the globe, and across all industries, just 34% of managers are women. This is a situation affecting women in all fields of work, not just those in the Internet industry. While, on average, female entrants to the workforce start off with a higher level of ambition to rise to top management than their male counterparts, within two years, these ambitions have palled, with men then being twice as likely as women to aspire to the upper ranks.[32] Here we are witnessing a critical disconnect: Women want to lead, but a number of factors are holding them back. Cultural socialization is at the heart of this incongruity. The upshot is that, according to Hacker Rank's 2018 Women in Tech Report, women older than 35 are 3.5 times more likely to be in junior positions than men of the same age.

The fact that just a third of all managers globally are women is naturally less than desirable – but this dips to a far lower level in the tech industry; a disappointing but unsurprising finding, given the overall lower level of participation of women in the tech workforce. Here we are confronted with a vicious circle. The absence of female manager role models diminishes women's confidence in aiming for management themselves – and also reinforces workplace biases concerning women's leadership competencies. Ultimately, disillusionment in terms of prospects of management is one of the reasons that women often do not stay in the field, even in the medium-term.

Consider some statistics: In Germany, the proportion of women in management in ICT specialist fields is even lower than the already very low female share of this workforce, spanning downwards from 14% in IT systems operations to just 9% in the field of software development (Bundesagentur für Arbeit, 2019). The situation in the US is not dissimilar, with female executives comprising just 11% of the total at Fortune 500 companies, a cohort which includes not just CISOs, but also CIOs (Forbes, 2018). The MSCI Index, which measures equity in companies across 23 developed and 26 emerging markets found that, in 2018, women accounted for just 3.2% of CEOs in IT companies.

Fig. 6 Gender Pay Gap in Tech Jobs, 2018



Source: Figures compiled by Honeypot, 2018, with figures collated from Eurostat, OECD, and local reports.

The number of women on boards in the ICT sector has a similar biography. Here, the MSCI Index found that in 2018, there were no female board members on a quarter (25.4%) of all ICT boards, while just 15.5% of all such boards had more than 3 female board members. This gives the Internet industry the lowest representation of women on boards across all industries.

A gender pay gap in the tech sector exists in the US and in all 4 EU countries specifically reviewed in this study (see Fig. 6), with the highest pay gap experienced in Germany. There are several reasons for this pay gap, including the higher proportion of women than men in part-time work, and stalled career development due to parental career breaks. But research also shows that women are 4 times less likely than men to negotiate for higher salaries,[33] with this attributable largely to issues of confidence (and to how confidence in women can be penalized): 61% of women participating in the 2015 KPMG Women's Leadership Study said they do not feel confident in asking for a raise, while 65% are not comfortable asking for a promotion.

32 A 2014 study reported upon by Forbes states that 43% of women aspire to top management in the first two years of their positions, compared with 34% of men in entry level positions. This study suggests that women enter the workforce with the same levels of ambition as men, feeling highly qualified and ready for advancement. However, after just two years, women's aspiration levels drop more than 60% while men's stay the same. Among employees with two or more years of experience, 34% of men are still aiming for the top, while only 16% of women are. See: https://www.forbes.com/sites/bonniemarcus/2018/11/18/what-does-it-take-to-keep-women-in-tech-companies-ask-them/

33 Men are four times more likely than women to ask for a raise—and when women do ask, they typically request 30% less than men do, says Carnegie Mellon University economics professor Linda Babcock, co-author of Women Don't Ask https://www.weforum.org/agenda/2018/04/women-are-still-not-asking-for-pay-rises-here-s-why/

Actions for Women & Leadership

See APPENDIX, Policy 3 for a more in-depth insight into the research & rationale underpinning each of these recommended actions.

1. Be transparent concerning salaries and promote the possibility for negotiating pay-rises as a norm within performance reviews.
2. Increase transparency and make pay and performance standards crystal clear. A career must not be dependent on the goodwill of a superior.
3. Make sure managers have the required tools and training to fully support their team members – and reward them when they do.
4. Assign sponsors to women employees, and prioritize this action as a Number One lever for change.
   - For further tips on assignation of sponsors – and to gain a clearer understanding of the distinction between sponsorship and mentoring – read a one-pager on the topic from Stanford University.[34]
5. Support aspiring leaders to tap into Women in Leadership mentorship and networking programs.
6. Support women leaders in your company to participate in Women in Leadership mentorship.
7. Champion female managers as role models.
8. For companies with only a small number of employees, consider linking to networks, such as:
   - "Femtec.Alumnae e. V."[35]
   - The Global Digital Women Network,[36] or
   - The Zonta Clubs[37]
9. For companies without sufficient women in leadership to showcase, link to platforms such as Inspiring Fifty,[38] which showcases the top 50 women in tech leadership roles, or tap into the eco Association Women in Tech interview series.[39]
10. Maintain contact and support with managers during parental leave.
11. Introduce leadership development and performance reward programs with a focus on constructive feedback. Combine "soft" and "hard" rewards.
12. Stress importance of attendance at industry events and use of social media platforms to boost profiles. Enlist women for speaking positions at events.

34 See: https://inclusion.slac.stanford.edu/sites/inclusion.slac.stanford.edu/files/The_Key_Role_of_a_Sponsorship_for_Diverse_Talent.pdf
35 See: https://www.femtec-alumnae.org/
36 See: https://global-digital-women.com/
37 See: https://www.zonta.org/
38 See: https://inspiringfifty.org/
39 See: https://international.eco.de/topics/new-work/

"I'm pushing the topic of visibility very hard: because women who show-case themselves digitally, engage in storytelling, and talk about their successes gain unbelievable visibility and are no longer dependent on their boss patting them on the shoulder and saying: 'You're doing a great job'. External visibility also increases internal visibility. This means that what these women do in companies suddenly becomes clear and tangible to all."

Tijen Onaran
CEO & Founder
GDW Global Digital Women GmbH

13. Establish Corporate Professional Development (CPD) programs, to include regular in-house skill upgrading in soft skills, such as leadership training, assertive management, self-organization, and communication.
14. Enlist male allies — VCs, board members, co-founders, etc. — to intentionally seek out women to fill leadership seats. Engage and empower senior male executives to sponsor up-and-coming women. Avoid approaches that focus on "helping" or "fixing" individual women; instead, male allies should focus on fixing the environment.
    - For inspiration, visit the site of the French alliance Jamais sans elles,[40] a "gentleman's club" that includes 50 male and female figures from the tech industry and promotes the representation of women at events and roundtables.
15. Appoint women to boards and as chairs of working groups.

40 See: http://www.femme-ingenieure.fr/2016/02/jamais-sans-elles.html

CASE STUDY, India

Jyoti Madan, Marketing Executive
Twinkle Kesarani, Peering Operations, DE-CIX India

- DE-CIX India, Internet Exchange, 11 employees

Equal leadership opportunities contribute to boosted morale and improved staff retention. This culture of fairness is one that any company can accomplish.

"From the outset, our company has cultivated an inclusive and open culture. The recruitment process has always been based on a person's merits, and roles and responsibilities are equally distributed on the basis of talent, performance, and experience – and not on a person's gender.

Having women and men work together has led to a healthy workspace with ample learning and development opportunities for everyone. Enhanced collaboration between women and men delivers the opportunity to multi-task, to get out of our comfort zones, and to learn about and keep up to speed on new updates in the tech industry. This is a good long-term approach, as it reaps benefits in terms of employees' performance, as well as for the company.

We're strongly of the opinion that tech companies should offer both women and men equal leadership opportunities based on their skills and experience, with this being essential to tackle the gender pay gap. Men and women should be paid equally – for work and in terms of other benefits, such as maternity and paternity leave. Equal leadership opportunities contribute to boosted morale and improved staff retention. This culture of fairness is one that any company can accomplish."

"When I look at my role as a mentor and the cooperation with my mentees, I believe that women still need to work on their self-confidence. What men always do and what women are less inclined to do is to directly and clearly state: 'That's what I want' or 'That's what I don't want.' This doesn't just apply to work, it also applies to private life."

"Behind every strong, successful woman you'll always find that at some point there has been a strong, successful, and brave man."

Stefanie Kemp
Head of Business Transformation, Innovation and Digital
Lowell Financial Service GmbH, Part of Lowell Group

CASE STUDY, Germany:

- **Deutsche Telekom, Stay in ContacT Network**[41]

In 2010, Deutsche Telekom created the Stay in ContacT network with a view to maintaining a gender-representative quota on leadership positions and to retain trained qualified employees. The network provides employees with support during parental leave by encouraging frequent contact, making it easier for parents to return to their job. The goal is to keep those on parental leave informed about the latest developments in the company via phone conferences (every six weeks), informative materials sent by email, and get-togethers. The network provides a platform where members can exchange information on topics such as work-life balance, career paths, or their planned return to work. These measures facilitate a smooth transition back to work.

Policy 4: Collaborating with Education Providers – Building the Pipeline of Female Talent

For the overall Internet industry, building the pipeline of female talent through promoting STEM subjects in general, and tech careers in particular, is essential for increasing the number of women applying for jobs in the industry. Reform of education is identified by a multitude of players, including the Vodafone Institute, as being the Number One prerequisite for tackling both skills gaps and the higher levels of skepticism that are prevalent amongst girls in some regions when it comes to digital careers.

Any company who is pursuing new recruits and who is likely to be doing so on a regular basis needs to consider building diverse recruitment channels. Being directly involved in initiatives which target girl and women learners, such as collaboration with training institutes, can bring strong short to medium-term dividends for companies in their recruitment endeavors – and has the added bonus of raising the profile of the company in the wider community. Actions must not necessarily be resource-intensive: they can range from light touch engagement, such as a presence at career fairs, to more long-term engagement through partnership activities with educational bodies.

The key objective of a company's collaborative policy should be to contribute to changing the narrative amongst girls and women concerning careers in tech: for example, "such careers are key to our future, have massive social implications, are exciting and diverse, rely on creative collaboration, and are equally open to both women and men." Personal contact and story-telling convey these messages in a way which can transform expectations amongst girls and women. Outreach activities can therefore be an excellent way to create a pipeline, not only into the Internet industry, but directly into your company.

Actions for Collaboration with Education Providers

See APPENDIX, Policy 4 for a more in-depth insight into the research & rationale underpinning each of these recommended actions.

1. Undertake outreach activities with elementary schools and early years in second-level.
   e.g. Dutch "Talent Viewer" for 9-12 year olds, a program which includes school visits from women in tech[42]
2. Participate in in-school awareness-raising with female role models in second-level schools.
   e.g. France: The Maisons Digitales program brings female tech professionals from Orange into the classroom
   e.g. US: Junior Achievement brings STEM professionals into classrooms to deliver career-readiness programs. Research shows that one-in-five Junior Achievement alumni eventually work in the same field as their JA volunteer[43]
3. Work with guidance counsellors in schools to help address the "leaky pipeline" syndrome involving girls who study STEM, and yet do not proceed to STEM careers.
4. Collaborate with universities in curriculum design and placements.
5. Collaborate with vocational education and training (VET) providers in the design and provision of inclusive training programs for the tech sector.
   - A highly useful resource in doing so would be ITU's Digital Skills Toolkit, which includes a series of recommendations for skills development programs for in-demand jobs and for adjustments to make them more inclusive of women[44]
6. Join forces with certifiers in the development of "lightweight" certification options.
7. Get involved in training of trainers/educators.
   e.g. VHTO & NEMO Netherlands gender awareness training for teachers in primary education, focusing on gender awareness with respect to STEM-skills[45]

41 See: https://www.telekom.com/en/careers/details/family-services-419470
42 See: http://genderandset.open.ac.uk/index.php/genderandset/article/view/413/756
43 See: https://www.juniorachievement.org/web/ja-usa/press-releases/-/asset_publisher/UmcVLQOLGie9/content/survey-teen-girls'-interest-in-stem-careers-declines
44 See: https://www.itu.int/en/ITU-D/Digital-Inclusion/Youth-and-Children/Pages/Digital-Skills-Toolkit.aspx
45 See: https://www.vhto.nl/over-vhto/english-page/activities-and-projects/primary-education-talent-viewer/

8. Support/participate in mentoring programs for the transition phase from tertiary education to the labor market.
   e.g. VHTO Mentoring Circle in the Netherlands[46]
9. Participate and support competitions for young women.
   e.g. Digital Women of Europe Award[47]
10. Run technology camps / Hackathons with a focus on girls.
11. Participate in empowerment and advocacy campaigns.
    e.g. UNESCO's "Stem and Gender Advancement" (SAGA)[48]
    e.g. UN's "International Girls in ICT Day"[49]
    e.g. Germany's "Informatik Biber"[50]
    e.g. US's "Lean in"[51]

CASE STUDY, Netherlands

Jeroen van de Lagemaat, Chair of TalentIT Twente Foundation (and Managing Director of NDIX B.V.)

- TalentIT Twente Foundation

"At the TalentIT Twente Foundation, we work together with two female lecturers from the Saxion High School. Two women – one who studied ICT, the other who learned it herself – started a project to get more girls interested in studying and working in ICT. This started initially as a very explicit action to involve more girls. But then the feeling arose that girls were being 'placed in a corner' through that explicit targeting, which resulted in a slight sense of discomfort amongst participants. So now the project leaders make sure that, in every event they organize, external presenters are always 50 percent male, 50 percent female. Without explicitly mentioning that their particular focus is on promoting women and girls in technology, they just do it – by showing it."

46 See: https://www.vhto.nl/over-vhto/english-page/activities-and-projects/mentoring-circlestm-and-transition-to-the-labor-market/
47 See: http://digitalwomanaward.com/europe/
48 See: https://en.unesco.org/saga
49 See: https://www.itu.int/en/ITU-D/Digital-Inclusion/Women-and-Girls/Girls-in-ICT-Portal/Pages/Portal.aspx
50 See: https://bwinf.de/informatik-biber/
51 See: https://leanin.org/

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7. Appendix:

Research & Rationale Behind Recommended Actions

Policy 1 Chart: Research & Rationale Behind Recruitment & On-Ramping Actions

Action	Why?
1. Commission unconscious bias training for all recruiters and hiring managers. 2. Establish clear and consistent evaluation criteria before review processes begin.	A US study conducted by 3 universities found that both male and female hiring managers were twice as likely to choose male candidates for STEM careers over female candidates, even when all applicants had equal skills. Moreover, when an applicant who performed worse in an interview was chosen over an applicant who performed better, two-thirds of the time the chosen candidate was a man.[52] This has much to do with stereotypes. As noted in the highly-acclaimed 2016 book, "The Internet of Women: Accelerating Culture Change,"[53] in ambiguous situations or when criteria are unclear, people tend to rely more on stereotypes in their evaluations. An interesting finding was also revealed by a German study "Women in IT" (Weitzel et. al, 2017).[54] In this study, 66 percent of the female IT experts surveyed stated that men with the same qualifications and experience have advantages in terms of recruitment opportunities; whereas only 39.7 percent of the male IT experts surveyed stated this.
3. In recruiting campaigns, tell your story.	Women would like to hear why your company is a great place to work. Learning about factors such as work-life balance policies and commitments to elevating workers can act as strong incentives for female candidates.
4. Champion female colleagues as role models in your recruiting campaigns.	Exposing women to positive female role models is an effective way to inspire women to enter into areas stereotypically viewed as masculine.[55]
5. Formulate job advertisements using gender-neutral phrasing. Avail of technologies such as Textio to remove gender bias from job descriptions.[56]	Unconscious bias training can only go so far, with companies needing to put processes in place to rein in biases. Removing gender bias from job descriptions can help to block bias.[57] Avoiding terms which might repel women, such as "competition" and replacing these with "collaboration," "relationships," "loyalty" will appeal to women candidates, as will a re-think of job titles (e.g. using "developer" rather than "engineer").
6. Refer in job advertisements to the wider social impact of the role.	As a paper from the Digital Scotland Business Excellence Partnership reports, job advertisements which highlight the wider social impact of the role attract more women. For instance: *"As a computer programmer, you'll be playing a key role in the design, testing and maintenance of software systems. You will contribute to the better use of our systems and support our client base which includes large national companies and small community-based employers".* [58] Explaining the wider social impact of a job is known to garner more interest from potential female applicants and, as a Harvard Business Review article notes, is particularly important for attracting women returners. 24% of aspiring women returners in the US are motivated by "a desire to give something back to society," with their time at home (and in their communities) modifying their world-view.[59]
7. In job descriptions, separate "required/essential skills" from "nice to have" skills.	Research undertaken by Hewlett Packard shows that women are unlikely to apply for a position unless they meet 100% of the requirements, while men will apply if they meet 60% of the requirements.[60]

52 See: https://www.pnas.org/content/early/2014/03/05/1314788111
53 See: Nada Anid (Editor), Laurie Cantileno (Editor), Monique Morrow (Editor), Rahilla Zafar (Editor) (2016) The Internet of Women: Accelerating Cultural Change
54 See: https://www.uni-bamberg.de/fileadmin/uni/fakultaeten/wiai_lehrstuehle/isdl/4_Women_in_IT_20170210_WEB.pdf
55 See: https://www.researchgate.net/publication/282848827_The_effects_of_stereotypes_of_women's_performance_in_male-dominated_hierarchies_Stereotype_threat_activation_and_reduction_through_role_models
56 See: https://textio.com/team/
57 See: Nada Anid (Editor), Laurie Cantileno (Editor), Monique Morrow (Editor), Rahilla Zafar (Editor) (2016) The Internet of Women: Accelerating Cultural Change
58 See: https://www.ourskillsforce.co.uk/media/2355/tackling-the-technology-gender-gap-together_guide.pdf
59 See: https://hbr.org/2005/03/off-ramps-and-on-ramps-keeping-talented-women-on-the-road-to-success
60 See: https://www.glassdoor.com/employers/blog/attract-more-women-in-tech/

8. Anonymize applications for the first selection round in order to remove any possibility of unconscious bias.	Companies are acting too much on the principle of similarity (to themselves/to previous employees) when selecting candidates. This has been found to be particularly the case among German companies.[61]
9. In job advertisements, either transparently state the fixed salary on offer, or indicate that employers can negotiate their salaries. 10. Make sure men and women with equivalent credentials start out at equal levels, and are paid equally and at a competitive rate with others in the industry.	Men are significantly more likely to engage in salary negotiations than women. The gender gap in job applications and subsequent negotiations is much more pronounced for jobs that leave the negotiation of wage ambiguous. As a Harvard Kennedy School study found, when an employer clearly states that employees can negotiate their salaries, the gender gap in job applications and negotiation closes.[62]
11. Redesign job profiles to focus on skills matching and prioritization of potential over technical qualifications.	While specific skills are naturally necessary for tech work performance, these skill requirements change very quickly: what is most important is the potential to acquire and flexibly adapt skills.[63]
12. Engage in more diverse sourcing and target women aside from ICT graduates with a willingness to learn.	The increasingly high service component characterizing the Internet industry means that it will also develop into an attractive field of work for talents without a technical background.[64]
13. Support the creation of a talent pool by reaching out to hubs for aspiring and established women in tech, and feed job adverts into their portals.	A lack of the type of instrumental ties characterizing male networks tends to disadvantage women in recruitment situations. Becoming a part of virtual communities helps to surmount this obstacle and builds the pipeline of female talent.[65]
14. Endeavor to have mixed-gender interview panels.	One of the most decisive factors in whether or not a female candidate accepts a job is if there was a woman on the interview panel. Women are far more likely to join a company when they can interact with women who are already there, and can testify to a company's commitment to diversity.[66]
15. Position your firm as a training company, offering apprenticeships, on-ramps, and training programs for beginners (with a defined minimum number of women – e.g. 40%)	Career "on-ramp" programs can help tap into a vastly under-utilized talent pool. Such programs will become more and more important as the skills deficit deepens.[67]

61 See: https://www.eco.de/rahmen-und-arbeitsbedingungen-fuer-frauen-in-der-internetwirtschaft-ist-situation-und-handlungsempfehlungen/
62 See: http://gap.hks.harvard.edu/do-women-avoid-salary-negotiations-evidence-large-scale-natural-field-experiment
63 See: http://www.ecompetences.eu/faq-competences-skills-jobs/
64 See: https://www.eco.de/rahmen-und-arbeitsbedingungen-fuer-frauen-in-der-internetwirtschaft-ist-situation-und-handlungsempfehlungen/
65 See: https://www.eco.de/rahmen-und-arbeitsbedingungen-fuer-frauen-in-der-internetwirtschaft-ist-situation-und-handlungsempfehlungen/
66 See: https://www.forbes.com/sites/maynardwebb/2017/10/29/how-to-alter-your-hiring-practices-to-increase-diversity/#57787c892029
67 See: https://go.stradaeducation.org/on-ramps

16. Introduce "returnship" programs for women and men who have taken a career break of at least two years. Structure such programs like internships, ranging from 2 to 6 months.	Mothers who leave the workforce when their children are young but later want to re-enter are regarded as one of the global economy's greatest untapped resources.[68] "Returnships" allow women to refresh their skills and enable organizations to evaluate them as potential employees. Companies such as United Technologies, IBM, Apple, and Johnson & Johnson have built returnship programs specializing in tech jobs, with the help of the Society of Women Engineers[69] and iRelaunch.[70] Of those participating in these programs, around 85% have been hired into permanent jobs. Returnship programs in the tech industry are particularly popular in the US, the UK, Ireland, and India. To check out just one example with a wider berth, see Amazon's Returner's Web Progam, which also covers France, Germany, and the Netherlands.[71]
17. Sponsor or co-sponsor career-switchers from non-traditional backgrounds • e.g. digital starter weekends for girls/women[72] • e.g. coding boot camps, with a minimum quota of women, such as the Adobe Digital Academy (3-month boot camps, with minimum of 50% women, followed by internships).[73]	A four-year degree is not necessary for all tech jobs, nor is it a sure indicator of ability or mastery of a body of knowledge. Therefore, it's worth considering and recognizing alternative credentials in recruiting. As a 2019 McKinsey commentary notes, coding boot camps have become an accepted source of talent for some of the world's most prestigious tech companies because, after two to four months of intensive work, participants have proved themselves to be job ready. In 2017, 80% of coding boot camp graduates found a job that used their skills, and there are similar efforts in Europe and Asia.[74]
18. Build an internal inclusive culture in your organization (see Policy 2), and crucially, ensure that your marketing messages reflect the reality of your internal culture.	Just how important a company's culture is when it comes to areas such as recruitment is shown not least by the increasing importance of company appraisals on various platforms, as the eco Association German-language study on women in tech points out.[75] Particularly in the Internet industry, online company appraisals on sites such as "kununu"[76] are likely to have a significant influence on the application situation. These platforms serve applicants as a source of information on the inner workings of companies and thus provide important indicators as to whether diversity is already lived out in the company at different levels, or whether there is a discrepancy between the promise and the reality of corporate culture.

68 See: https://hbr.org/2019/06/helping-stay-at-home-parents-reenter-the-workforce
69 See: https://reentry.swe.org/
70 See: https://www.irelaunch.com/paidcorporateprograms
71 See: https://www.amazon.jobs/en/landing_pages/awsreturners
72 See: https://www.womensbusinessinitiative.net/current-events/female-digital-starter-weekend/
73 See: https://www.adobe.com/corporate-responsibility/youth-creativity/digital-academy.html
74 See: https://www.mckinsey.com/featured-insights/future-of-work/competitive-advantage-with-a-human-dimension-from-lifelong-learning-to-lifelong-employability
75 See: https://www.eco.de/rahmen-und-arbeitsbedingungen-fuer-frauen-in-der-internetwirtschaft-ist-situation-und-handlungsempfehlungen/
76 See: https://www.kununu.com/

Policy 2a Chart: Research & Rationale Behind Inclusive Culture Actions

Action	Why?
1. Encourage a mentality of inclusivity through unconscious bias training for all teams.	Unconscious bias training can be an important part of a culture-based, systemic process of developing more inclusive cultures.[77] Such training is worth offering to all teams – e.g. those in marketing teams, with the messages conveyed through marketing channels having an impact both on recruitment and on internal team culture. Ultimately, the voice of inclusion needs to embedded across the organization.[78]
2. Don't just seek to change mindsets, which can be a lifelong task – change behavior through including goal-setting as part of unconscious bias training.	Research indicates that implementing goal-setting into unconscious bias training may be the key to positive and long-lasting results.[79]
3. Undertake employee surveys and analyze these by gender. 4. If a finding emerges where clear distinctions between men and women are apparent, follow up with a targeted survey or focus group and subsequent actions. 5. Monitor turnover – on a gender-specific basis – and if this reveals a higher level of female than male turnover, then take action based on employee surveys.	As a Gallup study shows, employee engagement actions have a clear connection with profitability, productivity, turnover, and customer ratings.[80] A gender-differentiated employee survey is a proven tool for activating employee engagement, but only has merit if its findings are followed up on.
6. Promote relationship building through a workplace wellness program.	As a Forbes article points out, social connection provides an essential sense of cohesion in the office, which is the key to cultivating creativity, teamwork, and collaboration.[81] Employees with positive relationships become more dedicated and motivated to perform their best, and are more likely to stay with a company.
7. Foster a collaborative environment, which accords a higher value to teamwork than individualized work.	Collaboration brings meaning and adds value to the way women (and men) perceive their job. However, it is estimated that 38% of employees don't think there are high levels of collaboration in their work environment.[82] A sense of team spirit is felt most strongly when collaboration takes place and victories can be shared.[83]
8. Build confidence in employees' abilities through an environment of constructive, positive feedback.	One of the strongest female millennial traits is an expectation of regular feedback. Despite an affinity for the digital world, their preference is for important feedback discussions to take place face-to-face. Successful employers are those that can blend advanced technology and communication patterns with a culture of frequent and forward-looking career feedback delivered in person.[84]

77 See: https://cookross.com/wp-content/uploads/2017/02/CR_Unconscious_Bias_4-strategies_021017.pdf
78 See: https://www.ourskillsforce.co.uk/media/2355/tackling-the-technology-gender-gap-together_guide.pdf
79 See: https://hbr.org/2017/07/two-types-of-diversity-training-that-really-work
80 See: https://www.gallup.com/workplace/236927/employee-engagement-drives-growth.aspx
81 See: https://www.forbes.com/sites/alankohll/2018/01/31/5-ways-social-connections-can-enhance-your-employee-wellness-program/#3bd4da3527c4
82 See: https://www.samewave.com/posts/how-to-achieve-effective-collaboration-in-the-workplace
83 See: https://www.nutcache.com/blog/the-importance-of-collaboration-in-the-workplace/
84 See: https://www.pwc.com/gx/en/women-at-pwc/internationalwomensday/assets/next-generation-diversity-publication.pdf

9. Make learning and development an integral part of organizational culture.	LinkedIn's talent research shows that half of today's most in-demand skills (both hard skills, such as data mining, and soft skills, such as collaboration) were not on the list three years ago. This continual shift in in-demand skills is fuelling the need for employers to help employees in their further development and adaptation of skills to remain employable in years to come.[85]
10. Offer in-house learning and subsidize further education as an integral part of organizational culture. Provide chances to grow skillsets in everyday work and do not limit career trajectories to the proverbial "career ladder."	As an Entrepreneur Europe article states, offering employees the chance to move through a career lattice – laterally, vertically, and sometimes diagonally – will help them to explore new skills, projects, and positions, and will enable longer, more diversified careers within a company.[86]
11. Set up a mentoring pool and ensure that women are assigned with mentors – internal or external, female or male.	Research from Yale Scientific indicates that opportunities for mentoring are more likely to be offered to men,[87] which means that women are losing out. As Cheryl Sandberg of Facebook states: "Women with mentors are more likely to ask for stretch assignments and promotion than women without mentors."[88]

85 See: https://learning.linkedin.com/blog/top-skills/the-skills-companies-need-most-in-2018--and-the-courses-to-get-t
86 See: https://www.entrepreneur.com/article/300533
87 See: http://www.yalescientific.org/2013/02/john-vs-jennifer-a-battle-of-the-sexes/
88 See: https://www.fastcompany.com/3050430/why-women-need-career-sponsors-more-than-mentors

Policy 2b Chart: Research & Rationale Behind Flexible Work Culture Actions

Action	Why?
1. Institute flexible mobile and home office models. 2. Within teams, "unbundle" standard projects and identify chunks that can be done by telecommuting or shorts stints in the office.	The International Labour Organization's 2017 report on the future of work examined the impact of telework/ICT-mobile work, concluding that working from home in particular has a positive effect on work–life balance, mainly due to the reduction in commuting time and increased autonomy to organize working time.[89] The Netherlands (which is also the country ranked by the OECD as having the world's best work-life balance[90]) was found to have one of the highest shares of workers using ICTs.[91]
3. Establish flexitime as the norm: that is, allowing for working hours around agreed core times, self-rostering, compressed hours etc.	UK research from Capability Jane[92] reveals that the demand for flexitime is substantial. 80% of women and 52% of men want flexibility in their next role – however, fewer than 10% of UK advertised jobs currently offer flexibility, meaning the gap between supply and demand is huge. As pointed out in a Forbes article, offering flexitime can give employers – particularly those from SMEs – an important competitive edge. If employees have a good flexible work pattern, they are less likely to give this up.[93]
4. Create a clear written policy for how flexible working arrangements can be requested and implemented in the company.	As the Australian Gender Equality Agency states, having a formal flexible working arrangements policy helps companies to: increase staff loyalty, satisfaction, and commitment improve workplace productivity reduce absenteeism and staff turnover, resulting in lower recruitment & training costs attract, retain and develop talents be recognised as an employer of choice.[94]
5. Normalize different work models (part-time/job-sharing/tandem jobs).	Part-time work is particularly common among employed mothers. This may free up time for family commitments, but can mean an under-utilization of women's skills and often has negative consequences on career progression and for the industry. In the Netherlands, a working mother with two grown-up children has, on average, earned less than half of the earnings of otherwise similar female employees.[95]
6. Set targets for balancing out the percentage of women and men working part-time.	Applying a greater focus on men and their preferences regarding shorter working weeks could have a crucial effect on narrowing the gender gap in terms of female workplace participation and promotion. For countries with the highest gender disparities in the area of part-time work (Germany and the Netherlands), this is particularly important. Companies should not baulk at the prospects of more men working part-time. As the 2017 ILO study on the future of work reveals, those working shorter hours are shown to generally have higher levels of productivity – what the ILO refers to as "a virtuous cycle of reduced working hours and enhanced productivity".[96]

89 See: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_591502.pdf
90 See: https://www.weforum.org/agenda/2019/10/work-play-life-balance-stress-netherlands/
91 See: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_591502.pdf
92 See: https://capabilityjane.com/about-us/flexible-working/
93 See: https://www.forbes.com/sites/joyburnford/2019/05/28/flexible-working-the-way-of-the-future/#4744ae604874
94 See: https://www.wgea.gov.au/topics/workplace-flexibility/developing-a-flexible-working-arrangements-policy
95 See: http://www.oecdbetterlifeindex.org/
96 See: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---cabinet/documents/publication/wcms_649907.pdf

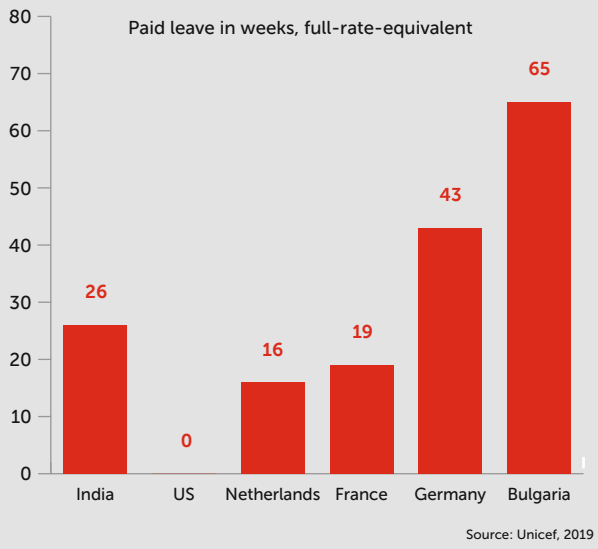
7. Encourage senior management (particularly men) to act as role models in their uptake of flexible work arrangements.	If senior management do not explicitly approve of flexible work arrangements, such arrangements can be tacitly deemed to be illegitimate or career-stoppers. In a Harvard Business Review survey, 35% of women reported various aspects of their organizations' cultures which effectively penalized people who take advantage of WLB policies, with telecommuting appearing to be most stigmatized.[97] Further US research shows that both men and women can be penalized for using flexible practices, with documented penalties including declines in pay, a lack of promotion, and mistreatment.[98] Flexible work arrangements will only be regarded as the norm when they are also availed of by management.
8. Provide support for child and elder care – for example: • on-site childcare • help in finding child and elder care • parents' networks • subsidies for emergency child or elder care	A recent World Bank Group report highlights what companies can do to tackle one of the key barriers to women's retention. It shows that, when companies take innovative approaches to supporting childcare, this significantly increases their ability to hire and retain talented women.[99] Motherhood is often a point at which companies lose experienced employees, but offering childcare can increase the retention of mothers. In some countries, such support is of particular significance. According to a 2015 World Bank paper, India, for example, has one of the lowest labor force participation rates for mothers in the world, including for highly educated women.[100] In spite of the significantly higher proportions of women in tech in India at entry level, nearly 50% of Indian women drop out of the corporate employment pipeline between junior and mid-levels.[101] There are ways to tackle this. For example, in India, the company Mindtree offers a range of childcare solutions for its employees. The result is that over 90% of women return after maternity leave. The case is compelling for large companies who are able to act with enlightened self-interest and provide high-quality childcare to their employees. It is naturally recognized that many SMEs – which account for 60 to 70% of jobs in most OECD countries[102] – may not be in a position to fund childcare. Alternatives can be to provide support in finding childcare – the very recognition of the issue faced by parents can contribute to a sense of inclusivity.

97 https://hbr.org/2005/03/off-ramps-and-on-ramps-keeping-talented-women-on-the-road-to-success
98 See: Coltrane, S., Miller, E., DeHaan, T., Stewart, L. "Fathers and Flexibility Stigma," Journal of Social Science Issues 69, no. 2 (2013): 279-302.
99 See: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/gender+at+ifc/priorities/employment/tackling_childcare_the_business_case_for_employer_supported_childcare
100 See: http://documents.worldbank.org/curated/en/539141468186871615/pdf/WPS7222.pdf
101 See: https://qz.com/india/348574/six-ways-to-combat-the-female-brain-drain-at-indian-companies/
102 See: http://www.oecd.org/cfe/leed/1918307.pdf

Specific Recommendations on Parental Leave

Action	Why?
In countries with poor parental leave programs, companies should: • Participate in lobbying and advocacy campaigns for improved parental leave programs for both women and men • Consider introducing their own parental leave policy – if the company is in a position to do so	Statutory parental leave policies play a central role in supporting work-life balance. However, employers who themselves introduce actions to enhance the strengths or compensate for the weaknesses of these policies can gain a major advantage in attracting and retaining women employees. Of the countries under review, Bulgaria offers the most generous amount of paid leave to mothers. At the other end of the spectrum, the US is a global outlier when it comes to paid parental leave (see Fig. 7 below); in the US, there is no federal law requiring paid family leave, meaning that it is particularly difficult to combine having a tech career with motherhood. In a recent study reported upon by Fortune, 85% of 716 women surveyed who left the tech industry cited maternity leave policy as a major factor in their decision to leave.[103] India appears at first glance to have a relatively generous policy, but the catch here is that the entitlement to the 26 weeks is only available to women working in companies with over 10 employees – with an Independent Review paper[104] estimating that only 1% of women benefit from this system.

Fig. 7 Paid Leave: Number Of Weeks Available to Mothers[105]



Source: Unicef, 2019

103 See: https://fortune.com/2014/10/02/women-leave-tech-culture/
104 See: https://www.independent.org/pdf/tir/tir_24_2_01_rajagopalan.pdf
105 See: https://www.unicef-irc.org/publications/pdf/Family-Friendly-Policies-Research_UNICEF_%202019.pdf

	While on the one hand, companies in the US and India are lobbying for change, on the other, a growing number of tech firms are themselves also offering gender-neutral paid parental leave to men as well as women, with information on 10 such policies included in a list by the US-based Tech Republic.[106] In India, a number of firms have also taken action to counter the poor national parental policy schemes in that region. For example, Hewlett Packard Enterprises India has extended its 26-week parental leave policy to also apply to fathers, hoping thereby to increase its Indian workforce by 20% in the next 5 years. Such policies are having a significant impact on attracting and retaining women in tech. Note: In designing a parental leave policy, companies should ensure that no assumption exists that mothers shoulder principal childcare responsibility. Such an assumption can impede work-life balance for women and contribute to a higher level of abandonment of the labor market. Consequently, it is important that work-life balance policies are pursued hand-in-hand with equality strategies.

Policy 3 Chart: Research & Rationale for Women & Leadership Actions

Action	Why?
1. Be transparent concerning salaries and promote the possibility for negotiating pay-rises as a norm within performance reviews.	Women's lower level of confidence isn't just a childhood legacy, but can also be a reaction to unconscious workplace bias. For example, according to research undertaken by the New York Times, women are viewed as less likable when they negotiate.[107] They're also less likely than men to get what they want when they ask for a raise, according to Harvard Business Review.[108] This contributes in turn to the gender pay gap – and to higher drop-out rates by women than men in the tech industry.
2. Increase accountability and transparency in pay and promotion decisions. Make pay and performance standards crystal clear. A career must not be dependent on the goodwill of a superior.	"Organization Science" research shows that organizations lacking transparency and accountability in pay and promotion decisions can experience "performance-reward bias," with women and underrepresented minorities receiving fewer rewards than they deserve based on performance.[109] It is therefore imperative that employers take steps to ensure that pay and promotion outcomes are clearly linked to employee performance.[110]
3. Make sure managers have the required tools and training to fully support their team members – and reward them when they do.	A 2019 joint McKinsey/LeanIn study found that women are more likely to think they have equal opportunities for growth and advancement when their manager showcases their work, helps them manage their career, and advocates for new opportunities for them on a regular basis. However, only around a third of employees say managers advocate for new opportunities for them a great deal, and less than a quarter of employees say managers regularly help them manage their careers.[111]

106 See: https://www.techrepublic.com/article/10-tech-companies-with-generous-parental-leave-benefits/
107 See: https://www.nytimes.com/2014/03/25/your-money/moving-past-gender-barriers-to-negotiate-a-raise.html
108 See: https://hbr.org/2018/06/research-women-ask-for-raises-as-often-as-men-but-are-less-likely-to-get-them
109 See: https://pubsonline.informs.org/doi/10.1287/orsc.2014.0950
110 See: https://hbr.org/2019/10/why-techs-approach-to-fixing-its-gender-inequality-isnt-working
111 See: https://wiw-report.s3.amazonaws.com/Women_in_the_Workplace_2019.pdf

4. Assign sponsors to women employees.	This is identified by a 2014 Center for Talent Innovation study as a Number One lever for change. Sponsors improve protégés' chances of being perceived as leadership material and help women to get their ideas heard. The same study found that, with a sponsor, women in STEM fields are 200% more likely to have their ideas implemented, and are 22% more likely to be satisfied with their rate of promotion.[112]
5. Support aspiring leaders to tap into Women in Leadership mentorship and networking programs	As a 2015 KPMG study on women and leadership found, 82% of professional working women believe access to and networking with female leaders will help them advance in their career, while 67% of women reported they'd learned the most important lessons about leadership from other women.[113]
6. Support women leaders in your company to participate in Women in Leadership mentorship	The 2015 KPMG study on women and leadership found that 76% of working women plan to personally take active steps to help other women advance in their careers.
7. Champion female managers as role models 8. For companies with only a small number of employees, consider linking to networks	According to the 2015 KPMG study on women and leadership, 86% of women report that, when they see more women in leadership, they are encouraged they can get there themselves.[114]
9. Maintain contact and support with managers during parental leave	Keeping in touch with (female) managers during parental leave will support women to keep their careers on an upward trajectory.
10. Introduce leadership development and performance reward programs with a focus on constructive feedback. Combine "soft" and "hard" rewards	The 2015 KPMG study on women in leadership found that more than half of working women (53%) indicate receiving praise from colleagues, leaders, and mentors most influences their perception of themselves in the workplace, vs. traditional rewards of raises (39%) and promotions (37%).[115]
11. Stress importance of attendance at industry events and use of social media platforms to boost profiles. Enlist women for speaking positions at events.	A large-scale international study undertaken by the event software firm Bizzabo reveals that, across industries, technology events have a long way to go before achieving greater gender balance when it comes to speakers. Across all industries, less than a third (31%) of speakers are female: in Internet-focused events, this dips to 21%, with countries such as Germany having one of the lowest proportion of women speakers.[116]
12. Establish Corporate Professional Development (CPD) programs, to include regular in-house skill upgrading in soft skills, such as leadership training, assertive management, self-organization, and communication.	A 2015 report by the Learning and Work institute found that women are significantly less likely to receive any employer training compared to men, and that women are given generic training, while companies pay for men to become better leaders. All of this impacts on women's ability to progress within a company.[117] The World Economic Forum's 2018 report on bridging the digital divide identifies the particular importance of promoting women's self-organization and communication skills-sets.[118]

112 See: https://www.talentinnovation.org/_private/assets/Athena-2-ExecSummFINAL-CTI.pdf
113 See: https://home.kpmg/content/dam/kpmg/ph/pdf/ThoughtLeadershipPublications/KPMGWomensLeadershipStudy.pdf
114 See: https://home.kpmg/content/dam/kpmg/ph/pdf/ThoughtLeadershipPublications/KPMGWomensLeadershipStudy.pdf
115 See: https://home.kpmg/content/dam/kpmg/ph/pdf/ThoughtLeadershipPublications/KPMGWomensLeadershipStudy.pdf
116 See: https://blog.bizzabo.com/event-gender-diversity-study
117 See: https://www.ourskillsforce.co.uk/media/2355/tackling-the-technology-gender-gap-together_guide.pdf
118 See: http://www.oecd.org/internet/bridging-the-digital-gender-divide.pdf

13. Enlist male allies — VCs, board members, co-founders, etc. — to intentionally seek out women to fill leadership seats. Engage and empower senior male executives to sponsor up-and-coming women.[119]	As a Forbes article states, having male allies is key for two reasons: Firstly, in technical organizations, men hold the majority of formal leadership positions, so they are often in a better position to make change — whether it be in subtle everyday instances or in changing larger business systems. Secondly, increasing diverse participation is not just "a women's issue" – diversity and inclusivity are business and human issues.[120] For more information on why the 'Fix the Woman/Person' approach rather than a 'Fix the Environment' approach is problematic, read the National Center for Women in IT's "Critical Listening Guide". [121]
14. Appoint women to boards and as chairs of working groups.	Extensive research shows that having women on boards (ideally comprising of a minimum of 30% membership) enhances competitiveness. To name one example: Catalyst research shows that companies with more women in executive positions have a 34% higher total return to shareholders than those that do not. [122] In addition, by appointing women to boards and as chairs, companies do more than widen the talent pool at the top of the company — they also send a signal that developing women as leaders is of wider importance to them.[123]

119 See: https://www.catalyst.org/wp-content/uploads/2019/01/the_gender_divide.pdf
120 See: https://www.forbes.com/sites/quora/2019/04/09/what-can-men-do-to-support-their-women-counterparts-in-tech/#70a2307ccb03
121 See: https://www.ncwit.org/resources/critical-listening-guide-just-because-you-always-hear-it-doesnt-mean-its-true
122 See: https://www.catalyst.org/research/the-bottom-line-connecting-corporate-performance-and-gender-diversity/
123 See: https://www.hsph.harvard.edu/ecpe/why-diversity-matters-women-on-boards-of-directors/

Policy 4 Chart: Research & Rationale for Collaboration Actions

Action	Why?
1. Undertake outreach activities with elementary schools and early years in second-level.	An Accenture study undertaken in the UK and Ireland found that half of girls aged between 7 and 11 described STEM subjects such as maths and computer science as fun and enjoyable.124 Initiatives which leverage such positive energy and portray positive role models can help to intercept a later onset of demotivation amongst girls.
2. Participate in in-school awareness-raising by female role models in second-level schools.	The crucial time to step up in terms of encouraging girls to develop an interest in tech and STEM is in their early teens. The Accenture UK/Irish study found that only 31% of girls aged 11-14 found tech subjects to be "fun," a dip of nearly 40% in enthusiasm from earlier years.[125] A recent 2019 survey by Junior Achievement (JA) conducted in the US shows that only 9% of girls between ages of 13 and 17 are interested in careers in STEM, down from 11% in 2018.[126]
3. Work with guidance counsellors in schools to help address the "leaky pipeline" syndrome involving girls who study STEM, and yet do not proceed to STEM careers.	Gender stereotypes inform daily practices in the education setting, including in career guidance and mentoring (a point highlighted by research of the Lithuanian Women's Issue Centre).[127] A clear example of the "leaky pipeline" syndrome comes from the Netherlands, where VHTO research reveals that less than 50% of girls with a STEM profile in pre-university secondary schools proceed to STEM studies, and that women who do go on to study in a STEM field are less likely than their male counterparts to work in a STEM occupation; they are more likely to work in education or healthcare.[128]
4. Collaborate with universities in curriculum design and placements. 5. Collaborate with vocational education and training (VET) providers in the design and provision of inclusive training programs for the tech sector. 6. Join forces with certifiers in the development of "lightweight" certification options.	As a 2019 Empirica study notes, collaborations between tech companies and universities as well as vocational education and training (VET) providers allow for a better understanding of industry demand and skills profiles. Applying such models, new digital degrees can be developed in terms of non-tertiary qualifications such as VET. This approach can deliver a practice-oriented workforce within a comparatively short amount of time. Through collaborating in such projects, companies can also boost the attractiveness of such degrees, by allowing better career options for their graduates.[129]
7. Get involved in training of trainers/educators.	More than half of teachers have developed an unconscious gender stereotype related to STEM-based subjects. A 2017 study by Accenture carried out in the UK and Ireland found 57% of teachers admitted they had gender-stereotyped thoughts about studying STEM subjects.[130]

124 See: https://newsroom.accenture.com/news/accenture-finds-girls-take-up-of-stem-subjects-is-held-back-by-stereotypes-negative-perceptions-and-poor-understanding-of-career-options.htm
125 See: https://www.computerweekly.com/news/450412570/More-than-half-of-teachers-admit-gender-stereotyping-Stem-subjects
126 See: https://www.juniorachievement.org/web/ja-usa/press-releases/-/asset_publisher/UmcVLQOLGie9/content/survey-teen-girls'-interest-in-stem-careers-declines
127 See: http://www.womensissuescentre.com/gender-ed-combatting-gender-stereotypes-in-education-and-career-guidance/
128 See: https://www.vhto.nl/over-vhto/english-page/about-vhto/current-situation-in-the-netherlands/
129 See: https://eskills4diversity.com/fileadmin/diversity/images/reports/diversity_final_report_exec_sum_final_20190204.pdf
130 See: https://www.computerweekly.com/news/450412570/More-than-half-of-teachers-admit-gender-stereotyping-Stem-subjects

8. Support/participate in mentoring programs for the transition phase from tertiary education to the labor market.	As the Dutch organization VHTO reports, many female students do not have a clear idea of their options after they graduate. They also indicate that they don't know much about the variety of possible jobs, and what a career path typically looks like in the technical sector.[131] Mentoring programs during this transitional phase can be key to addressing the leaky pipeline syndrome.
9. Participate and support competitions for young women.	Awards and prizes enhance visibility of both female role models and of companies themselves, in order to provide both girls and women with inspiration.[132]
10. Run technology camps / Hackathons with a focus on girls.	Technology and hackathon experiences can provide the type of mentorship that helps to tackle a lack of self-confidence when it comes to tech skills – and can give young women a "leg up" in the recruitment process into the sponsoring company.[133]
11. Participate in empowerment and advocacy campaigns.	Taking part in empowerment and advocacy campaigns encourages girls and young women, as well as boys and young men, to consider careers in the growing field of ICTs.[134]

131 See: https://www.vhto.nl/over-vhto/english-page/activities-and-projects/mentoring-circlestm-and-transition-to-the-labor-market/
132 See: https://news.microsoft.com/europe/features/if-we-want-more-girls-in-stem-its-our-responsibility-to-inspire-them/
133 See, for example an article from IBM Watson Health's chief scientist: https://searchcio.techtarget.com/feature/Run-a-hackathon-event-that-pays-off-and-draws-women
134 See: https://www.empowerwomen.org/en/community/events-opportunities/2018/03/international-girls-in-ict-day-2018

eco — Association of the Internet Industry
Lichtstrasse 43h, 50825 Cologne, Germany
phone +49(0)221/700048-0
fax +49 (0)221 / 700048-111
info@eco.de, https://international.eco.de
@eco_en, @ecoverband

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