WOMEN IN TECH

Laurence Jacobs

WOMEN IN TECH

A perfect fit for a sustainable and inclusive future

PELCKMANS

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Foreword by Cecilia Bonefeld-Dahl

Twelve years ago, I joined a dinner hosted by the Indian Ambassador. Around the table sat multiple other ambassadors. The Swedish Ambassador was talking proudly about the hundred or so engineers graduating from Swedish universities each year. I remarked that it was wonderful to see a Nordic country focusing on STEM skills, before the Indian Ambassador joined the conversation and explained that in India 200–250,000 engineers graduate each year, with equal numbers of women and men.

The technological supremacy of nations has always defined power, wealth and influence in the world, and whoever has the knowledge shapes the future. When India and China launched their educational strategies focusing on STEM skills 20 years ago, this was not a coincidence, but an integral part of their strategy.

The ability to educate, attract and retain technological skills is key to the success and growth of our economies, as well as our digital resilience. Yet today most children leave school without any knowledge about how to create technologies, despite 48% of them spending an average of 3–5 hours a day on some kind of device. At the same time, Europe is lacking somewhere between 350,000 and one million cybersecurity specialists and over 10 million ICT specialists.

The biggest impact of this lack of insight and ability in tech is hitting girls and women. These are the jobs of the future, yet only one in five ICT specialists is a woman. Across the EU, only 7% of CEOs and a third of board members are female. While this has increased in recent years, it is not enough. Many American companies have top management targets to employ more women. These policies certainly help and could be explored by more companies in Europe.

Society is also losing out on the potential of half the population. For several years now, women have outnumbered men in terms of graduates, but if you focus on STEM subjects only one third are women. These are millions of potential entrepreneurs and innovators who are not going into tech.

Aside from the lost economic potential, this also results in a male-dominated industry and products become biased towards men as they are made by men for men. Take AI – we need women involved to ensure it reflects the whole of society and does not discriminate.

One of the things I'm most proud of is my organisation's participation in Women4IT, a pilot project that has already trained 900 women to become data engineers and cyber specialists. 70% of them found employment in tech or became entrepreneurs.

DIGITALEUROPE, Agoria and other business organisations are taking up the responsibility to make sure that the technological era is led by both women and men, and that technologies of the future are created for men and women.

We must act now – Europe's equality and prosperity is at stake.

Cecilia Bonefeld-Dahl

Cecilia Bonefeld-Dahl is Director-General of DIGITALEUROPE, the leading digital technology industry association representing over 45,000 digital companies in Europe. She is a board member of Gaia-X and the European Commission's Industrial Forum and High-Level Forum on European Standardisation. She is also a member of the Stakeholder Cybersecurity Certification Group of ENISA. Previously, she was a member of the Advisory Group to the Secretary General of NATO on Emerging and Disruptive Technologies and the European Commission's High Level Expert Group on Artificial Intelligence. Cecilia Bonefeld-Dahl has more than 25 years of experience in the ICT industry and has held international positions at IBM and Oracle as well as being the founder of the global SAP implementation company and cloud provider GlobeIT. She is regularly invited to deliver keynote speeches on the digitalisation of business and society and the data-driven economy.

Preface

Ever since I was a little girl, I have had a strong interest in technology and how things work. I was always curious about how a microwave worked, what radio waves were, I enjoyed fixing alarm clocks and VCR cassettes and I loved assembling furniture with my dad. However, even though I had this interest and curiosity, I never considered pursuing a career in technology. When I had to choose a field of study at high school and university, I followed the interests and path of my parents and sisters and chose languages and history. Nobody, including myself, challenged my decision. It's possible that nobody noticed my interest in tech and digital either.

While I am happy with my background in history and feel that it gave me a broad foundation, I could have been just as happy studying STEM (Science, Technology, Engineering, Mathematics) subjects. I have been working in the IT and technology industry for almost 20 years, mostly in supportive roles. I now realise that having a background in STEM might have helped me find my place in the industry more quickly.

The technology industry is a place for women and men, regardless of whether they have a background in STEM. The 'war for talent' is ongoing and growing, and when we take a closer look, we see that there's a simple solution: making use of an untapped pool of talent – women.

We need more women in tech. It is a simple equation: access to interesting and sustainable jobs for women, and at the same time, companies finding the talent they need. So why has it been such a struggle to achieve this balance for so many years? One reason is that women and people from diverse backgrounds don't always find their way into tech easily, and companies don't always know how to reach them. Basically, supply and demand of talent are not in balance.

There are several factors that contribute to this imbalance. From their birth, girls (and boys) grow up with stereotypes. Having a look at kids' clothes, for example, teaches us that boys' clothes are about adventure, superheroes, monster cars and trucks, dinosaurs and tigers, etc. Girls' clothes are all about unicorns and ponies, princesses and Barbies, flowers and rainbows and sparkling and pink stuff. Girls ought to be good, polite, friendly and helpful, while boys are thought to be brave, strong, persistent and firm.

A lack of female role models and representation in children's books and schoolbooks is another reason. You hardly ever see female scientists, directors, engineers, ... nor do you see any dads doing household chores, being nurses or looking after babies.

There is also a narrow view of what the tech industry is and how women fit into it. At the same time, companies could do more to diversify their efforts to attract and retain women, and focus more on creating inclusive company cultures and leadership.

I have spent the last three years researching the topic of diversity and women in tech, reading hundreds of articles and studies, and meeting many interesting people and organisations. I am amazed and happy to have discovered such a large ecosystem of organisations, initiatives, companies, NGOs, and inspiring individuals working to bring these two worlds closer together and bridge the gender gap. And I cannot wait to share my findings with you. Because whether you are considering a job in tech, thinking about upskilling or reskilling to future-proof yourself, or you want to know how you can work on an inclusive company culture and embrace diversity, this book offers practical guidance and demonstrates that it is possible to make positive changes without starting from scratch.

So what is this current landscape? Why is it so important and necessary to focus on diversity, equity and inclusion? And can we really attract and keep more women in tech? To make real progress, we need to remove structural barriers, focus on digital skills, create inclusive company cultures and leadership, have an equal representation of women in all layers of society and business, gain access to funding for female founders, and inspire the next generation.

Together with Dirk Remmerie, journalist and driving force behind communications agency Xpair Communication, we have talked to many experts in the field about the current landscape and the importance of focusing on diversity, equity and inclusion, and how we can attract and retain more women in tech.

I sincerely hope that in the near future we will be able to bring about positive changes in the tech industry. At Agoria, we are working hard to make women in tech more visible and to create an inclusive and sustainable future. Our ultimate goal is a society where everyone can thrive and where diversity of perspectives, ideas and backgrounds is valued and everyone feels included.

Happy reading!

Introduction to Women in Tech

WOMAN IN TECH

A woman in tech is a woman who works in the technology industry or in a tech-related job, regardless of the industry. In this book we refer to the first, a woman working in the technology industry.

TECH INDUSTRY

The technology industry is composed of companies that develop, produce and sell technology products and services. These can be companies that manufacture and sell hardware, software and various types of technology-based services. It also includes companies that conduct research and development in the tech field, as well as start-ups and other small businesses that are working on new technologies and innovative products.

TOWARDS 2030

In 2022, Agoria set its sustainability strategy towards 2030 for the technology industry in Belgium, titled *Technology for a Better World*[1]. One of the report's focus areas was 'Care for People', which included a goal to achieve a more balanced male-to-female ratio and increase the number of women in leadership positions to 25% by 2030. Additionally, the report outlined an increased focus to support career development opportunities for older employees, young women, and individuals who are not currently in education, employment, or training.

DIVERSITY, EQUITY, INCLUSION

Chapter 3 delves into the extensive explanation of Diversity, Equity and Inclusion. In brief, these terms refer to the following:

- Diversity refers to a variety of people based on factors such as gender, age, ethnicity, cultural background, educational background, etc.
- Equity involves striving towards equal outcomes rather than merely providing equal opportunities.
- Inclusion means creating an environment in which individuals feel welcomed, safe and valued.

01

Representation of Women in Tech

01

General Overview

GLOBAL OVERVIEW

Women make up half of the world's population – 50.5% males versus 49.5% females. Most of the world's countries and regions have a higher female population, but China and India, which are the two most populous countries, have a higher male population. If we exclude China and India from the equation, there are more females than males in the rest of the world. Even though there is an equal representation at birth, that equal representation isn't carried forward throughout the entire lives of women. There is an under-representation of women in technology, in politics, in business, in the scientific and academic world, in media, etc.

This is in steep contrast to the fact that, across all sectors and industries, communities and societies, diverse teams and diverse leadership benefit everyone. Leaders should represent the people they serve and if you want your products and services to meet the user's wants and needs, you ideally have them created and developed by people with different backgrounds and experiences. There are many examples[2] like smartphones that are too big for women's hands or facial recognition algorithms that aren't able to recognise people of colour because the algorithms were trained on data sets that were predominantly composed of images of people with lighter skin tones. Voice recognition technology that understands women 70% less well than men because many algorithms are trained on 70% male datasets. Social media algorithms that are used to personalise content and recommendations can also be biased if they aren't developed by diverse teams. For example, an algorithm that is used to recommend job openings may be biased if it is trained on data that is predominantly composed of job openings that were posted by men.

Car seat belts cause greater injuries to women than men because the crash test dummies used to test cars are based on male bodies. Females and males have different body types, including average differences in height, weight, muscle strength, and torso, hip and pelvis shape.[3] These differences can significantly affect how our bodies react to car crashes. For example, women are three times more likely to suffer from whiplash injuries if their car is hit from behind. These differences in how our bodies react to car crashes matter. Fifty years after the first crash test dummy was invented, this will finally be solved. At the end of 2022 a female Swedish engineer, Dr Astrid Linder, designed an actual female crash test dummy. Crash test dummies have been used to test car safety since the 1970s. But to measure the impact on women's bodies, the car industry has been using small versions of the male test dummy. At 149cm tall and weighing 48kg, this smaller dummy is roughly the size of a 12-year-old girl. Not exactly a typical woman... And most of the time, that dummy was sitting in the passenger seat as well.

So it's clear that we need women and men, people with diverse backgrounds and roots, from politics and corporations to sports and STEM.

We do not solve tough problems, we do not innovate or create, unless we have the other half of our population being able not just to survive at work but thrive at work.

Reshma Saujani, Founder Girls Who Code

The technology industry is one of the fastest growing industries in the global economy but there is an increasing skills gap that can only be filled by an equal representation and participation of men *and* women. More women in technology will also help bridge the gender gap. Moreover, half of the purchasing power within households lies in the hands of women, so obviously we need women to be included when creating and developing new products and services.

The United Nations[4] gives us a nice overview of women in leadership and how we can increase their participation. Because, in general, we tend to focus a lot on the behaviour of women, which is referred to as 'fixing the women', instead of fixing the system and the work culture. The first approach tends to put the problem *and* solution on women's shoulders but that isn't fair. We need everyone to work together on closing the gender gap. There is a common misperception that when women win, men lose. The truth is that diversity doesn't limit the opportunities of others, on the contrary – the enhanced returns resulting from diversity and inclusion open up opportunities for everyone within an organisation. Let's take a look.

Women in businesses and entrepreneurship

In 2020 only 7.4% of Fortune 500 companies were being run by women. In Belgium only 14% of directors of listed companies are female, and only 3% are CEOs.[5]

What can we do to improve this?

- Equal pay for equal work
- Equal representation of women in boardrooms
- Parental leave for all parents
- And a last one – which should be the easiest, and doable for everyone – an equal share of housework and childcare

Women in Science

Worldwide, women make up 70% of all health and social care workers, often risking their lives, which was painfully visible during the Covid pandemic. Although over-represented in the field, women are severely under-represented when it comes to decision-making and leadership – women account for only 30% of leadership positions in the global health sector.

Women don't find their way that easily into STEM careers: gender bias and stereotypes, systemic barriers and discrimination are all holding them back.

What can we do to improve this?

- Raise awareness and break those stereotypes. STEM needs women and women need STEM
- Put a spotlight on women and girls in STEM (role models)
- Mentorship, sponsorship and allyship

Women in Policymaking

Only 22 out of the 195 countries in the world are currently being led by women as heads of state or government. Of all countries, 61% have never even had a woman leader. Only 25% of national parliamentary seats are held by women. It's safe to say that women are under-represented in public decision-making. And it's even more safe to say that the policies being created might not represent women's needs and priorities. If we don't act now, according to the World Economic Forum, it'll take another 136 years (!) to close the global gender gap.

What can we do to improve this?

- We need a long-term approach, over several generations, teaching the importance of gender equality and supporting young people
- By listening to and amplifying women's voices and experiences (via role models). Here the media play a critical role in sharing these voices and stories.

Women in Media and Entertainment

Women only account for 27% of top management jobs in media organisations. It's no surprise then that throughout all media (books, newspapers, films, etc.) stories by men prevail. That's exactly why in Belgium a group of diversity experts and female leaders from different companies and organisations set up an Inclusive Panels[6] charter and website. During the Covid pandemic, they found it striking how few women were being invited as experts to join panels, news and TV shows. Also, only 30% of events had a gender-balanced panel. It was time for change.

Since then, progress has been made. Data from VRT[7] shows that in 2022, 38% of the experts were women, versus 31% in 2019.

What else can we do to improve this?

- Read, watch and listen to media created by women
- Call out the under-representation of women in the media
- Make use of the Expertendatabank[8], which puts female experts and experts with diverse roots and backgrounds in contact with journalists and content creators. When creating your profile, you immediately get some media training as well.
- Have a look at all the different databases of experts the Inclusive Panels website has created

Women in Arts[9]

A survey conducted by the European Parliament in 2021 showed that 60% of (amateur) artists and/or students at art colleges in Europe are women. Yet only 3–5% of works in permanent art collections in Europe and the US are made by women. Structural change is needed to broadly integrate women's perspectives into collections, exhibitions and art history.

Source | Guerrilla Girls

In recent years, female artists have gained more attention and visibility, with exhibitions and debates focusing on their work and their presence in cultural developments. However, this increased visibility has not yet resulted in lasting integration into art history and museum collections. There are efforts to permanently incorporate women artists into these areas, but it seems that progress is slowing down, as evidenced by declining institutional investment and museum policies since 2008.

While temporary exhibitions can create a sense of hyper-visibility for women artists, the reality is that they are still under-represented in permanent collections. Data at the EU level is limited, but at the Prado, for example, only 10 out of 1,700 works on display are attributed to women. Similarly, the Louvre displays

around 30 artworks by women and the Musée d'Orsay's collection consists of just 296 out of 4,463 works by women, or less than 7%. While exhibitions dedicated to women artists are important and inspiring, they do not necessarily lead to long-term change in the representation of women in art history.

Women in Tech: it's the economy, stupid

Research published by McKinsey in January 2023 *Women in tech: The best bet to solve Europe's talent shortage*[10] shows that women in tech are the best bet to bridge the talent gap in Europe.
Despite the tech industry facing economic challenges globally, only 7% of the recent layoffs were in Europe, according to the State of European Tech report for 2022. In fact, a tech talent gap of 1.4 million to 3.9 million people by 2027 is projected by McKinsey for EU-27 countries. By doubling the representation of women in the tech workforce to 45% by 2027, Europe could not only close this talent gap but also benefit from a potential increase in GDP of €260 billion to €600 billion.

To shed light on the challenges facing women in tech in Europe, they conducted a comprehensive analysis of the entire development funnel, from primary school to entering the workforce. The research showed that the number of women in STEM courses significantly drops during the transition from primary and secondary education to university and from university to the workforce. There's a significant decline in the number of girls pursuing STEM disciplines in university, with a drop of 18 percentage points. The decrease is even more pronounced, with 31 percentage points, when looking at young women entering ICT disciplines specifically. Two primary factors for this decrease are firstly, girls receive less support from teachers, parents, and peers compared to boys in pursuing STEM careers during secondary school. Secondly, research indicates that girls are being told they are not good at STEM, often in subtle yet damaging ways, such as teachers calling on boys more frequently in STEM classes.
This drop in enrolment can lead to a vicious cycle. With a mere 19% of ICT bachelor students being women, the resulting isolation further contributes to women leaving these programs.

The percentage of women transitioning into tech roles after graduation is alarmingly low, with only 23% of women who hold STEM degrees taking on tech careers, compared to 44% of men. Women's representation in tech roles such as developers and data engineers are lower compared to those working within tech companies, and the trend is likely to worsen as the graduation rate of women in STEM disciplines decreases and the fastest-growing tech roles such as DevOps and cloud are least represented by women, only 8%. The highest representation is in product design and management (46%) and data engineering, science, and analytics (30%). Even if in tech and tech-adjacent companies 37% of employees are women, women only make up 25% of those working in tech roles.
A lot of room for improvement!

OVERVIEW BELGIUM

Women in Tech

According to Agoria, the proportion of men and women in the Belgian working population is evenly distributed: about 51% men and 49% women. Yet the employment rate for men is higher than for women: 75% versus 67%. This doesn't take into account the non-paid work women are performing in taking care of the household, children and other family members.

In the technology industry, we find 78% male employees versus 22% female employees. This ratio has hardly changed in the last 10 years (82% in 2011 compared to 78% in 2021). Out of these 22% female employees in tech, there is an over-representation of women in entry-level jobs and women in non-STEM jobs.

In Belgium only 10% of CEOs and founders of tech companies are women. So besides needing a lot more women to change this 78/22 ratio, we also need a lot more women in leadership positions. There are many reasons why women are finding it hard to move up the ladder and break the glass ceiling, and we need to act now to change things.

There is a large proportion of women not working outside of their homes. Women still take on the majority of childcare and household responsibilities, leading to less participation in the labour market. **In the technology sector, half of women who start a job in tech leave the industry before they turn 35**.[11] A non-inclusive work culture is the main reason:

- Women have to deal with inappropriate remarks and comments
- They work in male-dominated teams
- Colleagues and people they work with keep on assuming they are more junior than male peers
- They want to start a family and don't see a way to combine their job with family responsibilities
- The lack of opportunities for growth and promotions at work

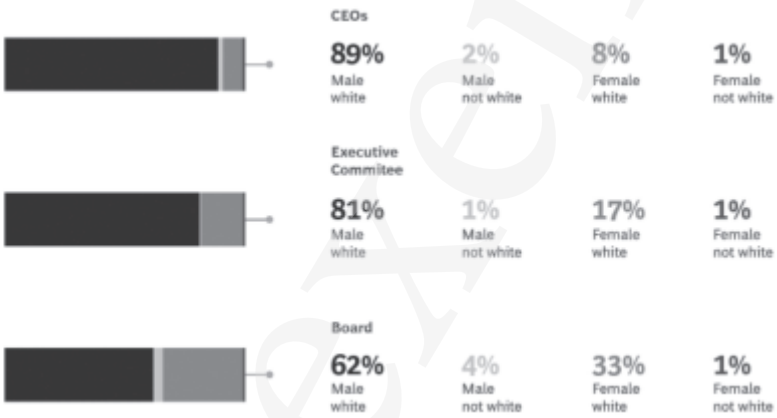
Women and the Belgian Labour Market

In November 2022 Boston Consulting Group and Google published their study *Untapping the True Potential of Belgian Workforce Diversity*. The main conclusions were that Belgian companies aren't diverse, women hardly reach leadership positions, and the initiatives taken to improve diversity, equity and inclusion lack impact. To gather data, they examined management teams of the top 100 Belgian companies (large corporations and SMEs) and launched a survey among +1,000 people who are part of the working population in Belgium. The study shows that gender and cultural diversity in management positions are still too limited. In addition, the study explains that the existing absence of diversity is a missed economic and social opportunity.

Let's take a closer look:

- On executive committees:
  - 18% women and only 2% non-white.
  - Women hold 25% of roles in support functions such as HR, legal and finance.
  - Only 11% of women have P&L responsibilities. This is a problem because these positions usually evolve towards CEO roles.
- CEOs:
  - Only 9% women.
  - 55% of existing CEOs are over 55, while this age group makes up only 33% of the active workforce.
  - Based on the number of women that graduate, we would expect six times more women in CEO roles. For more than 20 years now, more women have graduated with a university degree than men. The problem clearly doesn't fix itself.

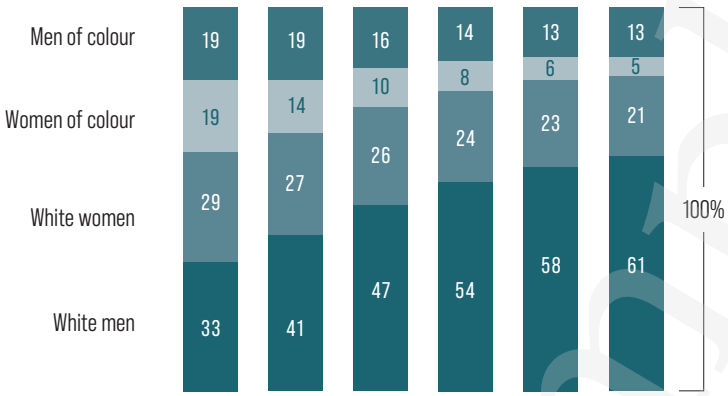
Leadership in Belgian companies is non-diverse, especially for CEO roles.
Top 100 companies HQed in BE.



Source | Boston Consulting Group

The most recent research from McKinsey shows similar figures worldwide:

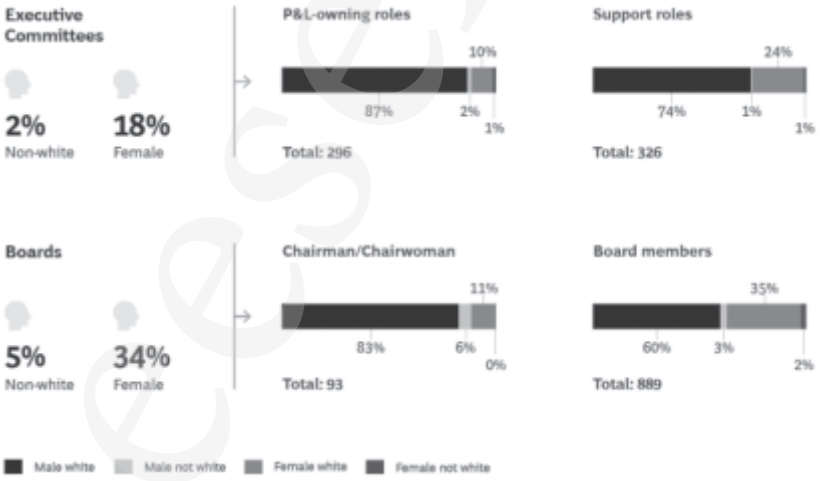
More women needed in leadership roles.
Despite modest progress, women are still dramatically underrepresented in leadership roles.
Representation in corporate role, by gender and race, 2022, % of employees.



	Entry level	Manager	Senior manager / director	Vice president	Senior vice president	C-suite
Women 2022	48	40	36	32	28	26
Women 2017	47	37	33	29	21	20
2017-2022, percentage point change	1	3	3	3	7	6

Source | McKinsey & Company

Diversity in leadership is higher in support fucntions and non-Chairman/Chairwoman roles. Top 100 companies HQed in BE.



Source | Boston Consulting Group