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SHAPING THE FUTURE OF WORK FOR WOMEN IN AI.

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Introduction

Written by Alessandra Sala, President of Women in AI and Sr. Director of Artificial Intelligence and Data Science at Shutterstock.

The last few years have seen a pivotal shift in the consideration of the role of women in society, from the private sector to governments and regulatory institutions both at regional and global levels. The topic of women's representation has been supported by a larger realization that diversity is critical to success. Diversity is a wide concept and it comprises of gender, race, ethnicity, and cultural background which are all key aspects to enrich traditionally male-dominated sectors with new opinions and ideas. Practical demonstration of this mindset shift towards engendering diversity can be witnessed in the many awareness campaigns and actions at a global scale. For instance, the gender index that tracks the progress towards closing the gender gap across countries and sectors as well as the vast media coverage on women in leadership positions and women-led organizations often showcase the positive impact of gender diversity at work and in society in general.

As many concrete actions toward gender equity continue to grow, there has been limited attention to the challenges that women are facing in their everyday lives. Work environments have been designed and optimized for men and highly influenced by their own perspectives and needs. A broader and diverse approach is of paramount importance if the goal is to attract more women in the workforce and, most impor-

tantly to retain them in those new career opportunities.

This report gives voice to those women who are or aim to enter the Artificial Intelligence (AI) workforce and provides a platform for them to express their needs on how to reconceptualize working environments to enable growth and success for everyone.

Alessandra Sala

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President of Women in AI
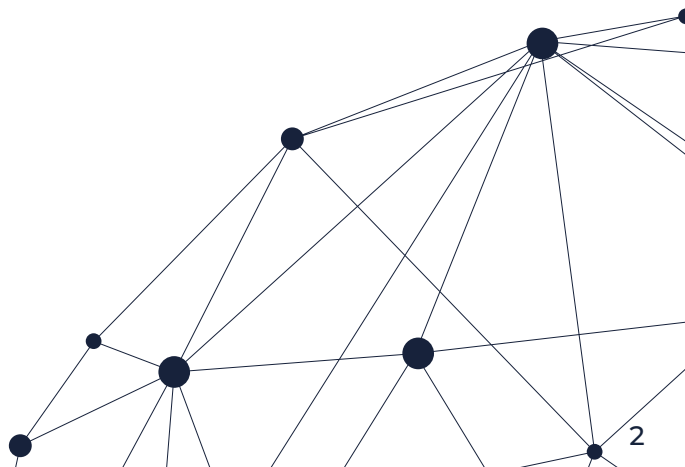
Women in AI, AI Sweden, and how this report provides a platform to women working in AI

Women in AI (WAI) is a nonprofit do-tank working towards shaping inclusive AI that benefits global society. This goal is reached by spreading knowledge using educational aims, conducting research, organizing events, and blogging.

The WAI community consists of 8,849 members and roughly 200 volunteers from 140 different countries (July, 2021). 96% of the members are women of which 55.5% are between 25 and 40 years old with different fields of expertise ranging from technical ones (Computer Science, IT, AI) to non-technical ones like Law, Economics, and Business. In contrast to Women in Tech, an international non-profit organization whose aim is to close the gender gap in the overall STEM (Science, Technology, Engineering, and Mathematics) sector, Women in AI's mission is more specific: to provide concrete actions to shift society towards inclusive AI representative of our multicultural society.

To accomplish these goals, Women in AI partnered with AI Sweden, the Swedish National Center for applied Artificial Intelligence supported by the Swedish government and the public and private sectors across the country. Sweden has long been a strong promoter of gender equality: its overarching principle is that everyone, regardless of gender, has the right to work and support themselves, to balance career and family life, and to live without the fear of abuse or violence. AI Sweden's mission is to accelerate the use of AI for the benefit of society, its competitiveness, and for everyone living in Sweden and beyond.

With the support of AI Sweden, Women in AI were able to published a survey and conducted interviews with leading women working in AI as tools to provide guidance for companies to help attract more women to AI roles and retain their female workforce. In addition, many women in the field of AI offered advice for others entering and within the field of AI on how to find the right companies for them, grow their careers, and foster an inclusive working environment. The survey was targeted at the substantial Women in AI community and shared among its networks to evaluate the experiences of women working in AI: their current satisfaction, their expectations, and if relevant their history with discrimination and sexual harassment.This preliminary report is based on the first 200 survey respondents from November to December 2021, of which almost all are women (99%), those who currently work in AI (81%), and have worked in the field for over 2 years (63%).

1% Data engineering (e.g. ETL processes)

2% Prefer not to say

3.5% Sales

7.5% Marketing

7.5% Software engineering

21.5% Data science (e.g. ML model development)

18.5% Management

16% Research

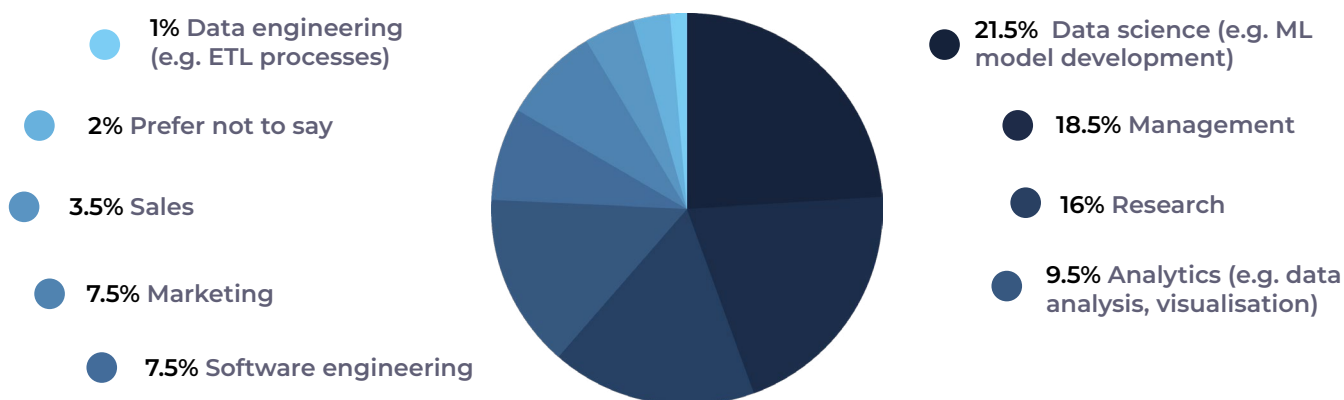9.5% Analytics (e.g. data analysis, visualisation)

Fig 1. The share of initial survey respondents in each field

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Setting the scene: The AI gender gap and why companies should care

"Working with a technology with the potential to transform society, it becomes more clear everyday that diverse perspectives, competences and backgrounds are needed."
Johanna Bergman - Head of Strategic Initiatives at AI Sweden

AI is part of everyone's lives. People interact with it every day even when they are not aware of its presence around them. Given its penetrating influence, it is essential that the "creators" reflect the diversity of the population, otherwise people will always interact with systems designed to serve only the needs of a certain subset. In the words of the Women in AI founders:

"Our world is made up of biases. Even with the hardest efforts, we will still be biased human beings. It is thus important that teams building the future of our world with AI applications embrace internal diversity as much as they can, in order to create an inclusive AI and represent the right image of a multicultural society. That's why we need not only more women in AI, but more diversity in general. This can extend to the skin color, religion, education, country, family, age, etc."

AI is changing the labor market, producing new skill demands for workers of the future and the demand for AI only looks to continue to grow. According to the World Economic Forum (2021), 97 million new jobs will emerge by 2025, with a majority requiring skills in artificial intelligence, engineering, product development, and emerging programming languages.[1] However, despite the surging demand for AI specialists, women have remained an untapped resource. The World Economic Forum (2021) also found there to be a substantial gender gap when it comes to technical jobs: women make up less than 25 percent of people working as AI specialists, in Cloud Computing only 14 percent, and in Engineering only 20 percent.[1] The gap appears even more stark at the "FAANG" companies—according to the AI Now Institute just 15 percent of AI research staff at Facebook and 10 percent at Google are women. [2]

Worse yet, this gender gap does not only currently exist but has remained chronic and static: McKinsey (2020) found that female representation globally increased by only 1 percent (from 14% to 15%) from 2017 to 2019.[3] Specifically, in AI this progress is even slower: the share of women in cloud computing has only improved by 0.2 percent and in Data & AI roles has declined by 0.1 percent since February 2018 (World Economic Forum, 2021).[1] At these rates, it would take over a century to achieve gender equality, an unacceptable timeline given global efforts to achieve the 2030 UN Sustainable Development Goals that both correctly posit gender equality as a goal itself (SDG 5) and as a lever to achieving all other interrelated SDGs.

Surveys and interviews conducted by Women in AI asked women who are working or have worked in the field of AI about the main drivers of this gender gap in the industry. A central theme presented by respondents focused on the emerging nature of the AI field as a challenge both for entry and to remain in the industry. Specifically, respondents noted the 'rules are still being defined' in what constitutes a role, a career path, building a team, and continued education within the AI workforce. In the words of Abigail Holman, Director of Data & AI at Deloitte,

"It's challenging at the best of times to be a woman in the workforce, let alone a woman in a minority in a very new industry. That said – it takes a lot of bravery and courage for the women now in data and AI, paving the way for the next generation of women."

Why should companies care? Gender diversity affects the bottom line, and the outperformance of diverse companies to industry peers is only increasing: McKinsey (2020) illustrated that companies with the most gender-diverse executive teams are 25 percent more likely to experience above-average profitability than those with the least diversity, an increase from 21 percent in 2017 and 15 percent in 2014.[3] Moreover, the performance differential between the most and least gender-diverse companies was substantial (48%) (McKinsey, 2020).[3] Also, gender representation communica-tes an attractive workforce for new talent: Glassdoor (2021) found that in evaluating an offer, 67 percent percent of job seekers consider workforce diversity, and PwC (2017) noted that 61 percent of women deciding where to work consider gender diversity of a company's leadership team.[4,5] Finally, a diverse workforce leads to a diversity of ideas: Hewlett, Marshall & Sherbin (2013) found teams with diverse leaders led to better products, as these teams were more likely to have commonalities with their end users. [6]

Shaping the future of work for women in AI: How companies can best attract & retain women

Human resource management [HRM] plays a significant role in designing the diversity management process, and offers a great variety of opportunities to enable success for women in AI. This section aims to provide companies with tangible actions to promote workforce diversity, including going beyond salary to support female talent in their personal and professional ambitions, promoting transparency on positive and negative workforce behavior and diversity, and committing to concrete actions on gender parity.

Diversity management describes the conscious use and management of workforce diversity, with the aim to exploit the different characteristics of employees as a source of new value creation and competitiveness while avoiding potential risks arising from people working together who significantly differ from one another.[7] Thereby, diversity management is a process that must be continuously adapted and refined to meet the needs of the company, and companies must carefully design a systematic diversity management approach to empower more women in AI. [8]

Human resource management [HRM] plays a significant role in designing the diversity management process as it provides the necessary "sub-systems, including recruitment, reward, performance appraisal, employee development and individual managerial behaviours in delivering competitive advantage through leadership and team work" (Basset-Jones, 2005). [9] Thankfully, many HR and recruiting professionals in the technology and AI industries are aware of the lack of diversity and inclusion and are increasingly investing to close the gap. Overall, PwC (2017) found 80 percent of employers have aligned their diversity and recruitment strategies, with 78 percent actively seeking to hire more women – especially into leadership roles.[6] The United Nation's Women's Empowerment Principles, guidance on promoting gender equity and empowering women in the workplace, has

been supported by more than 5,000 corporate signatories, including Amazon, PayPal, and Facebook.[10] Corporate sponsorships for initiatives to address lack of diversity in AI are prominent; for example Google, Facebook, Amazon, and Apple in 2017 all supported a Women in Machine Learning event for women to present their work at NIPS, an AI conference.[11] In the words of Anne-Katrin Neyer, CHRO at WAI, "companies must shift towards a culture in which the increase of diverse AI and data teams is fostered as a crucial strategic value.

This section aims to provide companies with tangible actions to become diversity winners: those with high levels of diversity that benefit from its consequential increased likelihood of financial performance.

A high salary is not enough: Support female talent in their personal and professional ambitions

Prompted by the COVID pandemic, companies have exhibited dedication to addressing employee well-being, establishing a wide range of steps including mental-health benefits, caregiver support, additional paid leave. However, burnout is still on the rise and women have been disproportionately affected by the pandemic: according to McKinsey (2020) women make up 39 percent of global employment but account for 54 percent of overall job losses.[11] For Women in AI respondents, 50

percent reported being satisfied with the conditions of their current role, a low score when compared to 76 percent in the US and 71 percent in Denmark from respondents to the Global Digital Talent Work Happiness Scores in 2020.[13] This is an unprecedented time, and will require companies to not only expand successful policies but also experiment with pioneering new approaches to enable job satisfaction and retention of their female workforce.

Specifically, Women in AI respondents noted the most important indicator for job satisfaction to be work-life balance, defined by both a flexible work environment (e.g. flexible hours, remote work) and ability to balance personal life and work. This finding is supported by research from the Global Digital Talent Work Happiness Scores in 2020 where work-life balance overwhelmingly trumped financial compensation and other factors as the most important factor in work happiness.[13] Flexible work arrangements have become the new norm during the pandemic, and companies continuing to embrace flexibility as well as setting clear expectations on ensuring employees carve out personal time will be key.

Women in AI respondents also pointed to a wide range of benefits to be important in satisfaction including parental leave, technical skill trainings, mental health benefits, legal counsel, mentorship coaching, and access to e-learning tools, to name a few. Learning analytics, i.e. the systematic work with data in the context of individual learning preferences of e.g. employees, could also be a promising step forward in supporting more women in proceeding a career in AI/data. There is no one-size-fits-all solution; rather, by listening to employees and co-creating new solutions especially if a policy fails to land, employers can better ensure their efforts lead to success for the women in their workforce and attract new talent.

"To retain talent, companies need to listen to employees' needs, give them a chance to develop knowledge, and support their activities outside the workplace. In 2022 a higher salary is not enough to retain talent: they also want more balance between their personal and professional life." - Silvia A. Carretta, Women in AI Global Legal Team Lead. Doctoral candidate at Uppsala University and WASP-HS graduate school, Lawyer and founder of IP and Tech Lab law firm.

Promote transparency on positive and negative workforce behavior, as well as on the value of diversity

Women in AI found that 73 percent of its survey respondents had experienced discrimination and 41 percent had experienced sexual harassment at work. These numbers are unacceptable, and companies must esablish a zero-tolerance policy for discrimination as well as concrete guidelines on everything from microagressions to sexual harassment. Congruence between policy and action is a necessity: providing platforms for the secure reporting of discrimination & harassment is essential, but also actions supporting victims as well as consequences for perpetuators. An open feedback culture at all levels is also critical, including at the most senior leadership.

Among the Women in AI respondents, 20 percent did not know if their companies took any actions to ensure diversity. Companies need to transparently communicate their goals and ambitions regarding diversity both internally and externally to attract and retain their female workforce. However, best practice would be for companies to not only aim to abolish negative workforce behavior but also foster positive environments, addressing the benefits of gender diversity and an inclusive workplace. McKinsey (2020) found that unaddressed misconceptions about fairness are a significant barrier to addressing the gender gap, with the prevailing belief that "everything should be the same for everyo-

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ne" failing to understand the increased exposure of women and other minorities to bias and microaggressions as well as their reduced opportunities for support and sponsorship.[3]

This is evidenced even amongst the Women in AI survey: a few respondents wrote how diversity is 'harmful', a 'threat', and 'misandrist', as well as how new female hires 'do not have the technical prowess to be in AI'. Employers must clearly communicate the 'why' behind each diversity policy and ensure messaging on hiring is focused on inclusive practices, rather than to fill quotas.

An 'official diversity policy is not enough': Commit to concrete actions on gender parity

"Diverse talent needs to know a company is committed to their experience being an equitable and inclusive one by creating checks and balances for equity across the employee experience from recruiting to hiring to promoting to exiting."
- Meckeel Beecher, Global Head Diversity Equity and Inclusion at Shutterstock

Hiring female talent is not enough – it's their experiences within a company that influence whether they remain and find success. Lack of purposeful follow-through on commitments to diversity and inclusion erode company credibility and further perpetuate systems of exclusion. Goals and ambitions are not enough if they are not followed by systematic, tangible action and measurable metrics.

What can employers do to sustain their commitments? Define and measure short- and long-term data-driven diversity targets around recruitment, promotions, and pay criteria, but also share these diversity statistics widely and transparently through surveys, dashboards, and analytics tools. Ensure initiatives are not only top-down but also be employee-led, with surveys

and townhall sessions for top level management to hear directly from employee experiences. Discrimination training is also the bare minimum: promote inclusivity as a key skill listed in job descriptions, assessed in performance reviews, demonstrated by senior leaders, and fostered in employee resource groups to build community.

54 percent of Women in AI survey respondents found that the leadership boards at their companies did not represent the diverse workforce, and 28 percent that found their companies did not give equal opportunity for promotion to all employees. A central theme among responses was how lack of female mentors and leaders led to difficulty 'imagining a clear path to leadership', as well as feeling 'doubtful' of their abilities, 'out of place', and that they 'stood out'. By building a transparent incentive structure based on skills, female talent in leadership roles will consequently increase, which in turn paves the way for diverse role models and increased sponsorship opportunities.

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Advice for women, from leaders in AI"

We interviewed senior leaders in the field of AI across the world, and across industries. These are the words of advice they had for women looking to enter and that are already working in AI to create a more inclusive space for us all.

On finding the right company

"During the hiring process, describe your ideas or dream projects. How a company reacts will tell you about the company, their culture and opportunities for personal development. Remember it's not just about you being a good fit; it's equally important that the company is the right fit for you." – Johanna Bergman, Head of Strategic Initiatives at AI Sweden

"Contact former employees in similar roles and ask them why they left and what experiences they had. For larger companies, ask for their diversity in numbers: share of representation, roles, years of employment, and turnover. For smaller companies, ask to be interviewed or to meet informally with potential colleagues to talk about the role and the people. At the end of the day, it is the people who make a company." – Silvia A. Carretta, Women in AI Global Legal Team Lead. Doctoral candidate at Uppsala University and WASP-HS graduate school, Lawyer and founder of IP and Tech Lab law firm.

"Check if the company's purpose and culture are aligned with your views. Check how they handle the practice of managing bias and explainable AI as it lays the fundamental foundation for responsible and ethical AI. You are not only being interviewed, you are also interviewing to see if the company is worth joining!" – Angela Kim, Women in AI Australia Ambassador and Director Data Anaytics & AI at Deloitte

On creating inclusive work environments

"Support and encourage others, connect people in your network, be generous with feedback, ask others for feedback. Everything is about people. Take part in creating an environment that you want to be part of." – Johanna Bergman - Head of Strategic Initiatives at AI Sweden

"Be kind. Be brave. Elevate and support each other! Also find a good mentor that can help you understand how the job environment works and how to channel your strengths. I'm extremely grateful for the few, special mentors that I had and still have in my personal and professional life" – Silvia A. Carretta, Women in AI Global Legal Team Lead. Doctoral candidate at Uppsala University and WASP-HS graduate school, Lawyer and founder of IP and Tech Lab law firm.

"I entered the industry as a female in AI with confidence, embraced my differences, and led with them. I didn't leave any room for anyone to treat me differently because I demonstrated how I'd like to be treated" – Abigail Holman, Director of Data & AI at Deloitte

On owning your talent as a woman in AI

"You deserve to be where you are. Never for a second doubt that." – *Meckeel Beecher, Global Head Diversity Equity and Inclusion at Shutterstock*

"I realized the only way that I can be successful is to be myself. The more you start to embrace the weird, wonderful person you are, the more effective you are at building relationships, doing your job, asking for help and supporting others. So be yourself, be whatever woman you are." – *Abigail Holman, Director of Data & AI at Deloitte*

"Enjoy, and do not worry about being a minority in the group, being different is unique - you contribute new perspectives and ideas that will drive innovation and push the boundaries to achieve something extraordinary." – *Angela Kim, Women in AI Australia Ambassador and Director Data Anaytics & AI at Deloitte*

Conclusion

AI is omnipresent, and its increasing presence in everyday life necessitates that creators reflect diversity of the population so that systems are designed to serve people of all backgrounds.

As the demand for AI skills escalates and as the female workforce is disproportionally threatened by the pandemic, it is imperative companies act quickly and boldly to become diversity winners and shape the future of the workforce to be successful for everyone. The framework described the best path forwards for companies: supporting employees in their personal and professional life through innovative approaches, promoting transparency in negative and positive workforce behavior, and committing to concrete actions instead of empty promises for diversity initiatives. It is worth the effort: not only have companies with greater diversity proven to demonstrate greater financial performance, but building a representative workforce also indicates an attractive culture for new talent and fosters a culture of diverse idea exchange.

Women in AI would like to emphasize the preliminary nature of these results, based on the first subset of 200 respondents. The next steps are to continue this research, collecting survey respondents and interviewees especially focused on identifying nuances in these results, such as how these findings differ for multivariate diversity such as in ethnicity, background, company size, and age.

Beyond offering advice to companies and shaping the workforce, this report also provided concrete advice for women entering and in the field of AI from women leaders themselves, on finding the right company, fostering inclusion in their companies, and owning their place as a woman in AI. If you would like your voice and opinions to be considered in forming part of the final outcome of this survey and help continue to shape the workplace women in AI truly deserve, please take a moment to complete this survey at LINK

Appendix

Demographic data

The data reported here are the demographics data on the first 200 responses. As the statistics show, the responses we got came from people (mostly women) holding leading AI-related positions, of different ages, and from different countries.

The respondents were 98.5% women from all over the world but mostly from Sweden (18%), Germany (10%), and the USA (10%). 44.5% of them were between 25 and 34 years old, 32.5% in the range of 35 and 44 years old, and the rest were older or younger. The vast majority (69%) of the interviewees described themselves as White or Caucasian and only 2.5% of them as Black or African American. The most popular highest level of education was a Master's degree (54%), followed by a Ph.D. (23.5%), and a Bachelor's degree (19%). Only 1% had a High school diploma or equivalent.

In order to assess the data more carefully, we asked what field they work on. 21.5% works in Data science (e.g. ML model development), 18.5% in Management, 16% in Research, 9.5% in Analytics, and the rest in Software Engineering and Marketing (7.5%), Sales (3.5%), and Data engineering (1%). Moreover, 33.5% of them are in a Team Leader position, 26.5% in a Mid position, 23.5% as a senior, 11% as a junior, and 2% as interns. The size of their company/organizations was mostly below 5000 employees but 27.5% work in an organization with more than 5000 workers. 80.5% of the respondents work in AI and roughly half of them are members of WAI.

Survey inspiration and questions

Our inspiration for the survey was the results of a pilot survey by Women in AI Sweden (2021) focused on identifying the most important factors when considering new opportunities in AI. Survey results inspired the categorization of potential expectations into two sections - general conditions (e.g. company's values, diversity, pay) and personal development (e.g. training, challenging tasks). We created several questions focused on diversity and the company's culture since 76.5% of the respondents mentioned that the company's values and diversity are important factors when considering a new job.

The results of the pilot survey also showed growth to be an essential factor when considering new opportunities (73.5%). The questions focused on personal development were inspired by the Women in Technology Survey results which indicate that the right training, as well as challenging and rewarding work, are the factors that make women stay in their IT roles. [14]

Moreover, we asked a question about experiences of discrimination and sexual harassment at work inspired by the results of Women in Tech Survey, which shows that 52% of the respondents experienced discrimination while working in tech. [14] We wanted to explore whether experiences in the AI industry match those results. The results of this survey also indicate the important factors while considering new opportunities, which also include flexibility factors, such as work from home, flexible working hours.

We also aimed to measure current satisfaction in AI roles. The Study of Factors Influencing Employee Satisfaction mentions several employee satisfaction factors (e.g. Fair & effective work, Freedom of expression, Opportunities for career advancement), which we used to create statements about current job satisfaction. [15]

Endnotes

1. World Economic Forum (2021, March), Global Gender Gap Report 2021.

2. West, S.M., Whittaker, M. and Crawford, K. (2019). Discriminating Systems: Gender, Race and Power in AI. AI Now Institute.

3. McKinsey & Company (2020, May). Diversity wins: How inclusion matters.

4. Glassdoor (2021, July). What Job Seekers Really Think About Your Diversity and Inclusion Stats.

5. PwC (2017, March). Winning the fight for female talent: How to gain the diversity edge through inclusive recruitment.

6. Hewlett, S. A., Marshall, M., & Sherbin, L. (2013, September). How diversity can drive innovation.

7. Gutting, D. 2015. Diversity Management als Führungsaufgabe. Wiesbaden: Springer Fachmedien Wiesbaden.

8. Charta der Vielfalt e. V. 2017. Vielfalt, Chancengleichheit und Inklusion: Diversity Management in öffentlichen Verwaltungen und Einrichtungen.

9. Bassett-Jones, N. (2005, May). The Paradox of Diversity Management, Creativity and Innovation. Creativity and Innovation Management, 14(2): 169–175.

10. UNESCO (2020, August), New UNESCO report on Artificial Intelligence and Gender Equality.

11. Simonite, T. (2018, August). AI is the future - but where are the women?

12. McKinsey & Company (2020, July). COVID 19 and gender equality: Countering the regressive effects.

13. BCG (2020). Digital talents: Global work happiness survey

14. Women in Tech (2019, September). Women-in-Tech-Survey.

15. Bhoganadam, S. D., and Dasaraju, S. R. (2015). A study of factors influencing employee job satisfaction.

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- **Silvia A. Carretta** - Women in AI Global Legal Team Lead. Doctoral candidate at Uppsala University and WASP-HS graduate school, Lawyer and founder of IP and Tech Lab law firm.
- **Abigail Holman** - Director of Data & AI at Deloitte
- **Angela Kim** - Women in AI Australia Ambassador and Director Data Anaytics & AI at Deloitte

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To learn more about Women in AI, visit womeninai.co

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