Capgemini
RESEARCH INSTITUTE

THE KEY TO DESIGNING INCLUSIVE TECH:

Creating diverse and inclusive tech teams

EXECUTIVE SUMMARY – KEY TAKEAWAYS

In this research, we explore the interplay between diversity of workforce and the inclusive design of technologies. We focus on gender-based and ethnicity-based inclusion and diversity in tech teams across sectors such as financial services, consumer products and retail, utilities, and healthcare.

Diverse and inclusive tech teams lead to more inclusive tech design

- **Organizations with advanced inclusive practices* are four times more likely to create inclusive products.**
- **Two out of five (40%) organizations with advanced inclusive practices involve the end consumer in every step of the design process, as opposed to only 6% organizations who don't have advanced inclusive practices.**

However, current inclusion and diversity practices are broken

- **Only 16% of women and ethnic-minority tech employees believe that they are well represented in tech teams.**
- **85% of leadership executives believe their organizations provide equitable opportunities for career development and promotions to every employee, but only 19% of women and ethnic-minority employees in tech functions agree.**
- **75% of leadership executives believe that women and ethnic minorities feel a sense of belonging in their organizations, but only 24% of women and ethnic-minority employees in tech functions agree.**
- **The perception gap between leadership executives and women and ethnic minorities regarding various inclusion processes and measures is narrower for organizations with an inclusive culture.**

Consumers are aware of tech-based discrimination – and many have experienced it

- **76% of ethnic-minority consumers expect organizations to develop technologies that can be used by a diverse set of consumers.**
- **Nearly 50% of women from ethnic minorities were offered lower credit facility for certain banking products.**
- **40% of ethnic-minority consumers faced difficulty in accessing information that was relevant to their gender/ethnicity while using healthcare services online.**

How can organizations move towards greater inclusion in tech teams and tech products?

- **Develop robust processes, practices, and value systems that enable inclusion**
  - **Focus on inclusive language, assess your referral, and culture fit criteria for inclusive sourcing and hiring.**
  - **Build transparency and greater equity in career progression and allotment of career opportunities.**
  - **Reduce microaggressions and create healthy environments.**
- **Drive fairness in AI systems and reduce algorithmic bias**
  - **Conduct an impact-assessment analysis for algorithms and automated decisions.**
  - **Screen datasets used to train AI systems for bias and audit them regularly.**
- **Lay down the technological and data foundations for fostering inclusion**
  - **Use tools and tech effectively to build greater inclusion.**
  - **Enhance data-collection and management practices for better tracking of diversity, equity, and inclusion (DEI).**
- **Keep diverse users at the heart of designing inclusive tech/digital products and services**
  - **Ensure women and ethnic minorities play a critical role in the design and development of digital technologies.**
  - **Incorporate checks and balances to ensure tech design and tech infrastructure are inclusive.**

* *Top-25-percentile organizations that have strong inclusive culture and practices compared to their peers.*

INTRODUCTION

Digital technologies are increasingly embedded in all aspects of human life. With the integration of these technologies into products and services, exclusionary and biased outputs are also increasingly common, including biases and discrimination from AI-enabled systems. For example:

An AI hiring tool developed by a large global technology company and later abandoned, was trained using a male-dominated dataset. As a result, it was biased against women and excluded applications from two women's colleges. The US Federal Reserve (the Fed, the US central bank) noted that similar algorithmic biases in financial services may lead to a higher rate of credit denial for women, especially African American women.[1]

Racial bias was discovered in a major healthcare risk-assessment algorithm that is used by over 200m people in the US. The system reportedly classified Black patients as being at lower risk on average than white patients, despite the former having a higher incidence of chronic illness, as the dataset administered to the system was insufficiently diverse. This made the AI less likely to flag eligible Black patients for high-risk care management.[2]

Against this backdrop, there has been a rising demand for greater diversity, equity, and inclusion (DEI) in the workforce, especially in technology teams that develop and deploy the technologies with which end users interact.

Understanding diversity, equity, and inclusion

While the terms are often used interchangeably, it is worth pointing out the differences:

Diversity refers to the presence of differences in a given environment/setting. In the context of a tech team or the workplace, it would generally refer to the presence of persons from diverse backgrounds, including (but not limited to) gender identity, ethnicity[3] (race, religion, nationality, etc.), socioeconomic status, sexual orientation, physical or mental ability, and learning style.

Equity refers to the commitment to promoting fair treatment, access, and opportunity within processes, procedures, and systems. The principle of equity acknowledges that there are historically under-served and under-represented groups and that there is a need to identify and eliminate barriers that have prevented their full participation. In the workplace, this translates to reducing wage gaps between different groups, providing equal work opportunities among other similar actions.

Inclusion is about creating a sense of belonging, feeling valued and respected in the workplace, especially for under-served and under-represented groups.[4]

As the use of new technologies become pervasive, questions of non-inclusive technology and lack of diversity in tech teams are gaining prominence. In this research, we explore the interplay between diversity of workforce and the inclusive design[5] of technologies.

For the purpose of this study, we focus broadly on gender-based and ethnicity-based inclusion and diversity in technologies and tech teams. We asked respondents to share their gender identity i.e., the personal conception of themselves as opposed to what they were assigned at birth. To capture their ethnic identities, we asked whether or not the respondents identified themselves as belonging to an ethnic-minority[6] or protected community.

We recognize that there are many forms of discrimination like exclusion due to disability, sexual orientation, age, education, etc. In this research, we explore two forms of exclusion i.e., exclusion due to gender and ethnicity.

We conducted a twofold global research study covering large organizations across nine countries in key consumer-facing industries (such as financial services, consumer products and retail, utilities, and healthcare):

- To capture the organizational perspective, we conducted a survey of 1,000 employees
  - 500 leadership executives from various functional groups in the organization (such as strategy, recruitment, customer engagement, technology, inclusion and diversity teams)
  - 500 employees in non-supervisory positions from technology teams in the same organization (such as UX/UI developers/designers, AI/data-science/analytics teams)
- To capture the end-user perspective, we also conducted a survey of 5,000 consumers.

We also carried out qualitative research, including:

- Focus-group discussions with diverse user groups in Germany, the US, and the UK
- Interviews with professors and researchers in design institutes, all involved in the area of inclusive design/ diversity and inclusion
- Interviews with industry executives belonging to leadership teams (including women and ethnic minorities), and employees (especially women and ethnic minorities) working in technology teams.

Broadly, this report explores four themes:

1. Diverse and inclusive tech teams lead to more inclusive tech design
2. Current inclusion and diversity practices are broken, and leadership is unaware
3. Consumers are not only aware of tech-based discrimination, but have personally experienced it
4. Organizations can build more inclusive tech teams and design inclusive tech products by learning from strong performers.

This report is special to us as we work to make Capgemini more inclusive and diverse.

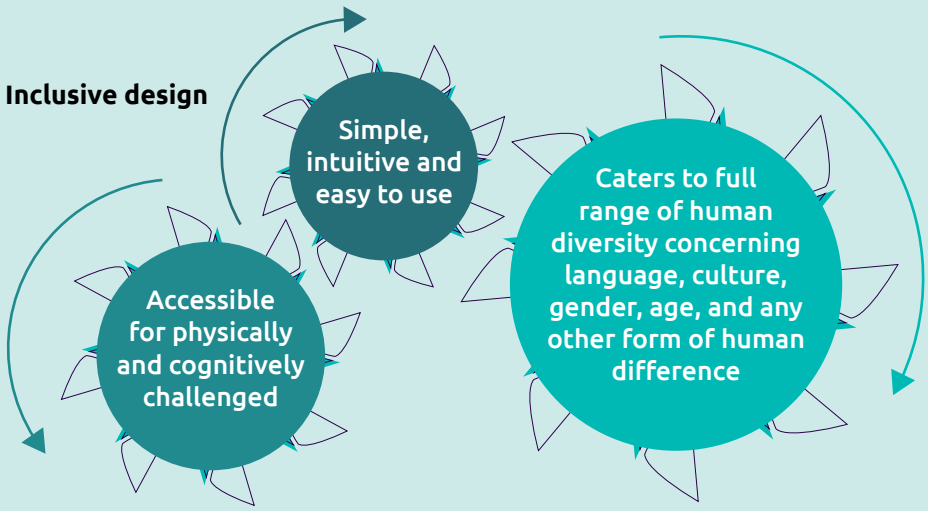
Why is diversity, equity, and inclusion (DEI) important?

DEI is not a purely ethical matter but also a business one:

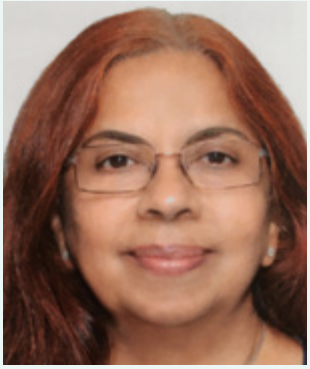
- **Increased employee retention and engagement:** A study indicates that 83% of millennials feel they are engaged at work when they believe the organization fosters an inclusive culture.[7] Disengaged employees owing to a non-inclusive workplace cost US companies an estimated $450bn–$550bn every year through lost productivity.[8]
- **Increased employee hiring:** Diversity and inclusivity can also be the difference between whether or not someone wants to work for an organization. About one in three job seekers would not apply at an organization that lacks diversity among its workforce.[9] Another finding is that three in 10 non-white high-tech workers in the US have left a job because of a lack of diversity or a hostile culture in their organization.[10]
- **Enhanced revenue and profit:** DEI has a ripple effect on revenue and profitability. In fact, companies with above-average total diversity had both 19 percentage points higher innovation revenues and 9 percentage points higher profit margins, on average.[11] Another finding indicates that organizations with the most significant gaps between the experiences of white and ethnic-minority employees averaged 8.6% revenue growth annually, while companies with the smallest gap averaged 11.1% growth.[12] In addition, organizations ranking highly in terms of gender diversity outperform their competition by 15% on average. And those who are ethnically diverse do better than their competitors, by 35%.[13]
- **Heightened creativity and innovation:** A diverse workforce brings more creativity and distinctive ideas to the table and can critically examine a task on many levels and understand consumers from diverse backgrounds. By developing products catering to a larger consumer base, organizations can boost efficiency, productivity, and consumer satisfaction. Also, inclusive companies are 1.7 times more likely to be innovation leaders in their respective markets.[14]
- **Better brand value:** DEI for an organization plays a vital role in building and maintaining an outstanding reputation, avoiding bad press and lawsuits.

Understanding inclusive design

Figure 1: What is Inclusive Design?



The inclusive design methodology aims to create solutions that can be used by a diverse group of people. In other words, it caters to the full range of human diversity. In this report, while referring to inclusive design, we are primarily focused on and speak of inclusive design of digital products, services and digital technologies (for example, apps, websites, online forms, AI-enabled systems, recommendation engines, conversational interfaces, among others).



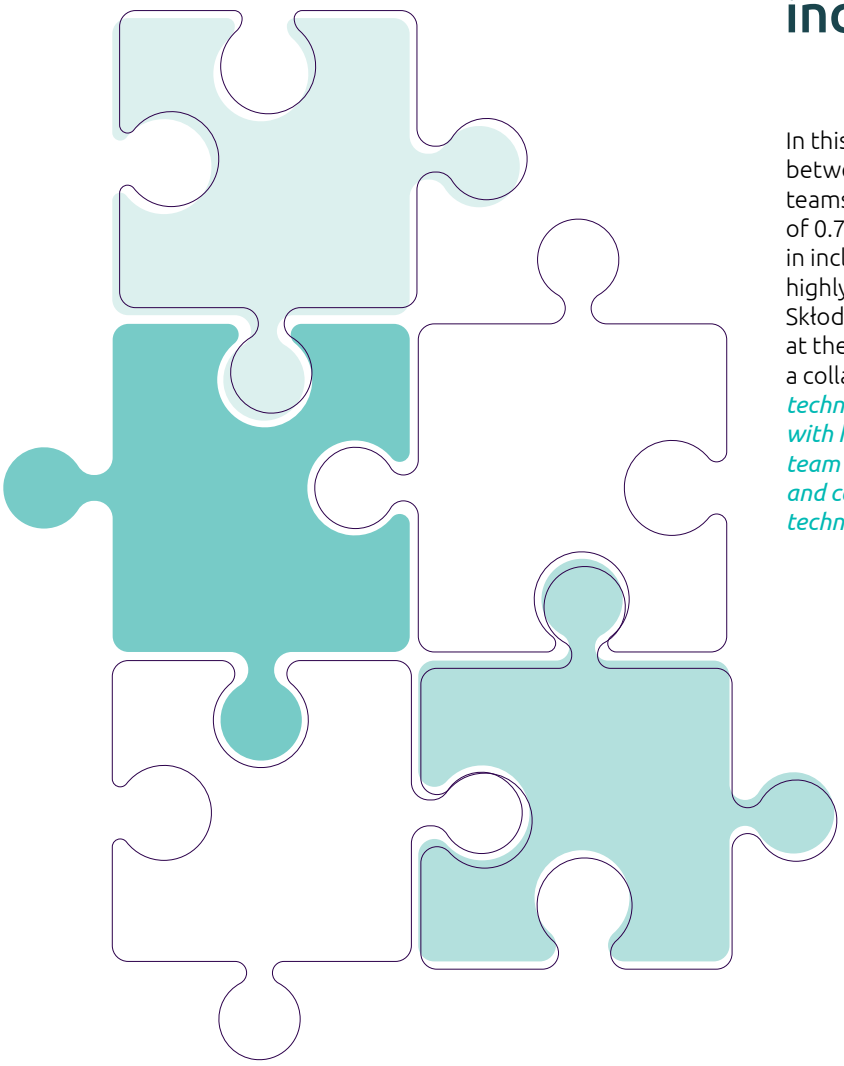
"Inclusive design is design that takes into consideration a variety of human differences. One aspect of it is to design for people with disabilities and that is about accessibility. But inclusive design is also about designing for other human differences: in gender, in sexual orientation, in language and culture, in race. People are different in a number of ways. Designing to include the needs of all these people – that is what inclusive design is."

Dr. Sambhavi Chandrashekar
D2L Corporation, a learning technology company

Source: Capgemini Research Institute analysis.

1 – Diverse and inclusive tech teams lead to more inclusive tech design

Strong workplace inclusion practices lead to more inclusive design practices



In this study, we set out to understand the relationship between inclusive technology and inclusive and diverse teams. We found a clear and direct positive correlation[15] of 0.71 between organizations who performed strongly in inclusive culture and practices, and those that scored highly in inclusive design practices. Dr. Matteo Zallio, Marie Skłodowska-Curie Senior Research Fellow in Inclusive Design at the University of Cambridge, outlines the importance of a collaborative culture and workplace: *"Building inclusive technologies and solutions has an intrinsic relationship with how people from diverse backgrounds within the tech team feel in the workplace. An improved sense of belonging and community for teams of people will lead to better technological outcomes and solutions."*

Exhibit 1: What makes an organization excel in workplace-inclusion practices and inclusive design practices?

We analyzed the responses from women and ethnic-minority tech employees and scored organizations on two dimensions: (1) inclusive culture and practices and (2) inclusive design practices.

Inclusive culture and practices

- Equal opportunity to grow in the organization
- Training and awareness for inclusive leadership
- Robust grievance-redressal mechanism for gender/ethnicity-based discrimination
- Comfort in sharing personal experiences with leadership and peers
- Sense of inclusion, belonging and respect from their leadership and teams

Inclusive design practices

- Awareness and importance of inclusive design within the organization and throughout the product development process
- View on whether digital products and the design process were inclusive
- Level of end-user/consumer involvement in digital design and development process
- Level of checks/balances to minimize ethnicity and gender-based exclusions

Based on the above-mentioned dimensions, we classified the organizations into two cohorts

1. Organizations with an inclusive culture: Top-25-percentile organizations in the first dimension (i.e., organizations that have strong inclusive culture and practices compared to their peers. The remaining 316 organizations have been classified as "The Rest").
2. Inclusion Frontrunners: A small group of organizations (10% of the sample) who are performing strongly on both dimensions: culture and practices, as well as inclusive design practices.

"Building inclusive technologies and solutions has an intrinsic relationship with how people from diverse backgrounds within the tech team feel in the workplace. An improved sense of belonging and community for teams of people will lead to better technological outcomes and solutions."

Dr. Matteo Zallio
Marie Skłodowska-Curie Research Senior Fellow in Inclusive Design at the University of Cambridge

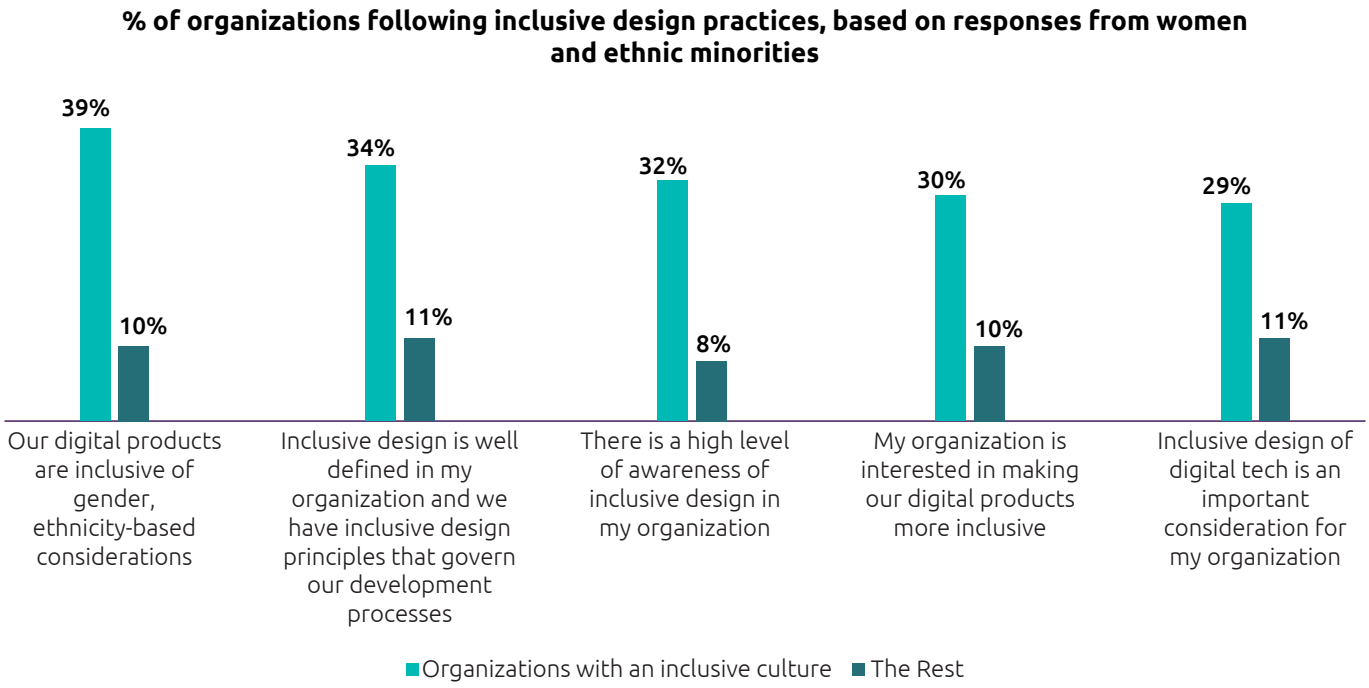
To further test the correlation result, we:

- Analyzed survey responses along two dimensions: (1) inclusion in workplace culture and practices and (2) inclusive design practices (see Exhibit 1, What makes an organization excel in workplace inclusion practices and inclusive design practices?).

Mario Girasole, executive vice president for Regulatory, Institutional, and Public Relations at TIM Brazil, an Italian telecommunications multinational company, outlines the relationship between inclusion in the workplace and inclusive design practices: *"One of the main barriers to adopting inclusive design of digital technologies is lack of information. Without knowledge, technological inclusion is perceived as an unnecessary and expensive choice. However, more people have started recognizing the value-added and benefits of inclusive design. This transformation is being observed in organizations that support DEI initiatives and include diverse people. These people, in turn, offer more varied viewpoints and more knowledge on the issues, thereby providing better solutions."*

As Figure 2 shows, organizations with an inclusive culture are more likely to use inclusive design practices, such as having a well-defined definition of inclusive design that governs their product development (34% for those with an inclusive culture compared to 11% for The Rest).

Figure 2: Organizations with an inclusive culture have better inclusive design practices



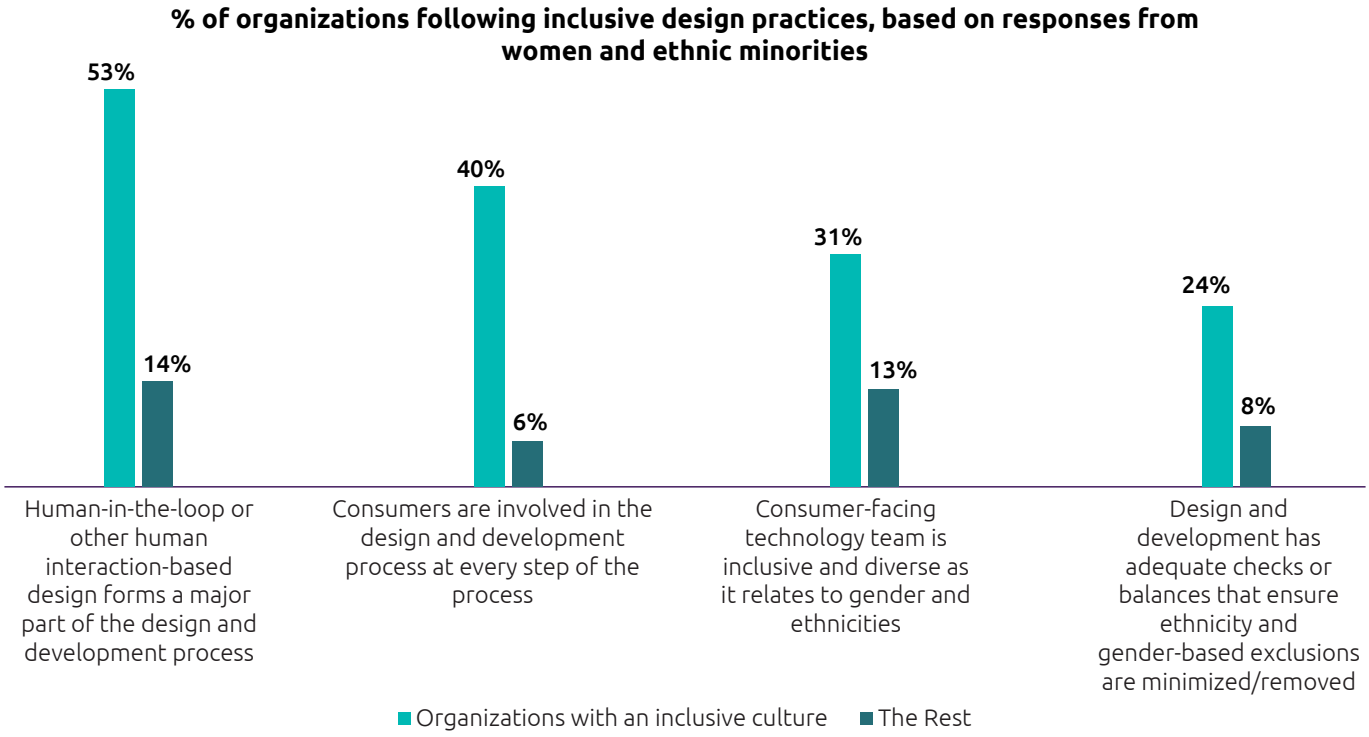
Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=418 ethnic-minority and women employees in tech functions from N=418 organizations under consideration with N=102 organizations with an inclusive culture.

Organizations with advanced inclusive practices are **4 times** more likely to create inclusive products.

Organizations with an inclusive culture have also taken steps to ensure product design considers ethnic minorities and women, as Figure 3 shows:

- More than half (53%) have human interaction as a major part of their design and development process (compared to just 14% of The Rest)
- 40% involve the consumer in their design and development process compared to just 6% of The Rest.

Figure 3: Organizations with an inclusive culture are more sensitive to the inclusion of women and ethnic minorities in their technology applications



Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=418 ethnic-minority and women employees in tech functions from N=418 organization under consideration with N=102 organizations with an inclusive culture.

40%

of organizations with inclusive culture involve consumers in every step of the design process, compared to only **6%** of the rest of the organizations.

Organizations with an inclusive culture believe strongly in a diverse workforce to enable inclusive product design. For e.g., nearly half believe that edge use cases (situations that occur at extreme operating parameters) are better understood in tech teams that are diverse and inclusive. This is compared to one in five of their peers (see Figure 4):

Figure 4: One in three inclusive organizations agree that involvement of women and ethnic minorities in teams brings in different perspectives on design

Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=418 ethnic-minority and women employees in tech functions from N=418 organization under consideration with N=102 organizations with an inclusive culture.

"Who are we including, who are we excluding and what factors have impacted our decision making process? How have we tested that our products have an inclusive design? What assumptions have we made? Have we consulted or been advised by the groups we are aiming to include – or are we making decisions on their behalf? In the event that we don't have a diverse employee base to help us keep diversity, inclusion and antiracism front of mind when we enter the design stage – are we keeping the diversity of out consumer base in mind to compensate for that?"

Kit Ahweyevu,
CEO of Mindweaver
(A firm focused on supporting organisations to bring diversity and antiracism to emerging technology by building and embedding diverse teams and culture change).

Inclusive design is still a rare phenomenon

Our survey findings indicate that, for tech employees (including women and ethnic minorities), traditional design processes are seen as giving short shrift to DEI:

Only 16% of all tech employees say that their digital products are inclusive of gender, and ethnicity-based considerations. Similarly, only a small share of tech employees, including women and ethnic minorities, believe that they are well represented in tech teams that produce digital products (see Figure 5).

Figure 5: Inclusive design practices – a rare phenomenon

Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=500 organizations, with N=500 tech employees, including N=418 women and ethnic-minority employees in tech functions.

2 – Current inclusion and diversity practices are broken

Leadership perceives processes and practices to be inclusive; diverse employees in tech teams disagree

Our research has revealed a gap between leadership's positive perception of inclusion in the workplace and the harsh reality experienced by ethnic-minority and women tech employees. Eighty-one percent of the leadership executives believe that leaders, managers, recruiters, and supervisors undergo rigorous and periodic bias training and are assigned personal accountability for systematically reducing micro-inequities[16] and promoting inclusive leadership. However, only 27% of women and ethnic-minority employees in tech functions agree that this is the case.

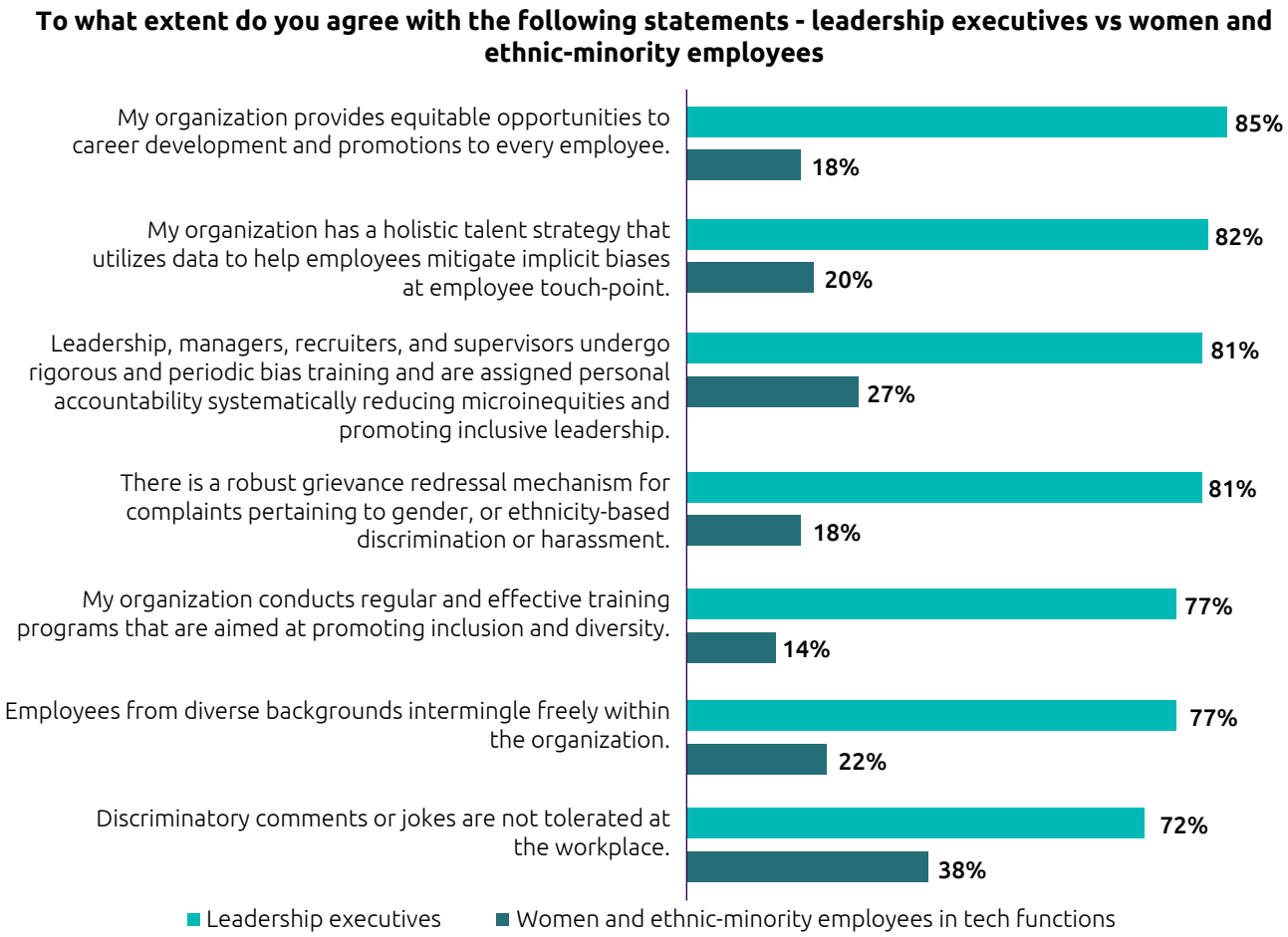
Similarly, 85% of leadership executives believe that their organizations provide equitable opportunities for career development and promotions to every employee, but only 18% of women and ethnic-minority employees in tech functions concur (see Figure 6). This perception gap creates a significant problem, with leadership executives believing progress is being made but on-the-ground employees being pessimistic about the real picture. *"The challenge is that once women and candidates from minority groups join an organization, they still might not find the work conditions inclusive,"* explains Prof. Bishakha Majumdar of Indian Institute of Management (IIM) Visakhapatnam. *"There is a chance that they are going to be dissatisfied, performance is going to suffer and they're going to drop out. This further reinforces the old myth that these people were only taken in for diversity's sake, and they were otherwise unfit for the work demands."*

85%

of leadership executives believe that their organizations provide equitable opportunities for career development to every employee, but only

18% women and ethnic-minority tech employees agree.

Figure 6: Leadership rates inclusion practices highly; women and ethnic minorities in tech teams disagree



Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March-April 2021, N = 500 organizations, with 500 leadership executives; N=418 women and ethnic-minority employees in tech functions.

The COVID-19 pandemic exacerbated some existing issues around women and ethnic-minority employees. Women were faced with a significant challenge of home care and keeping their jobs, which resulted in some being forced to leave employment. In the US, since the onset of the pandemic, 400,000 more women than men have left the workforce. The unemployment rate of Hispanic women, at 6.5%, is more than double that of Hispanic men. In December 2020, women accounted for all net job losses, while men achieved job gains.[17] In the EU, the unemployment rate among women rose by 1.1 percentage points since February 2020, while men saw a 0.7-percentage-point increase. A survey in Europe found that 4% of women who lost their jobs during the pandemic stopped looking for work, compared with just 1% of men. Even when women were able to keep their jobs, many were forced to cut back on their hours because of an increase in caregiving responsibilities. Analysis shows that, in Germany, wages for women declined by 8.6% during the first half of 2020, which was almost twice the fall experienced by men. In the UK, women saw their earnings decline by 12.9%, nearly double the drop relative to men.[18]

Tech employees from diverse backgrounds do not experience a sense of belonging in the workplace

This perception gap between the top of the organization and on-the-ground employees is wide:

- 75% of leadership executives believe that women and ethnic minorities feel a sense of belonging in their organizations, but only 24% of women and ethnic-minority employees in tech functions feel this to be the case.
- Nearly 70% of leadership executives believe that women and ethnic minorities are given an equal opportunity to grow in the organization, but only 28% of women and ethnic-minority employees in tech functions agree.
- 53% of women and ethnic minorities feel comfortable sharing personal experiences with other employees and peers, whereas only 9% of them feel the same comfort level with the leadership executives (see Figure 7).

Leadership executives need to go beyond just communicating to build tangible engagement and trust on matters of inclusion.

Figure 7: Leadership believes that employees have a strong sense of belonging; women and employees from ethnic minorities in tech functions disagree

Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=500 organizations, with 500 leadership executives; N=418 women and ethnic-minority employees in tech functions.

The perception gap between leadership and women and ethnic-minority tech employees is narrower in organizations with an inclusive culture

Our findings suggest that, although there exists a perception gap between leadership executives and women and ethnic minorities regarding various inclusion processes and measures, it is narrower for organizations with an inclusive culture. This means that women and ethnic minorities agree with the leadership executives to a larger extent in organizations with an inclusive culture on various practices.

Figure 8, below, illustrates the perception gap related to inclusion measures in organizations, e.g., the gap in leadership executives and women/ethnic-minority perception related to work-life balance and remote working is 21% for organizations with an inclusive culture, compared to 44% for The Rest.

Figure 8: The perception gap regarding inclusion practices is lower for organizations with inclusive cultures

Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=418 ethnic-minority and women employees in tech functions from N=102 organizations with an inclusive culture.

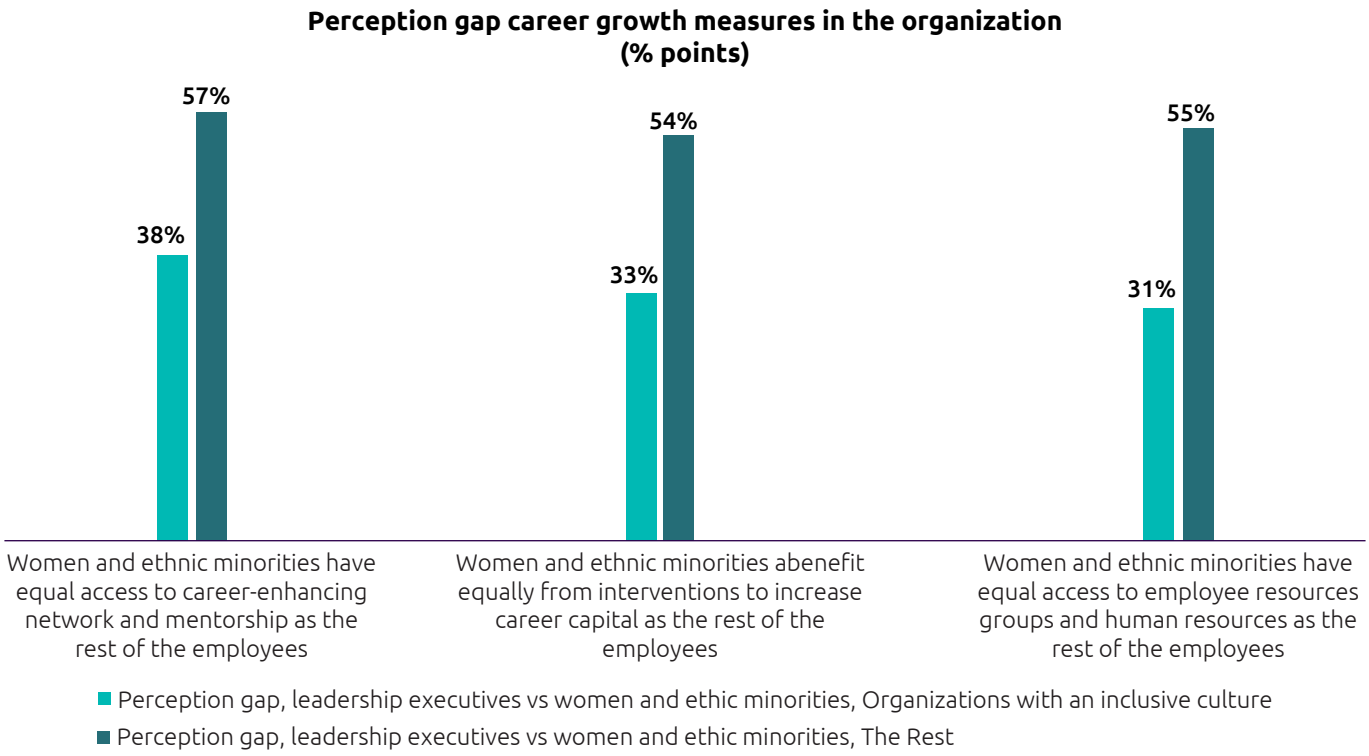
75%

of leadership executives believe that women and ethnic minorities feel a sense of belonging in their organizations, but only **24%** of women and ethnic-minority tech employees agree.

This difference in perception between inclusive organizations and The Rest is also reflected in practices related to career growth, as well as learning and development practices.

- Figure 9 shows women and ethnic minorities from inclusive organizations agree to a greater extent with their leadership executives on career-growth measures such as access to career-enhancing networks, employee resource groups, etc.
- The perception gap related to engaging employees through timely and personalized learning programs is 13% for inclusive organizations, compared to 23% for non-inclusive ones.

Figure 9: The perception gap for measures related to career growth is narrower for organizations with inclusive cultures



Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=418 ethnic-minority and women employees in tech functions from N=102 organizations with an inclusive culture.

The same can also be said for the perception gap relating to practices around learning, development, and promotions in organizations with an inclusive culture vs The Rest.

22%

Percentage of Black tech employees that feel they have an equal opportunity to grow.

Opportunity gaps exist for ethnic-minority and women tech employees

Women and ethnic-minority employees from tech functions shared their experiences of non-inclusive tools during the hiring and attrition stages:

- A 32-year-old man of Middle Eastern origin from the UK, who worked as a technology recruiter and is currently self-employed, told us: *"There is filtering out of certain names because there is an implicit bias against certain backgrounds."*
- A woman employee, who is an application architect and manager from a multinational consumer-goods corporation told us: *"When our leadership network follows up with ethnic-minority employees who are leaving, they realize that most of them believe that they are not getting promoted on time or being valued."*
- Another woman software engineer from a large high-tech organization in Germany says: *"Salary discrimination is a huge problem in Europe and Germany, in my company as well. Some of my co-workers, mostly guys, have a higher salary than me just because I am a woman."*

Several studies show that mothers in the workforce experience additional disadvantages compared to women who are not mothers. Mothers in the US who work full time are paid $18,000 less annually on average than fathers. The financial discrepancy experienced by mothers is also greater for women of color.[19]

Furthermore, when we explored the question of equal opportunities at work, we found:

- Only around one in five (22%) Black tech employees feel they have an equal opportunity to grow
- In product-management/design roles, only 8% of Black tech employees felt that they had equal opportunities to grow as compared to 36% of the rest of ethnic-minority tech employees
- In the 26-50 age group (who make up the majority of the working population), only 18% of Black tech employees feel that they have equal opportunities to grow, as compared to 28% of the rest of ethnic-minority tech employees

"The challenge is that once women and candidates from minority groups join an organization, they still might not find the work conditions inclusive. There is a chance that they are going to be dissatisfied, performance is going to suffer, and they're going to drop out. This further reinforces the old myth that these people were only taken in for diversity's sake, and they were otherwise unfit for the work demands."

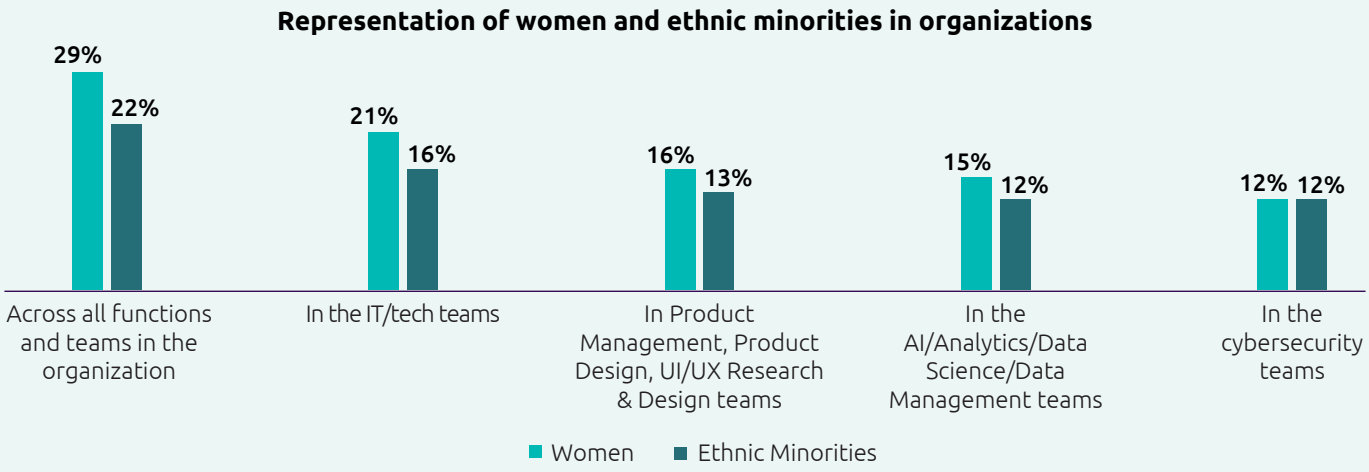
Prof. Bishakha Majumdar
Indian Institute of Management (IIM) Visakhapatnam.

Organizations report low diversity across tech teams

A certain level of representation of women and ethnic-minority groups in organizations is critical to bringing cultural changes. However, women and ethnic minorities are poorly represented in IT and tech teams (Figure 10). When we asked a data engineer from a leading insurance company how diverse her team was, she said: *"To be honest, it's not at all diverse. I was the only woman in my team and now it is only slowly expanding."* She goes on to say: *"I have worked in various companies and most of the time, I was the only woman in the team."*

1. Organizations, across all functions/teams, comprise nearly 30% women employees and 22% ethnic minorities.
2. However, in IT/tech teams, only one in five employees is a woman, and one in six is from an ethnic-minority. This drops even further in cybersecurity teams, where only one in eight employees is a woman or belongs to an ethnic-minority.

Figure 10: Women and ethnic-minority employees are underrepresented in technology teams compared to their overall standing



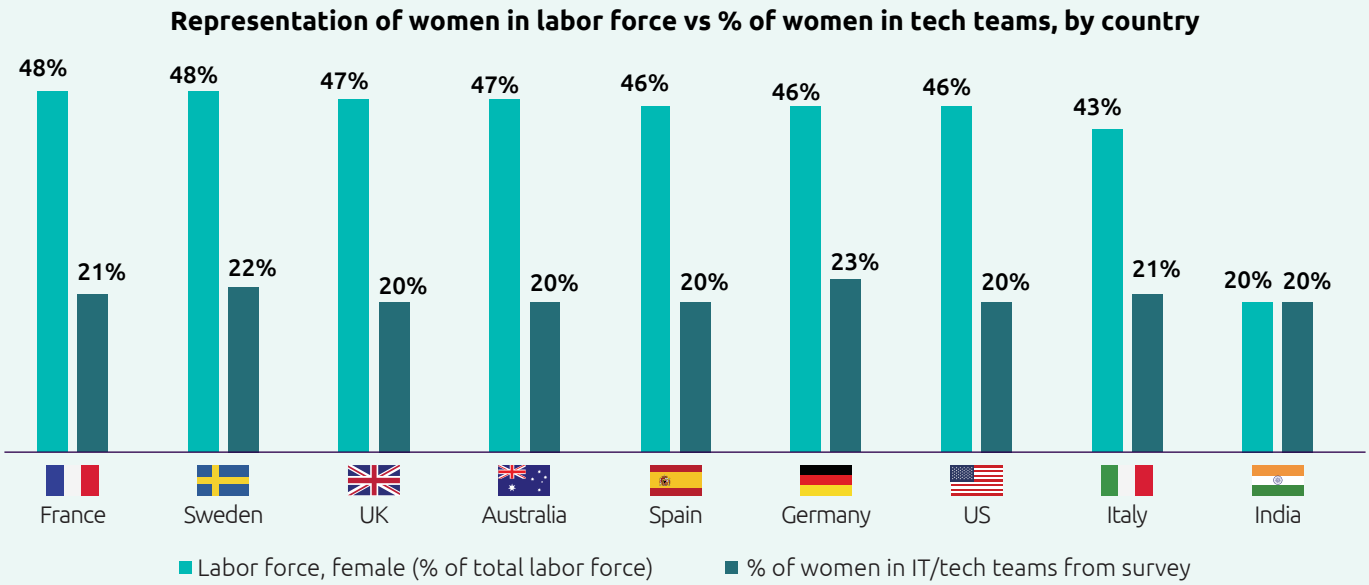
Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=500 leadership executives from 500 organizations.

"To be honest, my team is not at all diverse. I was the only woman in my team and now it is only slowly expanding. I have worked in various companies and most of the time, I was the only woman in the team."

A **data engineer**
from a leading insurance company

Further, we compared the representation of women in IT/tech teams in our survey to the share of women in the total labor force in our surveyed countries. We found that women are indeed grossly under-represented in technology teams across countries, with most countries with representation gaps of nearly 30 percentage points (Figure 11).

Figure 11: Women in tech teams are grossly under-represented



Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N=500 leadership executives from 500 organizations, World Bank report on World Development Indicators, May 2021.

Employees from ethnic-minority communities in IT/technology teams seem to be more representative of, or even outstrip, overall ethnic-minority populations for many geographies (e.g., 12.8%[20] ethnic-minority representation in the overall population in Germany vs 17% ethnic-minority representation in IT/tech teams as per our survey findings). However, in some countries, the representation is not representative of the country demographic. For example, in the US, ethnic-minority employees are underrepresented to an extent of 24 percentage points (40% ethnic-minority representation nationwide[21] vs 16% in IT/tech teams in our survey findings). This gap also exists in Australia, Sweden, and India, although not to the same extent as in the US. The discussion around ethnic-minority representation also shows greater nuances by community, as some ethnic-minority communities may be more or less represented; this needs to be considered when devising policies and targets for diversity and inclusion within tech teams. For example, in the US, 53% of Asian women work in management in professional and related occupations, compared to 37% Black women, and 29% Hispanic women.[22]

As we have seen, this overall lack of diversity is compounded by a lack of inclusive culture and practices in organizations.

21%

Percentage of women in IT/tech teams

3- Consumers are aware of tech-based discrimination – and many have experienced it

In the previous section, we examined women and ethnic-minority tech employees' perspectives on diversity and inclusion. Here, we explore the criticality of inclusive technologies from the consumer's standpoint. Our findings suggest that consumers have not only experienced how technologies can be discriminatory in several ways, but also have a very clear expectation for organizations to build more inclusive digital products and services.

Women and ethnic-minority consumers have had discriminatory experiences with technology across sectors

Based on our consumer research and focus-group discussions we held with women and ethnic minorities, we found that many of them had experienced tech-based discrimination first-hand.

A 29-year-old Black woman from the US, who works for a nonprofit public health company, said: *"On Facebook, if I show up in a friend's photo, I am incorrectly tagged as any Black person, regardless of gender or race. I feel like Facebook doesn't distinguish between Black people and their algorithm is not exposed to enough diverse users."*

Inequity in facial-recognition algorithms is well documented. In the Gender Shades project, an intersectional approach was applied to assess three gender-classification algorithms, including those developed by IBM and Microsoft. Subjects were grouped into four categories: darker-skinned females; darker-skinned males; lighter-skinned females; and lighter-skinned males. All three algorithms performed worst on darker-skinned females, with error rates up to 34% higher than for lighter-skinned males.[23]

"On Facebook, if I show up in a friend's photo, I am incorrectly tagged as any Black person, regardless of gender or race. I feel like Facebook doesn't distinguish between Black people and their algorithm is not exposed to enough diverse users."

A 29-year-old
Black woman from the US

A 27-year-old Black man from Germany described how online searches can reinforce stereotypes: *"Online searches of pictures of African kids show only hungry and poor kids in poverty. But a similar search for European kids only shows happy faces."*

The following points outline the discriminatory events that concern consumers in different sectors, from financial services to healthcare:

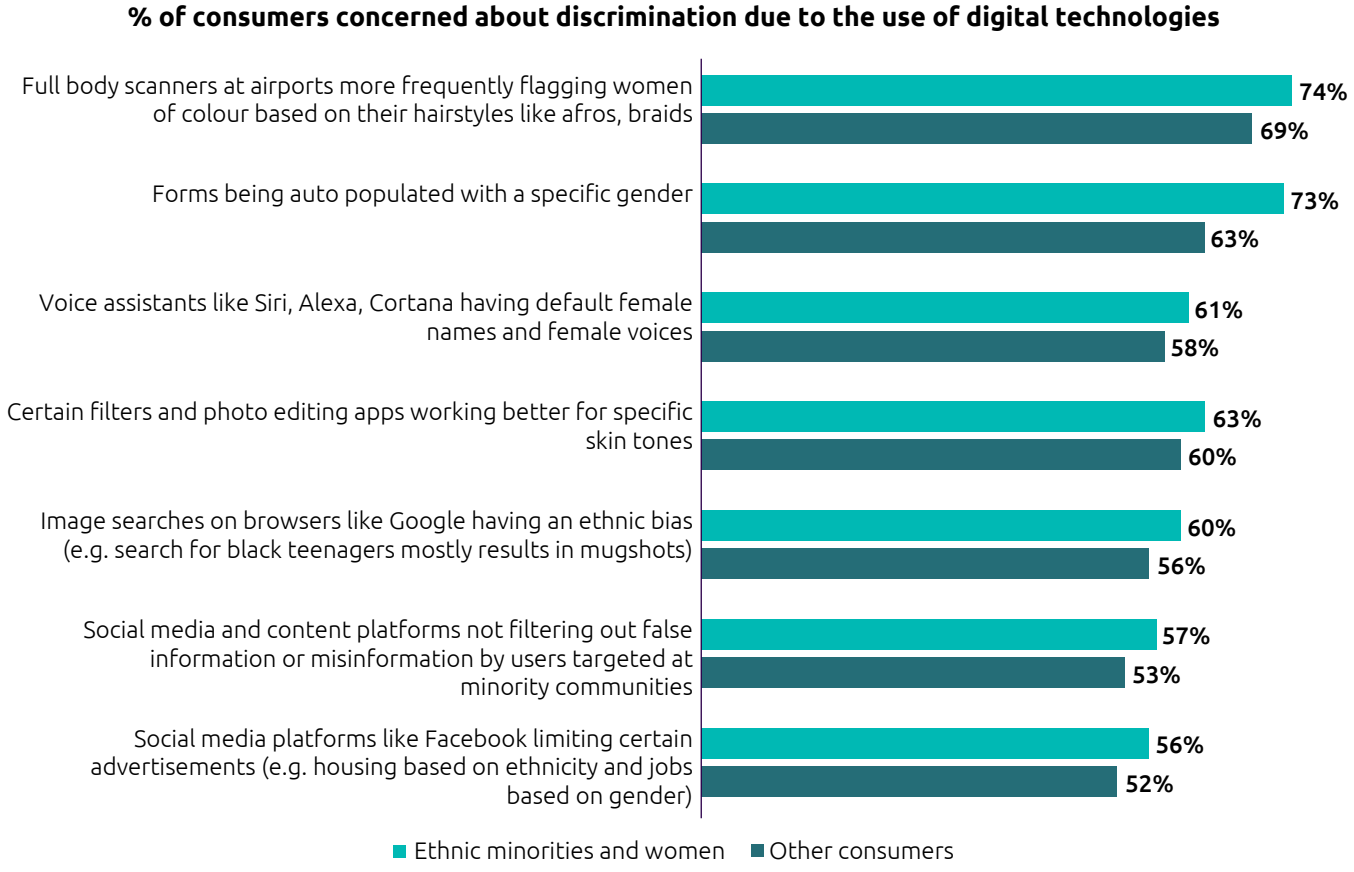
- **Financial services:** As per our survey, 50% percent of ethnic minorities, on average, believe they were offered lower credit online for certain banking products, compared to 28% of consumers who are not from ethnic-minority communities. It is well-established that better credit scores often lead to higher credit limits. Complex and opaque algorithms are used to make a variety of these decisions often, often without revealing the kinds of information included in the calculus. A 2007 report from the Federal Reserve found that Blacks and Hispanics had lower credit scores than Whites and Asians, and that "residing in low-income or predominantly minority census tracts" is a predictor of low credit scores. As people are likely to have friends and family that live nearby and are of the same ethnicity, using social networks to rate their creditworthiness could reintroduce factors that creditors aren't allowed to ordinarily consider,[24] which could potentially explain the worrying insight from our survey. Nearly 40% of ethnic-minority consumers believe they were not shown premium/high-end options for financial products, such as home/education loans, insurance, etc., compared to 16% of consumers not belonging to ethnic-minority communities. Sixty three percent consumers from ethnic-minority communities faced difficulty in filling forms due to their gender/ethnicity not being in the available options while using banking products and services such as home/education loans, credit cards etc. on apps/websites. Also, nearly 50% of women from ethnic minorities were offered lower credit line, compared to men not from ethnic-minority communities.
- **Consumer products and retail:** On average, 40% of ethnic minorities believe they were not shown premium or high-end luxury items while shopping online. A similar share of women belonging to ethnic-minority communities were not shown premium items while shopping online. This compares to 27% of consumers not from ethnic-minority communities. Another 30% of ethnic minorities shared that they faced chatbots/voicebots that used racially biased/sexist terminology during their interactions. The algorithm for these bots is usually designed to pick up publicly available statements and failed to differentiate between what is and is not offensive.
- **Healthcare:** Our survey reveals that 43% of women and consumers from ethnic-minority communities were not shown/denied access to healthcare facilities in high-end localities or offering very specialized services, compared to 30% of consumers not from ethnic-minority communities. Nearly 40% women and consumers from ethnic-minority communities faced difficulty in accessing information that was relevant to their gender/ethnicity while using healthcare services online (e.g., heart-attack symptoms may differ between men and women, yet recommendations are based largely on symptoms of men). This compares to 22% men not belonging to ethnic-minority communities.

Most consumers are perturbed with their discriminatory experiences with technology

Our survey shows that women and ethnic-minority consumers are concerned about different tech-based biases that have crept into digital and AI-based technologies, as Figure 12 shows:

- 60% of women and ethnic-minority consumers are concerned about online image searches having an ethnic bias
- 74% of this group are concerned about full-body scanners at airports more frequently flagging women of color (based on their typical hairstyles, such as afros and braids). An article by ProPublica reported that the full-body scanners that have become standard at airports across the US are prone to false alarms for hairstyles popular among women of color. The article shared the experience of a Black woman who travels frequently for work in the US, and almost every time she steps out of an airport body scanner, security screeners pull her aside and run their fingers through her hair (known as a "hair pat-down", a practice reported by many Black women in the past).[25] Other consumers are not too different in their concerns about discriminatory digital tech, as Figure 12 confirms:
- 63% of general consumers are concerned about forms believe they being auto populated with a specific gender.
- 53% of general consumers are concerned about social-media platforms not filtering out false information or misinformation targeting ethnic-minority communities.

Figure 12: More than six in 10 ethnic-minority and women consumers feel that certain filters and photo-editing apps work better for specific skin tones



Source: Capgemini Research Institute, inclusive design of technologies consumer survey, March–April 2021; N=5,000 consumers including 4000 women and ethnic-minority consumers.

A number of other consumers from our focus-group discussions revealed their experiences with tech-based discrimination:

- A 32-year-old Middle Eastern man from the UK said: *"Minorities such as me, with beards and facial hair, had problems with biometric scanning and facial-recognition software at airport stores. It wasn't designed to pick up people with facial hair. It is being rectified now."*
- A 26-year-old Asian woman from US said: *"Since I am from China, every time my parents or I use an Alexa or Google voice search, it interprets incorrectly. It discourages me from using this technology; I would rather type."*

In addition, certain consumers also have a perception that their data could be used to impact them negatively:

- 76% of gender non-binary or non-disclosed consumers from our survey thought their data could be used to negatively impact their employment opportunities.
- 66% of ethnic-minority consumers (including Asian, Black, Hispanic/Latino, Middle Eastern) concur.

This concern creates a hesitancy in personal-data sharing by certain segments of consumers.

"Since I am from China, every time my parents or I use an Alexa or Google voice search, it interprets incorrectly. It discourages me from using this technology; I would rather type."

A 26-year-old
Asian woman consumer from US

Case study: All about the customer experience

SSE, a multinational energy company based in Scotland, wanted to transform its customer-facing website by focusing on a more user-centered design to deliver the best possible experience to all customers.

Objectives:

- Embrace inclusive design to deliver an accessible service to all customers
- Acquire new customers through digital touchpoints
- Retain existing customers.

Method:

- Run workshops with senior stakeholders to establish and evolve business objectives and KPIs
- Train and mentor design team in all aspects of user experience
- Execute collaborative design sprints with design team and business stakeholders through phases of discovery research, concept-testing, guerrilla testing, prototyping, and usability testing
- Develop personas to represent customers and help embed these into the business
- Collaboratively develop a design-pattern library to improve the consistency of design across projects
- Conduct accessibility testing with real customers for further improvement.

Impact:

- 200% increase in conversions through the phone and broadband sign-up process
- Ease of access of all essential information to all customers
- Easy and automated meter-reading submission process for customers
- Collaboration across different parts of the business for user-centered design and delivery.[26]

74%

Percentage of women and consumers from ethnic-minority communities being concerned about full-body scanners at airports more frequently flagging women of color (based on their hairstyles, such as afros and braids).

Consumers expect organizations to build inclusive technologies

Consumers, especially those from ethnic-minority communities, expect organizations to build inclusive technologies that are intuitive to use (see Figure 13):

- 76% of ethnic-minority and women consumers expect organizations to develop technologies that can be used by a diverse set of consumers (61% for Other consumers).
- 72% of ethnic-minority and women consumers expect organizations to consult with diverse user groups during pre-design and development of technologies (66% for Other consumers).

Moreover, while ethnic-minority consumers and women expect organizations to build inclusive tech, general consumers hold similar expectations, as we see in Figure 13:

Figure 13: More than four out of five ethnic-minority consumers (women and men) want digital technologies that can be used by a diverse set of users

Source: Capgemini Research Institute, inclusive design of technologies consumer survey, March–April 2021; N=5,000 consumers including 4000 women and ethnic-minority consumers.

A 29-year-old Black US man from our focus-group discussions said: *"It's going to start with having an equal representation in teams that produce the technology. And then ensuring a proper sample that adequately represents minorities."* A Middle Eastern man from the UK echoes this sentiment, saying: *"I think technology is only as good as the exposure it gets. And the more exposure they get to different datasets, the more viable they become."* A 26-year-old Black man working at an AI startup in Germany says: *"More diverse people should join the teams working on technology. In addition, the datasets need to be improved to be as inclusive as possible."*

Organizations that lack inclusive tech risk losing business

In our focus-group discussions, many women and consumers from ethnic-minority communities described an instance when they felt a tech product or service from a particular organization was being non-inclusive:

- A 31-year-old Middle Eastern man from the US shared: *"If I'm interacting with a brand and feel that I am being discriminated against or made to feel excluded for some reason, I will not feel good about doing further transactions with them. I would look for businesses or services that are more inclusive, even if they are not as big or reputed as the bigger, discriminating brand."*
- A 25-year-old Black woman from Germany shared: *"I think such organizations should be penalized. I don't think people or organizations that have their products out there, which could have the option of contributing to diversity, should [go] the other way. I also think more people should avoid using them or blacklisting organizations that aren't inclusive in whatever they do or produce."*
- A 26-year-old Black man from the UK commented: *"Penalizing companies may not be enough. We have seen big companies being intentionally discriminatory and yet being able to get away with it because they enjoy [high] market share. There should be regulations to protect diverse and under-represented consumer groups, such that organizations are mandated to build inclusive digital products and services. Consumers should also collectivize for class-action lawsuits in case they are consistently being discriminated [against] by tech products and services. Including everyone should be treated as at the level of basic rights."*

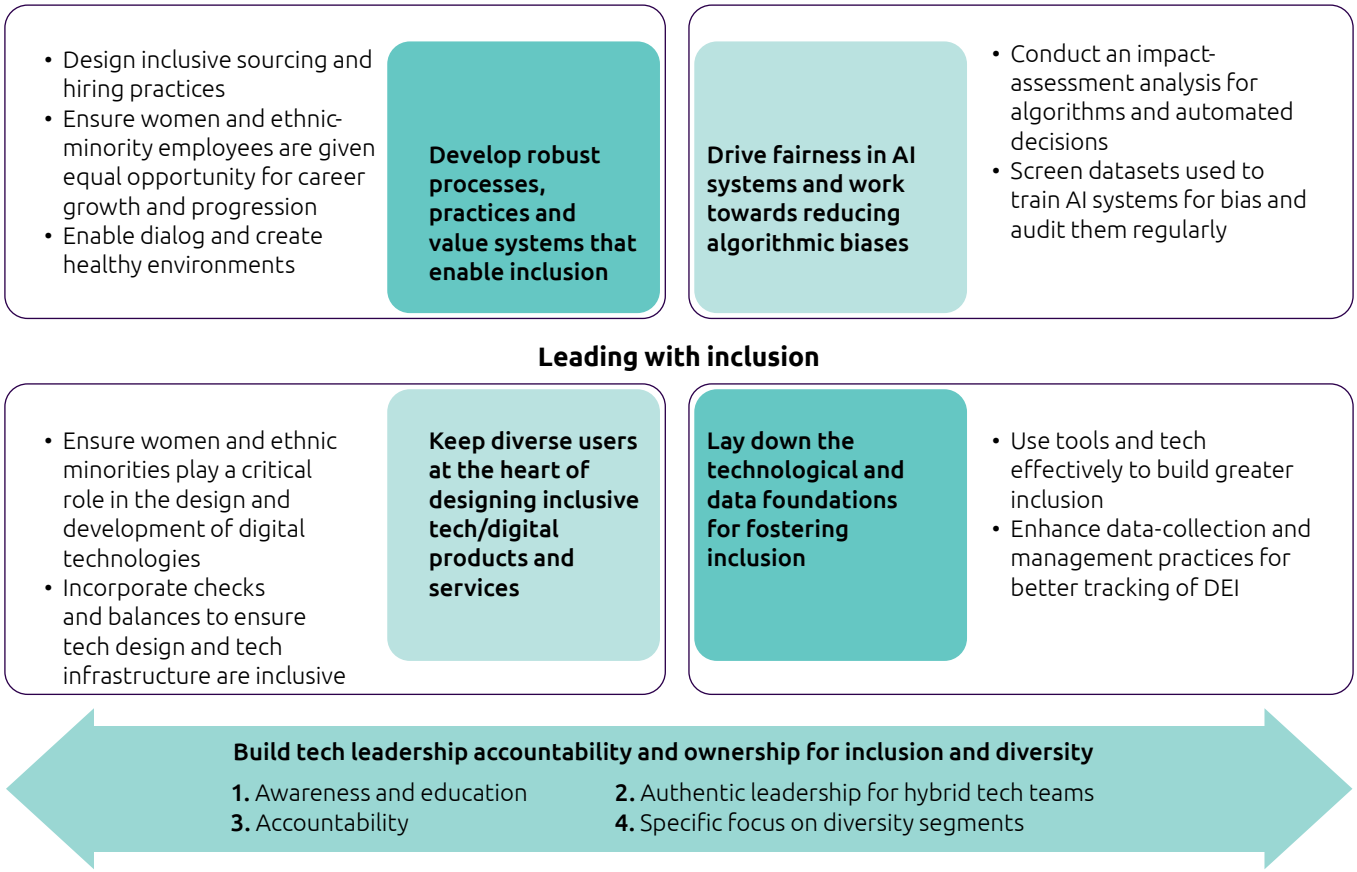
"It's going to start with having an equal representation in teams that produce the technology. And then ensuring a proper sample that adequately represents minorities."

A 29-year-old
Black man from the US

4 – How can organizations move towards greater inclusion in tech teams and tech products?

From our discussions with industry leaders, experts, and academics, and from our primary quantitative research, we believe that organizations can develop inclusive workspaces and tech systems by taking a few positive actions, underpinned by strong leadership accountability (see Figure 14). Using our key criteria for organizations to excel in workforce-diversity practices and inclusive design (see insert – What makes an organization excel in workplace-inclusion practices and inclusive design practices?), we scored organizations using the experience and feedback of women and ethnic-minority employees in tech teams. This is used to identify a small cohort of 10% of organizations who excel in both inclusive design of technology practices and workplace-inclusion practices. We call these organizations **"Inclusion Frontrunners."**

Figure 14: Building an effective inclusion and inclusive design strategy



Capgemini Research Institute analysis.

Build tech-leadership accountability and ownership for inclusion and diversity

There is an increasing need for organizations to drive progress on inclusion and diversity by engaging senior business leaders. In doing so, there will be greater accountability for its success and ensure that the strategy is linked to the organization's wider business goals.

Build greater awareness and educate leaders on inclusion in tech teams

There exists a huge gap between leadership and employees in tech teams when it comes to the perception of inclusive practices within organizations, as witnessed earlier in the report. It is imperative that leadership in tech teams become aware of the issues of inclusion and actively practice inclusive leadership of their staff.

Among the Inclusion Frontrunners, the perception gap between leadership and women and ethnic-minority employees is much lower compared to The Rest. This goes on to show that leaders in these organizations are much more clued into employee perception and are in closer agreement on inclusion practices in the workplace.

This education and awareness building can begin by leadership getting comfortable with discomfort of not knowing about other people's lived experiences and reality and having those conversations, however uncomfortable they may make, to learn and improve on tenets of inclusion. This is also a step in building greater employee trust. As we heard from a senior technology leader from a large North America-based beverage company, *"The leadership behaviors will make a huge difference in garnering employee trust and improving employee engagement. Leaders should be open and have humility to hear diverse employees and to learn from their experiences. Leaders have to empower, provide the space, nurture and adequately pay attention to diverse employees and their views."* There need to be frequent and transparent channels of communication with employees from diverse backgrounds to check on their wellbeing, learn where teams can improve, and to develop a radical sense of empathy with others.

Develop authentic leadership that drives flexibility and autonomy in hybrid tech teams in the "new normal"

Leaders in tech teams need to nurture remote-leadership skills and define what constitutes "authentic" leadership: encouraging autonomy, empathy, and transparency, as was highlighted in the future of remote work report by the Capgemini Research Institute.[27] Critical skills include empathy and active listening; understanding employees' stated and unstated pain points in a world where there is less physical interaction (especially for employees from diverse backgrounds, who are already trying to adjust to remote ways of working while developing a sense of belonging). Leaders need to develop emotional intelligence skills to lead more inclusively in the hybrid workplace while keeping in mind the kind of flexibility and empathy that could be extended to employees in tech teams. Leaders also need to place trust in employees to lead effectively in a virtual environment while ensuring leaders continue empathetic and authentic communications.[28]

Assign technology leaders greater responsibility and accountability for inclusion

Organizations need to shift primary responsibility of DEI from HR and Diversity offices to functional leaders. Technology leads need to be held accountable, as well as being responsible for diversity outcomes for their teams.

Leaders should be committed not just to improving diversity within the general workforce but at leadership levels in tech teams, where representation decreases further. Leaders need to have clear diversity-related targets for their teams and these targets should ideally be tied to broad societal representation. While this may appear challenging, it is time for organizations to consider the long-term societal impacts of a skewed workforce and take steps towards parity.

"On numerous occasions, especially with startups, organizations look at hiring a person with the exact same attributes as the one who just left. They are not open to hiring diverse candidates."

Elise Moron
founder, WEALO.io
(A recruiters' training program and consulting company)

On the downside of lack of diversity in leadership teams, the head of inclusion, diversity and equity at a large multinational energy company shared, *"If a board is only monoculture or mono-profile, the likelihood of making the same decisions all the time leads them to being less agile. Also, any women or any minority who operates at that level of organization tends to attract diverse talent to join or grow."* In addition, tying in tangible and non-tangible rewards (bonuses, recognition) for leaders could also aid in building greater accountability among leaders.

Build a greater focus on specific diversity segments, with a focus on country-level policies, practices, and representation

While gender-based diversity focus is well established across many organizations, tech teams are nowhere near achieving a representation that reflects the societal gender mix (~50%). Organizations need to bring a much greater focus on improving gender balance and diversity, in tech teams but also at leadership level. Organizations also need to build greater focus on ethnicity-based equity in tech teams, especially given how people of certain racial backgrounds are more directly impacted by discriminatory tech (persons from the Black community, for example).

In the wake of the George Floyd killing in 2020, various large organizations took strides to deal with racism within and outside the workplace. PepsiCo CEO, Ramon Laguarta, shared a commitment to expanding their Black managerial population through internal development and recruitment by 30% by 2025, and to add more than 250 Black associates to managerial roles by 2025, including adding a minimum of 100 Black associates at executive rank.[29] Bank of America pledged $1bn to fighting economic and racial inequalities over four years "to help local communities address economic and racial inequality accelerated by a global pandemic."[30] Different geographies have different definitions of who constitutes an ethnic-minority and organizations need to take measures to build more robust strategies to attract and retain employees from ethnically diverse backgrounds.

Develop robust processes, practices, and value systems that enable inclusion

Organizations need to start by putting various process and policies in place to create a safe and fair environment for all employees, from diversity to anti-harassment policies, and a clear inclusion mandate for technology teams. Also, organizations need to ensure bias-related workshops or discussions are mandated across tech teams and also the use of inclusive language and vocabulary while interacting in teams.

Design inclusive sourcing and hiring practices

Organizations need to think critically about recruitment and sourcing strategies for hiring and attracting from a wider pool. Elise Moron, founder of WEALO.io, a recruiters' training program and consulting company, reveals: *"On numerous occasions, especially with startups, organizations look at hiring a person with the exact same attributes as the one who just left. They are not open to hiring diverse candidates."*

While many organizations are already taking organization-wide diversity targets, we recommend that tech teams set ambitious hiring targets that reflect the societal representation in their respective regions. The diversity hiring should also be KPI-driven, with mandates for measuring progress and regular reporting. Organizations can take a few positive steps to make hiring and sourcing more inclusive:

Organizations need to ensure that the job descriptions use inclusive language and leave out any specific preference for gender and ethnicity, among other forms of diversity. Organizations can also conduct blind CV screenings to ensure gender is not a factor in determining suitability of candidates. According to writing-platform company, Textio, the use of gender-neutral language fills jobs 14 days faster than posts with a masculine or feminine bias. For example, Zillow Group, an online real-estate marketplace, was able to attract 10%-11% more women applicants than average by using certain words in their job postings.[31]

Critically assess your referral strategies to ensure that there is room for people who are outside the typical class/ethnicity/gender spectrum. Organizations can also incentivize referral for specific diverse/under-represented groups to boost hiring for such candidates. Pinterest, for example, encourages employees to refer candidates belonging to under-represented communities. This has increased the percentage of referrals from under-represented talent by 55x, and referrals of women by 24%, in just six weeks.[32] Nike also has a dedicated diversity-sourcing team to ensure diverse candidates are considered when filling a role. They have also built an inclusive hiring process, including writing inclusive job descriptions and blindly reviewing resumés.[33]

When checking for **cultural fit,** ensure that implicit biases around shared backgrounds and interests (which out-groups or first-generation professionals may not have) do not creep in. It is, therefore, important to clarify objectively what defines cultural fit and rate all applicants using the same criteria. When one insurance company began hiring in this way, it ended up offering jobs to 46% more ethnic-minority candidates than before.[34] Companies should also enable more women and ethnic minority employees to be active in interviewing their candidates. Engaging diverse talent in the recruiting processes beyond referrals results in more diverse hires.

However, focusing on hiring in itself is not enough. Organizations needs to also make focused efforts towards retention of diverse employees and have specific strategies to enable retention and engagement of diverse work pools.

Ensure women and ethnic-minority employees are given equal opportunities for career growth and progression

Research suggests that women and ethnic-minority employees being denied promotion, pay, and opportunity is a systemic problem. According to Citi Bank, the wage gap for Black workers alone stands at $2.7trn in the US.[35] In contrast, frontrunners in our survey ensure that women and ethnic minorities can progress along their personal career paths. This is achieved through building greater transparency and developing access to career-enhancing networks; something that organizations can implement.

- 58% have promotion policies that are standardized, formalized, and transparent
- 44% ensure that promotion plans are well-represented among women and ethnic-minority employees
- 56% of women and ethnic minorities in frontrunner organizations have access to career-enhancing networks as compared to 27% of the rest of the organizations. This is critically important, as Katherine L. Milkman, professor of Operations, Information and Decisions at the Wharton School, has outlined: *"White men tend to have the best social networks and be the best connected – that is an empirical fact; they preferentially get networking advantages."*[36]

US software company, Salesforce, has taken numerous steps to ensure that women and ethnic minorities can achieve equality within their organization in terms of pay, representation, and inclusion. They have built "Equality Groups," which represent and advocate on behalf of these under-represented communities. Volunteers in these organizations contribute considerable time and effort – and are compensated for doing so.[37]

Enable dialog and create healthy environments

Micro-aggressions (statements, actions, or incidents regarded as an instance of indirect, subtle, or unintentional discrimination against members of diverse backgrounds) often find their way into large organizations, creating a non-inclusive space.

- Only 38% of women and ethnic-minority employees in our study agreed that discriminatory comments or jokes are not tolerated at the workplace.
- Moreover, as we witnessed earlier, not all employees from ethnic-minority groups receive opportunities in the workplace (only 22% of Black employees feel they have an equal opportunity to grow as compared to 39% of Hispanic/Latino employees).

56%

of frontrunner organizations share that women and ethnic minorities have access to career enhancing networks as compared to 27% of the rest of the organizations.

Organizations need to find ways to provide healthy environments and platforms for employees of diverse backgrounds through communication and dialog. Barbara Pachter in her book The Power of Positive Confrontation, offers techniques to manage difficult conversations in the workplace.[38] Organizations must encourage all employees and allies of diverse groups to speak up when they witness micro-aggressions within their teams, thereby also acting as role models and ambassadors to greater inclusivity.

Organizations may also need to define strategies for specific ethnic-minority groups and other diverse employee groups, depending on the needs of the groups. Organizations should encourage small, secure discussion spaces for teams to share their experience of micro-aggressions and build a supportive culture that encourages teams to respect divergent views and recognize differing contexts. Employee resource groups also act as a positive way in which organizations can build healthy spaces and create an environment of trust while bringing about positive change outcomes for larger groups.

Strategic, measured, and deliberate approaches are particularly helpful in establishing safe spaces for employees to engage within tech teams. Humana, a US health-insurance company, launched a series of race-related conversations in the workplace when social unrest began rising in 2020.

"We can't let the fear of imperfection keep us from trying to make some sort of advancement in this conversation and to have some dialog with our teams," said Douglas Edwards, senior vice president of workplace experience for Humana. Discussion opportunities included talks hosted by a network resource group (NRG) for Humana associates of color; ally conversations with other NRGs; town halls; small group gatherings; and one-to-one meetings.[39]

Bank of America's employee resource group (ERG), Hispanic-Latino Organization for Leadership & Advancement (HOLA) has been making an impressive impact for the company, as well as its customers. With 30% of new checking-account clients identifying as Hispanic/Latino, HOLA advocated for more resources to be available in Spanish. As a result, the Bank of America mobile-banking app was updated with Spanish language. HOLA members have promoted the benefits of the mobile app among clients, resulting in a 33% year-over-year increase in 2017 alone. Additionally, the bank's financial-literacy site was also made available in Spanish and HOLA members are helping to improve financial literacy, both with clients and during community events. These efforts have resulted in clients on average spending 2.5 more minutes on the site and viewing more pages per session as compared to the English site.[40]

38%

Percentage of women and ethnic-minority employees that agreed that discriminatory comments or jokes are not tolerated at the workplace.

Drive fairness in AI systems and reduce algorithmic bias

We have shown throughout this report that a lot of tech-based bias stems from AI-based systems that cause harm and inconvenience to diverse groups – women and people of color, among others. Machine learning (ML), a subset of AI, is a tool for building models that accurately represent input-training data, and it allows a machine to learn automatically from past data without programming explicitly. It is well documented that, when undesired biases concerning demographic groups are in the training data, well-trained models will reflect those biases. Many researchers are working on models to mitigate unwanted biases in datasets. A recent UC Berkeley study investigated the generation of gender-related bias in image-captioning models and introduced a new Equalizer model to lower error rate.[41] Another study looks at fairness measures in the context of adversarial debiasing.[42] It is imperative that organizations begin with an understanding of AI-based bias and work towards an ethical AI framework that upholds values of transparency, explicability, and fairness.

Conduct an impact-assessment analysis for algorithms and automated decisions

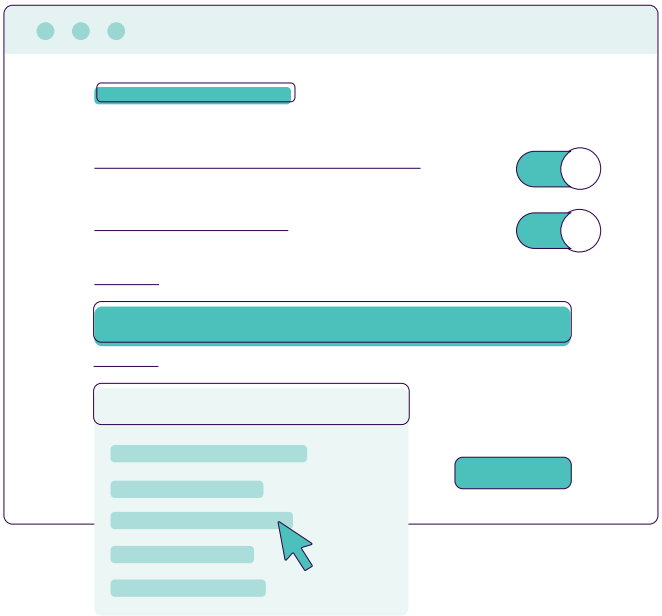
Organizations must focus on deciding what automated decisions need to be implemented and assessing the potential impact of biases that may exist in these AI-driven systems.

AI and data-science teams and other implementors of AI systems should have agreed views on the purpose of an algorithm prior to its deployment and develop a bias-impact statement. Organizations must also account for demographic testing of AI. The objective here must be to identify which segments of customers or demographics might be adversely affected by the outcomes of your AI application, in case there are large variations in accuracy and reliability of outcomes. Use this step to ensure that AI outcomes do not drastically change for different input conditions or user cohorts.[43]

In the case of determining which automated decisions require such vetting for unintended consequences and biases, teams must ask a few questions:

- Who will this impact negatively?
- What are the consequences for those impacted negatively? What is the severity of harm (e.g., mild inconvenience in the form of unsuitable recommendations; greater harms in the form of denial of loans; and long-term harms in the form of incorrect health-risk assessments)?
- What are the potential legal, social, and economic effects of such unintended consequences on communities, datasets, and design of these AI systems?[44]

New York University's AI Now Institute has already introduced a model framework for governmental entities to create algorithmic impact assessments (AIAs), drawing directly on impact-assessment frameworks in environmental protection, data protection, privacy, and human-rights policy domains. The purpose of these is to evaluate the potential detrimental effects of a given algorithm.[45]



65%

of frontrunner organizations use AI to assess employee sentiments as compared to 46% of the rest of the organizations.

Screen datasets used to train AI systems for bias and audit them regularly

AI teams need to ensure that good AI-related data-management practices are set up and followed by data-engineering, data-science, and AI teams. These teams should incorporate "privacy-by-design" and "diversity-by-design" principles in the design and build phase and ensure robustness, repeatability, and auditability of the entire data cycle (raw data, training data, test data, etc.), so as to be able to check for and mitigate algorithmic bias.

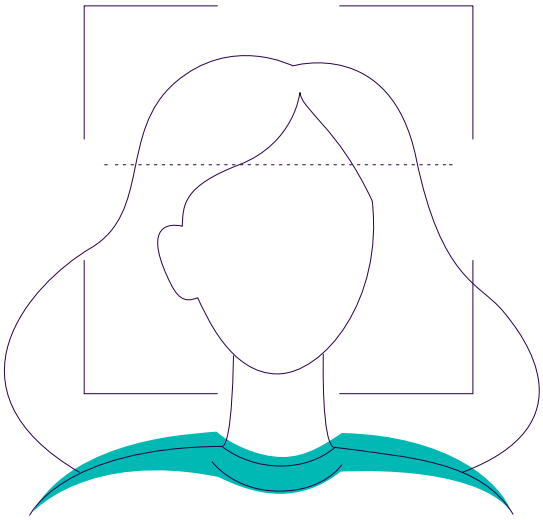
Teams need to particularly focus on ensuring that existing datasets do not create or reinforce existing bias. For example:

- Identifying existing bias in the dataset through use of existing AI tools or through specific checks in statistical patterns of datasets
- Being mindful of not creating a selection bias on the data when developing algorithms
- Exploring and deploying systems to check for and correct existing bias in the dataset before developing algorithms
- Conducting sufficient pre-release trials and post-release monitoring to identify, regulate, and mitigate any existing bias.

IBM's AI Fairness 360 is an open-source library in Python programming language, encompassing several techniques for evaluation of fairness, and identification and correction of bias.[46] Organizations have an opportunity to correct bias proactively in datasets by focusing on the training data. Defining what is fair and ethical and programming the algorithms as per the definition help in controlling historical inadequacies and human bias.

From a data-management standpoint, AI practitioners also need to:

- Ensure that data is sourced ethically and in line with regulation
- Check for accuracy, quality, robustness, and potential bias, including detection of under-represented minorities or events/patterns
- Build adequate data-labelling practices and review periodically
- Store responsibly, so that it is made available for audits and repeatability assessments
- Constantly monitor results produced by models, including their accuracy, and test for bias or accuracy degradation.[47]

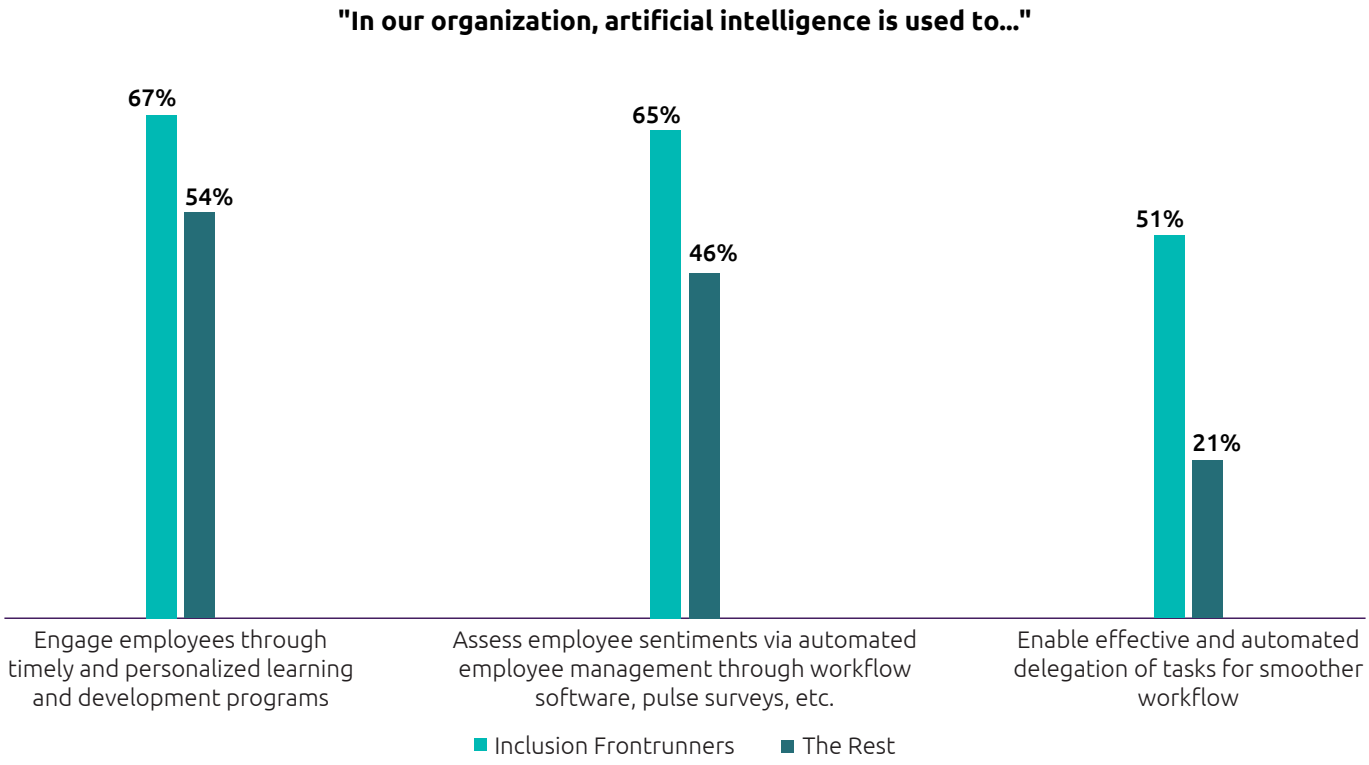


Lay down the technological and data foundations for fostering inclusion

Use tools and technologies to boost inclusion

Organizations can use upcoming tools and technologies more effectively to reduce human-led bias while putting in checks and balances for debiasing HR systems. One such tech is the use of AI, when deployed with care and when already checked for biases as we shared earlier. In our survey, we found that Inclusion Frontrunners are deploying AI more actively for promoting greater engagement as compared to The Rest (see Figure 15). This could also help in capturing data that could be crucial for sharpening DEI practices within tech teams.

Figure 15: More Inclusion Frontrunner organizations use AI for employee-engagement practices



Source: Capgemini Research Institute, Inclusive workforce and inclusive technologies survey, March–April 2021; N=418 ethnic-minority and women employees (in tech functions) from N=418 organization under consideration with N=43 Inclusion Frontrunners.

In addition, organizations can use certain tools that have been developed to target and reduce bias – such as bias-interrupter tools[48] and approaches that allow you actively to target bias and work towards reducing it. In addition, organizations can deploy bias tests for tech teams to recognize and reduce implicit internal bias. One such tool is Project Implicit's Implicit Association Test, which, through elaborate assessments, points towards hidden biases in humans.[49]

At the same time, organizations must ensure that they have checks and balances in place to identify existing bias in AI-based and other HR systems, and that they correct existing bias in the dataset before developing algorithms.[50]

Enhance data-collection and management practices for better tracking of DEI

Organizations need not only to capture but also to manage and disclose diversity-related data so as to improve diversity outcomes. A recent paper from Harvard Kennedy School suggests that the collection, analysis, and disclosure of diversity data can be a powerful tool for progress, when used correctly.[51]

Organizations need to strive for a careful balance between collecting diversity-related data and privacy of individuals. How can organizations build greater trust among individuals so that they willingly disclose their diverse background-related information (be it with respect to disability, ethnicity, economic status, or another aspect). Organizations need to be careful in storing and protecting this information while using it responsibly to come up with policies and practices for their employees.

While talking about tracking gender-diversity progress in a multinational telecommunications company, its global lead of inclusion and diversity shared, *"We track the number of applicants from each gender, promotions per gender, hiring redundancies, global job structure, pay equity, and access to training. We are also tracking the gender ratio in each job group and the presence of women on each level of the hierarchy."*

L'Oréal became a pioneer in the industry in 2007 when it called upon the French National Demographic Research Institute to conduct a thorough gender pay-gap analysis and go public with the results. (This practice contrasts greatly with US companies, where only 9% of corporations publish information on differences between the salaries of men and women.)[52] By taking a close look at their data around representation and hiring practices, the company was able to adjust to level the playing field. Today, 46% of the executives at L'Oréal USA are women and pay equity averages within 5%.[53]

Organizations should not only collect data through surveys, feedback, HR databases, and other tools deployed in the workplace; organizations should also look at the data collected from bias-interrupter and bias-decoder tools to check the kind of biases that creep in within their tech teams to take meaningful corrective decisions for the future. In addition, instead of letting the data sit in HR systems, it will be critical that tech middle-management and leaders are empowered with various datapoints and findings to help improve practices across DEI. Some key metrics to track for progressing on inclusion and diversity within tech teams would be:

- Monitoring percentage of women and ethnic-minority employees in smaller tech teams in comparison with the larger function, the company, labor market for the geography and industry standards
- Retention: Comparing average tenure for women and ethnic-minority employees to average tenure across the workforce or average tenure of the rest of the employees.
- Comparing promotion percentages, number of hires, employee engagement scores for women and ethnic-minority employees to the rest.[54]

67%

of frontrunner organizations believe that inclusive design is a source of innovation and differentiation as compared to 34% of the rest of the organizations.

"We are focused on building our teams' capabilities in creating more inclusive products. We have educational sessions specifically for certain roles like front-end developers, designers, product owners, and content managers. This is to ensure that they all have knowledge about the subject and the requirements."

Anna Simon
Online design manager at Telia

Keep diverse users at the heart of designing inclusive tech/digital products and services

Organizations need to focus on taking a holistic approach towards embedding inclusive design processes and practices within tech teams.

This is supported by our research:

- 67% of frontrunners believe that inclusive design is a source of innovation and differentiation (34% for The Rest)
- 56% believe that inclusive design increases revenue through increased usage (21% of The Rest) and 51% believe it increases customer satisfaction (27% of The Rest).

Enabling inclusive design allows organizations to build a strong competitive advantage. It enables organizations to expand their offering to new consumers while being competitive in a globalized environment. Diverse, empowered teams are required for ethical and inclusive solutions, technical design, and user experiences across markets and industries.

Some organizations are taking a focused approach to inclusive technology design. Planned Parenthood (a nonprofit organization that provides reproductive health care in the US and globally) launched its first digital product, Spot On – a free period- and birth-control-tracking app that's been downloaded more than 1m times since its debut in 2016. Spot On was developed to provide reliable birth control and period tracking in an inclusive, non-gendered way. The app seeks to empower all people of reproductive age to understand and manage their menstrual cycles, birth control, and sexual health. The app was designed to be gender-neutral and usable for people, regardless of their sexual orientation or gender identity and the emojis and color used were also reflective of that commitment (feedback from users praise that the design is not pink, for example).[55]

Ensure women and ethnic minorities play a critical role in the design and development of digital technologies, especially AI systems

Organizations need to acknowledge the importance of inclusive design and build awareness, in addition to working with a diverse set of users. As we heard from Elise Moron, founder of WEALO.io: *"You should be aware of your cognitive biases at the onset of product development. The product team should be neutral and gather feedback from all segments of society. You should design not for minorities, but you should design with these minorities, as you don't know better than them. Often, the product leaders go and create the product and then just ask for validation, but it's not enough."*

Organizations should:

- Approach the building of inclusive and diverse teams not just at an overall tech function level but drill down to various smaller teams and departments involved in the process of digital product development and design. The targets for diversity and inclusion therefore should also be at micro-team levels and not only at an overall product team or tech function level.
- Educate product design, UI, UX, and tech teams on the principles of accessibility in design, universal design, and inclusive design, and build awareness of differences in guidelines and methodologies.Anna Simon, online design manager at Telia, says: *"We are focused on building our teams' capabilities in creating more inclusive products. We have educational sessions specifically for certain roles like front-end developers, designers, product owners, and content managers. This is to ensure that they all have knowledge about the subject and the requirements."*

"The third and final dimension is - recognizing the broader beneficial impact. When we design for the edge we actually make products that benefit many others. It can be up to 3-4 times your expected audience."

Manisha Amin
CEO, Centre for Inclusive Design

- Design in tandem with end users/consumers and use iterative processes that check areas such as usability and experience from different user types. This should not be done only at the research phase or at the end of the product design, but throughout the design and development process, so that there is a consistent loop and an opportunity to make amends to the digital product/service.

Manisha Amin, CEO at Centre for Inclusive Design, a social enterprise for inclusive design in Australia, shared her views, on deeply embedding inclusive design with us: *"We use the dimensions first created by the Inclusive Design Research Centre. The first dimension is understanding who you are designing for and your own biases, and the diversity of the team. The second one is actually creating something new by co-designing products, using participatory design, and ensuring accessibility by working with not only a diverse set of employees but also users. The third and final dimension is - recognizing the broader beneficial impact. When we design for the edge we actually make products that benefit many others. It can be up to 3-4 times your expected audience."*

We also found this in our analysis of Inclusion Frontrunners. As Figure 16 shows:

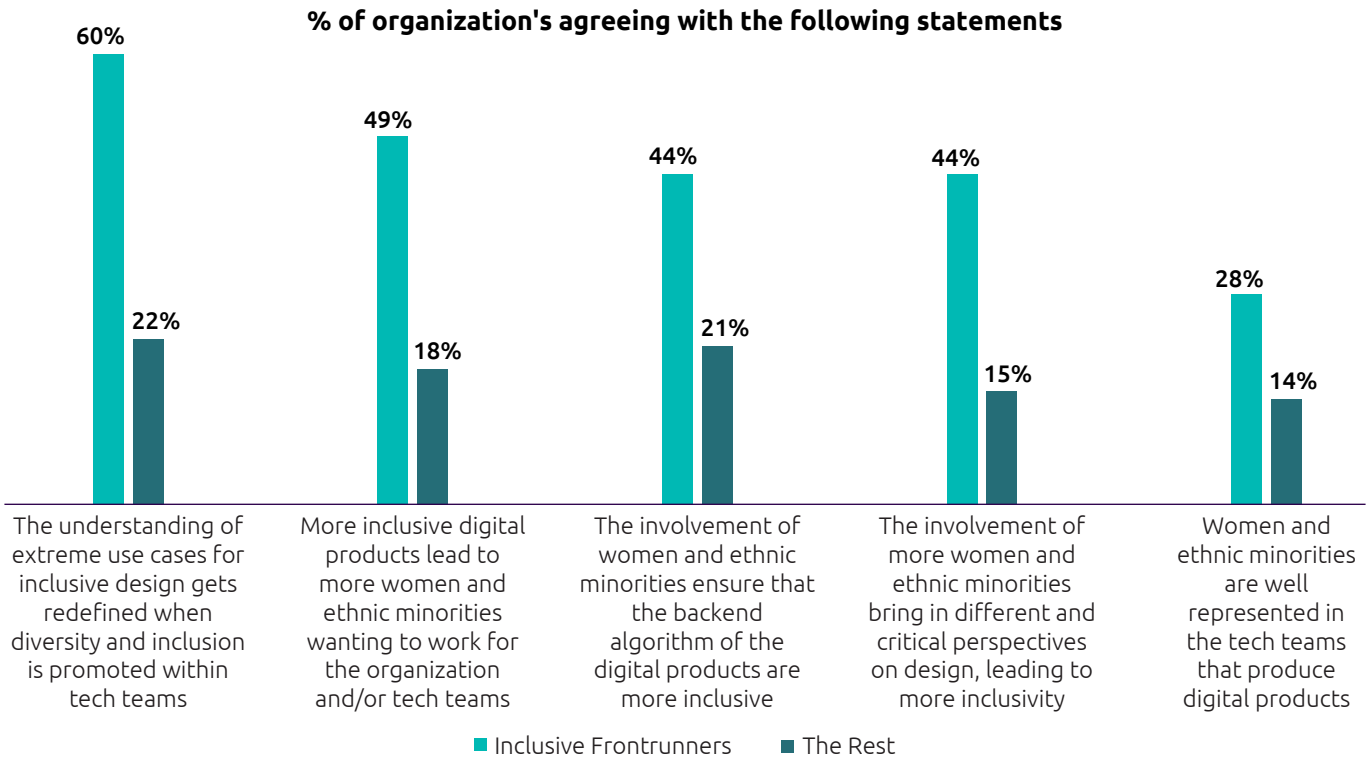
- 60% of frontrunners believe that creating a diverse and inclusive workforce enables a better understanding of inclusive design (22% for others).
- 44% of frontrunners believe that involving women and ethnic-minority employees ensures back-end algorithms of digital products are more inclusive.

Organizations should also build diverse teams for developing, deploying, and overseeing AI algorithms, drawing on a variety of racial, gender, educational, and demographic backgrounds. A recent research published by the AI Now Institute, estimates that only 18% of authors at some of the biggest AI conferences are women.[56] It also highlights links between the lack of diversity in the current AI industry and the discriminatory behavior of AI systems. Salesforce, the US cloud-based software company, is committed to building a workforce that reflects society. Salesforce claims to have 44% of its US workforce made up of underrepresented groups (women, Black people, Latinx, indigenous, multiracial, LGBTQ+, people with disabilities, and veterans), and 23.5% of women in its tech workforce globally.[57] In addition to diversity of people, diversity of disciplines must be encouraged – that of different viewpoints, educational backgrounds, and perspectives, to come together seamlessly during AI design to ingrain sensitivity in AI systems.[58]

60%

of frontrunner organizations believe that creating a diverse and inclusive workforce enables a better understanding of inclusive design as compared to 22% of the rest of the organizations.

Figure 16: Inclusion Frontrunners are aware that workforce diversity enables inclusive design and vice versa



Source: Capgemini Research Institute, Inclusive workforce and inclusive technologies survey, March–April 2021; N=418 ethnic-minority and women employees (in tech functions) from N=418 organization under consideration with N=43 Inclusion Frontrunners.

"For example, while developing COVID-19 vaccine management solutions, in order to create equitable access, we counseled our product and system integrator teams to send appointment reminders through email as well as text message, and to enable sign-ups through multiple channels . If sign-ups could only be performed online or via smartphone, and are only available in English, there would be risk of marginalizing those without access to technology, those who are less digitally literate, non-English speaking populations, and those who are only able to use lower-tech options."

Yoav Schlesinger
ethical AI practice principal, Salesforce

Incorporate checks and balances to ensure tech design and tech infrastructure are inclusive

A lot of organizations that build digital products and technologies already consider questions of accessibility, which is something that is often mandated by regulations. For example, Apple empowers its ecosystem by using Global Accessibility Awareness Day to highlight features, third-party applications, accessories, and products that support accessibility.[59] But there is a lot more to inclusive design than meeting accessibility standards. Organizations need to design for a great range of human differences and ensure that their tech products and solutions represent everyone.

As well as creating diverse tech teams, there are a number of factors to consider when designing and developing products:

- Design forms to be accepting of all genders and all ethnic-minority communities. For example, users should not have to choose from male and female-only gender binaries or be obliged to disclose their sexual orientation or ethnic status, among other demographic identifiers.
- Strive to include the widest possible range of voices in your product-development process; this is particularly important in research and testing.
- Consider how you are representing your users across your experiences, for example by using gender-neutral or gender-fluid iconography, representation, and celebration of ethnic diversity in imagery, and non-gendered language; be as intersectional in your design approach as possible.
- Check explicitly if your design works for particular communities and does not create specific risks or disadvantages for them; exclusionary design choices should be tested and eliminated.
- Design for flexibility, customization of use, and adaptability of contexts; allow customers to customize how they interact with a product.[60]
- A/B testing is often used in making design decisions, but can lead to exclusionary default settings;[61] tech and digital designers need to be cognizant of such biases, even in the most used design methodologies, in order to reorient their perspectives on designing for inclusion.

Yoav Schlesinger, ethical AI practice principal at Salesforce, explains: *"For example, while developing COVID-19 vaccine management solutions, in order to create equitable access, we counseled our product and system integrator teams to send appointment reminders through email as well as text message, and to enable sign-ups through multiple channels . If sign-ups could only be performed online or via smartphone, and are only available in English, there would be risk of marginalizing those without access to technology, those who are less digitally literate, non-English speaking populations, and those who are only able to use lower-tech options."*

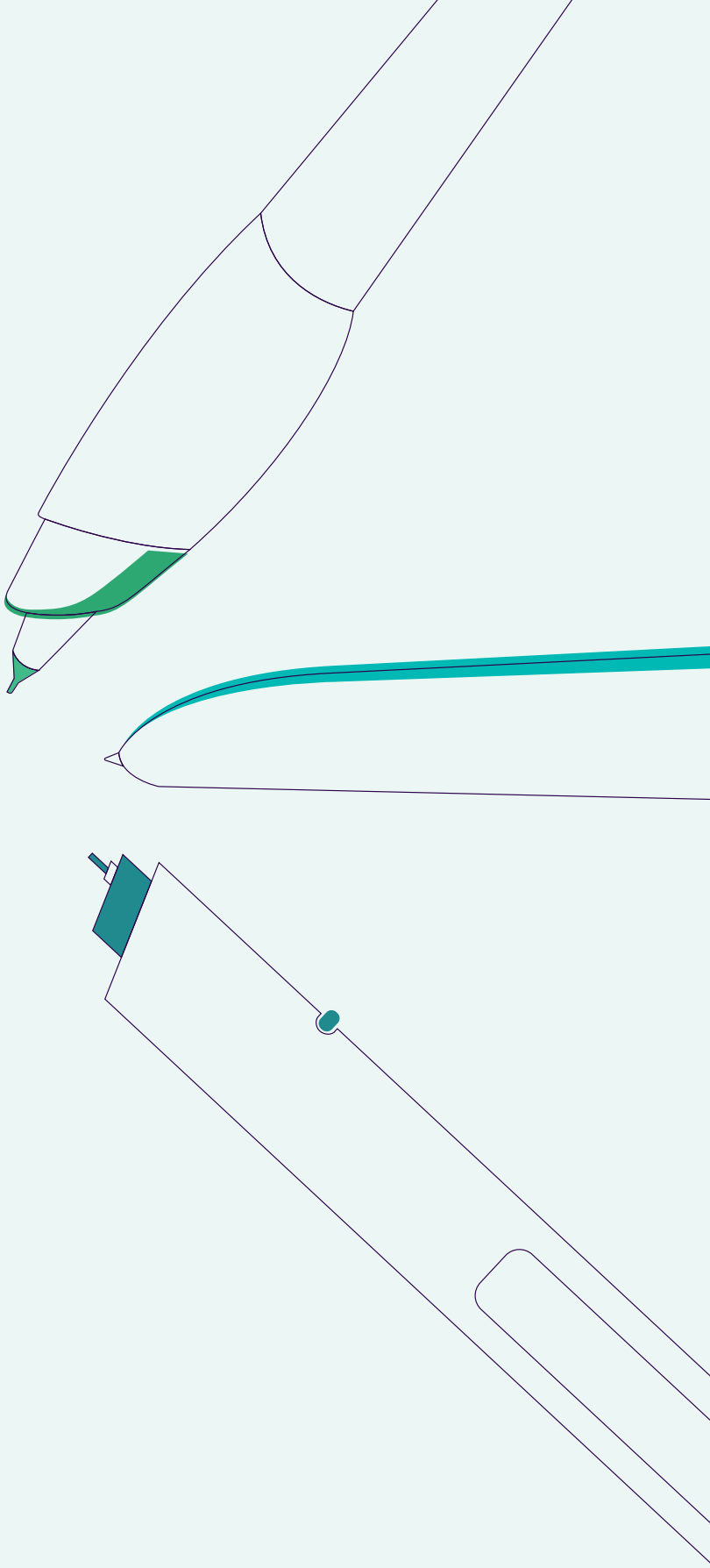
Building a case for inclusive design

"Inclusion is when you think about people who are not included or overlooked. When you're being exclusive, underrepresented communities tend to be under-resourced. Understanding the lack of resources is important because there's an opportunity to scale design solutions for other overlooked communities. Let's develop a plan with inclusive ambitious goals with measurable results that can be tracked over time. Let's be able to quantify this, audit it over the year, and showcase the benefits and profits. Let's build credibility behind it and show why it's important to do this repeatedly."

Nancy Douyon
CEO of Douyon Signature

"Developing inclusive projects means working with rooted historical-social issues – it is a profound cultural change and requires the involvement of a broad ecosystem. As we did at TIM, I believe in creating a governance model that involves the participation of employees, managers, and senior leadership, working continuously with training and communication teams. It is also essential to involve an ecosystem of diverse stakeholders to know the needs of ethnic-minority groups."

Mario Girasole
Executive VP, Regulatory, Institutional, and Public Relations TIM, Brazil



CONCLUSION

In this report, we demonstrate why inclusion in tech teams is so critical in the context of women and ethnic minorities, and how there is a clear relationship between inclusive tech teams and inclusive design of technology. The pandemic has also exacerbated the use of digital products, channels and services, as well as creating a situation where a very different kind of hybrid workplace is taking shape, bringing back into focus the need for inclusive virtual workspaces. The indiscriminate nature of certain technologies and online platforms being deployed by many consumer-facing companies, and the growing consumer awareness of such tech, points to the urgent need for building inclusive digital products and services. It also makes business sense: catering for the broadest span of human diversity opens up a much wider audience and a more loyal and engaged customer base.

However, as our research has shown, there is a lot more to do. Consumers are not only aware of discriminatory technology, they have experienced it first-hand, and they expect organizations to do better. Designing inclusive teams and developing inclusive products will also create more room for innovation, creativity, and greater scalability of digital products and services, and organizations not working on this will miss out on the huge potential that inclusion brings. Organizations need to act with urgency to drive inclusive design in technology, building a more inclusive digital future for their people and their customers.

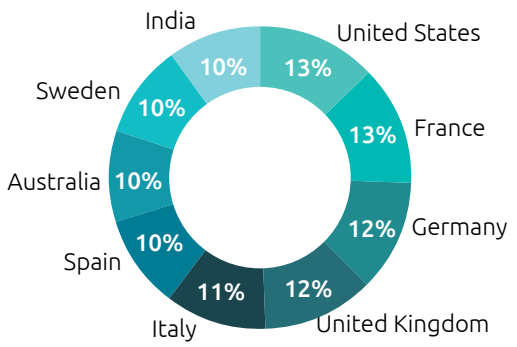
RESEARCH METHODOLOGY

We carried out extensive research with qualitative and quantitative components. We conducted executive and consumer surveys. Our focus was on the experience of women and persons of ethnic-minority communities across both the surveys. We also spoke to women and persons of color and ethnic-minority communities in our focus-group discussions and in-depth interviews, along with other industry experts.

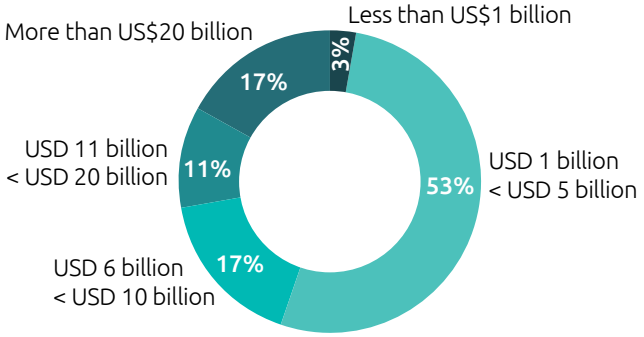
Executive Survey

We surveyed 500 organizations with one tech employee and one leadership respondent from each organization, a total of 1,000 executive respondents.

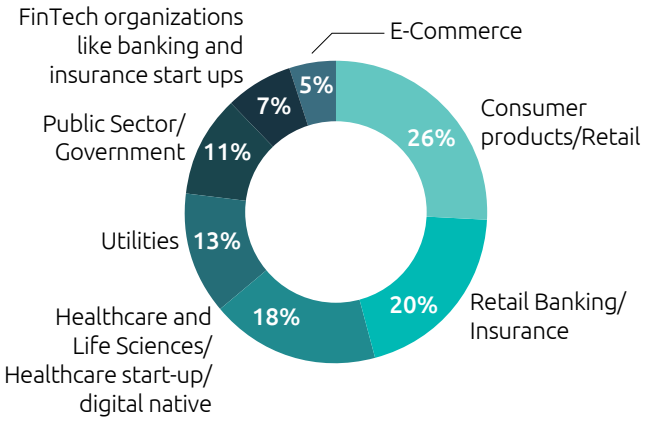
Country of headquarters of organizations



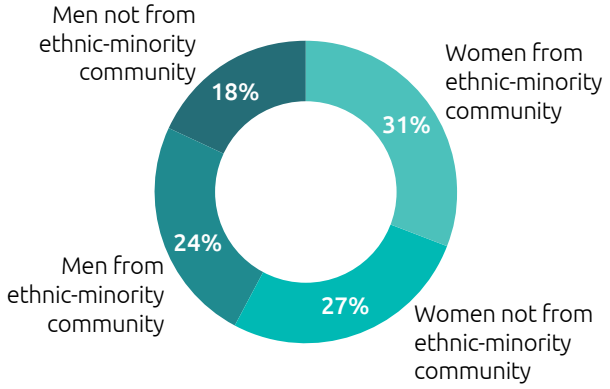
Annual revenue of organizations



Sector distribution of organizations



Distribution of respondents by gender and ethnicity



Source: Capgemini Research Institute, Inclusive workforce and inclusive technologies survey, March-April 2021; N = 1000 respondents, with one tech employee and one leadership executive from 500 organizations.

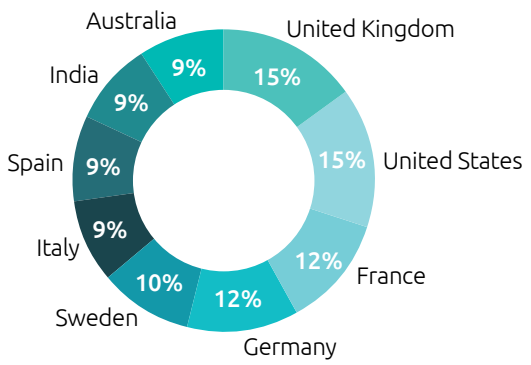
In-depth interviews

We conducted 32 in-depth interviews with industry experts, academics, think tanks, startups, and anonymized employees from various organizations. The experts and employees were from inclusion and diversity teams; tech and AI teams; UX and UI design teams; and AI ethics and universal design experts.

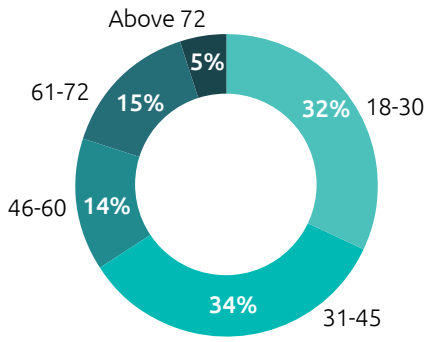
Consumer Survey

We conducted a survey of 5,000 consumers across nine countries.

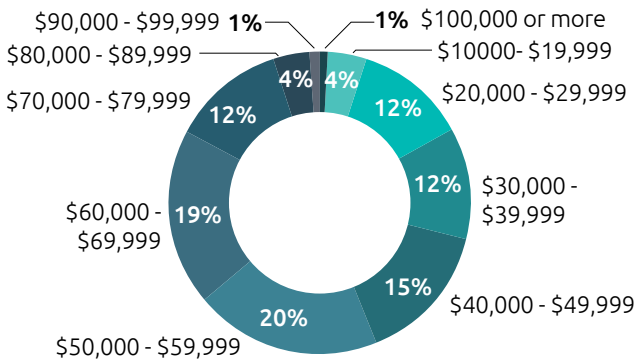
Primary residency of the respondent



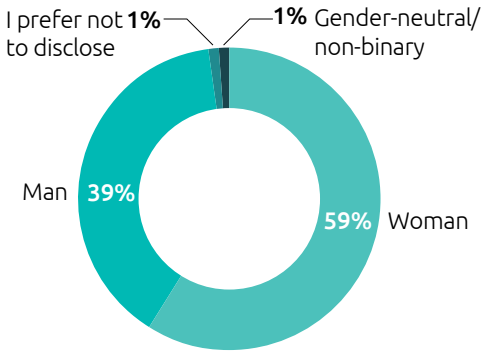
Age group of the respondent



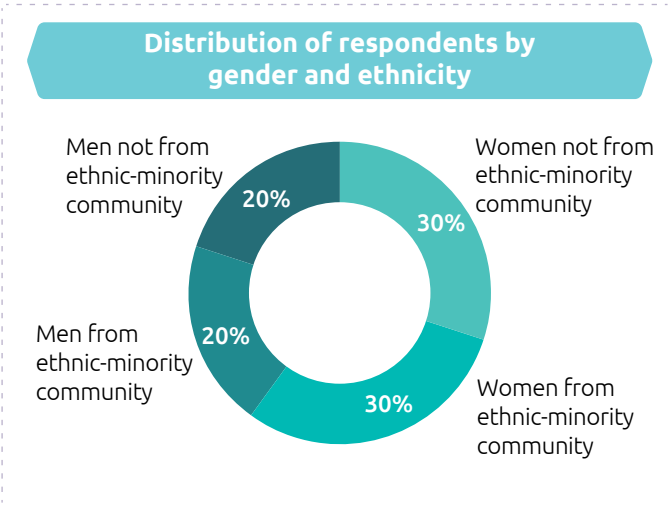
Household income of respondent

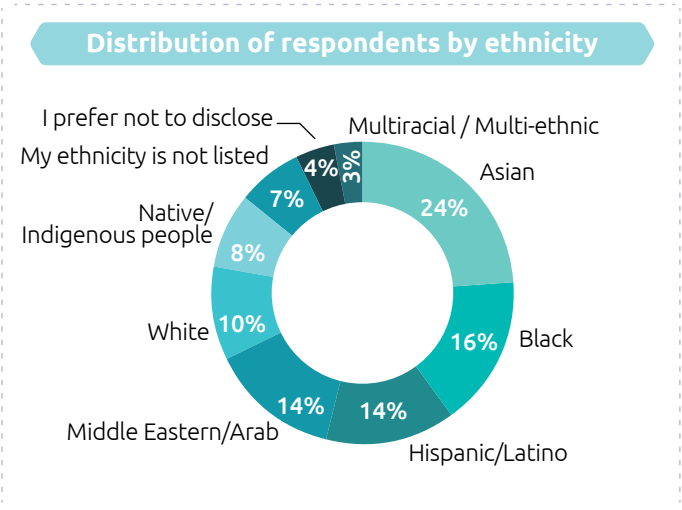


Gender identity of respondents



Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N= 5000 consumers.





Source: Capgemini Research Institute, Inclusive workforce, and inclusive technologies survey, March–April 2021; N= 5000 consumers.

Consumer focus group discussions

We conducted three focus-group discussions in the US, Germany, and the UK of 8–12 participants per country from diverse backgrounds in each group.

APPENDIX

Respondent categories through the report

Throughout the report, we have categorized leadership executives and employees into various groups:

		Women employees	Ethnic-minority employees	Women and ethnic-minority employees	Leadership Executives
Function	Technology	✓	✓	✓	✓
	All				
Gender and Ethnicity	Women from ethnic-minority community	✓	✓	✓	✓
	Men from ethnic-minority community		✓	✓	✓
	Women not belonging to ethnic-minority community	✓		✓	✓
	Men not belonging to ethnic-minority community				✓
	Gender-neutral/ Non-binary belonging to ethnic-minority community		✓	✓	✓
	Gender-neutral/ Non-binary not belonging to ethnic-minority community				✓
Role type	Non-supervisory	✓	✓	✓	
	Supervisory				✓

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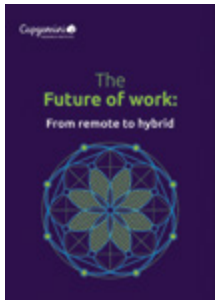
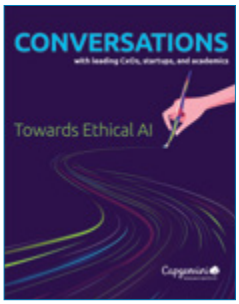
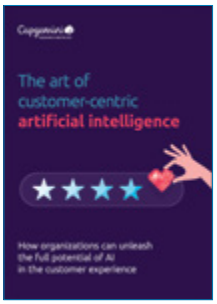


The Future of Work

AI and the ethical conundrum



Conversations Towards Ethical AI



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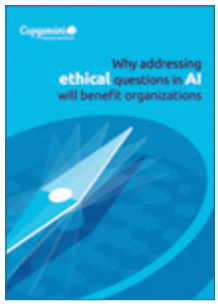
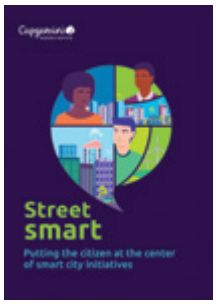


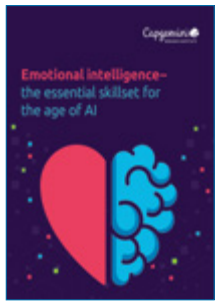
Why addressing ethical questions in AI will benefit organizations



Street Smart

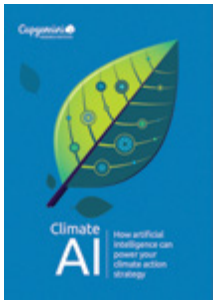
Upskilling your people for the age of the machine

Conversational Interfaces



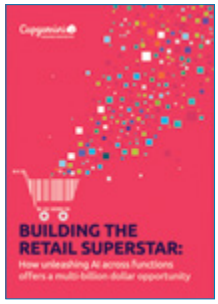
Emotional Intelligence

Smart Stores



Climate AI

Agile at scale



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