Royal Academy of Engineering

Dalberg

The EDI Engine

Evidencing the business benefits of equality, diversity and inclusion (EDI) in engineering

About this report

The following report was commissioned by the Royal Academy of Engineering's Diversity and Inclusion team. The Diversity and Inclusion research programme aims to arm D&I professionals, CEOs or chief executives and leaders with the data, knowledge, and tools to boost equality, diversity, and inclusion across the profession.

The report has been produced in partnership with Dalberg Advisors, a strategic advisory firm that works collaboratively across the public, private and philanthropic sectors to drive inclusive and sustainable growth.

The Dalberg team behind this report was led by Annette Chau, Daphnée Benayoun and Jake Maughan, and included team members Charlotte Hoiness and Chloe Tan. The views and opinions expressed in this report are those of the authors and don't necessarily reflect the views of the Academy.

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Glossary

Diversity, in the context of this report, refers to whether a single profession or workforce is representative of the wide variety of people, characteristics, backgrounds and identities that exist in wider society. The findings presented throughout this report reflect participants' perceptions of diversity across the engineering community.[1]

The engineering economy includes engineers working in engineering businesses and non-engineering businesses, as well as non-engineers working in engineering businesses.[2]

The engineering profession in the UK comprises all the individuals who work as engineers and technicians, all the professional bodies which support them and the statutory documentation which underpins competence.[3]

Equality is given different conceptual meanings by different people. It can refer to formal legal equality, non-discrimination, equality of opportunity, equality of outcome and substantive equality. It can refer to equality between people with different protected characteristics, as well as to socio-economic equality. Equality is also linked with justice, the removal of barriers to fairness and the transformation of society so that all may participate. Social inequality arises from interpersonal prejudice and systemic, structural and institutional bias.[4]

Equity, like equality, has different conceptual meanings for different people. While it's sometimes used interchangeably with equality, it usually frames equality (of outcome) as the desired end state, with an equitable approach being required to reach that end state. Equity focuses on recognising and rectifying systemic disparities, through targeted interventions aimed at levelling the playing field. Equity emphasises the need to offer fair and just opportunities, outcomes and treatment for individuals and groups, considering their unique circumstances, historical disadvantages, and intersecting identities.[5]

Inclusion is the extent to which people feel valued for who they are (their personal and professional background, experience, and skills). And the extent to which people feel they belong or 'fit' in the engineering profession and their organisation.[6]

Inclusive design is the design of mainstream products, services or projects that are accessible to, and usable by, as many people as reasonably possible, without the need for special adaptation or specialised design.[7]

Intersectionality is a theory and metaphor deriving from Black feminist scholarship, articulating how multiple, overlapping, and combined inequalities shape the experiences and outcomes of underrepresented groups.[8]

Neurodiversity refers to the concept that all individuals 'vary in terms of neurocognitive ability',[9] including people whose cognitive abilities are viewed as typical and atypical.[10] The term 'neurodivergent' describes individuals who identify as having one or more neurotypes. These can include but are not limited to, dyslexia, autism, Attention Deficit Hyperactivity Disorder (ADHD) or Tourette Syndrome.

Protected characteristics are identified in the Equality Act 2010 and relate to several legal rights and obligations. These are age, disability, gender reassignment (being trans), marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation. Among other things, individuals have a legal right to not be treated less favourably by their employer because they have or are perceived to have a protected characteristic.[11]

Introduction

The following report primarily explores the business and economic benefits of Equality, Diversity and Inclusion (EDI) in engineering. We recognise that the value of EDI extends beyond these benefits. Advancing EDI is not only a legal requirement, it is also the right thing to do: equality is a human right and justice is not a commodity. Nevertheless, given the ongoing EDI gaps and challenges in engineering, we believe it's valuable and motivating to highlight the tangible benefits that effective EDI measures can bring to engineering innovation, commercial success and broader economic growth. We hope this work encourages more engineering companies to prioritise EDI internally and embed it throughout their business practices.

The following report aims to communicate and evidence the business and economic advantages of EDI. This is integral to the Royal Academy of Engineering's work to support the UK engineering economy to become more equal, diverse and inclusive. This report seeks to incorporate insights across all protected characteristics, where data was available, and to provide engineering-specific evidence on the benefits of EDI. It uses standardised definitions throughout. However, when sources have different definitions, we'll use their language to accurately reflect their findings.

Methodology

To assess the impacts of EDI on engineering businesses and the wider UK economy, we conducted a rigorous literature review of the latest research on EDI. We also held interviews with stakeholders across a range of engineering businesses to contextualise and triangulate our findings. A wealth of research consistently points to a link between EDI and positive business results. But, in some cases, the evidence shows correlation rather than causation. And proving what would've happened without EDI interventions is challenging.

We're aware that studies represented in this report are open to critique, regarding shortcomings in methodologies or the presentation of results. With that said, the review shows that effective EDI measures can be linked to business and economic benefits, both theoretical and empirical. A compelling body of evidence underscores the benefits of EDI on businesses' commercial performance and suggests that realising these benefits is achievable for companies of any scale. The systematic evidence is further bolstered by the insights gathered from interviews with stakeholders, who provided real-world examples and case studies on the tangible benefits of EDI for businesses.

The final section of this report outlines recommendations for engineering companies to further advance their EDI. These were developed drawing on desk research and interviews conducted for this report and informed by the principles of:

- The Diversity and Inclusion Progression Framework for Professional Engineering Institutions, developed in collaboration with the Royal Academy of Engineering ("The Academy") and the Science Council;
- The Academy's learning from research on Inclusive Cultures, and from developing the Inclusive Leadership Programme and the Graduate Engineering Engagement Programme;
- The Academy's Culture+ EDI platform, which offers practical tools and support tailored to the specific needs of startups, scaleups, and SMEs, and a unique approach to embedding a culture of inclusion.

Executive summary

Equality, Diversity and Inclusion (EDI) is integral to engineering outcomes and the performance of engineering businesses. Equality, diversity and inclusion are the cornerstones of building a just and equitable world where everyone thrives. In engineering, EDI is vital but isn't fully adopted by many organisations. Engineers create products and deliver services that impact everyone. So, by embracing diverse perspectives, engineers can unlock new ideas, drive innovation and develop more effective, inclusive and safe solutions for everyone.

For engineering businesses, EDI is a win-win. It isn't only the right thing to do – it also fuels commercial performance and brings benefits that are integral to engineering businesses' performance. As a result, advancing EDI can unlock wider benefits for individuals and the economy. It means greater fairness and justice for engineers. At a national level, the engineering economy employs 8.1 million people and accounts for over 30% of the UK's economic output.[12] That contribution can be further enhanced and the UK engineering economy can be sustained and propelled if we harness the talents of a diverse engineering workforce.

The four 'P's

By prioritising EDI, companies can boost their business and engineering performance, driving benefits in four areas: **People, Products and services, Partners,** and **Processes.**

Multiple studies have found that diverse companies outperform their less diverse counterparts. The commercial benefits of EDI extend to engineering specifically. For example, businesses with a higher share of women in engineering roles generate higher returns than businesses that are less gender-balanced.[13] Underpinning financial performance, EDI unlocks benefits that are integral to the success of engineering companies across four areas, the four 'P's. These are outlined in figure 1.

Figure 1 **The four 'P's: People, Products and services, Partners, and Processes**

PEOPLE

By championing EDI, companies are better positioned to attract top engineering talent, boost staff retention and satisfaction, alongside overall workforce performance and productivity.

PRODUCTS AND SERVICES

Companies that embed EDI can stimulate problem-solving, creativity and the development of more innovative and inclusive products and services. By developing solutions tailored to a wide range of end users and needs, they can unlock new market opportunities.

PARTNERS

Prioritising EDI can enhance customer engagement and enable investment. Many customers require businesses to meet EDI criteria and a growing number of investors factor EDI into their investment decisions.

PROCESSES

EDI can enhance companies' operational excellence and bring cost efficiencies, by increasing psychological safety so employees feel empowered to raise issues (particularly linked to health and safety) and reducing potential fees from legal disputes.

Figure 2 **Evidence for the benefits of EDI**

Source: Dalberg

PEOPLE

© Rolls-Royce PLC

Enhances talent attraction

- **81% of engineers** consider diversity as an important factor when **choosing an employer.**
- **82% of women** in engineering and construction report that the **presence of role models** informs their decision to join a company.
- A global study, focused on various engineering sectors, found that **86% of employees** considered diversity, equity, and inclusion **critically important; 62% would turn down a job offer** from a company that does not endorse diversity.
- Engineering companies (spanning startups, SMEs and large businesses) interviewed for this report, said they saw **a rise in job applications** after launching EDI measures.

Engineering companies, from startups and SMEs through to large businesses, said they saw a rise in job applications after launching EDI measures

Improves talent retention

- Women in architecture, engineering and construction in Australia are over **one-and-a-half times less likely to leave** their jobs when their workplace is inclusive versus exclusive.
- Women executives at US public firms were **less likely to leave** their firms when their **CEOs were perceived to value diversity.**
- Gen Zs and millennials at diverse companies are **42 percentage points more likely to stay** beyond five years than those who consider their firm un-diverse.

Women in Australia are over one-and-a-half times less likely to leave their jobs when their workplace is inclusive versus exclusive

Boosts staff satisfaction and performance

Teams with inclusive leaders are 17% more likely to report high performance

- Engineering companies interviewed for this report, noted **increases in staff satisfaction** after adopting EDI measures.
- **53% of UK engineers** surveyed said that feeling included at work **increased their motivation** – **45%** said it **improved their performance.**
- Women in Architecture, Engineering and Construction in Australia have a **15% higher level of career satisfaction** when they work in **inclusive workplaces.**
- Across industries, teams with inclusive leaders are **17% more likely to report high performance.**

PRODUCTS AND SERVICES

Reduce potential risks and costs of product re-design

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- Ignoring the needs of diverse users is costly – **changes made after a product is released can cost up to 10,000 times more** than changes made during the conceptual design phase.
- **Re-design costs can make or break businesses**, and have an outsized impact on SMEs and start-ups.

The use of male dummies in car crash safety tests, exposed women to 47% higher chance of serious injuries and a 17% higher likelihood of death in car crashes

Stimulates the development of more inclusive products

- **Diverse teams with lived experience are uniquely positioned** to design solutions for underrepresented groups, highlighted by recent innovations for older adults, visually impaired people and noise sensitive individuals (please see pages 35–37).
- Failing to consider diverse needs can be detrimental – the **use of male dummies in car crash safety tests, exposed women to 47% higher chance of serious injuries** and a 17% higher likelihood of death in car crashes versus men.

Reach a wider range of end users and tap into new markets

- **Inclusive products and services** that consider a wider range of users, can reach **up to four times the number of customers** than their original intended target group.
- Inclusive solutions can reach customer segments that have been historically overlooked – **older households are projected to spend £550 billion a year** by 2024; the spending power of **disabled people** and their families is **estimated at £274 billion.**

Inclusive products and services can reach up to four times as many customers

Fuels innovation, enhancing engineering solutions

- **Companies with more diversity** are more innovative – they have 1**9% more revenue from new products and services** than companies with below-average diversity scores, according to a cross-country study.
- More diverse and **inclusive teams had 121% more patent citations** than un-diverse teams.
- **Scientists from underrepresented groups innovate at higher rates** than their counterparts in majority groups, but their contributions are taken up at a lower rate.
- Improvements in a **team's diversity led to higher levels of novelty in new products**, in manufacturing firms in Turkey.

Inclusive teams had 121% more patent citations than un-diverse teams

PARTNERS

© This is Engineering

Gives businesses a competitive advantage with customers

- Over **50% of UK consumers** say that a brand's **diversity and inclusion practices** affect their purchasing decisions.
- In working with the UK public sector, EDI is crucial: **The HS2 railway project**, which awarded £23.7 billion in contracts has EDI as a key pillar of its evaluation framework, and **90% of its suppliers have EDI accreditation.**
- Corporates are paying more attention to their suppliers' EDI – **60% of 178 corporates** across the S&P 500, FTSE 250 and FTSE 100, are establishing and **expanding supplier diversity programmes.**
- Engineering companies reported that a **growing number of clients request EDI information** and **expect contractors to embed inclusivity** in the delivery of products and services.

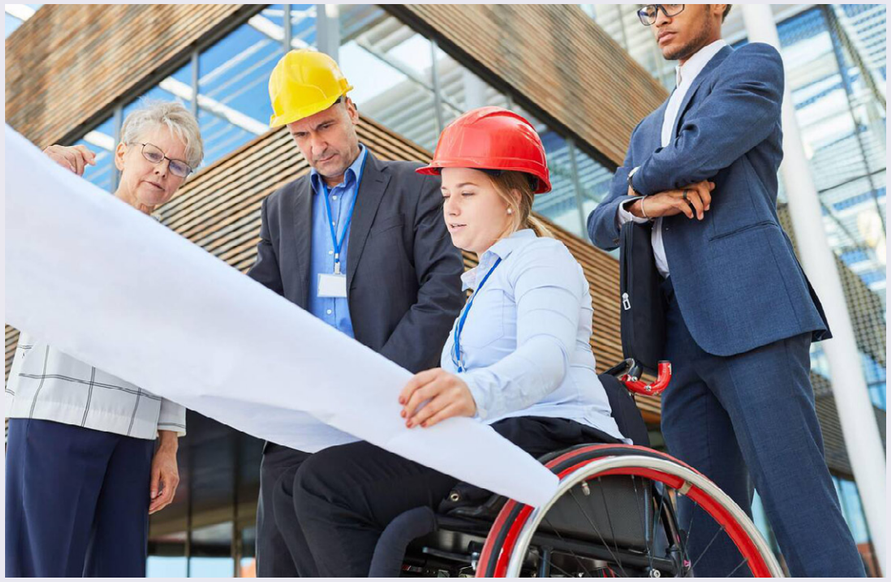
78% of global investors surveyed want companies to prioritise environmental, social and governance improvements, even if it affects their profits

Equips companies to attract investment

- **78% of global investors** surveyed **want companies to prioritise Environmental, Social and Governance (ESG) improvements**, even if it affects their profits.
- **Over half** of private equity firms collect or will **collect EDI data** from their portfolio companies.
- The number of **US venture capital firms requesting EDI information** from their investees **doubled** between 2018 and 2022.
- A number of engineering companies report that a **growing number of their investors and company boards are paying more attention to EDI** achievements.

Over half of private equity firms collect or will collect EDI data from their portfolio companies

PROCESSES



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Helps avert costs associated with legal disputes

- The **compensation thresholds for discrimination** claims in UK employment tribunals experienced their **largest year-on-year increase** between 2022 and 2023.
- In 2022/23 the **highest compensation awarded in the UK was £1.77 million** for a disability-related discrimination case.

In 2022/23 the highest employment tribunal compensation awarded in the UK was £1.77 million for a disability-related discrimination case

The average UK penalty for health and safety violations was £150,000 and the total sum of fines issued was £54.5 million in 2018/19

Enhances risk-management, including health and safety

- In the US, employees who reported **feeling psychologically unsafe** were **80% more likely to report they had been injured at work**, compared to those who felt psychologically safe.
- Employees who believed their employers discouraged health & safety reporting were **2.4 times more likely to have experienced a work injury.**
- This can be costly – in the UK, the **average penalty** for health and safety violations was **£150,000** and the total sum of **fines issued was £54.5 million** in 2018/19.

Enhances operational efficiency, through supplier diversity

- **Increased supplier diversity** has been found to foster competition between suppliers, **improving product quality and reducing costs**, making supply chains more agile and resilient.
- Companies who **engaged with minority-owned and women-owned** business enterprises in the US, reported annual **cost reductions of 8.5%.**

Increased supplier diversity has been found to foster competition between suppliers

EDI isn't just a win for companies – it impacts individuals, the engineering ecosystem and the entire economy. The benefits of EDI extend beyond individual businesses and can:

1. **Foster a professional culture where all engineers can thrive and contribute to their fullest potential.** By making sure all engineering talent is given equal treatment and recognition, EDI is vital to achieving greater justice and fairer outcomes for diverse engineers, unlocking the full potential of the workforce.
2. **Expand the talent pool and foster sustained growth of the engineering economy.** By widening the talent pool and nurturing diverse talent, EDI efforts can lead to a more sustainable engineering ecosystem – one that can harness a highly skilled engineering workforce. In doing so, EDI can foster innovation and the long-term growth of engineering businesses and the engineering economy.
3. **Contribute to a stronger and more inclusive UK economy.** By advancing EDI, engineering companies have the potential to enhance their commercial performance, stimulate the growth of the engineering economy and unlock benefits for the wider UK economy. In parallel, inclusive design allows more people to use engineering products and services, fostering more economic activity.

Unlocking these benefits requires significant progress in engineering.

Despite some EDI efforts, engineering in the UK lacks diversity and solutions often fall short of meeting diverse user needs. There is a growing emphasis on EDI in engineering, marked by a range of initiatives and campaigns to encourage EDI in the profession. This has spurred some progress. For example, the gender pay gap is narrower in engineering than for all UK workers (10.8% versus 16.2%).[14] And inclusive design (which aims to make products and services accessible to, and usable by, as diverse a group of people as reasonably possible)[15] is gaining momentum. This is highlighted by the introduction of standards, such as the British Standards Institution BS 8300 which outlines how to make buildings more accessible and inclusive.

However, engineering lacks diversity across a range of protected characteristics. In the UK, women only make up 16.5% of the engineering workforce, compared to nearly half of the UK workforce – this is lower than the share of women engineers in other countries.[16] In May 2024 Engineering UK released new data showing the proportion of women working in engineering and technology roles has declined in the past year from 16.5% to 15.7%, and that the drop is concentrated among women aged 35 to 44.

Only 11.4% of engineers[17] are from minority ethnic groups, versus 28.2% of the working-age population.[18] Equality of pay and opportunity are still unbalanced, particularly as underrepresented groups are still underrepresented in leadership positions.

Further work is needed to make all engineers feel valued, regardless of their background. Black, Asian or minority ethnic, LGBTQ+, disabled people and women all feel less included in the engineering profession than white heterosexual men.[19] Finally, despite efforts to promote inclusive design, many products and services fall short of diverse end user needs. From oximeters that misread Black patients' oxygen levels and led to serious health risks during the COVID-19 pandemic, to inaccessible websites for disabled people, more needs to be done.

There is no silver bullet – the slow pace of progress on EDI is driven by a range of complex, interlinked factors.

At the societal level, social norms perpetuate stereotypes and feed into a vicious cycle where underrepresented groups are discouraged from entering engineering. This reinforces the perception that engineering isn't accessible and perpetuates low levels of diversity. At a sector-wide level, the narrow engineering talent pool contributes to a growing 'skills gap', with nearly half of UK engineering businesses struggling to find talent[20] and many struggling to retain diverse talent, particularly at senior levels.

Globally, the share of engineers quitting their jobs at engineering companies rose to between 16% and 17% in 2023 – a rise of nearly two percentage points from three years ago.[21] In turn, the limited diversity of the workforce perpetuates non-inclusive engineering practices, as the preferences of underrepresented groups risk being overlooked. Finally, at the company level, EDI gaps are driven by a range of internal challenges, from limited awareness of EDI and resource constraints to a lack of leadership prioritisation of EDI.

But something can be done – engineering businesses can be powerful agents of change in addressing these barriers and advancing EDI.

While EDI barriers are not easy to address, engineering businesses can play a role in tackling them. For example, they can work with schools and governments to make engineering more appealing to diverse groups. They can proactively hire diverse talent and foster an inclusive environment where everyone can excel. They can also implement a range of internal EDI initiatives to address company-specific bottlenecks. Failing to do this could be a missed opportunity.

To do this, businesses can follow some cross-cutting guiding principles that focus on assessing, developing and enhancing their EDI efforts.

EDI is not a one-size-fits-all. The practicalities of applying these principles and advancing EDI will vary by company size, resources, and needs. Nevertheless, companies can follow certain guiding principles that are relevant across businesses. Engineering firms also have the opportunity to engage with Royal Academy of Engineering programmes to support their EDI journey.

Ultimately, a collective effort – from companies and stakeholders in the engineering ecosystem – is needed to make meaningful progress on EDI. This includes contributions of individuals, governments, educational institutions and professional organisations.

> "Innovation comes from a breadth of opinions and ways of solving a problem."
>
> – Peter Mountney, Odin Vision[80]

Key recommendations companies can consider:

1. **Understand your starting point:** Collect data to evaluate your company's EDI practices, policies and culture using tools such as surveys. Analyse results to identify strengths, weaknesses and areas for improvement.
2. **Collaborate with experts and partners:** Leverage external resources and expertise to guide your efforts. Work with external partners and your community to promote the engineering profession and advance EDI.
3. **Adopt a leadership-driven, strategic approach:** Make sure senior leadership champions EDI efforts to drive change across your organisation. Align your EDI efforts with your company's broader strategic goals and planning processes to increase leadership accountability and commitment. Develop a vision and set measurable goals for advancing EDI.
4. **Tailor initiatives to organisational needs:** Set ambitious yet realistic goals tailored to your company's needs, resources and capabilities. Prioritise high-impact initiatives and design a flexible approach that enables adjustment based on ongoing progress and learnings.
5. **Cultivate a culture that embeds EDI:** Foster an environment where EDI is integrated into everyday practices. Encourage open communication, celebrate differences, increase internal awareness about EDI and proactively address bias and discrimination.

1. Why EDI matters

Equality, Diversity and Inclusion (EDI) involves fair treatment, participation and opportunity for all.

EDI aims to eliminate prejudice and discrimination based on an individual or group's characteristics.[22] It's an essential step in fostering fairness, justice and equity for all. Equality, Diversity and Inclusion are mutually reinforcing.

Equality requires diversity and an environment where all individuals feel included. EDI is multi-faceted and applies across protected characteristics defined in the 2010 Equality Act, including age, disability, transgender identity, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex and sexual orientation.[23] It can also extend to other diversity characteristics, including socioeconomic status.[24]

Diversity is also intersectional as individuals have multiple, interlinked identities. While this report will predominantly focus on protected characteristics, it seeks to showcase evidence across a range of characteristics. It'll also explore how multiple identities shape the experiences and outcomes of different groups.

EDI is especially important to engineering as it stimulates the development of more effective, inclusive and safe engineering solutions.

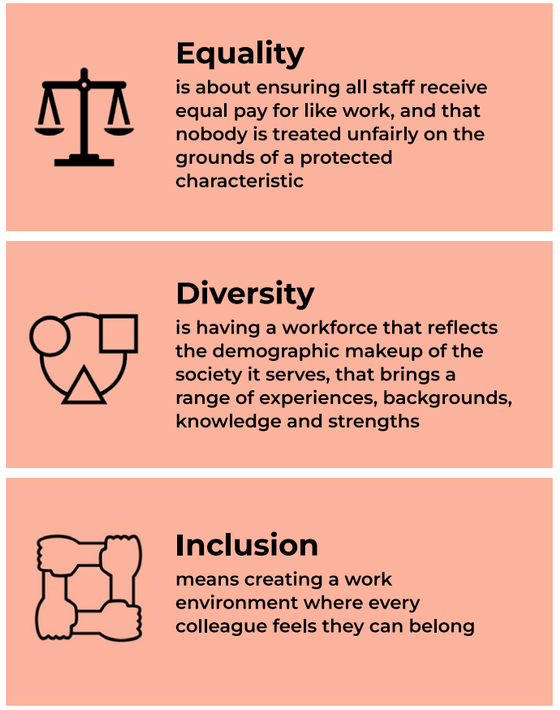
Engineers bring innovation to life by designing and delivering engineering solutions – products, services and processes that allow societies to run, generate economic opportunity and drive social impact.[25] Central to the profession is a culture that engineers describe as "solution-orientated," "creative," and "collaborative." [26]

Embracing equality, diversity and inclusion is essential for this culture to thrive. In the dynamic engineering landscape, diverse perspectives can boost creativity, unlock new ideas and drive advancements in products, services and systems. Not considering a broad range of end users can lead to ineffective solutions. These could include automatic soap dispensers that are unable to detect dark skin,[27] cars that are less safe for women because they were tested using male crash test dummies,[28] or public transport systems[29] and digital services[30] that are not accessible for disabled people. Embracing EDI and factoring in the diverse needs of a range of end users is therefore essential to the development of products, services and technologies that are more tailored, fit-for-purpose and inclusive.

For engineering businesses, embracing EDI is not just a moral, legal and social imperative – it's strategically important.

By providing equal opportunities, embedding equitable practices, embracing diversity and fostering inclusivity, engineering businesses embracing EDI can live up to their organisational values. They can also accelerate their commercial performance and drive benefits for their People, Products and services, Partners, and Processes (the four 'P's) – each of which is discussed in detail in the next section.

Figure 3 **Equality, diversity and inclusion**



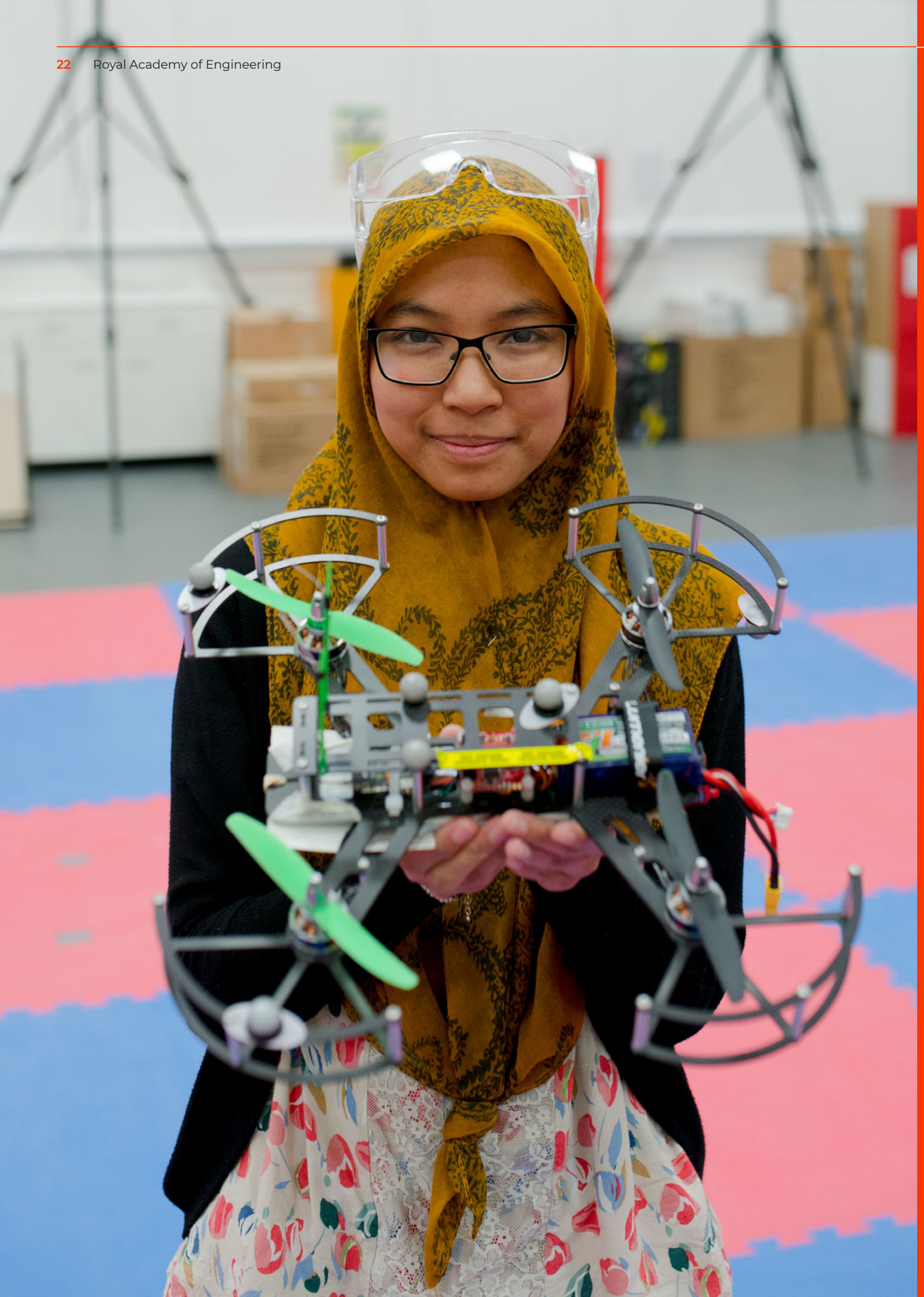
Source: Dalberg

EDI can unlock benefits for individuals and the wider UK economy.

A focus on EDI means greater fairness and justice for engineers. By prioritising EDI, engineering businesses can create environments where engineers from diverse backgrounds feel valued, respected, and empowered to contribute their unique perspectives and talents. On a national scale, EDI can unlock the full potential of the engineering workforce and economy.

In the UK, the engineering economy generates an estimated £646 billion in direct Gross Value Added (GVA) annually (over 30% of economic output) and employs 8.1 million people.[31] For example, in Birmingham and Glasgow, the engineering economy employs around 114,000 and 97,000 people, respectively.[32] Across the country, it accounts for at least one in ten employees in any given local authority (as observed in the Isles of Scilly) and can reach up to half of the workforce (as observed in Copeland, Cumbria).[33]

By harnessing the talent of a diverse engineering workforce to drive innovation and boost business growth, improved EDI in engineering has the potential to propel the engineering economy. Given the significant contribution of engineering to the UK economy, this can generate far-reaching economic impacts. For example, bridging the gender gap in labour market participation – as well as Science, Technology, Engineering and Maths (STEM) qualifications and wages – could increase the size of the UK economy by 2% or £55 billion by 2030.[34]



2. The opportunity of EDI

Business benefits: EDI is linked to stronger business performance

By embracing EDI, engineering businesses can boost their commercial success.

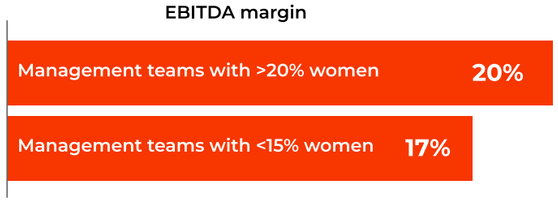
Measuring the causal effect of EDI on business performance is challenging, but multiple studies have identified a strong correlative link:

- Diverse leadership within businesses is strongly correlated with financial performance. A global study of 1,265 businesses across industries found that businesses with the highest levels of gender and ethnic diversity in their executive teams (in the top quartile of diversity) are 39% more likely to financially outperform their industry median. This is compared to businesses with the least diverse leadership (in the lowest quartile of diversity).[35]
- In Europe, businesses with over 20% women in management teams have higher Earnings before Interest, Taxes, Depreciation and Amortisation (EBITDA) margins compared to those with fewer women (Figure 4).[36]
- These benefits extend to businesses of all sizes. A study of French Small and Medium Enterprises (SMEs) found a positive link between the share of women on corporate boards and improved return on assets.[37]
- Increases in the share of women in the overall workforce also correlate with increases in business performance, as measured by return on assets.[38]

Going beyond gender, businesses that adopt a holistic EDI strategy and embrace diversity across a range of characteristics reap even greater rewards. For example, businesses that have gender-diverse leadership and promote inclusivity for LGBTQ+ employees see higher market returns compared to those focusing on one diversity characteristic.[39]

Companies with diverse leadership and inclusive teams are uniquely positioned to attract and keep top talent. This is one of many ways in which EDI boosts business performance, unlocking a range of other benefits.[40]

Figure 4 **Financial performance in businesses, based on the representation of women in management teams – depicting Earnings before Interest, Taxes, Depreciation and Amortisation (EBITDA)**



Source: The CS Gender 3000 in 2021: Broadening the diversity discussion, Credit Suisse Research Institute, 2021

The engineering economy specifically can gain commercial and ethical benefits from embracing EDI practices.

Businesses with a higher share of women in engineering roles generate a higher return on assets than their counterparts who are less gender balanced.[41]

In a study of manufacturers, construction firms and property developers in Australia, researchers found that work-life initiatives, such as flexible work and holiday arrangements, appeared to have a significant and positive impact on companies' profit before tax, but only in workplaces with a "highly supportive diversity environment". This is because diverse workplaces can enhance the effectiveness of work-life initiatives, minimise conflict, demonstrate support for diversity, and consequently increase job satisfaction, participation and productivity.[42]

It also found that companies with more gender-diverse boards were more likely to introduce these work-life and gender-equality human resource initiatives, further reinforcing the commercial benefits of diverse leadership.[43] When individuals from underrepresented groups are part of leadership teams, they can draw on their lived experiences and guide businesses to implement more effective EDI interventions, unlocking tangible business benefits, including strong financial performance.[44]

Underpinning financial performance, EDI brings benefits that are integral to the success of engineering businesses, for People, Products and Services, Partners, and Processes.

When engineering companies take steps to nurture equality, diversity and inclusion they can enhance the experiences of their engineering workforce, the quality of their products and services and their internal processes. Externally, EDI strategies and actions can shape how customers, investors and communities perceive and interact with businesses.

This report further examines these benefits and showcases how EDI can enhance engineering businesses' performance across four pillars: People, Products and services, Partners, and Processes.

Figure 5 **People, Products and services, Partners, and Processes: the four 'P's**

Source: Dalberg

PEOPLE

Improved talent attraction, satisfaction, performance and productivity

Engineers are at the heart of every engineering business – maximising their potential is vital for business success.

Engineering businesses rely on engineers with problem-solving skills and technical expertise to design, develop and deliver projects, products and services and drive innovative thinking. The need for EDI is more pressing than ever against the backdrop of the UK engineering skills gap and growing competition for talent. By prioritising EDI, engineering businesses are better positioned to attract a wider pool of applicants, retain talent from diverse groups, foster that talent and create a more positive and productive environment for their workforce, which draws on varied perspectives and skills.

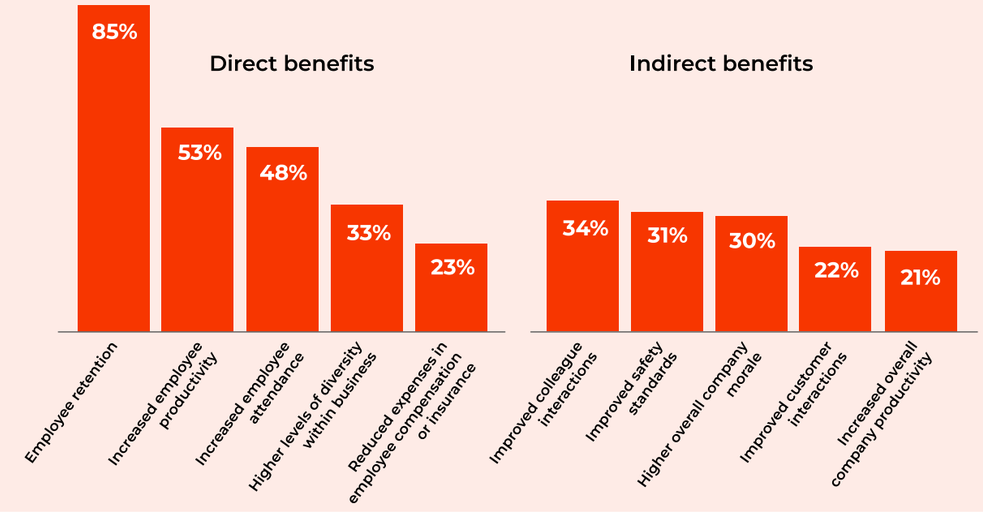
> "There is a shallow talent pool, so we have to widen the net and invest in future talent"
>
> – Carl Hickson, bp [45]

Spotlight: Making accommodations for disabled people improves staff retention and productivity

In a US survey of 3,528 employers across industries and business of different sizes, employers reported that making accommodations for disabled employees (as required by law) enhanced the experience and performance of these employees. Among employers who implemented accommodations, 85% indicated they were able to successfully retain disabled employees, while 53% observed that accommodations increased the productivity of disabled employees. These benefits extended to businesses' operations and their overall workforce. After making accommodations, 34% of employers reported improved interactions among colleagues and 31% reported improved safety standards. These accommodations were relatively low cost; almost half of employers reported no expenses while recurring accommodations had a median yearly cost of $3,750.

Source: 1) Workplace accommodations: low cost, high impact, JAN, 2023

Figure 6 **Share of employers who made accommodations for disabled employees that reported benefits**



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Spotlight: To create an inclusive environment for diverse employees, Stantec supported Employee Resource Groups (ERGs) and introduced accommodations for neurodivergent and disabled employees

Stantec is a global engineering consultancy, offering services across areas such as engineering, interior design and architecture. In the UK, it has around 3000 employees and works with 2000 clients.[1]

In 2021, Stantec began developing an IDE (Inclusion, Diversity and Equity) strategy in the UK and Ireland (UK&I). As a part of this, the company supported the establishment and growth of Employee Resource Groups (ERGs) by dedicating financial resources and allocating staff time to them. Stantec now has 72 ERGs globally, for a range of groups. In the UK&I these include Women@Stantec, Pride@Stantec, Neurodiversity@Stantec, Persons with Disabilities (PWD)@Stantec, Military and Veteran Advocates (MAVA)@Stantec and Reach@Stantec, an overarching ERG dedicated to IDE.[2] The ERGs aim to foster a supportive environment for diverse employees and raise awareness about their needs through initiatives such as Coffee Collectives, webinars and learning sessions.

Stantec also offers accommodations to remove barriers for all employees throughout the employee lifecycle. For example, job applicants can ask for disability or neurodiversity-related adjustments at any point during the interview process, and this is made clear via job adverts and webpages. During staff onboarding, Stantec supports employees to discuss adjustments and records these in an "Employee Passport."[3]

Stantec reported that the ERGs and accommodations for staff have helped to foster an inclusive work environment. In Stantec's 2023 global employee engagement survey, which measures a range of dimensions to understand staff involvement and enthusiasm in the workplace, "inclusion" was the highest-performing dimension, with Stantec outperforming peer organisations on this metric.[4] Stantec's disability smart accreditation[5] self-assessment score also improved to 50% from 21% in one year, and the company conducted a Neurodiversity Smart Accreditation assessment, to understand how neurodiversity smart the business is and identify areas for improvement.[5] The company also reported that the interventions contributed to attracting diverse talent. For example, a number of recently hired employees said that Stantec's support for the neurodivergent community was one of the key reasons they joined the company.[6]

Sources: 1) About, Stantec, 2) Stantec Employee Resource Groups, Stantec, 3) Dalberg Interview, Stantec, March 2024, 4) Ibid., 5) A disability management audit developed by the Business Disability Forum to help organisations understand how well they are performing when it comes to disability inclusion, 6) Dalberg Interview, Stantec, March 2024.

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Talent attraction

Job candidates care more about EDI than ever before.

A global study of job candidates across professions found that 86% consider diversity, equity and inclusion in the workplace "critically important."[46] First impressions last, and businesses' EDI efforts can affect candidates' perceptions from the moment they start their job search. Acknowledging and adjusting business policies to cater to a wider range of candidates' needs, and embracing EDI initiatives, such as flexible working arrangements, can help businesses cast a wider net, attract talent and close the skills gap.

Research on nearly 4,800 employees spanning multiple industries revealed that 61% of women and 49% of men employees research businesses' leadership diversity. Compared to other professions and sectors, these factors were considered the most important for women in engineering and construction (79%), and in industrial manufacturing (71%).[47]

A company's commitment to EDI can also affect candidates' decisions. A survey of engineers revealed that 81% consider diversity as an important factor when choosing an employer.[48] Similarly, about two-thirds of women and men seek positive role models at an organisation, when deciding whether to accept a position. This is especially important to women working in engineering and construction – 82% report that the presence of role models informs their decision.[49]

EDI can even be a decisive factor. A global survey of 3,100 professionals found that almost two-thirds of employees would decline a job offer from an organisation that doesn't endorse diversity.[50] This sentiment is especially strong among Gen Zs and millennials[51], who actively look to align their career choice with their values. Thirty-nine per cent of Gen Zs and 34% of millennials have turned down employers due to value conflicts, according to a global survey of over 14,000 participants.[52]

"Having a diverse team enables individuals to envision themselves working in the company"

– Daniel Stewart, ViridiCO2[53]

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Spotlight: Businesses that adopt EDI initiatives are better positioned to attract a wider range of candidates

When applying for jobs, applicants are motivated by a range of priorities. A study of 13,382 individuals found that the share of job applicants who are motivated by "traditional" rewards, such as compensation and career advancement opportunities, has fallen. Lifestyle changes and major events like the COVID-19 pandemic have caused a shift in attitudes, meaning that more people have a wider set of career motivations, such as doing meaningful work, having workplace flexibility and receiving wellbeing support. Younger workers (aged 18-24) in particular value diversity in the workplace and belonging to an inclusive and welcoming community. Acknowledging and adjusting business policies to cater to a wider range of candidates' needs, and embracing EDI initiatives, such as flexible working arrangements, can help businesses cast a wider net, attract talent and close the skills gap.

Source: 1) The Great Attrition is making hiring harder. Are you searching the right talent pools?, McKinsey & Company, 2022

A focus on EDI widens the available talent pool and makes engineering businesses more attractive to candidates.

With the rising demand for EDI at work, businesses can stand out and attract more applicants. For instance, the Northumbrian Water Group (NWG) saw a 49% increase in overall job applications between 2022-2023. This came after implementing its Together for Inclusion, Diversity and Equity Strategy (TIDE) in 2022.

NWG received a record number of applications from underrepresented groups – applications from women and people from Black, Asian and minority ethnic backgrounds increased by 15% and 10%, respectively.[54]

EDI strategies can also prompt businesses to extend their recruitment efforts beyond conventional channels and identify highly qualified candidates that may have fallen through the cracks.[55] For example, to hire more diverse candidates, The Fire Surgery (a fire engineering consultancy with 15 employees) expanded its university outreach program to engage students across a wider range of universities. They currently have a 60:40 gender split, with nine women and six men at the company.[56] Another company, the BT Group, attracted 300% more women to engineering roles after updating their job postings to incorporate gender-neutral language.[57]

For SMEs and start-ups, a focus on EDI can be a competitive advantage.

SMEs and start-ups often have limited resources for recruitment events, apprenticeships and marketing. By showcasing their EDI efforts, such as flexible work policies or a commitment to inclusive design, SMEs and start-ups can stand out to candidates in a competitive landscape.

An experiment in the Netherlands found that start-ups, including those in engineering and information technology, with a higher representation of women were more likely to gain interest from applicants who were women. When fewer women were represented, women were significantly less interested in the opportunity compared to men.[58]

By adopting more inclusive recruitment practices, businesses can also make better hiring decisions.

Fair and robust hiring processes can improve candidates' experiences, help businesses find high-quality candidates and reduce the risks of staff turnover. When implicit biases such as stereotyping, selection bias and in-group bias go unchecked, they can cloud decision-making during recruitment and lead to worse hiring decisions.

For instance, unconscious bias may favour candidates based on 'culture fit', who share similar backgrounds or thinking patterns, but aren't necessarily the most qualified.[59] When businesses introduce interview processes that minimise bias, such as standardised interview questions or anonymised resumes, they're better equipped to assess applicants' potential objectively and hire candidates based on their skills.[60]

Given the high costs of recruiting a new employee – averaging from £1,500 to £3,000 (sometimes even more for senior roles) – hiring the right people, with the right skills is critical.[61] The cost of getting hiring decisions wrong is even higher for smaller businesses and start-ups, as recruitment activities can take up a greater share of resources and divert attention away from revenue-growing business activities.[62]

> "Small businesses have to compete for talent, who want to work at a place that reflects their values and does meaningful work."
>
> – Kathryn Dewell, Civic Engineers[63]

Spotlight: Inclusive and fair recruitment processes can enhance the overall experience for job applicants

The job application process is often an applicant's first point of contact with a company – making an impression counts. IGNYS, an electronics design and software engineering consultancy, shares an interview guide with applicants before their interviews to help them feel prepared and manage their expectations during the recruitment process. This attempts to mirror the real-world process in which engineers are often given their tasks ahead of time before starting a project. Interviewees are also given detailed directions on reaching the office, improving accessibility. According to IGNYS, the business has received positive feedback from applicants on the interview process.[1]

Source: 1) Dalberg interview, Ignys, December 2023

Talent retention

Equal, diverse and inclusive workplaces are also better equipped to retain engineering talent.

Employees are more incentivised to continue working in and contributing to their firms when EDI measures are in place. Women in architecture, engineering and construction are less likely to leave their jobs when their workplace is inclusive. This is because they're well-integrated and can meaningfully contribute in the workplace, with turnover intent over 1.5 times higher among women in exclusive working environments.[64]

According to a UK study across industries, almost half of neurodivergent employees who received tailored adjustments from employers (for example, text-to-speech software and changes to noise levels), expressed a strong desire to stay at a company, compared to under one-fifth of those without adjustments.[65] EDI efforts can also affect retention at different career stages.

Among senior management, research on 365 executives in large US public firms revealed that women executives were less likely to leave their firms when their CEOs were perceived to value diversity, as they experienced higher levels of psychological safety.[66] Among younger employees, a survey of Gen Zs and millennials found those who consider their firm diverse are 42 percentage points more likely to stay beyond five years than those who consider their firm not to be diverse.[67]

Staff satisfaction and productivity

Fundamentally, integrating EDI boosts overall staff satisfaction.

By prioritising EDI, businesses can cultivate an environment where employees feel valued, respected and included. This can enhance the wellbeing of the overall workforce. According to a Gallup Survey of over 40,000 employees across the US, those who reported feeling included at work were more engaged than their counterparts who didn't feel included.[68] A study of 1,863 employees in a US State Government agency found employees who believe the agency prioritises diversity also feel a greater sense of belonging and pride.[69]

Further, in a survey of 3,528 US employers across industries and company sizes, 30% reported that overall company morale improved after they made accommodations for disabled employees, while 21% reported higher overall company productivity (Figure 6).[70] These benefits extend to engineering businesses.[71] For example, after introducing their first Diversity and Inclusion strategy, NWG reported their staff satisfaction score increased to 77% in 2023 – up by 7% from 2022.[72]

Similarly, WSP, an engineering consultancy company, saw a steady improvement in their net promoter score (a metric measuring how likely employees are to recommend an organisation to others as a place to work).[73] And Peakon Employee Voice measures (which captures employee sentiment) increased from 8.0 to 8.2 after launching their Global Inclusion and Diversity strategy.[74] Finally, by adopting an EDI agenda, businesses also signal that they recognise underrepresented employees' needs, which can improve their experience at work.

In turn, a focus on EDI contributes to higher staff performance and productivity, including among engineers.

According to a global study of over 1.5 million employees and 80,000 business units, employee satisfaction is positively related to higher productivity. Higher levels of wellbeing increase staff motivation to do well and lead to positive shifts in attitudes and behaviours.[75] To enable a diverse workforce to thrive, an inclusive environment is crucial. This is apparent in engineering.

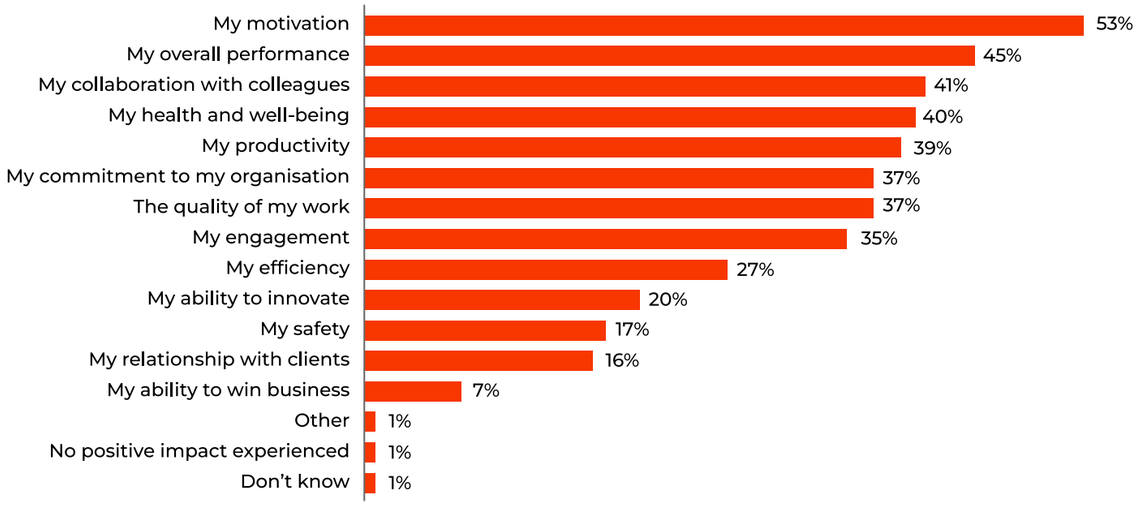
In a Royal Academy of Engineering survey of over 1,500 engineers in the UK, respondents said feeling included at work improved their motivation, performance, collaboration and productivity, among other benefits (Figure 7).[76] A study of the Australian Architecture, Engineering and Construction sector found that women working in inclusive workplaces have a 15% higher level of career satisfaction compared to counterparts working in exclusive ones.[77]

Across industries, teams with inclusive leaders – who make employees feel respected, valued and that they belong – are 17% more likely to report high performance, 20% more likely to say they make high-quality decisions and 29% more likely to report working collaboratively.[78]

> "Having a diverse team strengthened our product and better equipped us for user interactions. This saved us time, resources and increased our overall productivity."
>
> – Peter Mountney, Odin Vision[80]

> "If you have a diverse workforce without an inclusive culture, diversity won't work."
>
> – Luke Ives, Arup[81]

Figure 7 **Engineers report a range of improvements from feeling included at work (% of engineers)** [79]



Source: Cultural inclusivity in engineering, Royal Academy of Engineering, 2023

PRODUCTS AND SERVICES

More inclusive, adaptable and innovative products and services

Prioritising EDI enables businesses to develop products and services that meet a wider range of end user needs.

In engineering, embedding inclusivity throughout the design and development of solutions is essential. By considering the needs of a broad spectrum of users, engineering businesses can create more effective, inclusive and safe products and services. And they'll be able to reach a larger market and increase revenue.

Inclusive design happens when products or services are made in a way that's accessible to and usable by as many people as reasonably possible.[82] This process can bring a range of benefits. It enables businesses to address the needs of diverse groups, opening doors to new markets and customer segments that have been historically overlooked.

For example, inclusive solutions can cater to the UK's ageing population and the one in four people who report they are disabled.[83] By 2038, the UK population over 60 is projected to increase by 32%, versus 8% growth of the overall population.[84] Looking ahead to 2040, older households are expected to spend £550 billion annually, surpassing the projected spending of younger households by £221 billion.[85] Addressing the needs of older populations therefore presents a growing market opportunity.

Meanwhile, more than half of disabled people face difficulties accessing services, compared to 22.1% of non-disabled people.[86] Failing to address these needs is a missed opportunity for businesses – the spending power of disabled people and their families is estimated at £274 billion.[87]

By embracing inclusive design and developing products and services that cater to a range of end users, engineering businesses can not only better serve these populations but also transform missed opportunities into tangible gains.

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Spotlight: Considering the needs of older adults can lead to more tailored caregiving solutions

Misconceptions about older adults, particularly their resistance to technology, have led to a major gap in the caregiving market. For instance, 52% of older people in the UK are willing to embrace health technology, but only 2% of GPs would recommend technology care solutions to the same group. This has left many without access to technological solutions that could significantly improve their lives. Recognising this problem, David Grey, the primary carer of his grandmother with Alzheimer's, founded GG Care. GG Care is a virtual care companion powered by Amazon Alexa for older adults and people living with dementia. GG Care simplifies everyday tasks through Interactive Reminders (IRs), which break down complex tasks into easily digestible steps using questions, prompts, and hints. By integrating inclusive design from the get-go, GG care has developed a new, innovative solution that demonstrates the power of identifying and addressing unmet needs. In recognition of this, GG Care was awarded Innovate UK's Inclusive Innovation award in 2022/2023. This will allow the team to capitalise on the learnings from their recent user testing.[2]

Sources: 1) The Daily Telegraph features ORCHA research, ORCHA, 2021, 2) Dalberg interview, GG Care, December 2023

Spotlight: Innovating for sound accessibility can enhance customer experiences and engagement in public spaces

80% of individuals who need hearing aids abandon them due to discomfort and usability issues.[1] These issues are heightened in public spaces which, often, are not designed to cater to people who are noise sensitive. As a result, 86% of adults with noise sensitivity aged 20-40 have left a venue because of noise, with 70% never going back to the same venue. Once noise levels reach above 62 decibel, their appetite for spending drops by 75%.[2]

To tackle this issue, Marion Marincat launched Mumbli after losing 80% of his hearing. The start-up developed an innovative product that improves audio accessibility and enables noise-sensitive individuals to comfortably socialise in public spaces. Using sound monitoring sensors, Mumbli works with venues and event spaces to adjust their noise levels, make them more accessible and cater to a wider range of customers.[3]

By serving 30% of the population who are noise-sensitive, Mumbli's solution taps into a large and unaddressed market. Mumbli's clients include Sofar Sounds and the Queen Elizabeth Olympic Park, and they have been recognised by the World Health Organization. In 2022, they won Innovate UK's Inclusive Innovation award to further test and refine their solution.[4]

Sources: 1) Adoption, use and non-use of hearing aids: a robust estimate based on Welsh national survey statistics, Dillon et al., 2020, 2) Dalberg interview, Mumbli, December 2023, 3) Ibid., 4) Mumbli, Innovate UK

Spotlight: HS2 Old Oak Common Station intentionally considered the needs of diverse travellers to enhance their experience

For many disabled people, train stations can be daunting labyrinths that fail to cater to their needs. According to a 2019 government report, 21% of persons with self-reported disabilities reported that they anticipate challenges, such as navigation issues, when travelling by rail.[1]

To improve the experiences for all travellers at HS2 Old Oak Common train station, a design team led by engineering consultant WSP, supported by WilkinsonEyre Architects, Mima and David Bonnett Associates (an Inclusive and Access Specialist Sub-Consultant) conducted accessibility trials using a new technology combining Virtual Reality eye-tracking and emotion-sensing. Participants with both visible and invisible disabilities were asked to navigate around the train station and WSP's innovative technology tracked potential challenges throughout the participants' journeys, to identify adjustments to improve their experience[2] User-focused feedback from the trials will continue to feed into the development of one of the largest stations to be built in the UK, to ensure it is accessible and inclusive to all travellers.[3]

Sources: 1) Research on experiences of disabled rail passengers, UK Government, Department for Transport, 2019, 2) Virtual reality brings HS2 Old Oak Common to life, pbctoday, 2021, 3) Equality, Diversity and Inclusion Annual Report 2022-2023, HS2, 2023

In turn, more inclusive products and services enable businesses to address unmet needs and tap into new or larger revenue streams.

Inclusive products and services that consider a wider range of users can reach up to four times the number of customers than their originally intended target group.[88] This is because they embrace a truly broad range of end users and enable people with multiple intersecting identities to share the same consumer experience.

Underrepresented groups are no longer considered 'niche' users, but are integral to the design and development process. This can bring a range of commercial benefits for businesses. By designing solutions that meet a broad spectrum of needs, inclusive design can enhance end users' experience, leading to improved customer loyalty and retention. This is reflected in the 94% of consumers who are loyal to companies that deliver a consistently good customer experience.[89] This can then generate knock-on financial benefits for companies. As the examples on the following page showcase, inclusive design does not require a trade-off. It can often lead to better products that accelerate business success.

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Spotlight: One of the world's top selling cars is an example of inclusive design

The 1999 Ford Focus car was developed to consider a wide range of customers.[1] To meet the needs of people of all ages, the car was designed to improve access for older drivers and passengers, while simultaneously catering to younger adults.

So the car designers themselves could better understand how different groups would interact with the car, they wore "Third Age Suits" that simulated a range of impacts of ageing, including hearing loss, visual impairments, stooped posture and impeded flexibility. This prompted designers to make adjustments, such as an elevated seat height, which was rare at that time. Since then, the Ford Focus has become one of the world's top selling cars and other carmakers have adopted similar accessibility features. These adjustments were made without compromising on the comfort and convenience of younger users.[2]

Sources: 1) Inclusive Design Toolkit - Other case studies, University of Cambridge, 2) Inclusive design. Why it matters., Innovia, 2016

Spotlight: Making mobile images more accessible to a wider audience is linked to increased sales

Direct images and captures often fail to clearly convey crucial details of sales products on small mobile screens. This becomes a particular challenge for visually impaired users who rely on clear information to understand the 4Ws of a product: Who is the brand? What is the product? Which variety is it and hoW much of it is there?

To make mobile images more accessible to a wider audience, including people with visual impairments, Mobile Ready Hero Image Guidelines were launched to help consumers on mobile e-commerce websites spot differences between products by conveying the brand, type and amount of product within the constrained space of a mobile phone screen. A/B split testing results showed that products with mobile-ready images received a 20% sales uplift in eight weeks. Brands such as Ben and Jerry's experienced a 3.6% sales uplift in the UK in 2018.[1]

Source: 1) Mobile ready hero image guidelines: evidence of hero image benefits, University of Cambridge

When engineers incorporate EDI considerations in the development process, they can also address potential business risks and costs.

Products and services that consider diverse needs early on are often more durable[90] and are less likely to require expensive design adjustments or retrofits to meet the needs of excluded individuals.[91] Incorporating inclusive design later in a project is more expensive, less sustainable, and can often lead to delays, especially when changes require new regulatory approvals.[92] Changes made after a product is released can cost as much as 10,000 times more than changes made during the conceptual design phase.[93] Costs at that scale have the potential to make or break businesses and can have outsized impacts on SMEs and start-ups. For example, the CEO and Co-Founder of WeWALK (a start-up that developed a smart-cane for visually impaired people), emphasised the importance of addressing diverse user needs early-on, due to high upfront hardware development costs. He noted that re-designing the smart cane hardware would have cost them almost half of the total project costs, putting the start-up's survival at risk.[94]

> "It [is] very hard and expensive to resolve design issues when you have a product – this is why it's so important to embed diverse users from the beginning."
>
> – Gökhan Meriçliler, WeWALK [95]

EDI also ensures that the needs and wants of a wider population, including underrepresented groups, are embedded in the development of products and services.[96]

Diverse teams are a key step towards building more inclusive products and services. When team members bring a range of experiences, abilities and perspectives they are better equipped to understand and address the diverse needs of end user groups.[97] This enables them to catch potential design flaws and develop solutions that are more tailored to a wider range of end users.[98] For example, a wheelchair user can draw from their lived experiences and contribute ideas to improve the design of a building, to make it more accessible. Embracing inclusive design leads to a positive feedback loop – it can encourage businesses to build diverse teams that bring different experiences, abilities and perspectives, who then develop more inclusive solutions.[99] Even if a team does not represent the full spectrum of end users, engaging a truly representative group of end users and experts at each stage of the product development process – from research to design to testing to development – can close potential design gaps and spur the development of more inclusive products. Engaging with end users themselves can surface insights that risk being overlooked. Failing to do this can be detrimental, as illustrated by the example of car designs that overlooked women (See spotlight on page 40).

> "A design process seeking to include the disability community should focus on employing disabled people as equal participants."
>
> – Fast Company, 2021 [100]

> "If you have a more diverse design team, you automatically have a more diverse set of experiences to bring to the design process."
>
> – Joanna Bonnett, COWI [125]

> "There is an opportunity to change, to move away from treating EDI and engagement with communities as a 'tick box' exercise. This should be an integral part of the process, to make sure that our working culture, and the solutions within our projects, are inclusive and embedded in lived experience."
>
> – Mei-Yee Man Oram, Arup [101]

Ultimately, EDI fuels innovation and enables businesses to enhance their products and services.

By embracing EDI, engineering businesses can simulate creativity, enhance problem-solving and unlock innovation. Engineers with different backgrounds and lived experiences bring their own approaches to the table.[102] Diverse teams are therefore uniquely placed to solve complex, multifaceted problems and generate new ideas. A study of 1.2 million US doctoral recipients in science over three decades, found that scientists from underrepresented groups innovate at higher rates than their counterparts in majority groups. Yet these innovations are often undervalued – for instance, novel contributions by gender and ethnic minorities are taken up at a lower rate. Recognising and valuing all individuals equally is therefore crucial to unlocking innovation.[103] Across the board, interviewees consistently mentioned that embracing EDI enabled their teams to develop more robust, effective engineering solutions.[104]

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Spotlight: Failing to consider women in car design exposes them to greater safety risks

In an example of key user needs being overlooked, crash-test dummies have been designed to cater to the "average" male. Since the 1950s, crash-test dummies were designed with the 50th-percentile man as a reference. This meant that car safety tests did not account for women's body measurements and exposed women to higher risks when driving. As a result, women have a 47% higher probability of sustaining serious injuries and are 17% more likely to die in a car crash compared to men.[1]

Source: 1) The deadly truth about a world built for men – from stab vests to car crashes, Perez C, 2019

A range of studies showcase the benefits of EDI initiatives for products and services. For instance, a study of manufacturing firms in Turkey found that improvements in a team's demographic diversity resulted in higher levels of originality and novelty in new products.[105] According to an analysis of the '100 Best Companies to Work For' in the US, the average EDI scores of professionals (including Research & Development staff and technical professionals) are positively linked to the number and quality of patents. More diverse and inclusive teams[106] had more than double (121%) the patent citations of non-diverse teams.[107] Finally, a study of 1,681 companies across eight countries found that companies with a more diverse workforce were more innovative.[108] It found that companies with above-average diversity scores got 19 percentage points more revenue from new products and services compared to companies with below-average diversity scores.[109]

"Innovation comes from a breadth of opinions and ways of solving a problem."

– Peter Mountney, Odin Vision[110]

"Even though diversity could bring in more debates and disagreements, a diverse team makes for richer conversations and different ideas, which ultimately contributes to better products in the long term."

– Matt Bird, Supercritical Solutions[111]

"Engaging a range of end users from the beginning, allows you to identify problems early-on, refine your design and develop more innovative products that work for everyone."

– Abi Hird, Defankle[112]

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To fully harness the benefits of diversity, businesses must cultivate inclusivity and openness.

Unlocking the potential of engineering teams requires more than bringing different people together. It's crucial to foster an inclusive and open environment where everyone feels safe to share their unique ideas.

This is what a study of pharmaceutical drug development teams found. Diverse teams (across dimensions such as gender, age, tenure and functional expertise) were more innovative, but only when they felt psychologically safe, meaning they were comfortable speaking up, sharing different perspectives and learning from each other.[113] Therefore, building a diverse team is only the first step. Businesses need to cultivate an environment where everyone feels valued and heard. This helps teams overcome potential challenges in businesses with moderate levels of diversity, where people with similar backgrounds prefer to work together. When teams are truly diverse and inclusive, they can stimulate more creativity and innovation.[114]

PARTNERS

Enhanced customer engagement and increased investment

EDI can give businesses a competitive advantage – consumers are more likely to engage with companies that align with their values.

Consumers are increasingly conscious of their consumption patterns and are more likely to buy goods and services from businesses with strong reputations for EDI. This is especially relevant for consumer-facing engineering businesses. Over half of UK consumers say that a brand's diversity and inclusion practices affect their purchasing decisions.[115] A global study of 11,500 consumers revealed that young adults (18-25) are especially conscious of this. When buying automotives, household equipment, or financial services, approximately one-third of young adults considered whether companies used inclusive marketing when making purchasing decisions. In the US, participants from ethnic minority backgrounds were up to 2.5 times more likely to recognise brands that actively encouraged diversity when making purchase decisions.[116] By showing a commitment to EDI, companies can build customer loyalty and boost their brand reputation.

EDI matters more than ever for clients – when working with the public sector, it's a necessity.

EDI principles are embedded throughout the public procurement process and are increasingly considered during evaluation. In accordance with the 2010 Equality Act, the UK public sector is required to comply with the Public Sector Equality Duty when conducting procurement.[117] Many government tenders include an EDI section and the Social Value Act requires public authorities to consider social, economic and environmental impacts when procuring goods and services.[118] Having a robust EDI policy can improve engineering businesses' tender scores and increase the likelihood of securing government contracts. For engineering firms that work with the public sector, EDI is no longer a nice-to-have, it's a necessity.

Spotlight: HS2 sets a high bar for EDI among its suppliers

High-Speed 2 (HS2) is a high-speed railway project that aims to connect major cities in the UK. HS2 has awarded £23.7 billion worth of procurement contracts.[1] In building a robust supply chain, HS2 has included EDI considerations as a key pillar within its evaluation framework for supplier assessments.[2] 90% of their suppliers hold external accreditation in EDI.[3] HS2 also encourages Tier 1 suppliers to apply the same evaluation framework to their own procurement activities.[4] As of 2023, HS2's total corporate expenditure on businesses owned by women, ethnic minorities and disabled people amounted to a total of around £177 million.[5]

Sources: 1) HS2 Ltd Corporate Plan 2023 – 2026, HS2, 2022, 2) Supplier guide, HS2, 2020, 3) Our Equality, Diversity and Inclusion Work, HS2, 4) Supplier guide, HS2, 2020, 5) Equality, Diversity and Inclusion Annual Report 2022-2023, HS2, 2023

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To engage commercial clients, it's becoming more important for engineering companies to show a commitment to EDI.

Corporates are paying more attention to their contractors' and suppliers' EDI commitments. Civic Engineers noted that in 2023, 68% of their client bids in 2023 required information on EDI procedures, compared to only 42% in 2021.[120] Many place a strong emphasis on supplier diversity and look to procure from other businesses that are majority-owned and operated by individuals from underrepresented groups.

Approximately 60% of 178 corporates represented in the S&P 500, FTSE 250 and FTSE 100, mentioned they're establishing and expanding supplier diversity programmes.[121] For example, IBM requires their first-tier suppliers to report their own spending on diverse suppliers.[122] Similarly, property developer CBRE has pledged to spend $1 billion with diverse suppliers in 2021, and to grow this spend to at least $3 billion in five years. In doing so, they plan to increase partnerships with businesses that are owned by underrepresented groups.[123]

In light of this trend, engineering businesses that embed EDI have a competitive advantage. For example, WSP noted an instance where a client provided positive feedback on a pitch where they specifically underscored the diversity of WSP's team.[124]

> "Asks [from customers] are becoming more complex and sophisticated. EDI is not just a nice-to-have, but needs to be embedded in decision making."
>
> – Luke Ives, Arup [130]

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Beyond encouraging workforce and supplier diversity, many clients expect contractors to embed inclusivity in their products and services.

Clients increasingly recognise the value of inclusive design in engineering and are placing more weight on it. In response, several engineering firms have established dedicated inclusive design practices. According to an interviewee at the engineering company, COWI, although EDI considerations may not always be explicitly stated in project briefs, they' re often considered during the project consultation phase.[125]

Stakeholders at other engineering companies also mentioned that their clients have asked them to show how they plan to account for diverse users and communities in project delivery.[126] Civic Engineers highlighted an instance where a client worked with a dedicated accessibility contractor who advised on inclusive design for a building project. For example, they developed doors with distinct colours from the rest of the building to make them more visible to people with visual impairments.[127]

Another engineering consultancy, Arup, had a client who held regular performance reviews related to EDI to hold businesses accountable.[128] Even when clients don't explicitly impose EDI requirements, when companies proactively embed EDI, they can develop solutions that better serve their clients. For example, Arup worked with a hotel chain who initially doubted the need for accessible rooms due to a perceived lack of demand. After reviewing the rooms, Arup found the cause of this: The rooms were not catered to disabled guests. They then designed accessible rooms and adapted them to maximise flexibility for different needs. This opened up the hotel to a wider customer base.[129]

By considering a range of end users and lived experiences, engineering businesses can better anticipate end user needs. They can also develop solutions more fit for purpose, improving client experiences.

> "Most local authorities, particularly in London, place a large emphasis on ethnic balance in particular. But EDI is a common quality consideration on most bids now with the big corporates. It was a criterion on a large bid we just submitted."
>
> – Kathryn Dewell, Civic Engineers

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Investors are also placing more emphasis on EDI when making investment decisions.

Despite inflationary pressures and cost of living concerns in the UK, investors agree that Sustainable and Responsible Investment (SRI) continues to be a dominant theme for investors and is likely to build over the long term.[131] They increasingly expect investees to meet Environmental, Social and Governance (ESG) requirements, including EDI targets.

Beyond the UK, a global survey of investors found that 78% want companies to prioritise ESG improvements, even if it affects their short-term profits.[132] Another survey of 185 private equity firms, revealed over half of firms collect or will collect EDI data from their portfolio companies.[133] Meanwhile, in the US, the number of venture capital firms requesting EDI information from their portfolio companies doubled between 2018 and 2022.[134]

In the public markets, shareholders have become more vocal about EDI. In 2021, a record number of EDI-related shareholder proposals were filed and supported, such as requests for companies to conduct EDI audits, progress reports and policies.[135] In 2023, diversity was one of the top five most popular shareholder proposal topics.[136]

Against this backdrop, engineering companies report that their investors and company boards are paying more attention to their EDI achievements.[137]

Although there's still a gender bias against funding women-led companies,[138] a growing number of investors expect their investees to prioritise EDI.

ViridiCO2, a chemical engineering start-up that converts carbon dioxide into high-value chemical intermediaries, recently raised £3 million from the EQT Partners. To secure the funding, ViriCO2 had to develop an EDI policy as a prerequisite for investment.[139] Another start-up, WeWALK believed that their EDI policies and inclusive product helped them raise funding.[140] For one of their investors, Nesta, the lived experience of WeWALK's team and their product's alignment with Nesta's impact thesis were key reasons why they invested £750,000 in the company.[141]

EDI commitments are also tied to grant funding. For example, Innovate UK, the UK's national innovation agency that runs the Inclusive Innovation awards, requires all applicants for their Investor Partnership Programme to meet certain EDI requirements.[142] Not all investors prioritise EDI yet, but this trend is shifting rapidly. As more funders embrace EDI, engineering firms relying on external funding need to keep up.

This trend is reinforced by growing regulatory pressures on businesses to meet EDI requirements. In the UK, Regulatory bodies, including the Financial Conduct Authority (FCA) and The Pensions Regulator (TPR), are raising the standards for companies to embed EDI. For example, the FCA issued new 'Listing Rules', whereby listed companies are required to report on women and ethnic minorities' representation on their boards and executive teams, and explain why targets haven't been met so investors have a clearer picture of diversity within senior leadership.[143]

Companies and investors alike are now more accountable for meeting rising EDI standards. In turn, they're likely to demand more from their partners and investors, creating ripple effects for engineering companies that will face growing pressure to advance EDI.

PROCESSES

Enhanced operational excellence and reduced costs

EDI can help engineering companies better manage risks, including health and safety.

Businesses have an obligation to uphold health and safety (H&S) standards. This is paramount in many engineering sectors, particularly those that are risk-prone where engineers and other workers spend time on-site or working with machinery. So companies can safeguard the H&S of their employees, it's vital they foster an inclusive, open environment where people feel psychologically safe and comfortable reporting safety concerns and incidents without fear of reprisal.

EDI is integral to establishing psychological safety – overlooking it can have serious consequences. A survey of 1,494 people across industries in the US found that employees who felt psychologically unsafe were 80% more likely to report that they'd been injured at work than those who felt psychologically safe. Employees who believed their employers discouraged reporting were more than twice as likely to have experienced a work injury.[144]

From a financial perspective, safeguarding H&S can also avert costs from accidents. In 2018/19, the average penalty for health and safety violations was £150,000 and the total sum of fines issued was £54.5 million.[145]

Improving EDI can also help businesses avert costs associated with legal disputes.

Between 2022 and 2023 the compensation thresholds for discrimination claims in employment tribunals saw their biggest year-on-year increase. Minimum compensation thresholds rose from £990 to £1,100, while the maximum compensation levels rose from £49,300 to £56,200.[146] In 2022/23 the highest compensation awarded at a tribunal was £1.77 million for a disability-related discrimination case.[147]

Besides compensation, businesses also incur other related costs. A FTSE company estimated that preparation for a discrimination tribunal cost them £125,000 in management and legal time.[148]

Beyond the financial costs, getting EDI wrong can permanently damage a business' reputation. Prioritising EDI is the right thing to do for staff wellbeing and it helps prevent long-term financial and reputational damages.

EDI can also bring operational advantages. Encouraging supplier diversity can enhance the efficiency and resilience of engineering businesses' supply chains.[149]

When businesses widen their pool of suppliers, they can foster competition between suppliers, improving their product quality and reducing costs. In turn, supplier diversity can make supply chains more agile and resilient.[150] When IBM first implemented its Global Supplier Diversity Program in the US over 50 years ago, it saw a range of domestic benefits such as cost reductions, improved brand appeal and revenue increases. This motivated the business to expand the program globally in 2004.[151]

According to IBM, establishing a diverse supplier network increased their ability to assess and implement different approaches, giving the company a competitive advantage.[152] A study in the US revealed companies that engaged with minority-owned and women-owned business enterprises (MWBEs) reported annual cost reductions of 8.5%.[153] By working with diverse suppliers, businesses can boost their commercial performance, generating knock-on economic impacts.

> "If [we] don't have teams that are psychologically safe where they feel their opinions count, lives are potentially at risk."
>
> – Natasha Whitehurst, Rolls-Royce

Spotlight: Supplier diversity can bring commercial advantages, contributing to inclusive economic growth

Supplier diversity (the engagement of a wide range of suppliers, including minority-owned businesses) can bring business advantages and generate knock-on economic impacts. In 2019-2020, minority businesses contributed at least £74 billion to the UK economy, including £47.9 billion in employee salaries and £4.7 billion in post-tax profits. A 2019-20 study estimated that approximately one million of the six million UK businesses are minority-owned businesses.[1] They employ almost three million individuals, including 640,000 self-employed minority individuals.[2] When businesses purchase products and services from diverse suppliers, they can not only enhance their commercial performance but also support a significant portion of the economy. More importantly, they can drive economic growth while being inclusive. Supplier diversity, when combined with local sourcing, can also help businesses reflect the wider community in which they operate and lower businesses' carbon footprint, if applicable.

Sources: 1) Minority Businesses Matter, Legrain and Fitzgerald, 2021 , 2) ONS (2020), as cited in Minority Businesses Matter, Legrain and Fitzgerald, 2021

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Economic and societal benefits: EDI not only impacts engineering companies, but individuals, the engineering ecosystem and the wider economy

1. Greater justice and fairer outcomes for diverse engineers

Promoting EDI in engineering underscores the principle of equal opportunities and outcomes. This means all engineers, regardless of their background or differences, are equipped to thrive and succeed in their careers. Across the board, interviewees emphasised that embedding EDI is not only a strategic consideration but also a moral obligation. Over recent years, there's been a growing recognition of the importance of equality, diversity and inclusion. The expectation that companies prioritise it will only continue to grow with time.[154]

2. Sustained growth of the engineering economy

Advancing EDI in the engineering profession can lead to a more sustainable engineering ecosystem that can harness a highly-skilled workforce and culture of continuous innovation. Improved EDI has the potential to reshape the perception of engineering as a forward-thinking profession that reflects the diverse tapestry of the UK's population. The previous sections showed how EDI leads to stronger outcomes across the four 'P's. As a collective, businesses can build a happier, more satisfied workforce and adopt innovative practices resulting in greater knowledge-sharing. Ultimately, this creates a more sustainable and competitive engineering landscape.

3. Greater contribution of engineering to the UK economy

With collective action, mainstreaming EDI in engineering businesses can contribute to a stronger and more inclusive UK economy. By advancing EDI, companies have the potential to further boost their commercial performance and stimulate the growth of the engineering economy. As the engineering economy accounts for over 30% of the UK's economic output, this can have an outsized impact on the UK economy.[155] Further, inclusive design enables a broader range of people to make better use of engineering products and services, stimulating economic activity. For example, inclusive transport and infrastructure in a local area allows more people to engage in daily activities, such as visiting local businesses and attending community events. This can improve the economic yield of engineering investments and bolster local economies.[156]

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3. Spotlight on wins in engineering businesses – case studies

Case study 1

bp demonstrate how embedding EDI in product and service delivery can improve customer experiences

Image: bp

Company overview

bp is an integrated energy company delivering solutions to customers in 70 countries around the world. The company's purpose is to reimagine energy for people and our planet. Its sustainability frame translates that purpose into action and underpins its strategy. bp employs 88,000 people in 61 locations and is headquartered in London, UK.

EDI interventions

To improve EDI, bp introduced measures to make customer and employee experiences more inclusive:

Approach and policies

bp's sustainability frame introduced in 2020 sets out aims to 'get to net zero', 'improve people's lives' and 'care for our planet'.

Within this, bp is committed to achieving Greater Equity for its workforce through supplier diversity and by making customer experiences more inclusive. These are reinforced by a 'framework for action', to enhance transparency, accountability and action.

Within products and services

bp is introducing measures to ensure its mobility and convenience customers have an inclusive experience when they refuel or shop with bp.

In the UK, bp's measures include:

- **Adapting its experience design** through a partnership with fuelService, which allows disabled customers to call or message ahead of journeys to arrange assistance at bp retail sites.
- **Conducting comprehensive accessibility audits** of bp-owned retail sites through AccessAble (an accessibility guide) to inform improvements and provide customer accessibility data.

EDI actions

To implement EDI interventions, bp took a range of steps:

- **Established a measurable approach in fifteen countries** to gather feedback on the inclusivity/accessibility of customer experiences.
- **Completed accessibility audits of 300+ UK sites** which fed into publicly available insights reports about car parking, entrances, circulation and toilets to inform accessibility decisions during refurbishment programmes.
- **Extended its UK partnership** with fuelService to the US to offer inclusive experiences to a wider customer base, covering over 700 bp and Amoco US retail sites.
- **200 employees were assigned across bp** to make customer experiences more accessible and inclusive.

> "Time and again we are reminded that sustainability is simply good business. By making our retail offer more accessible to a wider population, we are delighted to welcome a larger customer base to our sites."
>
> – Tracey Clements, SVP Mobility and Convenience

Business outcomes

- **After bp introduced these retail accessibility interventions, it reported significant and growing customer usage.**
- **7,000 customers booked assistance through fuelService in the UK in 2023 (vs. 5,100 in 2022).**
- **The company also saw high levels of customer satisfaction: the average rating from customers who have used fuelService is 4.8 / 5.**
- **Since launching the "voice of the customer" programme (which provides insights on how inclusive customer services are) in July 2022, 88% of participating customers provided positive feedback about the accessibility of bp's retail sites and the services they received; they praised the fuelService offering, the accessibility of the sites and inclusive bp staff.**
- **In turn, this generates commercial benefits for bp. Making its retail experience more inclusive supports bp's ambition to double convenience gross margin by 2030 (from a 2022 base of $1.5 billion).**

Case study 2

Buro Happold saw an improvement in talent attraction and staff satisfaction after introducing EDI policies

Image: Maciek Lulko

Company overview

Buro Happold (BH) is an integrated consultancy of engineers, designers and advisers. The firm provides engineering consultancy, design, planning, project management, and consulting services for buildings, infrastructure, and the environment. BH has 3,000+ employees globally.

EDI interventions

To further embed EDI, in 2020 BH launched Equity Plans tailored to each region and introduced EDI measures:

Hiring

BH's job postings use inclusive language, applicants are asked standardised interview questions to reduce bias and are offered adjustments; hiring managers are trained on inclusive hiring practices.

Career progression

BH introduced measures to review promotion decisions, mitigate potential biases and enhance accountability in promotions.

Training & development

Development plans are being introduced for all staff, with a focus on developing women in leadership; BH monitors the share of women that attend the Leadership and Development (L&D) Programme.

Accountability

Leadership has EDI targets for its teams; L&D offerings have EDI outcomes woven into them; each region has its own Equity Plan with globally consistent EDI metrics, which are reviewed quarterly.

Pay equity

BH has been reporting on its UK Ethnicity Pay Gap for the past three years and is aiming to do the same for disabled and LGBTQ+ colleagues.

EDI progress

In 2023, BH reported a more diverse workforce and new inclusion metrics:

33% of their UK engineering workforce are women (and 26% of their leadership team).

16% of BH's UK employees are from minority ethnic groups, up from 9% in 2020; the share is lower at leadership levels (8%).

77% Global Inclusion index score * in its first Inclusion Survey in 2023.

BH's gender pay gap fell from 22% to 17.1% between 2018 and 2022, and its ethnicity pay gap fell for nearly all ethnicity groupings.

* A score representing the level of inclusion felt by staff in an organisation or a group within it.

"People are looking for inclusive organisations with a sense of purpose; if you don't prioritise and aren't authentic about EDI, you risk lagging behind."

Business outcomes

- **After BH introduced its Equity Plans in 2020, it reported improvements in talent attraction.**
- **BH saw a 400% increase in overall candidate applications, from 33,000 to 136,000 in a year thus broadening its candidate pool.**
- **The company also reported enhanced employee experience.**
- **BH's employee net promotion score, which measures how likely employees are to recommend a company as a workplace, increased by an average of 15% (from 2021-2023).**
- **Globally 85% of employees at BH report feeling respected at work and 82% feel they can be their authentic selves at work.**
- **More employees disclosed diversity information, indicating that they feel a greater sense of psychological safety.**
- **BH's demographic data declarations in the UK have grown to almost 80% of employees disclosing diversity information (up from 55% in 2018).**

Case study 3

Duku believes that its inclusive design approach enabled it to develop more user-friendly products that meet the needs of a range of end users

Image: Duku

Company overview

Duku is a product design consultancy that provides design-to-market, engineering and intellectual property services. Founded in 2013, Duku has designed over 500 products, from electronics to medical devices and consumer products. The company is based in Cheltenham and has 10 employees.

EDI interventions

Duku seeks to adopt an inclusive design approach by engaging a wide spectrum of end users at different stages of the product lifecycle:

Product design

Duku seeks to understand diverse users' lived experiences and needs; at the start of the project, Duku conducts interviews and questionnaires with an intentionally diverse range of end users to outline the goals and priorities of the project. For example:

- When designing an accessible Electronic Vehicles (EV) charging station, Duku interviewed 400 disabled drivers to understand the barriers faced.

Testing and product development

Duku tests products with a variety of potential end users. By conducting live user trials using prototypes, Duku observes real interactions, helping it identify how intuitive and practical the design is:

- When testing the EV charger prototypes, a variety of drivers tried the designs in electric cars and marked parking bays to create a real-world test environment.
- In an ongoing project in the marine industry, to include user testing, Duku has engaged nine organisations, groups and experts so far.

EDI progress

Duku reports that it has successfully embedded inclusive design across multiple projects:

- **60% of clients' initial project briefs mention inclusivity.**
- **80% of Duku's work includes inclusivity in the design brief** (a document outlining the project details) as Duku encourages its above-mentioned clients to include that focus within the initial design phase.

> "Duku guided us every step of the way throughout our collaboration. Without their support, bringing such a complex product to fruition would have been nearly impossible"
>
> – Duku client

Business outcomes

- **Duku's leadership believes that its emphasis on inclusive design enabled it to develop more innovative products. The company has received recognition from the Institution of Engineering and Technology (IET) and Innovate UK for its work.**
- **It has supported various clients to develop novel products, that embed inclusive design:**
  - **HangAIR, the world's first forward incliner designed for people suffering from respiratory illnesses, back pain, sleep deprivation or burnout; the primary objectives were comfort and adjustment to different body shapes and sizes.**
  - **Car boot mounted ramp system to allow storing of mobility scooters in a vehicle, for people with limited mobility, dexterity and strength.**
  - **Push-a-long toy car made from sustainable materials, for neurodivergent children to play outside more confidently.**
  - **Changing the design for disabled drivers to allow charging with one hand instead of two, led to an increase in disabled drivers' who would consider an EV from 25% to 61%, by improving accessibility.**
  - **Duku developed a first-aid kit for allergies in schools that could be easily reached, opened and operated by all adults, but hard for children to unlock.**
- **Duku's emphasis on EDI has helped strengthen its client relationships, with clients commending its inclusive design approach:**
  - **Duku has an average customer satisfaction score of 4.8 / 5.**
  - **Clients commended Duku's inclusive design approach and highlighted that it helped them increase market size, improve market reception and get industry award recognition.**
  - **An increasing number of clients are requesting Duku to consider underrepresented groups in their projects, reflecting a growing awareness of the benefits of inclusive design.**
- **The company noted that considering diverse end users' needs allowed it to develop more user-friendly products. For example:**

Case study 4

Ignys reports that its EDI measures have contributed to talent attraction and staff wellbeing, alongside product innovation and client satisfaction

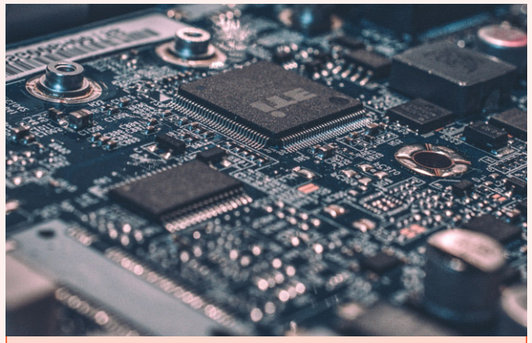


Image: Infrasilist

Company overview

Ignys is an ethical electronics design consultancy with software and hardware development expertise. It specialises in electronics products across areas, including sensor interfacing, displays and indication, radio, energy and more. Ignys supports clients at every stage of product development, from idea conception and feasibility studies to prototyping, product testing and compliance. It is based in Nottingham and has 24 employees.

EDI interventions

In 2023, Ignys launched EDI efforts aimed at moving the company from an "Equality" to an "Equity" model and unlock the potential of its staff, with a focus on neurodivergence:

Recruitment

Ignys gives candidates an interview guide outlining the process, potential questions and expectations, along with a "What to expect when visiting us" guide to ensure accessibility, particularly for neurodivergent candidates.

Training & development

Ignys' leadership team undertook training to deepen their understanding of neurodivergence and how to support staff in the workplace.

Staff resources

Employees can access mental health support and speak to a counsellor via an Employee Assistance Programme and private health cover.

Communication

Staff have 'Social Bios' on their backgrounds and personal tastes to foster an inclusive environment and help new hires connect with colleagues.

Processes

Ignys offers flexible working arrangements; staff can work from home and hold meetings however they feel is most productive and comfortable.

EDI progress

In 2024, Ignys reported advances in workforce diversity and high levels of staff inclusion:

- **25% of Ignys' leadership team and 20% of the overall workforce are women.**
- **25% of staff identify as an ethnic minority.**
- **30% of the workforce identify as LGBTQ+.**
- **95% of staff report feeling included in the company's culture.**

> "We are free to be who we are without judgement and to make mistakes without recrimination"
>
> – Jason Jibrail, Senior Software Engineer at Ignys

Business outcomes

- **Since Igyns introduced its "Move to Equity" strategy in 2023, the company reported improvements in talent attraction and staff satisfaction:**
  - **Ignys has seen a 140% uplift in applications in one year since changing its recruitment processes, with a noted improvement in candidate quality.**
  - **According to Ignys, as candidates are now higher-quality, recruitment is faster; Ignys' hiring timelines have fallen from over a month to two weeks for its five last hires, saving it around £1,500 worth of staff time per role.**
  - **Staff have frequently expressed that they are satisfied in their roles (both privately in surveys and openly in townhalls), citing a sense of psychological safety driven by the company's mental health awareness and support.**
  - **100% of its staff has disclosed diversity information, a potential indication that staff feel a sense of psychological safety.**
- **Ignys was awarded the "Best Design Team" three years in a row at the ELEKTRA awards, a feat that the company's leadership links to the diversity of its problem-solvers and its open and accepting culture.**
- **Customer satisfaction averaged 4.65/5 in the 2023 annual customer survey, with executives at several partner companies highlighting the value of Ignys' "diverse experience" in creating a wider and more innovative range of solutions.**

Case study 5

ViridiCO2's leadership believes the company's EDI efforts have enhanced health & safety, innovation, and investment, alongside workforce wellbeing

Image: Hans Reniers

Company overview

ViridiCO2 is a chemical engineering start-up that delivers a patented technology that transforms CO2 into high-value chemical intermediates. This aims to address the lack of mitigative Carbon Capture Utilisation (CCU) technology. The company is based in Southampton and has 16 full-time employees.

EDI interventions

Since ViridiCO2 was founded in 2021, it has taken steps to embed EDI: In 2023, ViridiCO2 launched an EDI policy that codified a range of its practices:

Product development

In team meetings, all staff are encouraged to contribute ideas, regardless of their seniority either in the meeting or through an anonymous suggestion box; this provides an opportunity for all employees to contribute to problem-solving, including younger, entry-level engineers.

Staff engagement

ViridiCO2 holds weekly open forum meetings for all employees to voice opinions on experiences, company values as well any concerns, particularly regarding health and safety.

Compensation

To increase pay transparency and equality ViridiCO2 has set salary bands for each level.

Hiring

Staff at different levels participate in the hiring process, providing feedback and scoring to bring in different perspectives and reduce bias in hiring decisions.

Community engagement

ViridiCO2 funded the provision of menstrual products at the University of Southampton (its base).

EDI progress

In 2024, ViridiCO2 reported a relatively diverse workforce:

- **38% of its workforce are women (and 25% of management).**
- **42% of its employees are from minority ethnic groups.**
- **17% of its employees identify as LGBTQ+.**

> "If people don't feel safe at work, then they won't want to work here."
>
> – Daniel Stewart, Co-Founder and CEO, ViridiCO2

Business outcomes

- **The company's leadership believes that fostering an inclusive environment has contributed to better health & safety:**
  - **By participating in open forum meetings, ViridiCO2 reports that employees feel greater psychological safety in raising and mitigating safety concerns - for example, graduate staff were asked to share any areas of ViridiCO2's operations that made them uncomfortable and suggest practices from previous workplaces that ViridiCO2 could incorporate.**
- **ViridiCO2 shared examples of instances where having a diverse team contributed to problem-solving and innovation:**
  - **In team meetings, ViridiCO2 has received inputs from a range of diverse staff at all levels, including two female graduates who have consistently come up with innovative ideas and contributed to IP generation, including how the company could improve its core technology to enhance implementation with customers.**
- **Having an EDI strategy was a pre-requisite for some of ViridiCO2's investors:**
  - **To secure £3M in funding from EQT ventures, ViridiCO2 was asked to develop and share an EDI strategy, including EDI policies and procedures.**
- **Since the company was founded in 2021, no one has left the business.**
- **100% of staff would recommend ViridiCO2 as an employer, with some staff emphasising that they value the fact that the company pays attention to the needs of all staff and its consistent efforts to improve.**

Case study 6

WeWALK's focus on serving the visually impaired community enabled it to tap into an unaddressed market and develop a novel, patented technology

Image: WeWALK

Company overview

WeWALK is a UK-based start-up that developed a smart cane to enhance the mobility of visually impaired people. The smart cane is a patented technology that aims to improve safety and independence with obstacle detection, accessible multimodal navigation, and public transport integration. The company was founded in 2020 and has 18 employees.

EDI interventions

WeWALK integrates EDI considerations into its product development processes and workplace culture:

Product development

WeWALK considered the needs of people with visual impairments throughout the smart cane design and development – 20% of its staff, including the co-founder, has lived experiences of visual impairment and the company consults 34 "explorers" in the visually impaired community monthly.

Recruitment

WeWALK recruits individuals from visually impaired and disabled communities in collaboration with partner organisations including RNIB, CNIB, Guide Dogs, and through open calls, conferences, demo days, and events.

Staff engagement

WeWALK adopts a W3D (Discuss, Decide, Deliver) decision-making approach, where staff openly discuss options, reach a consensual decision and then deliver it; the company also runs quarterly 360 surveys and weekly "WeGrow" sessions to gather staff feedback.

Partnerships

WeWALK works with partners that promote EDI; it has R&D partnerships with Microsoft's AI for Accessibility and works with leading blind institutions.

EDI progress

WeWALK received the 2024 Startups 100 Diversity, Equity, and Inclusion Award

- **20% of the team have lived experience of visual impairment.**
- **33% of WeWALK's staff are female.**
- **The company has an average staff satisfaction rating of 4.8 / 5.**

> "Our product is different because it integrates the lived experiences of visually impaired people"
>
> – Gokhan Mericliler, Co-founder and CEO

Business outcomes

- **WeWALK's focus on developing a product for the visually impaired community enabled the company to access a market that was historically overlooked:**
  - **In the UK, the number of visually impaired people is expected to double to over 4 million by 2050 yet they continue to face barriers to independent orientation, navigation, and safety.**
  - **Responding to this need, WeWALK developed a smart cane and the company now has thousands of customers in over 65 countries since 2020.**
- **WeWALK has received several high-profile awards (e.g., Time "Best Invention", "Amazon Startup of the Year")**
- **The company set up an "Accessibility Consultancy" division for other organisations to learn from its best practices.**
- **WeWALK noted that integrating diverse user perspectives early on led to a more efficient and cost-effective product development process:**
  - **It created a prototype within 1 year and a final product within 3 years (vs. an average product development time of 5 years for similar products).**
  - **The leadership believes that engaging the visually impaired community throughout the design process, helped avoid an estimated £400K – £500K in re-design costs and months of staff time.**
- **WeWALK's funders and investors were drawn to the company's inclusive approach: It has raised over £3M in funding to date.**
- **Several funders have highlighted WeWALK's lived experience and dedication to social equity as a central reason for their engagement, including Nesta Investments, KHP Ventures, APY Ventures, Vestel Ventures, NEC X and Microsoft.**

4. The status of EDI in engineering

There is growing momentum to improve EDI in engineering, as organisations increasingly recognise its importance. For example, the UK Standard of Professional Engineering Competence, which sets the requirements for people to become registered engineers, has been updated with greater emphasis on diversity and inclusion.[157] In addition to the Royal Academy of Engineering (the Academy), a range of organisations – including the Association For Black and Minority Ethnic Engineers-UK, the Women's Engineering Society (WES), InterEngineering, Women in Science and Engineering (WISE), EngineeringUK and Equate Scotland – run initiatives that aim to dismantle stereotypes, build the future talent pool and support companies to embed EDI.

The Academy, in partnership with EngineeringUK and major engineering and educational organisations, runs the This is Engineering campaign to encourage more young people (aged 13-18), from all backgrounds, to consider engineering careers. Since it started in 2018, the campaign has reached 65.4 million young people. Additionally, the Institution of Engineering and Technology (IET) launched their Smash Stereotypes to Bits and the #IamAnEngineer campaigns to showcase the need for EDI in engineering and to attract more diverse talent into the field.[158]

WISE launched a Ten Steps Framework campaign to encourage companies to recruit, retain and develop women in STEM.[159] Companies across engineering sectors are also taking steps to embed EDI internally. These include large businesses alongside several start-ups and SMEs that are developing and implementing EDI strategies. A range of tools have been developed to support these efforts. These include frameworks (such as the Academy's Diversity and Inclusion Progression Framework 2.0)[160] and software to measure, track and improve EDI for engineering businesses. This also includes the Academy's Culture+ platform which supports start-ups and scale-ups to embed an inclusive culture from the outset).

In turn, the engineering profession has made some progress in EDI. The gender pay gap in engineering is narrower than in other professions at 10.8% versus 16.2% for all UK workers. Some occupations stand out – production and process engineers have a mean gender pay gap of 5%, while civil and mechanical engineers have negative pay gaps, with women earning more. Medium businesses (1000-5000 employees) have a mean gender pay gap of 1%.[161]

Meanwhile, inclusive design is gaining momentum, underpinned by legal requirements and standards. For example, the 2010 Equality Act mandates employers and service providers to make reasonable adjustments for disabled people, including in the planning and building process,[162] while standards such as the British Standards Institution's BS 8300 outlines how to make buildings more accessible for disabled people and has an explicit emphasis on inclusivity.[163]

Against this backdrop, the UK Government's Access for All Scheme has improved accessibility in over 200 stations across the country.[164] Although accessibility guidelines don't apply across all protected characteristics and their implementation is mixed, engineers are increasingly considering diverse user needs. Frameworks like The Inclusive Engineering Framework help embed inclusivity and prevent bias throughout the development of engineering solutions.[165]

Nevertheless, EDI in UK engineering is far from where it needs to be, lacking diversity across protected characteristics.

The status of EDI in UK engineering across protected characteristics

Gender

Women only make up 16.5% of the UK engineering workforce compared to 47.7% of the overall workforce.[166] This is far behind other countries (Figure 8) and progress has also been slow. In over a decade, the share of women in engineering has only increased by six percentage points (from 2010-2021).[167] At current rates of progress, it will take over 100 years for equal numbers of women and men in engineering roles.[168] Within the engineering workforce, the distribution of roles is also uneven. Fewer women work in 'core' engineering occupations (15.2%) than in 'related' occupations (19.0%).[169]

In certain sectors, the gender imbalance is acute. Women only account for 4.7% and 4.2% of engineering roles in construction and mining, respectively.[170] In the start-up ecosystem, in particular, gender representation remains unbalanced. In manufacturing, only 11% of spinout companies (that were founded using university-based research and commercialised through university business and enterprise development officers) have at least one women founder.[171]

Ethnicity

The ethnic diversity of engineering is not representative of the UK population. In the UK, approximately 28.2% of the working-age population is Black, Asian, Mixed or from another ethnic group.[172] Yet, only 11.4% of employees in engineering occupations are from minority ethnic groups, two percentage points lower than the share across all occupations.[173] Certain groups are especially under-represented. For example, among Black workers, only 4.9% are in manufacturing, 3.5% in construction, compared to 16.2% in finance and 47.2% in public administration, education and health.[174]

LGBTQ+

Data on the makeup of LGBTQ+ individuals in engineering is scarce. The UK Census only started collecting information on sexuality in 2021 and figures are likely to be underreported.[175] A 2015 survey of 279 engineers found that 6% of respondents reported they were LGBTQ+ and half of them concealed their sexual orientations at work.[176]

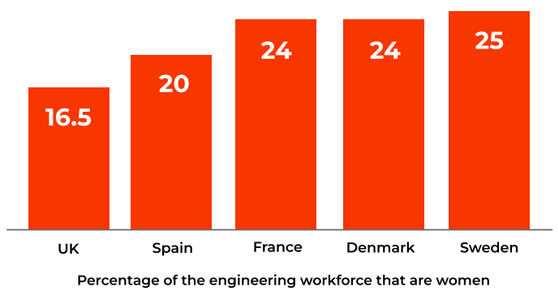
Disability

Disabled people are also under-represented in engineering. Only 11% of people working in engineering occupations are disabled, compared to 15% of employees in other industries.[177]

Age

The engineering workforce lacks diversity in terms of age. There are fewer younger and older adults in engineering relative to other professions. 8.1% of engineers are under 25, compared to 11.4% in non-engineering professions. Only 3.7% are over 65, compared to 5.2% in non-engineering professions.[178]

Figure 8 **The gender balance of the engineering workforce in the UK versus other countries**[179]



Sources: Trends in the engineering workforce between 2010 and 2021, EngineeringUK, 2022; *Observatory of engineering from Spain 2022*, Engineering Observatory, 2022; Why will there still be so few women engineers in 2023?, Les Echos, 2023; *Mapping engineering leaders*, Danish Society of Engineers (IDA), 2018; Sweden's engineers' equality program, Sveriges Ingenjörer, 2022

Pay, opportunity and inclusion

Despite advancements in equality of pay and opportunity, there is significant room for improvement.

The gender pay gap persists in engineering, largely due to women's under-representation in senior and higher-paid roles.[180] In the UK, 91% of engineers in the top career grade and 92% of those in the upper pay quartile are men.[181] This imbalance is higher than in other professions – 68% of full-equity partners at law firms (the most senior level) are men.[182] And in the UK's National Health Services (NHS), men occupy 42.2% of the upper pay quartile.[183]

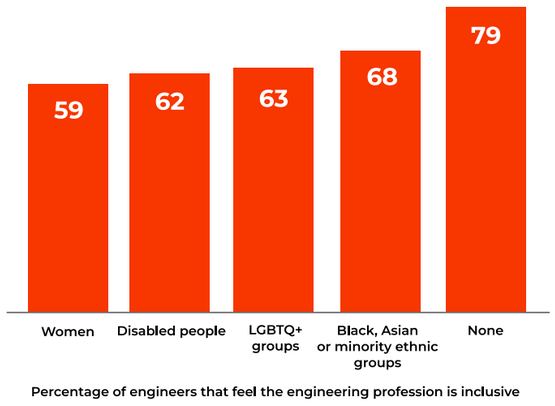
Certain engineering sectors and businesses continue to lag behind. There is still a 13.2% gender pay gap in electrical engineering, while smaller businesses (with under 1000 employees) and large businesses (with over 5000 employees) have a mean gender pay gap of 20.5% and 13.1%, respectively.[184] Beyond gender, pay disparities for other protected characteristics are often overlooked.

While gender pay reporting is mandatory for employers with at least 250 employees, this is voluntary for other characteristics such as ethnicity, disability, religion or sexual orientation.[185] Where data is available, it's clear pay gaps persist. In manufacturing, for example, the disability pay gap is 12.6%.[186] Differences in career progression also expose inequalities. Seven in ten engineers agree there is a glass ceiling for engineers,[187] and women only make up 15.3% of leadership roles in engineering jobs.[188] Thirty-one percent of ethnic minority engineers hold managerial roles, compared to 35% of white engineers.[189] Once again, data around career progression across other protected characteristics, including age, disability and sexual orientation remain scarce.

More needs to be done to make all engineers feel valued for who they are and that they belong.

The Royal Academy of Engineering's survey of 1,500 engineers revealed that while the majority (69%) feel that the culture of engineering is inclusive, an analysis of responses from different groups paints a different picture. Black, Asian and minority ethnic engineers feel less included in the profession compared to white engineers, while women feel less included than men (See Figure 9). Similarly, people who identify as LGBTQ+ or have a disability feel less included than their white, heterosexual, male and non-disabled counterparts.[190] People from underrepresented groups also reported they are disproportionately more likely to experience bullying and harassment.

Figure 9 **Inclusivity of the engineering profession by protected characteristic group**



Source: Cultural inclusivity in engineering, Royal Academy of Engineering, 2023

A study of US universities found that nearly 40% of female engineering students reported experiencing some form of sexual harassment.[191] This continues once they enter the workforce. A quarter of women and LGBTQ+ engineers report having experienced such mistreatment, over twice the rate of white, heterosexual men.[192] Nearly a third of Black, Asian and minority ethnic engineers and engineers with a disability have experienced bullying and harassment – three times more than white heterosexual men.[193]

Ageism is also prevalent in engineering, with 79.5% of engineering workers reporting that age-based discrimination is common in their workplace.[194]

Some groups also feel like they can't fully express themselves. Over a quarter of engineers don't think they can discuss their religious beliefs and faith at work, with some reporting cases of Islamophobia.[195] 13% of LGBTQ+ engineers are not open about their sexual orientation at work, compared to 3% of heterosexual engineers.

Within the LGBTQ+ community, there's also variation. For example, 90% of gay women are open about their sexual orientation compared to 59% and 57% of those who identify as bisexual and pansexual.[196] Though these trends are prevalent across the profession, engineers' experiences vary. For example, engineers who work in small engineering businesses are more likely to find their workplace inclusive (71%) than those in large businesses (64%).[197]

Finally, despite efforts to advance inclusive design, inclusivity isn't consistently embedded in the design and development of engineering products and services.

Many designers report relying on ad hoc approaches to meet Equality Act requirements which, themselves, mandate far less than what is actually needed to achieve a holistically inclusive design.[198] Solutions often overlook the perspectives of individuals who weren't involved in their development. Given the limited diversity of the engineering profession, this often means engineering products and services fail to consider and meet the needs of ethnic minorities, women, LGBTQ+ people and disabled people.[199]

For example:

- **Oximeters that accurately detect oxygen levels for Black people.** A study of hospital patients receiving supplemental oxygen in the US found that Black patients were nearly three times as likely as white patients to have undetected low oxygen levels. This suggests potential racial bias in the design of oximeters.[200, 201]
- **Artificial Intelligence (AI) systems that inherit and amplify biases based on the data they are trained on.** For example, a hiring algorithm favoured applicants based on words which were more typically found on men's CVs.[202]
- **Airport body scanners that overlooked trans people.** The scanners misinterpreted mass detections in the groin area of women as threats, resulting in invasive and traumatic experiences for transgender individuals who were subjected to pat-downs.[203]
- **Digital services that aren't designed to accommodate disabled people.** Ninety percent of top local authority websites in the UK aren't accessible.[204] A UK survey of disabled customers found 50% of people who had problems buying items (due to poor digital experiences) ended up not purchasing the product and 48% found an alternative provider. Poor digital experiences were the most prevalent when buying groceries (39%), train tickets (38%) and apparel (36%).[205]

The drivers of persistent gaps in EDI

Persistent gaps in EDI are the result of a combination of societal, profession-wide and company-level drivers – there is no silver bullet.

Societal drivers

Social norms reinforce stereotypes and limit the diversity of the engineering talent pool. This untapped potential is a missed opportunity to create a diverse, inclusive, and productive engineering workforce. Children as young as 7-15 internalise stereotypes, with boys more likely to see themselves as aligned with the characteristics of a scientist (such as hard-working, clever and creative) than girls.[206] Negative stereotypes and biases can persist throughout life, as public perceptions about ageing can lead older adults to see themselves as "too old" to learn.[207]

Negative stereotypes across groups feed into a vicious cycle – historical exclusion discourages underrepresented groups from entering engineering, which reinforces the perception of engineering being unwelcoming, and perpetuates initial barriers. Girls are less likely than boys to aspire to an engineering career,[208] while Black and Asian engineering graduates are less likely to pursue engineering careers compared to their white counterparts (37% of Black engineering graduates are employed in engineering six months after graduation versus 41% of Asian and 60% of white engineering graduates).[209]

These differences can be exacerbated by socio-economic status. Only 35% of young people (aged 13-19) in lower-income households know what subjects to study to become an engineer, versus 52% in high-income households.[210] Parental perceptions also affect their children's career aspirations. A survey found over half of parents from lower socio-economic backgrounds thought their children were unlikely to pursue STEM careers because they faced challenges such as a lack of confidence, role models and high-quality teachers.[211]

Even once people enter the workforce, biases can amplify disparities. In a survey of 2,110 civil engineers, 81% recognised that racism exists in civil engineering and projects. According to these individuals, this was mostly manifested through unconscious biases (72%), the diversity of their organisation (49%) and the way people were treated or spoken about (47%).[212]

Engineering profession-wide drivers

The narrow talent pool feeds into a critical 'skills gap' in engineering. Finding talent is increasingly difficult. A quarter of all current job advertisements in the UK are related to engineering and technology.[213] By 2030, engineering occupations are projected to grow at a faster rate than other occupations (2.8% versus 2.3% growth), creating 173,000 new engineering jobs that will need to be filled.[214]

Despite this need, 49% of UK engineering businesses face challenges recruiting individuals with the necessary skills [215] and nearly three-quarters of engineering and Research & Development-focused companies report talent gaps.[216] Compared to large businesses, SMEs and start-ups face even greater difficulties attracting engineering graduates [217] and mid-career women professionals from larger engineering firms.[218] These gaps have far-reaching impacts. The shortage of STEM workers is costing the UK economy £1.5 billion annually.[219]

The engineering profession also faces challenges with talent retention. Globally, the share of engineers quitting their jobs at engineering companies rose to between 16% and 17% in 2023 – a rise of nearly two percentage points from three years ago.[220] In the UK, engineering businesses also struggle to retain a diverse workforce. Between 2011 and 2020, the retention rate of women in engineering was five percentage points lower than men. The gap was greater in engineering than in other professions, such as law, business / finance and architecture, in the UK.[221]

As they progress through their careers, it's harder to retain women at mid-career levels.[222] Ten percent of women aged 20 to 34 will leave their role in an engineering role within a year, over three times the rate of men the same age.[223] From 2011-2020, women exited the engineering profession at twice the rate of men due to career obstacles like stereotyping, isolation, bias and limited flexibility post-maternity leave. They were also more likely than men to leave engineering for another field.[224] Despite improvements in the retention of minority ethnic staff and disabled people in engineering, people from minority ethnic groups are still 16% more likely to leave engineering than white people.[225]

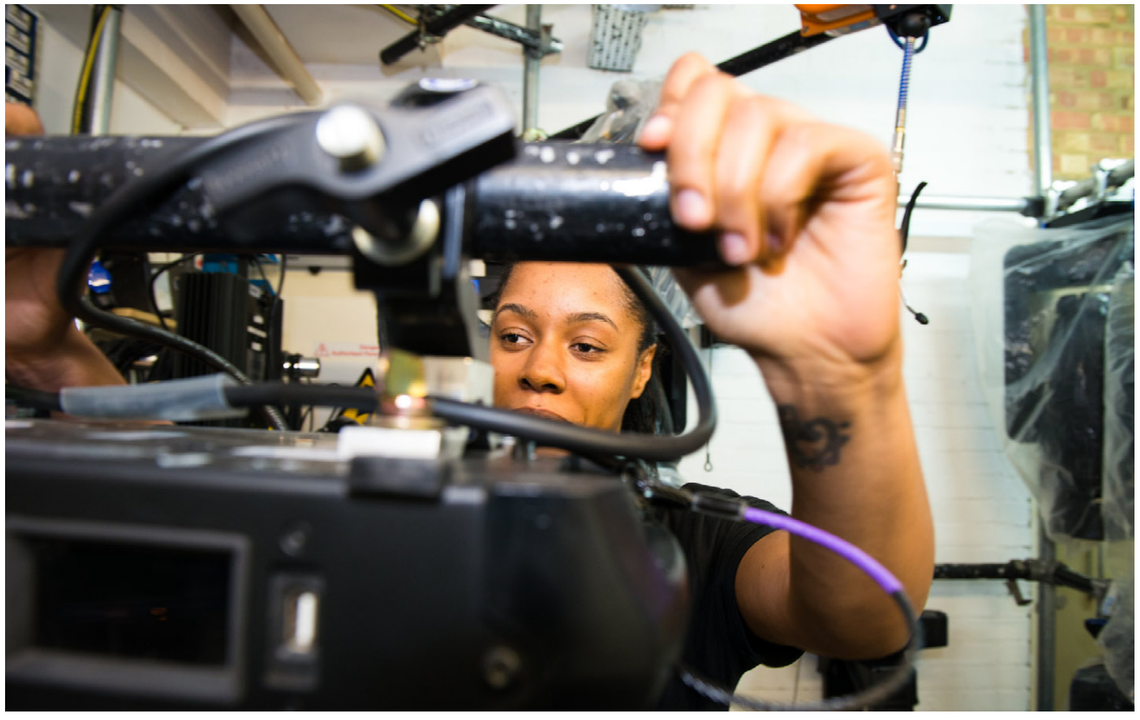
Finally, the limited diversity of the engineering workforce contributes to non-inclusive engineering practices. As highlighted above, the preferences and perspectives of the largest group (white, heterosexual, non-disabled, men) can become the default standards for the engineering design and development processes, excluding the needs of other groups.

Company-level drivers

In engineering companies, EDI gaps stem from a range of factors. Though the specific drivers may vary, companies face common internal challenges with advancing EDI. One major obstacle is limited awareness. Many companies lack a clear understanding of the benefits of EDI and how to effectively embed it. This translates into practical challenges.

Interviewees reported they lacked the infrastructure to collect diversity data or faced difficulties obtaining EDI information from staff, hampering their ability to identify and address issues effectively.[226] Resource constraints are another challenge, particularly for start-ups and SMEs. They often struggle to dedicate financial resources to fund EDI initiatives, such as diversity training, outreach programmes and apprenticeships due to barriers such as costs.[227]

Dedicating time to manage EDI efforts can also be difficult for smaller companies with fewer staff.[228] Another stumbling block is a lack of leadership prioritisation and accountability. When EDI isn't seen as a strategic priority, EDI efforts often lack support and momentum. In turn, employees aren't incentivised to prioritise EDI and it takes a back seat.[229] These internal challenges, along with many others, contribute to persistent disparities in EDI within engineering companies. They put the brakes on progress towards a more diverse, equitable and inclusive profession.



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5. What next? Recommendations to enhance EDI

The following section outlines how companies can advance EDI in engineering. It also provides guiding principles they can follow to enhance their EDI efforts. Further details on the sources and process for developing these recommendations are provided in the 'Methodology' section at the start of the report (page 5).

Engineering businesses can be powerful agents of change in addressing barriers and advancing EDI

Societal drivers of change

Businesses can play a role in dismantling social norms and biases. To increase the attractiveness of engineering education and careers, companies can work with education institutions to showcase the variety of engineering careers. They can also make them more appealing to diverse groups by providing students with role models or running mentorship programmes. Studies have found this can boost female students' interest in engineering.[230, 231]

Companies can also collaborate with government and professional associations. They can advocate for policies and support initiatives that incentivise access to STEM education for underrepresented groups. They can also contribute to public awareness campaign showcasing the diversity of engineering careers and challenge stereotypical portrayals of engineers. Internally, they can make commitments to enhance EDI, conduct training to challenge social norms and dismantle biases, alongside other initiatives.

Engineering profession-wide drivers of change

Across the engineering profession, businesses can take steps to attract and retain diverse talent and foster inclusive engineering. To attract diverse talent, companies can take proactive steps to embed EDI in their hiring practices. For example, companies can use inclusive language in job advertisements or work with outreach and apprenticeship programmes that engage diverse candidates. According to a 2017 survey, only 9% of businesses took action to attract or recruit more Black, Asian and minority ethnic, or LGBTQ+ employees.[232] To retain and nurture talent, businesses should prioritise fostering a culture of inclusivity where employees from diverse backgrounds feel they belong and are supported to stay in engineering. For example, companies can conduct outreach, support employee resource groups, run mentorship programmes and provide equitable opportunities to staff across training, development, and career advancement. This is especially important to retain staff as they progress through their careers. Not addressing these gaps is a missed opportunity.

Company-level drivers of change

Engineering businesses can adopt the practices outlined on the following pages (pages 75–79) to address their internal barriers. These apply to a range of businesses with different needs and resources. The way these are implemented will vary by organisation.

Guiding principles for advancing EDI

To advance EDI, companies can apply some cross-cutting guiding principles relevant to all businesses.

EDI is an ongoing journey and each company's path is unique. As such, the steps companies can take will vary. While there's no 'right answer' for advancing EDI, companies can consider certain principles to guide them through their EDI efforts – regardless of where they are in their journey.

These principles offer a foundation for all companies seeking to nurture equality, diversity and inclusion in their workplace and deliver more inclusive engineering solutions.

They're structured to address the diverse needs and contexts of small (less than 50 employees), medium (50-250 employees), and large companies (more than 250 employees) within the engineering sector.

1. Understand your starting point

Begin by assessing your current EDI practices, policies, and culture. Understand where your company stands regarding EDI to identify areas for improvement, set meaningful goals and track progress.

To do this, companies can review their organisational data and conduct staff surveys to measure:

- **Equality (including pay, career progression)**
- **Diversity across different protected characteristics**
- **Employee experience of inclusion in the workplace and engineering processes**

Analyse survey results to identify strengths, weaknesses and areas for improvement in your company's EDI efforts.

Small companies

- Begin by conducting a self-assessment-using readily-available online tools and resources to create customised surveys.

Medium companies

- Identify similar companies in your industry or sector that have demonstrated strong EDI progress. Benchmark your company's performance against these organisations to identify areas of improvement and best practices.
- Work with industry networks to engage these organisations and facilitate knowledge sharing.

Large companies

- Invest in comprehensive EDI audits conducted by external experts to assess your EDI practices, policies and culture. Use these to gain deeper insights into the root causes of EDI challenges and establish benchmarks for progress and areas for improvement.

> "Large organisations have to take EDI to the next level. It's important to broaden and be innovative in your thinking."
>
> – Jane McDonald, Babcock

2. Collaborate with experts and partners

Depending on where your company is at in its EDI journey, you can leverage a range of external resources and expertise to guide your efforts. As well as consultancies, organisations such as those below work directly with businesses to help them implement successful EDI efforts:

- The Association for Black and Minority Ethnic Engineers-UK (AFBE-UK)
- The Women's Engineering Society (WES)
- InterEngineering
- Women in Science and Engineering (WISE)
- Equate Scotland

Engaging with Royal Academy of Engineering programmes – including Culture+ (for start-ups and scale-ups), the Inclusive Leadership Programme or the Graduate Engineering Engagement Programme – can help businesses on their EDI journey.

Moreover, you can work with external partners and your community to promote the engineering profession and advance EDI.

Small companies

- Engage and explore collaboration opportunities with industry associations and professional organisations. These can help you access EDI resources, best practices and networking opportunities.
- Work with peer companies, local community organisations and educational institutions to promote STEM education and career opportunities for underrepresented groups.

Medium companies

- Establish strategic partnerships with NGOs and advocacy groups specialising in EDI who can provide guidance and resources to help enhance your EDI initiatives.
- Explore opportunities to collaborate with these organisations on joint EDI projects, awareness campaigns and training programmes.
- Sponsor and support EDI-focused events and initiatives within the local community, demonstrating a wider commitment to EDI.

Large companies

- Lead or participate in industry-wide EDI initiatives such as projects, research initiatives, policy and advocacy efforts.
- Work with other organisations, including companies, government agencies and industry stakeholders to leverage collective resources and drive systemic change at the regional, national, and international level.

3. Adopt a leadership-driven, strategic approach

Strong leadership from the top is a crucial step in successfully embedding EDI and driving action across your organisation. Build buy-in among senior staff members and identify leadership within the company that can act as EDI champions. To further incentivise EDI efforts and increase accountability, don't treat EDI as a checklist – make it an integral part of your company's mission.

Align EDI efforts with your company's broader strategic goal and embed them into your wider strategic planning processes. Integrate EDI considerations into all aspects of your business' operations, including the research, design, development and delivery of engineering solutions, including supply chain diversity.

To drive progress, develop a vision and set clear goals for advancing EDI within your business that are SMART (Specific, Actionable, Measurable, Relevant and Time-Bound). Develop an action plan with clear timelines and responsibilities.

Small companies

- Foster a culture of inclusive leadership by providing training and support for managers to champion EDI efforts.
- Assign clear roles and responsibilities to leadership and employees leading EDI efforts.
- Integrate EDI objectives into existing strategic plans, focusing on achievable short-term goals that contribute to long-term success.

Medium companies

- Engage senior leadership in setting EDI goals and objectives with clear accountability and reporting mechanisms.
- Establish a dedicated, cross-functional EDI task force to oversee the integration of EDI principles into all aspects of organisational strategy.

Large companies

- Embed EDI considerations into corporate governance structures and strategic decision-making processes, ensuring alignment with long-term business objectives.
- Establish executive-level EDI committees to oversee organisational EDI strategy and monitor progress against key performance indicators.

4. Tailor initiatives to organisational needs

Set ambitious yet realistic goals for your EDI initiatives tailored to your company's needs, resources and capabilities. When determining which EDI initiatives to pursue, prioritise high-impact and high-feasibility.

Design a flexible and adaptable approach that allows you to iterate and adjust your initiatives based on feedback and the evolving needs of your businesses.

Small companies

- Identify and implement initiatives proven to be relatively low-cost and high-impact. These could include EDI training for all staff, inclusive hiring practices (such as blind CV screening and inclusive language in job advertisements) and flexible work policies to promote inclusivity.
- Regularly assess progress and the impact of each of these initiatives and refine them accordingly.

Medium companies

- Prioritise high-impact and scalable initiatives. For example, consider investing in EDI recruitment and career advancement strategies to attract diverse talent and support their development.
- Explore partnerships with local community organisations and schools to attract candidates and create affiliation groups or career development programmes for staff.
- Establish mechanisms for regular review of EDI efforts.

Large companies

- Develop comprehensive EDI action plans with clear objectives, timelines, and resource allocations for each initiative.
- Where relevant, tailor EDI plans to different business units and regions.
- Assign leaders to these plans and build accountability mechanisms. For example, embed EDI progress into leadership performance reviews.
- Leverage internal expertise and external partnerships to enhance EDI measures.
- Invest in robust monitoring and evaluation mechanisms to track progress, identify areas of improvement and drive accountability.

5. Cultivate a culture that embeds EDI

Building a culture doesn't happen overnight. It takes long-term, concerted efforts to embed EDI. To do this, companies must cultivate an environment where EDI is woven into everyday practices.

Encourage open communication among all staff, celebrate differences and achievements, actively seek diverse perspectives, increase internal awareness about EDI and proactively address bias and discrimination.

Small companies

- Create channels for open communication such as anonymous upward feedback surveys or cross-functional team meetings.
- Celebrate diversity and establish mechanisms to address bias and discrimination proactively.

Medium companies

- Establish employee resource groups and diversity councils to provide platforms for dialogue, feedback, and collaboration on EDI initiatives.
- Increase internal awareness of EDI efforts by conducting training and providing materials on EDI.

Large companies

- Integrate EDI principles across all levels, sectors and regions of the organisation.
- Implement cultural competency training for all staff, creating a workplace environment where differences are valued and respected.
- Introduce comprehensive policies and procedures, including reporting mechanisms and investigations, to identify and tackle bias and discrimination.

Improving EDI is everyone's responsibility – not just the role of companies

Advancing EDI is a collective responsibility going beyond individual companies. It requires concerted action and collaboration across various sectors of society. Therefore, individuals, government bodies, educational institutions, and professional organisations must all drive meaningful change and foster a more equitable, diverse, and inclusive world.

By mobilising collective efforts and leveraging the expertise and resources of all stakeholders, we can create a more equitable, diverse, and inclusive world for everyone. The full potential of EDI and meaningful change in engineering and beyond can only be realised through collaboration and shared commitment.

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