Room for diversity: a review of research and industry approaches to inclusive workplaces

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Abstract

Purpose – This paper aims to explore how the scientific literature and company reports have addressed inclusive workplace design and strategies to date.

Design/methodology/approach – This paper adopts a scoping review to answer the following question: To what extent is inclusion present in workplace design and related strategies? An analysis of 27 scientific papers and 25 corporate social responsibility reports of the highest-ranked companies in the Great Place to Work global ranking disentangles the main aspects related to workplace design and strategies for promoting inclusion.

Findings – This paper opens avenues for four macro-categories of diversity (psycho-physical aspects; cultural aspects; socio-economic conditions; and ability, experience and strengths) to support the development of inclusive workplace design and strategy. Besides, multiple spatial scales emerged as material and immaterial elements of the workplace encountering inclusion and diversity.

Originality/value – Nowadays, the workforce is becoming more diverse. Although diversity, equity and inclusion (DE&I) has become key to many organizations, it remains unclear how DE&I principles are applied in workspace design and strategies. This scoping review provides a novel perspective on the topic by integrating scientific knowledge and practice-based approaches which still address this matter independently.

Keywords Design, Diversity, Inclusion, Workspace, Workplace management, Workplace strategy

Paper type Research paper

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Introduction

The modern workplace has undergone significant transformations in recent years, especially given the changes in the ways of working that the COVID-19 pandemic has boosted, which have highlighted the relevance of individual needs and preferences. This trend is accompanied by a growing emphasis on diversity, equity and inclusion (DE&I), which has brought about new challenges and opportunities for organizations. Nowadays, diversity in the workplace is extremely important for organizations. Growing efforts have been directed to increase diversity starting from companies' core business, for instance, through powerful mission and vision statements, human resource (HR) policies and recruiting strategies. Nevertheless, it is unclear whether similar attention has been devoted to the way physical workspaces welcome an increasingly diverse workforce. This paper explores how both the scientific literature and company reports have been addressing inclusive workplace design and strategy so far. The aim is to advance the awareness and relevance of this issue in both corporate and research agendas.

Diversity awareness

The 21st-century society is becoming more diverse, generating a growing complexity in meeting people's needs (e.g. elderly and cultural issues). In total, about 6–10 out of every 100 people in Europe live with a disability, accounting for around 135 million people (WHO, 2019). This number is expected to increase due to population ageing and the rising prevalence of chronic conditions, including non-communicable diseases (e.g. diabetes and cancer).

According to estimates from the "Disabilities and Inclusion" report by the U.S. Center for Talent Innovation, about 30% of the professional workforce could report one of the impairments that would be defined as "disability" by the federal authorities [1]; nevertheless, the majority is kept hidden. Based on the same research, 62% of employees reported an invisible disability, among which depression and other mental health conditions, such as attention deficit hyperactivity disorder, diabetes and more (Jain-Link and Taylor Kennedy, 2019). At the same time, more than ever before, today's workforce is composed of people with a large age span, who have different origins and cultures. On the one hand, consumers are looking for companies with a proven commitment to DE&I, and, on the other hand, employees are looking to leadership who make a difference. Organizations must evolve or risk a shrinking candidate pool, reduced market share and ultimately, lost profitability (Oracle, 2021). This contributes to enhancing awareness of social issues within companies and workspaces and attention to DE&I-related matters.

Inclusive design

Strategies such as Inclusive Design (Clarkson and Coleman, 2015), Universal Design (Mace, 1985) and Design for All (EIDD, 2004) already exist to achieve the exact goal of creating inclusive environments, by going beyond the minimum requirements of accessibility and architectural barriers defined by law. In 1995, Ron Mace coined the term *Universal Design* (UD) in the USA (Mace, 1985). *Design for All* was defined in 2004 as "the design for human diversity, social inclusion and equality" (EIDD, 2004). The expression *Inclusive Design* originated in the UK as a strategy to understand the user experience and to address marketing of particular design objects to the appropriate target (Clarkson and Coleman, 2015). These strategies have the common objective to promote an environment able to satisfy the needs of the widest range of users with or without disabilities, regardless of age, gender, culture, physical abilities, cognitive limitations, needs, professional status or personal preferences (Froyen, 2012). They recognize the importance of diversity and inclusivity in design and seek to create environments that are equitable and accessible for all. In this paper, we are going to use the term *Inclusive Design* to comprise all the above-mentioned design strategies.

Regarding the application of these strategies, the seven "Principles of Universal Design" were developed in 1997 by the Center for UD as guidelines to inspire designers (Connell *et al.*, 1997). These principles have been updated with the eight Goals of UD (Steinfeld and Maisel, 2012) that also highlight the importance of social inclusion and equity. Nevertheless, examples of real application of these principles remain isolated best practices that are still far from becoming a standard, especially in corporate real estate and workplace strategies. Operative tools are much needed to support designers in identifying users' physical and social needs within the built environment and translate them into inclusive design solutions (Mosca and Capolongo, 2023). Theoretical evidence on the topic is missing too. Theories borrowed from complementary fields (Bakker and Demerouti, 2007; Lefebvre, 1991) have been applied for long as an interpretive framework in workplace-related literature. These theories already help disentangle how comfortably different people interact with the work environment, but they could be enriched thanks to a broader understanding of the diversity spectrum.

Workplace design and strategy

Inclusion in workplace design and strategy is crucial for organizations that aim at creating a welcoming and supportive environment for all employees. Indeed, the positive impact of inclusive work environments has been registered on employees' motivation, satisfaction, engagement and retention (Grant *et al.*, 2013). In this regard, the COVID-19 pandemic has dramatically affected work environments and work-life balance. The pandemic highlighted how much the physical environment can affect people's well-being (Amerio *et al.*, 2020), mental health (Kniffin *et al.*, 2020), social relationships, customs and habits. Workplace design solutions and strategies, among which providing ergonomic equipment, enhancing natural light and accommodating amenities for physical activity and relaxation, are becoming essential for organizations to promote health and well-being. At the same time, key performance indicators are required to monitor the effectiveness of such measures (Dolcini *et al.*, 2023).

In this context, businesses have become highly interested in proving their corporate social responsibility (CSR) also by adopting environmental, social and governance (ESG) criteria. Multiple organizational performance metrics, also targeting DE&I principles, are now being developed into ESG evaluations. Even if CSR and ESG related reporting and adoption are not compulsory yet, companies that prioritize inclusive design have experienced several positive consequences: they are more likely to promote a culture of diversity, reduce discrimination and improve employee retention and engagement, in addition to revenue growth and profit margins (AAPD and Disability:IN, 2022). For example, Microsoft has made a significant commitment to DE&I and has developed an inclusive design toolkit to help designers create products and services that are accessible and inclusive for all users (Microsoft, 2021). Google has implemented a range of design actions to create a flexible and inclusive workplace, like ergonomic environments and flexible working conditions, that have contributed to a more diverse, satisfied and innovative workforce (Google, 2022). Similarly, Deloitte has introduced inclusive design principles within its HR strategies, such as workplace flexibility, agile working and diversity training, which have resulted in higher employee engagement and satisfaction rates (Deloitte, 2022). Among the multiple actions that companies have embraced in this direction are also: the introduction of "Chief Diversity Officers"; the administration of internal surveys to assess the mismatch between the company's and their employees' perception whether the corporate environment is inclusive; and the elaboration of new metrics for benchmarking (Oracle, 2021). Finally, organizations in some countries – such as

Brazil, the UK and the USA – have developed indicators assessing all forms of diversity. A recent survey by McKinsey and Club 21e Siècle asked 800 executives about the diversity of origins and socio-economic conditions of their people (McKinsey, 2022). The results highlighted a considerable gap between diversity as measured by objective data (e.g. national origin) and as reported by the personal perception of respondents. For this reason, McKinsey's underlined the need for companies to embed a diversity action plan in a broader approach to inclusiveness implanted in the organization's culture.

Despite wide evidence of increasing engagement by companies in DE&I matters, not much is known about how these plans also effectively regard workplace design and strategies. To tackle this gap, this article adopts a scoping literature review. By mapping both scientific papers and company reports related to CSR policies, this study identifies key themes and new investigation avenues. The combination of both scientific contributions and company reports is deemed crucial to address practical insights which are of interest for organizational goals and can have direct effects on corporate real estate strategies, as well as on individuals. Ultimately, the findings from this review will provide a foundation for future research and practice in inclusive workplace design and strategy.

The paper is organized as follows. In the methodology section, the specific approach that we adopted for this scoping review is described in detail. The results are structured according to:

- diversity categories (i.e. diverse features of people using workspaces to different extents);
- material and immaterial elements affecting inclusion (i.e. physical and non-physical aspects of the space that may have an impact on people inclusion in the workplace); and
- workplace design and strategies (i.e. workplace-related approaches at different levels that play a role in promoting inclusion).

Finally, some theoretical and practical implications are addressed in the discussion and conclusion.

Methodology

A scoping review methodology was adopted to provide a broad, in-depth overview of the existing literature and finally develop a synthesis of principal themes for inclusive workplace design and strategy. A scoping review, indeed, aims at being as comprehensive as possible, including both scientific and non-scientific outlets. By doing so, the objective was to collate both academic and practice-related implications of the issue, for different reasons. First, to the authors' knowledge, the scarcity of scientific literature addressing the topic from a comprehensive and holistic lens benefits from additional, non-academic sources. Second, comparing the state-of-the-art of academia and practice is necessary to verify the alignment between the two. Third, academic publications are likely to miss hands-on approaches (especially in some disciplines included in this literature review), whereas company reports tend to lack scientific evidence for specific choices or arguments. Linking the two sources makes it possible to provide useful insights to overcome these limitations and to suggest priorities for strategic actions towards transdisciplinary efforts.

This research uses the framework by Arksey and O'Malley (2005) for scoping reviews. The framework includes five stages, namely, identify the research question, screening of relevant studies, post hoc inclusion and exclusion criteria, charting the data and collating,

summarizing and reporting the results. All these stages were performed subsequently as described below.

The first stage entails *identifying the research question* as the stage that guides the search strategy. The specific research question of this paper is: To what extent is inclusion present in workplace design and related strategies? The definition of the research question led to the first *screening of relevant studies* (stage two of a scoping review). In February 2023, existing scientific publications on the topic were scouted through Scopus Database to ensure high quality of contributions.

Upon discussion among the authors, a structured search for titles, abstract and keywords in Scopus combined two sets of keywords: a first set related to inclusive design (i.e. "inclusive design" OR "universal design" OR "design for all" OR "inclusi*" OR "accessibility" OR "neurodiver*"), and a second set related to workplace design (i.e. "workspace*" OR "organis* space*" OR "office space*" OR "office design").

Altogether, 455 references were listed, mostly published after the year 2000. The study selection involved *post hoc inclusion and exclusion criteria* (third stage of scoping review). In this phase, we excluded literature in mathematics, physics, earth sciences, biology, chemical sciences, agriculture, pharmacy and immunology. Of note, results in these disciplines emerged because the keyword "workspace" can also be intended as the setting of lab experiments.

The titles and abstracts of the remaining 341 studies were independently analysed by all the authors to evaluate their consistency with the research question. After this screening, 241 papers were dropped because they were unrelated to the aim of this paper. Namely, these studies focused either on universal design, inclusive design or design for all but in other spatial contexts than the office (such as hospitals or schools) or they focus on workplace design but without an inclusive design lens. Among the remaining 100 studies, 72 papers did not find agreement among the authors (i.e. 13 papers were considered not relevant by three out of the four authors of this paper and 59 papers were considered irrelevant by two out of the four authors). Twenty-eight papers were unanimously selected by all authors as precisely targeting the research question. One of these 28 papers was a short version of another paper in the list (Smollan and Morrison, 2019), so it was excluded. Another paper (Khan and Chandra, 2022) could not be downloaded from the authors' institutional accounts, thus was excluded. In addition, one paper (Branham and Kane, 2015) was retrieved from a previously run query with a broader disciplinary spectrum dating back to March 2022, as it turned coherent with the scope of the review. Finally, the list of scientific papers included 27 papers.

As to the fourth and fifth stage of the scoping review methodology – *charting the data* and *collating, summarizing and reporting the results* – this research adopted qualitative content analysis. Data was charted to *diversity features* that each paper targets and to *types of space* under analysis. A summary framework was created to report the preliminary results from scientific literature (Table 1). The framework lists different aspects, including: the *diversity features* that were considered in each study (e.g. age, gender, race, abilities, etc.), the *objectives* of the specific study, the *methods* adopted to perform the study, the *outcomes* of the selected papers and the *types of space* under consideration. The full analysis is available in Table S1 of the Supplementary materials. An additional analysis of the reference countries of the studies is reported in Table S2 of the Supplementary materials.

After selection of scientific sources, the analysis was extended to companies' reports. As there is no comprehensive database of corporate reports specifically dealing with inclusion, the authors collected CSR reports of companies that are largely recognized as "good places to work" by their employees. Specifically, the *World's Best Workplaces* ranking developed

Paper	Diversity	Objective	Method	Type of space	Outcome
Migliore *et al.* (2022)	Gender	Show how the workspace influences female workers and gender equality	SLR – systematic literature review (68 papers)	Various office types + home as a workspace + new working spaces	Spaces are often designed for the ideal type of worker: a Caucasian middle-aged man. Scholarly conversations neglect the effects of specific spatial arrangements of the house on women's work outcomes and relationships with colleagues. Authors call for further research on these new working spaces (e.g. co-working spaces or maker spaces) mainly focus on women's work outcomes (e.g. productivity), while little is known about the alleged relations between these workspaces and women's status aspects

Table 1.
Analysis of the reviewed scientific papers

Source: Authors' own work

by the *Great Place to Work* (GPtW) (www.greatplacetowork.com/worlds-best-workplaces) was used as a reliable source to retrieve the best performing multinational companies on a global scale. GPtW assesses companies based on employee opinions on the extent to which the organization succeeds in creating workplaces that positively impact people and communities. These reports include information on companies' policies and practices related to sustainability goals, including DE&I policies.

The first 25 of the World's ranking were selected and their CSR reports collected from their websites. As the aim of this paper is to tackle workspace strategies related to inclusion, the analysis is based not only on the CSR reports but also on companies' websites and other corporate reports. In addition, from the Valuable500 companies, some additional information on specific measures for inclusion was gathered. The Valuable500 is a voluntary network of companies from all over the world working together to promote inclusion. Twelve out of the selected 25 companies had a profile on the Valuable500 website (www.thevaluable500.com/members).

In parallel to what has been done for the scientific literature, a summary framework was created to report the preliminary results from the analysis of corporate reports (Table 2). The framework lists different aspects, including: the *diversity categories* that the companies addressed (e.g. diversity of age, gender, race, abilities, etc.), as well as design features, policies and strategies that were explicitly cited in the reports as workplace strategies (material and immaterial) targeting inclusion.

In sum, Figure 1 shows the different steps of the scoping review in a Prisma-like flow diagram (Moher *et al.*, 2009) adapted for the present research.

Rank #	Diversity	Design features	Workplace policies	Strategies
Company #7	age, race, gender, ethnicity, disability, neurodiversity, refugees sexual orientation, veteran	"Accessible Tools – The access to tools that equip the workspace, enable work anytime and anywhere, enhance work, and reduce the hassle. Beyond collaboration, technology and digital tools provide workers the ability to conduct critical activities away from a desk or out in the field Dedicated Spaces – The designation of spaces for clear purposes: Teaming, 'deep' work, well-being, and networking and connecting dedicated spaces such as break rooms away from working areas, wellness spaces for recuperation, or private rooms for work and personal conversations Design – The design of the workspace that accommodates the personal and work needs of the workforce, workers can use a mobile app to find free desks, parking spaces, or even report issues to the facilities team Organizations may also utilize data analytics to generate insights about lighting, printer, and desk usage" www.action.deloitte.com/insight/190/elevating-the-workforce-experience-the-places-relationship	"Workplace culture founded on respect and characterized by inclusive behaviors and an appreciation for diversity in its many forms. ALL IN is focused not only on helping our people live our values and thrive in a culture that is respectful and inclusive, but also on designing and implementing targeted actions and interventions that can make a positive impact when it comes to our diversity, equity and inclusion goals" (Deloitte, "Global Impact Report 2022")	Increase the number of Black and Hispanic/Latinx professionals in our US workforce by 50% Increase US workforce female representation to 45% Increase the representation of racially and ethnically diverse US partners, principals and managing directors (PPMDs) to 25% by 2025 Increase the number of female US PPMDs by 25% by 2025 (Deloitte, "Global Impact Report 2022")

Source: Authors' own work

Table 2.
Analysis of the reviewed corporate reports

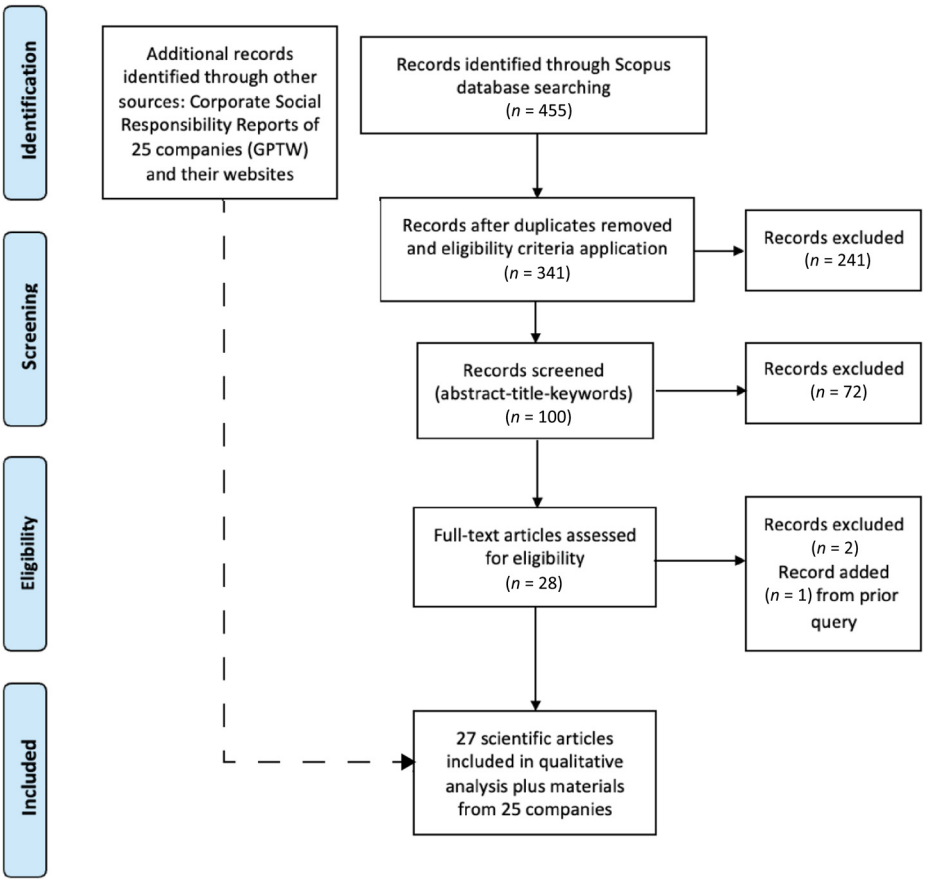


Figure 1.
Prisma-like flow diagram

Source: Authors' own work

The analysis and interpretation of both scientific literature and companies' documents are reported in the section below.

Results

The literature considered in this review covers a broad range of countries (refer to supplementary material S2 and S3) and disciplinary perspectives. In particular, most of the contributions come from the USA (seven papers and 12 company reports) and in general cover mainly western countries (i.e. the UK, France, Switzerland). Interestingly, among scientific papers, other countries emerge from the affiliations of the authors that may reflect additional viewpoints on the topic of inclusion (e.g. Bangladesh, Nigeria, Turkey). Although this fragmentation makes results of company reports and scientific literature not fully comparable, it also presents an opportunity to reflect on a comprehensive approach to address inclusion in the workplace.

A similar issue emerges when considering the disciplinary fields of scientific outlets. This scoping review covers architecture, facility management, organization and

management science, HR management and alike without any of them prevailing. This suggests the high potential for interdisciplinary investigation of inclusion as well as the value added by combining multiple perspectives.

Diversity categories

Out of 27 scientific papers and 25 CSR reports, a wide range of diversities was detected.

On the whole, 14 different categories of diversity could be distinguished (listed here in alphabetical order to avoid any prioritization): Age, Background, Culture, Disability, Ethnicity, Family status, Gender, Nationality, Race, Religion, Sexual orientation, Veteran status, Other (the latter including, Individual characteristics, Abilities and Personal experience) and Work conditions and tasks. While some of them are understood without any need for explanation (e.g. age, nationality), for some others the meaning may be more complex. However, a definition is hardly found in any of the company reports; more likely, they are found instead in the scientific literature. Company reports offer a variety of terms to indicate the same diversity category, whereas the scientific literature is more precise and consistent in the selection and use of specific terms (see Table 3). For instance, Narenthiran *et al.* (2022) and Das *et al.* (2021) spend a few lines defining neurodiversity as this is the focus of their respective studies, also because it is not recognized officially by WHO – International Classification of Diseases. Van Laer *et al.* (2020, p. 1023) describe in detail the type of disability that their paper addresses, namely, physical and sensory impairments:

> The group with physical impairments includes individuals officially classified as having certain limitations related to physical activities, mobility, dexterity, or stamina (e.g. individuals with neuromuscular disorders, spinal cord injuries, spina bifida, respiratory disorders or cerebral palsy) while the group with sensory impairments includes individuals officially classified as having certain degrees of vision (e.g. individuals with cataracts or glaucoma) or hearing loss (e.g. individuals with auditory neuropathy or Usher syndrome).

Some categories that would deserve more attention are, for instance, those of Ethnicity and Race that here are kept separate because they were found in multiple reports mentioned at the same time as if they were alternative and additional types of diversity rather than as synonyms. The term Race is generally used to describe physical and genetical characteristics, whereas the word Ethnicity has a more nuanced meaning aiming to characterize people according to a common history, oftentimes reflected on sharing religion, language and culture. Even though the latter term has recently become the most common by far, Race is still found in a considerable number of reports. This opens up to further reflections on the opportunity to aggregate other items including Culture and Nationality.

Among the scientific papers, the majority address "disabilities", including eight which focus on physical impairment (Bend and Priola, 2021; Branham and Kane, 2015; Kar and Mullick, 2014; Kwon (2020); Mathiasen and Frandsen, 2016; Moschonas *et al.*, 2014; Van Laer *et al.*, 2020; Wang and Piper, 2018). These include motor, sensory and mental impairments depending on ageing (Moschonas *et al.*, 2014; Kar and Mullick, 2014) and congenital impairment such as blind and deaf people, and people with motor difficulties.

The second most studied type of diversity is gender, which is specifically the focus of four papers (Reddy, 2022; Migliore *et al.*, 2022; Marzban *et al.*, 2022; Nash, 2021) and is mentioned by two papers (Appel-Meulenbroek *et al.*, 2020; Kwon, 2020). Sexual orientation and family status, all of which encompass the way people express themselves and relate with each other in private life spheres, do not seem to be objects of scientific research yet for what concerns workplace design and strategy, except for one paper (Willis, 2009).

Table 3.
Summary of diversity categories found in the review

Diversity categories	Definition	Synonyms	#Scientific papers	#Company reports	#Total
Gender	Gender identity and/or expression	Gender Sex Gender expression Gender identity Transgender status Women People with diverse gender identities	6	24	30
Disability	Physical and sensory impairments including motor, vision and hearing deficiencies (also combined with each other)	Disability, Disabilities People with disabilities Physical and mental disability *Motor, vision, hearing impairment, motor deficiencies* *Physical and sensory impairments* *Parkinsonians* *Blind people* *Disabled people (deaf and deaf-blind users in particular)*	8	21	29
Ethnicity	Ethnicity characterizes people according to a common history, oftentimes reflected on sharing religion, language and culture	Ethnicity, Ethnicities Color Ethnic, color, cultural or racial terms Black people Latins Indigenous peoples People of colour Ethnic diversity Ethnic or national origin	1	23	24
Age	Biological age	Age Generation *Elderly* *Older workers* *Older adults*	6	17	23

(*continued*)

Table 3.

Diversity categories	Definition	Synonyms	#Scientific papers	#Company reports	#Total
Sexual orientation	Sexual attractions to other people that go under multiple acronyms, the more comprehensive of which is LGBTQIA (lesbian, gay, bisexual, transgender, queer or questioning, intersex and asexual or allied)	Sexual orientation LGBT+ people LGBTQ+ community Lesbian, gay, bisexual, transgender and intersex (LGBTI) LGBTQIA (lesbian, gay, bisexual, transgender, queer or questioning, intersex and asexual or allied) People with diverse sexual orientations *Queer (or non-heterosexual)*	1	22	23
Other	Various personal characteristics including individual abilities, perspectives, perceptions, health status, cognitive status, strength and other personal or physical attributes. In particular, neurodiversity includes conditions such as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), learning disabilities (e.g. dyslexia, and dyspraxia) and psychosocial disabilities (e.g. anxiety, depression)	Ability, Abilities Experience Strength and perspectives Neurodiversity Genetic information Any other personal or physical attribute Mental health *Individual traits* *Personality (introverts vs extroverts)* *Health* *Personal perceptions* *Individual characteristics* *Cognitive impairment* *Fully capable vs strength limitations*	9	12	21
Veteran status	Ex-member of the armed forces	Veteran, Veterans Veteran status Military veterans Refugees Military leave or service Status as a disabled veteran	0	18	18
Race	Used to describe physical and genetical characteristics shared by groups/ populations	Race Ancestry Minority	1	16	17

(*continued*)

Table 3.

Diversity categories	Definition	Synonyms	#Scientific papers	#Company reports	#Total
Religion	Religious and spiritual beliefs	Religion, Religions Creed Religious and spiritual	0	12	12
Nationality	Legal identification of a person in international law, ranging from nationality, citizenship and place of residence	Nationality, Nationalities National origin Citizenship Citizenship status Place of residence	0	10	10
Culture	National and organizational culture that can express, on the one hand, through appearance, habits and beliefs, and on the other through company sub-cultures	Culture Appearance or beliefs Education Cross-cultural diversity *National culture* *Culture and identity* *Innovation sub-culture (organizational)*	2	7	9
Background	Socio-cultural and economic context where the person grew, including language	Cultural background Social background Socio-economic background Language	0	7	7
Family status	Household situation including marital status, parenting status and other caregiver status or need for public assistance	Marital status Status with regard to public assistance Care status Caregiver status Parents	0	5	5
Work condition/tasks	Different conditions under which workers perform their tasks, including skills, types of use and activity in the space, job contract and different flexible working arrangements	Skills *Precarious workers (job security)* *Employees working remotely* *Work pattern* *Types of use and activity in the space*	4	1	5

Note: The synonyms in italics are those that can be found only in the scientific literature
Source: Authors' own work

Other types of diversity are considered, especially neurodiversity (Narenthiran *et al.*, 2022; Das *et al.*, 2021) individual characteristics and personality (Kämpf-Dern and Konkol, 2017; Contin de Oliveira *et al.*, 2023; Afacan, 2015; Zhang and Sanake, 2020; Marzban *et al.*, 2022), individual culture and national background (Appel-Meulenbroek *et al.*, 2020).

Age is also a concern of six papers that consider especially how older adults may develop physical constraints different than other people, which deserve particular attention in the work environment. Four of them address age with specific attention (Afacan, 2015; Moschonas *et al.*, 2014; Kar and Mullick, 2014; Marzban *et al.*, 2022), other two only mention it as a relevant factor to be kept under control (Appel-Meulenbroek *et al.*, 2020; Kwon, 2020).

Finally, in the scientific literature, there are a few papers recognizing work conditions and tasks as relevant factors impacting on individuals' approaches and needs in the workplace. On the one hand, this encompasses recruiting and flexible working policies depending on organizational culture (Lô and Diochon, 2019) and accessibility of new working spaces that ensure job security (Pacchi and Mariotti, 2021). On the other hand, this reflects the way people work and the tasks they have to accomplish (Adenipekun *et al.*, 2021; Jeske and Ruwe, 2019).

Similarly, companies' reports address a wide variety of diversity categories. As expected, every report does not focus on a specific category; instead, they embrace and list several diversity features. The most cited diversity features by most companies are employees' disabilities, ethnicity/race (23 + 16 reports overlapping in some cases), gender (24 companies), sexual orientation (22 companies) and age (17 companies). Of note, most companies have policies targeting veterans (18 companies) that the scientific literature disregards.

Finally, it is worth noting how some papers do not focus on a particular diversity category while approaching inclusion from a more complex standpoint that surpasses the concept of accessibility and usability of spaces. "Inclusion" is used by Jeske and Ruwe (2019) referring to the degree to which an employee feels a sense of community and belonging in a work system, being accepted by others for their unique characteristics and treated as an insider. Harvie-Clark *et al.* (2019) introduce an intriguing idea regarding the varying expectations that users have of the acoustic comfort in a space based on the type of activity undertaken in that environment. This hints at the variability of "diversity" over time, depending on the work task that people are busy with throughout a single day at work. Clearly, this goes beyond stable characteristics of individuals and is strongly dependent on organizational policies, strategies and core business.

Material and immaterial elements affecting inclusion

The scientific papers included in the review investigate either the material elements of the workspace or the immaterial aspects that affect inclusion.

The former topic is typically addressed by papers within facility management and architecture literature that study, with a functionalist approach, how to improve the equipment and arrangement of workstations to make them more easily and comfortably usable for all (Afacan, 2015; Branham and Kane, 2015; Kar and Mullick, 2014; Mathiasen and Frandsen, 2016; Moschonas *et al.*, 2014; Zhang and Sanake, 2020). Also, the activities and work tasks performed by people can affect the way people feel in different working environments (Harvie-Clark *et al.*, 2019). By addressing Indoor Environmental Quality and the perceived comfort by office occupants, Zhang and Sanake (2020) describe multiple design alternatives, which are partially independent from the type of work and organization hosted in a building but can provide different indoor environmental conditions to people. These include mechanical systems, external and internal walls, flooring, roofing, openings and green building certifications. Some papers go into the detailed description of single

elements like the height of sound-absorbing screens between noise sources and receivers and recommendations for application (Harvie-Clark *et al.*, 2019).

The latter topic, instead, is covered in a distinct set of papers, mostly in management and organization studies. This includes a couple of papers that elaborate on power relations in the workplace (Lô and Diochon, 2019; Van Laer *et al.*, 2020). In addition, this also concerns research on the perception of employees whether they feel the working environment being inclusive or not (Willis, 2009; Smollan and Morrison, 2019), which is in line with trends reported by a number of companies (Oracle, 2021).

Even though the papers covering more immaterial aspects do not specifically analyse the spatial components of the workplace, they still consider the space as an important agent in underpinning a sense of inclusion for diverse categories of people. For instance, Lô and Diochon (2019) argue that the presence of a FabLab into the Renault headquarters is the key factor empowering the emergence of innovative sub-cultures within the company. We infer from here that the typology of an office is crucial in enabling novel attitudes. Nash (2021) analyses the spatio-temporal rhythm of workers in the City of London, arguing that the way people walk and move around the urban setting reflects the organizational place as being inclusive or exclusive. The author interprets the organizational place looking beyond the spatial configuration of a single company to encompass the wider geographical location of organisations within a city, in this case, London.

Whereas most of the papers either consider exclusively the/one "diverse" category of employees or consider "diversity" only tangentially, interestingly, one paper (Van Laer *et al.*, 2020) specifically investigates the relations between disabled and non-disabled employees.

Unlike scientific contributions, the companies' reports included in the review consider mostly immaterial aspects of the workplace that affect inclusion. Beyond HR policies for equal hiring and career advancement, the companies conceptualize their work environment as an immaterial place where to:

- promote sense of belonging (EY, company #13; Accenture, company #17);
- create a workplace culture founded on inclusive behaviours and appreciating diversity in its many forms (Deloitte, company #7; Hilti, company #8); and
- capture employee sentiment towards diversity and inclusion (SAP, company #15).

These definitions remain at the general level showing companies' workspaces more as metaphorical places of inclusion than as physical workplaces that promote inclusion.

On the whole, the analysis of both literature and reports showed two distinct approaches. On the one hand, there are *strategies* that refer to solutions and spatial features for workspace design (e.g. workstation, layout), on the other hand, one can find *policies* related to inclusion dealing mostly with HR-related issues (e.g. diversity promotion in the hiring process and leadership). The two remain mostly separated.

Besides the elements affecting inclusion, at times, the literature places specific attention on the outcomes expected when adopting such elements. The outcomes of the selected scientific studies range from more abstract to more practical. Some studies come out with design specifications or identify punctual factors influencing the experience of diverse categories of workers (Kar and Mullick, 2014; Branham and Kane, 2015; Afacan, 2015; Mathiasen and Frandsen, 2016). Some studies only hint at the potential of certain spaces to empower the widest range of workers but without specific reference to workplace strategies or layout solutions (Lô and Diochon, 2019; Smollan and Morrison, 2019; Kwon (2020); Marzban *et al.*, 2022; Pacchi and Mariotti, 2021). Finally, some studies try to outline a conceptual framework (Kämpf-Dern and Konkol, 2017). The only paper introducing the

concept of innovative measures to assess the effectiveness of inclusive environments is Kwon (2020) proposes to expand the approach of deliberately developmental organization in which the principle of productivity is not dominant, but *continuous learning, growth and development* are at the centre. However, this study does not specifically refer to design and architectural solutions. Overall, the outcomes remain still underdeveloped and poorly systematized, most of the time failing to report concrete measures to monitor them.

The relevance of spatial dimensions for inclusion

The way research approaches spatial factors for inclusion is varied. It crosses different scales, from the smallest, including furniture arrangements and equipment, to the largest, such as the location of an office within the city and the whole city as a socio-cultural context. In sum, the reviewed documents conceptualize spatial dimensions as part of a multi-level system composed of scattered workplace design, strategy and policies.

Some papers focus on one or more specific devices that support daily work such as corridors, telephone, drawer, stapler, printer (Moschonas *et al.*, 2014), counters (Kar and Mullick, 2014) and lighting (Mathiasen and Frandsen, 2016). Some others put attention on a range of design features altogether, such as those related to zoning/partitioning, lamps and blinds to deem lighting, furniture ergonomics, thermal control and acoustic panelling (Narenthiran *et al.*, 2022).

Others instead address layout and arrangement of workstations, for example, Branham and Kane (2015) study shared workspaces, Mathiasen and Frandsen (2016) look at single and open-plan offices, open-plan settings are addressed by Afacan (2015) and Smollan and Morrison (2019). One paper (Harvie-Clark *et al.*, 2019), while discussing acoustic comfort, argues that different targets and requirements can be described for the individual workstation, adjacent workstations and the floor plan. One study considers some architectural characteristics at the building scale, which may impact the perception of indoor environmental quality, especially the choice of mechanical systems and materials used for external and internal walls, flooring, ceiling, openings and green building certifications (Zhang and Sanake, 2020).

Moreover, the location of the office within a city comes across as crucial in determining equal treatment of employees. For instance, one paper hints at the fact that when an office is located in an isolated area, it requires safe and secure transport arrangements especially for women (Reddy, 2022). Nash (2021) takes the whole City of London as the context of study. In its autoethnographic analysis, the author pays particular attention to materiality: the architecture and the placing of objects around the city do have an impact on the flows and rhythms of space and the behaviour of human actors.

A few papers cover third spaces (Appel-Meulenbroek *et al.*, 2020; Pacchi and Mariotti, 2021; Lô and Diochon, 2019; Jeske and Ruwe, 2019), and some include homes as workspaces (Das *et al.*, 2021; Wang and Piper, 2018; Narenthiran *et al.*, 2022). Finally, academic workspaces are also taken into account (Adenipekun *et al.*, 2021; Zhang and Sanake, 2020).

Regarding the level of description of the spatial dimension, some papers specifically describe the workplace setting of study, some others instead barely touch upon the physical characteristics of the spaces (e.g. these characteristics emerge only implicitly from some interview extracts in Van Laer *et al.*, 2020). Some papers are a-specific regarding the type of workspace (Willis, 2009; Kämpf-Dern and Konkol, 2017; Van Laer *et al.*, 2020; Kwon, 2020), and many of them do not describe any spatial characteristics of the space other than being a workspace of some organization (Van Laer *et al.*, 2020). Some others instead are very precise in the description of the type of space where the study is undertaken, describing the single materials found in the space. This is most common in laboratory experiments and studies on

specific equipment and arrangements or comfort levels (Mathiasen and Frandsen, 2016; Zhang and Sanake, 2020).

Clearly, the attention and level of the description of the space and specific spatial implications depend also on the disciplinary background of the authors. As this literature review was interdisciplinary on purpose, results include a wide variety of conceptual specifications of the workplace as well as definitions of inclusion.

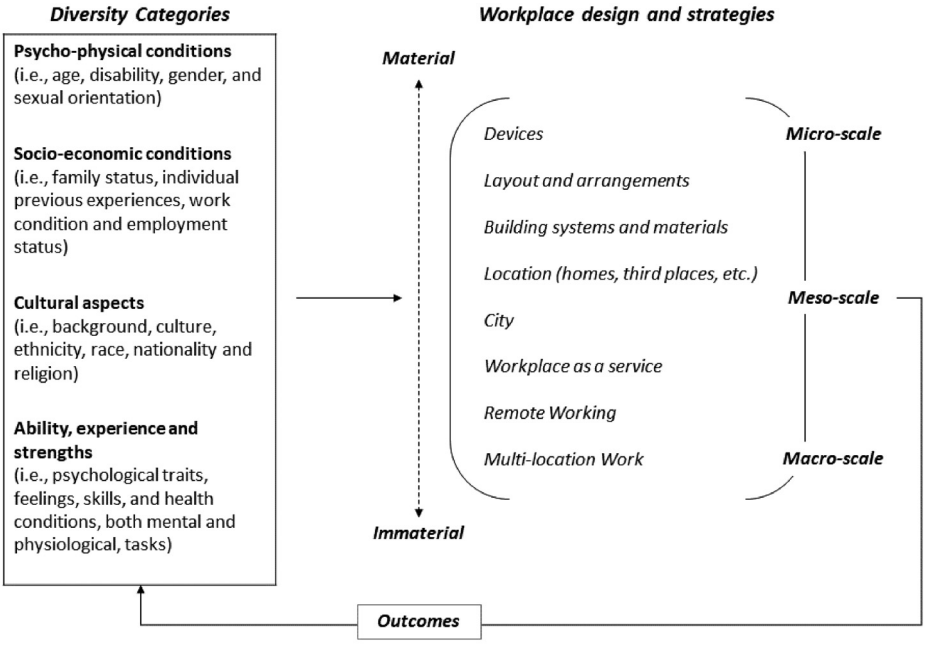
Conversely, corporations barely cite in their CSR reports any design solutions or strategies to promote inclusion. By retrieving information on their office buildings through other sources (i.e. companies' websites), it was indirectly possible to relate the office features to inclusion strategies even if the connection of the two was not explicitly stated by the company. For instance, 13 out of 25 companies talk about flexible office design to allocate diverse activities and people. Similarly, most companies promote policies of remote working to reach sustainable goals (e.g. company #17, Accenture; company #15, SAP). This is in line with the tendency to start approaching reporting and measurement of different kinds of actions, coherently with the need for ESG evaluations. Of note, the CSR report of Sopra Steria, company #23, similarly to what is considered by Pacchi and Mariotti (2021) mentions specific policies towards "social openness". The report peculiarly cites "a policy promoting diversity and access to employment for young people from working-class and rural areas, aimed at diversifying our recruitment" (Sopra Steria, "Corporate Responsibility Report 2021", p. 113). However, any reference to the workspace is missing at any scale as most reports do not link diversity categories to specific design features or workplace strategies. In conclusion, this study leverages on CSR reports as valuable resources for obtaining a broad understanding of organizational dynamics. However, these reports primarily serve the purpose of communication with shareholders, whose goal is not to address specific office design features. Therefore, future investigations should extend beyond company reports and delve into technical reports authored by workplace strategists and designers. These experts are uniquely positioned to bridge the gap between strategic business goals and tangible spatial solutions.

Discussion

After analysing both scientific papers and company reports, an evident disconnection emerges. Both articles and reports hardly manage to intersect the relations among DE&I, work and space.

In particular, research and academic studies have increasingly recognized a positive impact of diversity within the workplace by focusing on specific diversity categories. Nevertheless, the application of Inclusive and UD principles was detected only in one scientific paper (Kar and Mullick, 2014). This suggests that inclusion is still an underestimated issue in corporate real estate and workspace design and strategy, and a reference framework to inform workplace decisions is still missing. Therefore, this study proposes a conceptual framework (Figure 2) representing different interconnected elements. Firstly, it identifies four macro-categories of diversity. Then, it lists a number of workspace elements – both material and immaterial – extending across three scales (macro–meso–micro) of workplace design and strategies. Finally, it shows the recursive relationship between the workplace and diversity categories via outcomes. This framework offers a basis for future research and practice on inclusive design strategies and principles as explained below.

While several categories of diversity emerged, it was difficult to associate specific workplace design and strategies to those diversity categories. The 14 different categories that have been identified refer to different aspects of diversity that deserve to be tackled with distinct workplace measures. Two macro-categories can be distinguished, namely, psycho-physical and cultural aspects, which are already affirmed in the literature, along with two additional aspects, namely, socio-economic conditions, and ability, experience and strengths.



Source: Authors' own work

Figure 2.
Conceptual framework for future research and practice on inclusive workplace design and strategy

Psycho-physical characteristics of people, including age, disability, gender and sexual orientation, relate to the need for spaces to be accessible and usable in the same way for the widest range of users, regardless of impairments or individual identity and preferences.

Cultural traits are recognized in background, culture, ethnicity, race, nationality and religion. These characteristics have more to do with a welcoming and respectful atmosphere that workspaces guarantee to all their users.

In addition to these categories of diversities, that were already recognized in recent papers (Sinocropi and Cortese, 2020), this review highlights the emergence of some supplementary aspects that are relevant for workplace design and strategies for inclusion.

Socio-economic conditions of people, include family status and individual previous experiences (such as veteran status) as well as work conditions, which, so far, have been related to access to employment as an HR policy, but may have an impact on the workspace as well. For instance, to promote diversity and access to employment from different socio-economic conditions, companies can act through their location strategies, diversification of asset portfolio (e.g. including coworking spaces, FabLabs, etc.) and workplace related ancillary services (e.g. nursery for working parents, caregiver support, etc.).

Finally, an emerging category that future research should consider embraces other aspects including *ability, experience and strengths*. These regard the very personal relationship that each individual undertakes with the working space according to their psychological traits, feelings, skills and particular health conditions, both mental and physiological. This last category of diversity may be further explored through the lens of some workplace-related theories. Among them, the Job Demands-Resources model (Bakker and Demerouti, 2007) could explain the role of space to support individuals in carrying out their tasks leveraging on their peculiar traits as resources. Similarly,

tensions and power relations with coworkers can be smoothened through the lived experience of the space as per Lefebvre's theory based on each individual's experiences and strengths.

It is worth noting that various facets of diversity can be associated with the geographical scope of the examined literature. The analysis undertaken in this research indicates that fragmented definitions of certain diversity categories may depend on the variety of countries involved in the review (e.g. those where the scholars work or the company is located). Further research can investigate in-depth possible country-specific approaches to DE&I.

In addition to the diversity categories, *the workspace* also emerged on different scales. The principles of Universal and Inclusive Design (e.g. Equitable use, Simple and intuitive use, Perceptible information, Appropriate size and space for approach and use) can be applied to workplace design spanning from a single workstation design to layout design and even urban design – to both enable employment opportunities for everyone (Kar and Mullick, 2014) and enhance the overall quality of work life and well-being for people. In fact, material and immaterial aspects of the workplace encounter inclusion and diversity only if tackled at multiple spatial scales. On the *micro-scale*, equipment and arrangement of workstations, including materials used and indoor environmental conditions, affect the usability of the workspace for different categories of people. On a *meso-scale* are architectural choices in terms of layout differentiation of areas within a floor plan, mechanical systems, as well as the location of the office. This goes along the trend of expanding work activities beyond the traditional organizational boundaries towards multiple other spaces dispersed across cities and territories in a logic of "extended activity-based working". Last, on a *macro-scale* other places host work activities and can favour or hinder inclusion, such as homes, third spaces and the city as a whole.

When one looks at the space concept throughout the scale gradient, additional and more immaterial aspects can play a significant role for inclusion such as perceptions of the space and the entanglement of bodies, objects and discourses. Eventually, with a growing variety of recognizable diversity categories and workplace scales, in-depth analyses of cross-sectional effects are still missing. More in practice, those principles relate to policies encompassing workplace as a service, remote working, and multi-location work, which are opening up new frontiers for workplace strategies. This paper supplies the literature with an integration of academic contributions and company reports. Systematic literature reviews often fail to include more practical insights which are of interest for organizational goals and can have direct effects on corporate real estate strategies. This specific scoping review, on the contrary, matches the approaches and priorities of professionals on both sides. On the whole, the research stream on inclusion and its practice-related implications requires an interdisciplinary and transdisciplinary approach, which needs to be consolidated in future studies and applications. Such an approach would benefit further advancements in monitoring and management of the outcomes expected when adopting design solutions and workplace strategies.

Conclusion

The study explores the relation between inclusion and workplace environment by means of a scoping review of scientific papers ($n = 27$) and company reports ($n = 25$). The analysis underlined that the topic of DE&I is underdeveloped in terms of workplace design and strategies. By crossing the reviews of scientific literature with company reports, this paper provides a few critical considerations as well as a framework for future research and practical actions.

In general, academic studies tend to focalize their attention either on "diverse" categories of employees or on "diversity" as a tangential aspect. Research investigated how diversity, in general, can be better accommodated in specific workspace environments. In particular, the variety of "diversities" that could be detected from both papers and company reports suggested four macro-categories of diversity, namely, psycho-physical conditions, socio-

economic conditions, cultural aspects, and ability, experience and strengths. However, more research is welcome to disentangle cross-sectional evidence and meet companies' and individuals' needs while facing a wide range of diversities in workspaces. A missing link between diversity categories and workplace strategies was detected, especially in company reports. This was already noted by a long stream of literature that criticized the high degree of subjectivity in the preparation of CSR reports which hinders its interpretation and, therefore, its use in decision-making processes (García-sánchez, 2020).

Future development of this research will entail an expansion of both the methodology and the scope of this paper. Firstly, by increasing the number of keywords, based on the diversity categories and workplace scales identified in this first review of the literature, it will be possible to include more studies on the topic. Secondly, a more accurate analysis of design features and strategies across different scales will help understand and measure the possible outcome of the workplace on diversity categories. In this regard, interactions with professional workplace designers and strategists may help gather more precise insights in addition to the general information accessible via CSR reports. Expanding data collection with empirical methods (e.g. surveys, interviews, observations and more) would contribute to a more comprehensive understanding of the intricate relationship between organizational strategy and physical workplace design. Moreover, better integration between material and immaterial elements of the workplace should be encouraged. For instance, the existing principles and frameworks of Universal Design, that have barely been adopted in the analyzed studies, could be used as a reference to enhance the introduction of inclusive design in workspace environments.

The study confirms the remarkable alertness surrounding diversity in the workplaces, along with growing attention to DE&I related matters. The progress of awareness in this direction will hopefully help recognize the value that different individuals can bring to organizations. As research has already shown what organizations can gain by embracing diversity and promoting inclusion, this matter deserves to be not only embedded into social responsibility actions and HR policies but also increasingly implemented in workplace design and strategies. To promote the topic of inclusion in the workplace, a stronger and more practical collaboration between the academic and corporate sectors is needed. Only such a holistic approach in the creation of equitable and inclusive work environments can eventually drive innovation and bring strategic advantage to organizations.

Note

1. "A person with a disability is typically defined as someone who (1) has a physical or mental impairment that substantially limits one or more 'major life activities,' (2) has a record of such an impairment, or (3) is regarded as having such an impairment." (https://www.dol.gov/agencies/odep/publications/faqs/general).

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Supplementary material

The supplementary material for this article can be found online.

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