An investigation into how organizations can rethink their space to be more inclusive and to help an increasingly neurodiverse workforce thrive—and in the process gain a competitive advantage. The spectrum of human brain functioning and behavior forms a wide continuum, with each of us occupying a unique point. While most people operate within a range considered neurotypical, a significant percentage extend into ranges considered neurodiverse. “Neurodiversity” refers to the natural range of variation in human neurocognition. It’s an umbrella term for people who aren’t neurotypical, and includes such conditions as autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), dyslexia, dyspraxia (a neurologically based physical disorder) and Tourette syndrome, among others. Approximately 15–20 percent of people are “neurodivergent.” Neurodiversity also includes neurological challenges resulting from brain injury or other environmental causes. Even among those considered neurotypical, one in four will experience a mental health challenge, such as depression or stress, at some point in life. Because of widespread under– diagnosis, more than half of those on what are considered neurodiverse areas of the continuum don’t even know it. In addition to just being the right thing to do, some progressive employers are beginning to recognize that accommodating the different wiring of neurodiverse people can provide a huge competitive advantage. This is leading to a range of more inclusive policies, programs and procedures, though this recognition is only just beginning to affect workplace design. This research and advisory firm’s office features a simple concept and clear lines for easy navigation. Splashes of color add interest, while strong images reinforce branding and aid in wayfinding. Using natural materials, varied ceiling heights and different light levels for private and public areas humanizes the space. Diverse work settings accommodate various user needs. The space has a welcoming, harmonious feel. THE NEW PARADIGM Instead of seeing natural variations in the brain as pathologies, the new neurodiversity paradigm welcomes and facilitates the diverse talents of those of us who think differently. Neurodiverse thinkers often possess exceptional talents when it comes to innovation, creative storytelling, empathy, design thinking, pattern recognition, coding and problem solving. Journalist Harvey Blume, who along with autism advocate Judy Singer first used the term “neurodiverse” in the late 1990s, pointed out that neurotypical was simply one kind of brain wiring that could even be inferior when it comes to working with technology. “Neurodiversity may be every bit as crucial for the human race as biodiversity is for life in general,” writes Blume. “Who can say what form of wiring will prove best at any given moment? Cybernetics and computer culture, for example, may favor a somewhat autistic cast of mind.”1 Success stories abound. Leading companies working to attract and retain neurodiverse talent include Hewlett Packard Enterprise, Microsoft, IBM, Google, Ford, EY, Dell Technologies, Walgreens, JPMorgan Chase, SAP, DXC Technology, the British Broadcasting Corporation, Deloitte and UBS, among many others. As part of its inclusive and autism hiring programs, Microsoft hosts an annual “Ability Summit” for employees, outside experts, and government, business and academic leaders to discuss the importance of an inclusive culture and explore how technology can empower people with special abilities.2 JPMorgan Chase reports that after three to six months of working in its Mortgage Banking Technology group, autistic employees were doing the work of people who typically required three years to train—and were 50 percent more productive.3 At SAP, neurodiverse team members helped develop an innovation that led to a technical solution worth an

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estimated $40 million in savings.4 And at DXC Technology, employees voluntarily it's a strange paradox, that over the last 10 years there has been a dramatic increase in the accessibility of neurodiverse information, yet organisations are still not accessing and applying that information at the rate required to support neurodiverse employees' Cheryl Winter, Director, Cheryl Winter Coaching In this research and advisory company's office, clean, crisp spaces accented by strategic use of color and pattern generate interest without being overwhelming. Natural materials bring a sense of comfort. The lighting rhythm creates subtle movement and interest. spread good news about the firm's autism hiring program, representing organizational values in action.5 The challenge is that neurodiverse workers may not always be able to thrive within existing workplace norms and practices. Along with their upside talents, people with certain kinds of neurodivergence may be challenged to concentrate, manage distractions, regulate emotions, recall information, process details quickly or communicate effectively. Despite the sought-after advantages and specialist skill sets that neurodiverse thinkers bring, they frequently face obstacles in getting and staying hired. Through its BBC CAPE (Creating a Positive Environment) neurodiversity initiative, the BBC has created an immersive video that helps viewers experience the challenges of working in a typical office from the perspective of the neurodivergent.6 Actions that forward-thinking employers are taking to make it easier for neurodiverse staff to contribute include modifying the interview process, matching neurodiverse employees with in-house mentors and conducting awareness training for existing staff. On-the-job accommodations can be as simple as permitting the use of noise cancelling headphones, reducing lighting or screen brightness, providing access to supportive software, and allowing breaks for activity or a change of scene. Employers surveyed by the U.S. Job Accommodation Network (JAN) reported that more than half of the adjustments cost nothing to implement and the rest came at a typical cost of $500.7 The premise of inclusive design is that instead of trying to choose or change people to fit their environment, an organization can get the right people for its needs—and simultaneously help them live more fulfilling lives— by changing the environment to welcome all those people who offer unique talents. There is a lack of understanding from the managers of neurodiverse staff that results in them not being able to provide the right guidance and support. Some people are also afraid to share that they might struggle with certain tasks, where really they are very gifted and talented but just learn differently." Will Wheeler, Founder, The Dyslexic Evolution DESIGN FOR INCLUSION The most common workplace challenges center on the issue of sensitivity. Neurodiverse thinkers often can be over- or under-stimulated by factors in their environment such as lighting, sound, texture, smells, temperature, air quality or overall sense of security. Any comprehensive approach to designing for neurodiversity should carefully consider these experiential aspects of the work environment. That said, different neurological conditions manifest in different ways, and even people who share the same condition may experience it to varying degrees and express it in different forms. "If you've met one person with autism, you've met one person with autism," Dr. Stephen Shore, an advocate for people with that condition, has said, and his statement applies to other conditions just as well. That is why one of the most effective ways to design for diversity is to provide choices. Choice enables people— neurodivergent and neurotypical alike—to more effectively manage their own needs with dignity and autonomy. Versatile environments

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that provide for a range of preferences make differences less apparent, fostering equality and integration. These environments also allow for individual and operational changes, helping to make an organization more adaptable. Below we highlight some of the design considerations behind what our research, conversations and professional experience suggest are five of the most impactful types of choice: spatial character, acoustic quality, thermal comfort, lighting and degree of stimulation. But because an environment's overall sense of order and meaning is what provides context for all other choice decisions, we first need to consider spatial organization. Spatial Organization Good spatial design excites curiosity and rewards exploration with the delight of discovery. It should also be intuitive. Visitors as well as regular occupants can understand where they are and can easily find their way. However, for some people with neurodiverse conditions— especially those who thrive on repetition, predictability and clear boundaries to feel secure—the need for legible spatial order may be intensified. Spatial order and ease of wayfinding become essential. Effective spatial design strategies include: ● Creating spaces that are memorable and that use a rhythm of common elements to generate a reassuring sense of order and thus assist the brain's innate positioning systems. Such design should, at the same time, avoid confusing repetition of identical spaces or features. ● Landmarks and focal points (such as a staircase or artwork), viewpoints (such as a mezzanine overlook) and clear lines of sight (including views to the outdoors) can help building users orient themselves. ● Meaningful variations in lighting levels can help as people naturally tend to walk toward brighter spaces or paths. Also consider the strategic use of materials, colors and signage. Particularly in complex environments, clear and consistent terminology is critical for some people with neurodivergence. Concise messages, plain (sans serif) typography and informational hierarchy ease sensory overload. Consistent cues with redundant messaging in colors, numbers and words provide multimodal assistance to the full range of building users as they head to their destinations. spread good news about the firm's autism hiring program, representing organizational values in action.5 The challenge is that neurodiverse workers may not always be able to thrive within existing workplace norms and practices. Along with their upside talents, people with certain kinds of neurodivergence may be challenged to concentrate, manage distractions, regulate emotions, recall information, process details quickly or communicate effectively. Despite the sought-after advantages and specialist skill sets that neurodiverse thinkers bring, they frequently face obstacles in getting and staying hired. Through its BBC CAPE (Creating a Positive Environment) neurodiversity initiative, the BBC has created an immersive video that helps viewers experience the challenges of working in a typical office from the perspective of the neurodivergent.6 Actions that forward-thinking employers are taking to make it easier for neurodiverse staff to contribute include modifying the interview process, matching neurodiverse employees with in-house mentors and conducting awareness training for existing staff. On-the-job accommodations can be as simple as permitting the use of noise cancelling headphones, reducing lighting or screen brightness, providing access to supportive software, and allowing breaks for activity or a change of scene. Employers surveyed by the U.S. Job Accommodation Network (JAN) reported that more than half of the adjustments cost nothing to implement and the rest came at a typical cost of $500.7 The premise of inclusive design is that instead of trying to choose or change people to fit their environment, an organization can get the right people for its needs—and

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simultaneously help them live more fulfilling lives— by changing the environment to welcome all those people who offer unique talents. Acoustic Quality Impromptu meetings at a nearby space, mobile phone users who seem to believe the cone of silence really works, the continual pinging of technology—the everyday sounds of a typical workplace can make it hard for employees to focus. While it takes about 20 minutes to settle into a state of flow, workplace interruptions occur, on average, every seven minutes. At the other end of the acoustic range, an office space can actually be too quiet. Without low-level, ambient background noise to absorb them, every murmur or cough intrudes. Where neurotypical employees may find ambient noise—or the lack of it—counterproductive, employees who are especially sensitive or prone to distraction, such as those with autism or ADHD, can find it downright disabling. They may adapt by wearing headphones, seeking out their optimal environment for hyperfocus or using a sensory distraction they can control to mitigate the impact of others who they can't. Companies that depend on all their employees' ability to concentrate, however, are increasingly prioritizing a comprehensive— and therefore more inclusive— approach to acoustic design. Effective acoustic design for the workplace provides a variety of auditory settings in support of diverse activities, locates them appropriately relative to one another and specifies assemblies for acoustic comfort within spaces and acoustic separation between them. Acoustic design may also consider whether a sound masking or white noise system would further increase comfort. Thermal Comfort Along with acoustics, thermal comfort consistently ranks on workplace surveys as one of the top environmental irritants. Researchers have found that it has a significant impact on productivity. Thermal comfort can vary with personal factors such as clothing, activity level and metabolism, as well as neurology. One solution to this variety is to provide individual temperature controls, such as an operable window or air diffuser, to enable workers to adjust their thermal environment to their liking. Estimates link individual temperature controls to productivity increases of as much as seven percent, depending on the nature of the task.9 Other elements of effective thermal design for the workplace include: ● Controlling solar gains in perimeter spaces so people beside the windows don't overheat. ● Improving the performance of the building envelope for even conditioning throughout the space. ● Decoupling heating and cooling zones from ventilation (with radiant systems, for example) for more effective and quieter conditioning. ● Designing thermally varied spaces, such as a naturally ventilated atrium or an outdoor patio, so people can choose a location that suits their thermal preference. Lighting Lighting offers another opportunity for inclusive design to make a difference. Measures can be as simple as replacing fluorescent fixtures (which can have a distracting flicker and buzz that are perceptible only to the neurodivergent) LED fixtures. Lighting research conducted at the University of Toronto has suggested that bright lighting levels can intensify feelings, both positive and negative, and that dimming the lights can result in more rational decisions, a finding that some neurodiverse thinkers may already know from experience.10 Other studies have found that changing lighting color and intensity over the course of the day to mimic nature's diurnal changes can also help to reduce stress. Again, these benefits are likely to affect the neurodivergent as well as neurotypical employees. More comprehensively, workplace- wide access to daylight can result in increased physical well-being, improved mental and emotional health, and increased productivity and happiness for all workers. The evidence for our need for daylight is so compelling that several countries

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have enacted laws requiring workplace access to daylight. Some studies suggest that the benefits start to kick in with a minimum of four hours of light per day, whether from natural or artificial sources. Several design standards offer guidance on daylight for workplaces. LEED's Daylight credit, for example, requires specified glare-free daylight illuminance levels for 75 percent of regularly occupied spaces. The WELL Building Standard sets a baseline of 95 percent of building inhabitants sitting within 15 feet of the perimeter, with a fallback requirement for appropriate electrical illumination. Ultimately, the opportunity for staff to tailor lighting to their preferences may be one of the most effective ways to get this key aspect of workplace productivity and well-being right—and to enhance autonomy and comfort for all. Degree of Stimulation For people with certain types of neurological conditions, visual, auditory or scent-based sensory cues can be overwhelming. For others, a lack of stimulation is the problem, resulting in an inability to focus. Creating options for employees to control or choose the degree of sensory stimulation in their surroundings is a key aspect of inclusive design. Providing different microenvironments to choose from is one approach. Minimizing visual clutter, creating quiet and tech-free zones, and incorporating areas of rest and reprieve into circulation areas and level changes can also be beneficial. Use of color is a significant consideration. Blues and greens tend to calm and reassure while yellow, orange and red tend to stimulate and uplift. Jarring or clashing colors that neurotypical people may overlook can deeply disturb others with heightened sensitivity. Pattern and texture also contribute to sensory stimulation. Using predictable patterns and incorporating symmetry or fractals can help people understand, manage and navigate their world. Selecting organic patterns or incorporating irregularity and complexity can invite others to focus and engage. Like patterns, texture can dial up or down the intensity of stimulation in the environment. Natural elements such as the trickle of water or a view of a roof meadow can be both calming and stimulating, providing a focus of soft fascination that offers relief to people struggling with either too much or too little stimulation. Natural materials are often more comprehensible, calming and uplifting than their synthetic or ersatz counterparts—all good things for neurodiverse thinkers. In fact, many of the principles of biophilic design that have been shown to offer benefit neurotypical people in the workplace can also contribute to an environment that's more inclusive of neurodiversity. DESIGN STRATEGIES A workplace assessment can provide HR and corporate real estate teams with valuable information for creating more effective work environments for the neurodivergent. In planning a new space or overhauling an existing one, incorporating these design features will help create an inclusive culture and physical environment that works better for everyone. ● Provide a wide variety of spaces— some for socializing and others for semi-private or private concentration. ● Create active zones and space that encourage movement. ● Place work points in low-traffic areas. ● Offer dedicated quiet rooms to accommodate intense concentration. ● Consider using dividers in appropriate areas to block and reduce noise. ● Design acoustically sensitive environments that generate white noise. ● Use acoustic dampening materials around loud equipment or noisy areas to alleviate crossover sounds. ● Provide work spaces that are not over-lit and that have adjustable lighting levels or areas with varied lighting levels. ● Avoid fluorescent lighting and poor- quality LED to reduce flickering. ● Ensure access to daylight. ● Incorporate natural elements into spaces to create a calming effect. ● Provide work spaces that are well-ventilated. ● Create non-stimulating color schemes

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intermixed with areas of high stimulation. ● Mitigate stress by avoiding chaotic patterns in work areas. ● Prevent sensory overload by creating an ecosystem with different settings and microenvironments that enable people to find the right level of stimulation, be it visual, auditory or physical. For those who are under-stimulated, provide spaces that have hands-on tactile elements and sensations that can assist with focusing. ● Design space that is intuitive to navigate and has a sense of order. ● Use color strategically to help with orientation and wayfinding. ● Emphasize wayfinding cues through repetition of signage as well as consistency and clarity of message. ● Create spaces that enable visual connections. ● Include distinct, memorable spaces. ● Consider providing nourishment stations to help all staff maintain healthy blood sugar and hydration levels. ● Consider providing areas for doodling/ drawing in collaborative areas. OPERATIONAL CHANGES Organizations should create HR programs that educate and sensitize neurotypicals on working and engaging with neurodiverse employees. For example, offering training about how to adjust to or ignore certain self-stimulating (a.k.a. "stimming") behaviors can be highly beneficial. Consider these simple, no- or low-cost accommodations, all of which will benefit the neurodiverse and neurotypical and create a more inclusive workplace: ● Provide awareness training to help staff understand neurodiversity among colleagues. ● Promote a flexible work culture. Allow staff to work from home when they need to concentrate, for example, and offer flex hours so staff can minimize distractions. ● Offer options so employees can choose the environment that best suits them and the task at hand. ● Give people choices about where they sit. This can significantly increase satisfaction and impact engagement and productivity. ● Offer an ergonomics assessment program. ● Allow for seating away from doors, windows and colorful displays. ● Reduce visual clutter and provide uncluttered work surface space and storage space. Promote a clean desk policy. ● Display important information where it can easily be seen. ● Provide accessible storage options for people needing an increased sense of security and order. ● Eliminate or shield flashing devices and equipment. ● Provide easy access to necessary supplies and materials. ● Permit employees to use noise-canceling headphones to reduce distractions. ● Provide equipment with accessible instructions. ● Provide assistive software and technology such as speech-to- text software, time management programs and organizational tools. ● Provide dual monitors to facilitate organization and information retention. ● Minimize glare by strategically locating monitors and using glare-reducing film. ● Encourage intermittent breaks between focus periods. ● Give clear action points in meetings. Avoid metaphors or ambiguity. ● Encourage the use of aids such as stress balls so staff can fidget without distracting others. ● Allow staff to book meeting rooms BENEFITS FOR ALL Designers have an opportunity to influence the physical and cultural adaptations required to make workplaces more inclusive. We need to ensure that the most valuable assets and currency of any business—its people—have the opportunity to be happy, healthy, engaged and empowered. Creating spaces that meet the psychological needs of a wide spectrum of talent starts with the basics. It focuses on workplaces that provide optimal ranges of temperature, lighting, air quality, noise, ergonomics, and a sense of comfort and security. Going further, designing for the neurodivergent creates space that enables all individuals to find suitable levels of privacy and concentration, connection and engagement. There is no single solution for designing space that best accommodates everyone. But when achieved within an organizational culture of respect and inclusivity,

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attention to design elements that consider the needs of the neurodivergent and that provide choices can reduce the adverse effects of neurological difference, take full advantage of the numerous benefits, and support broader organizational values and goals. The significant overlap between design for neurodiversity and the wider movement toward design for improved health and well-being suggests that the benefits of a more inclusive workplace apply to the entire population. This can help all of an organization's members cope with the day-to-day stresses of life and achieve their full potential.

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