



WERNER VOGELS'

Tech Predictions for 2025 and Beyond



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Looking ahead to 2025 and beyond

We have entered an era of unprecedented societal challenges and rapid technological advancements. Harnessing technology for good has become both an ethical imperative and a profitable endeavor. From clean energy innovations unlocking new avenues for sustainable development to AI-powered tools tipping the scales in the fight against disinformation, we are witnessing technology augment human ingenuity in inspiring ways. The rise of intention-driven technologies is reshaping our relationship with the digital world, promoting focus and well-being over mere attention capture. All the while, a mission-driven workforce is emerging, more eager to tackle hard human problems than chase the bottom line. In the coming years, using technology for positive impact will not just be possible—it will redefine the way we think about success.

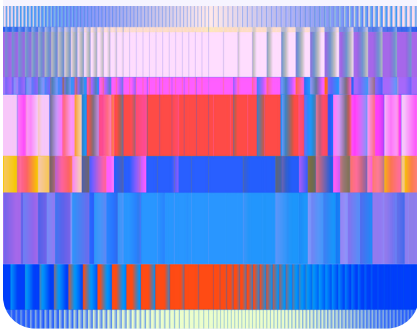


The workforce of tomorrow is mission-driven

The workforce of tomorrow will not only be driven by financial success and career progression, but by a deeper desire to create positive change in the world. The organizations and businesses that acknowledge this shift and embrace purpose-driven work will be poised for long-term success.



Millennials and Gen Z typically show greater concern about issues like inequality, mental health, and the looming threat of climate change.



As the world faces urgent challenges around sustainability, social equity, food and economic security, and responsible AI usage, a quiet revolution is unfolding in the job market—a move towards work that benefits humanity. Across industries and generations, there is a palpable shift in worker values and preferences, with a growing number of people seeking roles that allow them to make a meaningful impact on society and the environment.

The evidence is compelling. Research has shown that Millennials and Gen Z, now the largest segments of the global workforce, place a premium on finding meaning and purpose in their work. In fact, a [recent study by the Harvard Business School](#) makes the claim that college graduates are willing to sacrifice pay for jobs with prosocial impact. This trend is not limited to young workers either—research indicates that employees across all age groups are increasingly gravitating towards roles that have a prosocial impact.

Sustainability-focused positions are among the fastest-growing job categories across the US and Europe. LinkedIn's 2024 "Jobs on the Rise" list highlighted environmental health and safety managers and sustainability analysts as experiencing explosive growth. But this is more than jobseekers self-selecting into these roles, the market is driving this trend as well. Take for example the shift towards renewable energy, which is being propelled by a combination of falling technology costs, supportive government policies, and increasing demand for clean energy solutions. This further reinforces the idea that doing good can also be profitable.

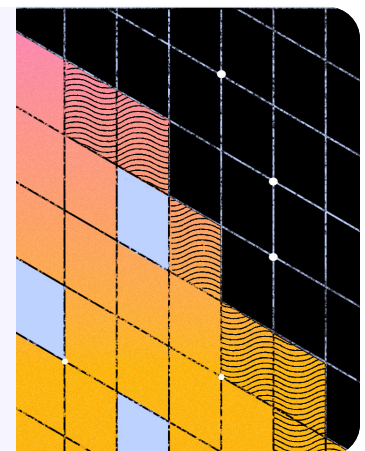
To that end, traditional professions are increasingly embedding sustainability principles and social impact at their core, giving rise to hybrid roles that combine conventional skills with environmental and social expertise. At Amazon, I've observed a growing number of engineers actively seeking projects with prosocial impact. Whether it's engineers developing energy-efficient algorithms for data centers, architects designing carbon-neutral buildings, or finance professionals specializing in sustainable investing, the boundaries between business and social good are blurring.

Compared to previous generations, who were more concerned about personal freedom and economic growth, Millennials and Gen Z typically show greater concern about issues like inequality, mental health, and climate change. As digital natives, they recognize that they can help solve these hard human problems with technology. This points to fundamental realignment of career aspirations and societal values.

To remain competitive, businesses across all sectors must adapt their strategies to attract and retain purpose-driven employees. This means creating roles with positive social impact, integrating sustainability principles into existing positions, and authentically embedding environmental, social, and governance values into core business strategies. Companies that offer meaningful work and empower employees to drive positive change will attract the best talent. Moreover, these organizations will position themselves for long-term success in a world where social and environmental considerations are integral to business performance.

Ultimately, evidence points to a future where the pursuit of purpose takes on equal, if not greater, importance than the pursuit of profit. The workers of tomorrow will not simply be driven by the bottom line, but by a deeper desire to create positive change in the world. Organizations that recognize and harness this shift will be the ones that thrive in the decades to come.

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A new era of energy efficiency drives innovation

Surging power demand and climate imperatives are driving a transformation in how we generate, store, and consume energy. The expansion of nuclear and continued growth of renewable energy will lay the groundwork for a future where our energy infrastructure is a catalyst for innovation, not a constraint.



Two years ago, I predicted a surge of innovation in smart energy technologies, focusing on storage solutions, decentralized grids, and intelligent consumption systems. This was a response to the global energy crisis and the unprecedented challenges posed by the COVID-19 pandemic. However, the landscape has evolved drastically since then. The advent of generative AI, coupled with a broad push for electrification across various sectors—from transportation to manufacturing—have significantly increased energy demand. These developments have intensified the urgency for more robust and scalable energy solutions.

In the last decade, renewables, such as wind and solar have become increasingly scalable and reliable, marking a significant milestone in our transition towards cleaner energy production. They've been instrumental in reducing our carbon footprint and decentralizing productions. In China, renewables account for 37% of total energy capacity, and by 2028, renewables are projected to generate 42% of the global energy supply. Yet, despite their rapid advancement and widespread adoption, renewables alone cannot meet our accelerating energy demands fast enough. To bridge this gap, we need a constant, modular, round-the-clock complement.

Nuclear has re-emerged as a promising solution. It's not about returning to old models but embracing cutting-edge technologies such as Small Modular Reactors (SMRs). These reactors are smaller, flexible, and easier to maintain and operate than traditional nuclear plants. Companies like Amazon are already making significant investments in this area (for example, leading a [\\$500 million funding round in X-Energy to develop SMRs](#) and partnering with [Energy Northwest to develop SMRs in Washington state](#)), signaling renewed confidence in its potential. Moreover, advances in fabrication technologies, such as local-electron beam welding, which reduces the time it takes for nuclear grade welds from a year to roughly a day, have the potential to drastically reduce build times. Innovations in seismic safety, like the work being done by Japan's Atomic Energy Agency, will make nuclear power a safer option in earthquake-prone areas. What's even more interesting is the opportunity that SMRs present to repower existing sites already connected to the grid, such as decommissioned coal plants, providing an accelerated path to fill critical energy needs and alleviate stress on the grid.

However, addressing our energy challenges extends beyond generation; it also involves rethinking consumption. As the demand for computational power grows—driven by the widespread adoption of generative AI across industries—we must reconsider how data centers consume energy. Today, US data centers alone consume 4% of the nation's electricity, with projections suggesting a rise to 9% in the next five years. The best thing that we can do is move away from legacy infrastructure and shift to hyperscale data centers, which will decrease energy consumption by nearly 25% through improved efficiency and economies of scale. Beyond that, the next frontier will involve designing data centers as flexible load centers, capable of adjusting their consumption based on real-time grid needs. This will not only optimize energy usage, but also enhance the stability and resilience of the grid we all rely on.

This transformative shift will require more than technological innovation; it demands a skilled workforce, from nuclear engineers and machinists to grid management experts and material scientists. Investing in education, training, and reskilling programs will be crucial. And it will reshape economies by creating high-paying, highly skilled jobs and driving innovation across sectors. Ultimately, we are poised to enter an era where we are no longer constrained by our energy demands. Clean energy, bolstered by technological innovation, and a skilled workforce, is set to unlock a new era of innovation, redefining what's possible and propelling us to a sustainable, clean energy future.

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TODAY

4%

IN THE NEXT FIVE YEARS

9%

Technology tips the scales in the discovery of truth

As disinformation spreads at unprecedented rates, a new wave of AI-powered tools will emerge to empower journalists, researchers, and engaged citizens in their quest for truth. This technological revolution will democratize investigative capabilities, accelerate fact-checking, and begin to close the gap between the spread of misinformation and its debunking.



We have rapidly shifted from an era of prolonged news cycles that lasted weeks or months to a constant stream of updates that break at the speed of a click. Social media platforms have become a primary source for disseminating and consuming news, and it's never been harder to distinguish between what's true and false. A world where being first is more important than being correct has [eroded public trust in traditional media and news outlets](#). The implications are profound: a significant portion of the populace struggles to identify genuine information (52%), leading to widespread skepticism and sharing of misinformation. Yet, if technology has helped fuel the crisis, it is also the key to solving it.

52%

A significant portion of the populace struggles to identify genuine information

In the past decade, Open-Source Intelligence (OSINT), has emerged as a vital tool in unraveling complex investigations and uncovering truths hidden beneath layers of deception. Organizations, such as Bellingcat and ProPublica, have used public data (geolocation, chronolocation, IP addresses, etc.) for everything from [exposing human rights violations](#) to [investigating international conflicts](#). Major newsrooms worldwide, including the BBC, Der Spiegel, and the New York Times, have all adopted OSINT methodologies to fact-check and validate investigations (and in some cases have [open sourced their tools](#)). However, this process remains painstakingly manual and labor-intensive, often taking weeks or months (sometimes years) to yield results. In contrast, those propagating misinformation can do so instantly with a single tweet or manipulated image or video, creating a significant imbalance in the information ecosystem. This disparity underscores the need for better tools to combat misinformation and disinformation.

We're on the cusp of a movement that will put tools in the hands of consumers, fundamentally changing the current power dynamics. Innovations, such as the [TrustNet browser extension](#), offer the promise of real-time, crowdsourced fact-checking for web content. [GeoSpy](#) extracts data from photos and quickly matches features against geographic regions, countries, and cities. Similarly, generative AI systems that augment daily news with relevant academic knowledge are emerging, such as [Proem](#), providing a necessary aid to validate claims and stem the spread of inaccuracies (both accidental and intentional). And investment in this sector is growing, with more than [\\$250 million in funding](#) dedicated this year to startups developing solutions to these pressing problems. Market forecasts suggest that the OSINT industry could reach a valuation in the billions in the coming decade, reflecting its expanding influence beyond journalism to sectors like corporate brand management and governmental operations.

In the years ahead, we can expect a shift in the direction of fact. The development and democratization of these tools will level the playing field, allowing accurate information to flow as rapidly as disinformation. This transition will not only help to restore public trust in traditional news sources, but also enhance the overall quality of discourse across digital platforms. The impact will be far-reaching, benefiting consumers, businesses safeguarding their reputations, and governments and organizations striving to maintain informed populaces.

As technologists, we have a crucial responsibility in this transformation. By innovating and building tools to help detect and deter disinformation, we can reshape the information landscape. Our collective efforts will contribute to a more informed society, resilient against the tides of digital deception. The path forward is clear: use technology not just to connect the world, but to protect the integrity of the information that binds us.

Open data drives decentralized disaster preparedness

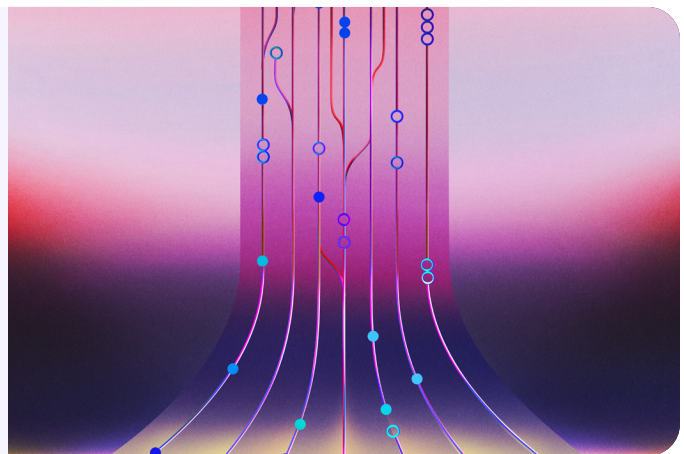
Disaster resilience will be fundamentally transformed through the power of hyperlocal, community-sourced data. This shift will redefine disaster management from a top-down, reactive model to one that is proactive, decentralized, and community-driven.



From Typhoon Alley to the Australian bush, the severity and frequency of natural disasters worldwide are on the rise. Today's disaster response systems often struggle with fragmented or inaccessible data, particularly in vulnerable and isolated communities. During recent events, such as Hurricanes Helene and Milton in the southeastern United States, inland areas were severely impacted—with critical resources unmapped because they were considered low-risk for hurricanes. These events underscore a critical truth: in an age of escalating disasters, timely and accessible data isn't just beneficial—it's essential.

At the core of effective disaster preparedness is data—the ability to collect and use it within a structured framework. While top-down relief efforts have advantages, such as mobilizing large-scale resources, they often lack the nimbleness and dynamism required for rapid response. We are witnessing a shift toward community-centric platforms that empower individuals to take charge of their safety. With the ubiquity of cell phones, communities are empowered to collect diverse, on-the-ground information. For example, during the 2022 floods in Lismore, Australia, residents used social media and Google Sheets to coordinate rescues—[creating an impromptu data ecosystem](#). More community-based apps are emerging, like those used to track wildfires (for example, [Watch Duty](#)), enabling residents to report real-time conditions and guide

In the face of increasing disasters, this shift from reactive to proactive, data-driven disaster preparedness isn't just nice to have; it's an absolute necessity.





500k

VOLUNTEERS
GLOBALLY

response efforts.

These grassroots efforts are evolving into decentralized resilience systems. Advances in edge computing and satellite connectivity during disasters enable real-time data capture and processing, even in the harshest conditions. This technological evolution is not just about faster data—it's about shifting power dynamics and bringing decision-making closer to those most affected. This ensures first responders and residents have immediate access to actionable insights, allowing them to make critical decisions without waiting for centralized systems to activate.

Realizing this future requires close collaboration between communities, local governments, and humanitarian organizations. It's one of the main reasons I recently announced the launch of the [Now Go Build CTO Fellowship](#). As a long-term technology leader, I feel a deep responsibility to mentor and support organizations and individuals using technology to tackle social and environmental challenges. Our first cohort includes the [Humanitarian OpenStreetMap Team \(HOT\)](#), which mobilizes over 500,000 volunteers globally to map vulnerable regions, and [Help.NGO](#), who deploy drones and perform edge computing using AWS services for real-time disaster zone mapping, providing local responders with high-resolution images and real-time data when conventional communication systems fail.

By putting data and decision-making power in the hands of communities, we are not just improving disaster response—we're creating a network of disaster management hubs that enhance preparedness. In the face of increasing disasters, this shift from reactive to proactive, data-driven disaster preparedness isn't just nice to have; it's an absolute necessity. Ultimately, by embracing a community-centric, data-forward model, we're building a future where technology augments human resilience, enabling communities to navigate an increasingly unpredictable world with confidence and autonomy.

Intention-driven consumer technology takes hold

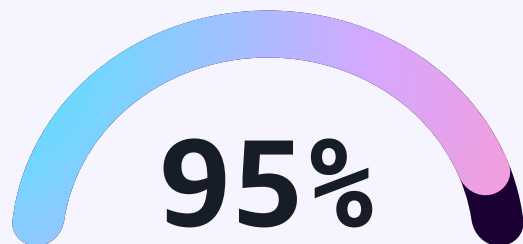
A subtle shift is underway that is redefining our relationship with consumer technology. As more and more people look for a refuge from constant distraction, devices are emerging that prioritize mindfulness, intentionality, and deep thinking over a barrage of fleeting stimuli. In 2025 and beyond, technology will empower rather than distract us—and we'll be better for it.



In a world where our devices are extensions of ourselves, capturing attention has become a billion-dollar industry. Every swipe, headline, and notification are meticulously engineered to hook us. This relentless pursuit of our attention has led to unintended consequences, such as rising levels of anxiety, depression, and a pervasive sense of distraction. Between 2009 and 2022, daily social media use among teens skyrocketed from 50% to 95%—and [mental health for many worsened](#). 72% of U.S. high school teachers consider student phone distraction a major problem. The [“Stress in America” survey](#) found that constant phone checkers experience higher average stress levels. And [internal documents](#) from TikTok reveal that users can become addicted after just 35 minutes of use. These alarming trends underscore the urgent need to reevaluate our relationship with technology and prioritize intentional, mindful usage.

In response to these challenges, a growing movement is emerging with a focus on intentional disconnection and mindful technology choices. Schools throughout the world are implementing cell phone bans with striking results. At [Grant High School in Portland](#), lunch is loud again as students engage in face-to-face conversations. Teachers report increased focus in class and decreased instances of bullying. This forced disconnect is gaining popularity among adults too. [The Offline Club](#) in Amsterdam, launched in early 2023, provides a refuge from the digital world and has attracted over 150,000 followers in just months. These initiatives signal a broader shift in how we think about and use technology.

(Research indicates that) employees across all age groups are increasingly gravitating towards roles that have a prosocial impact

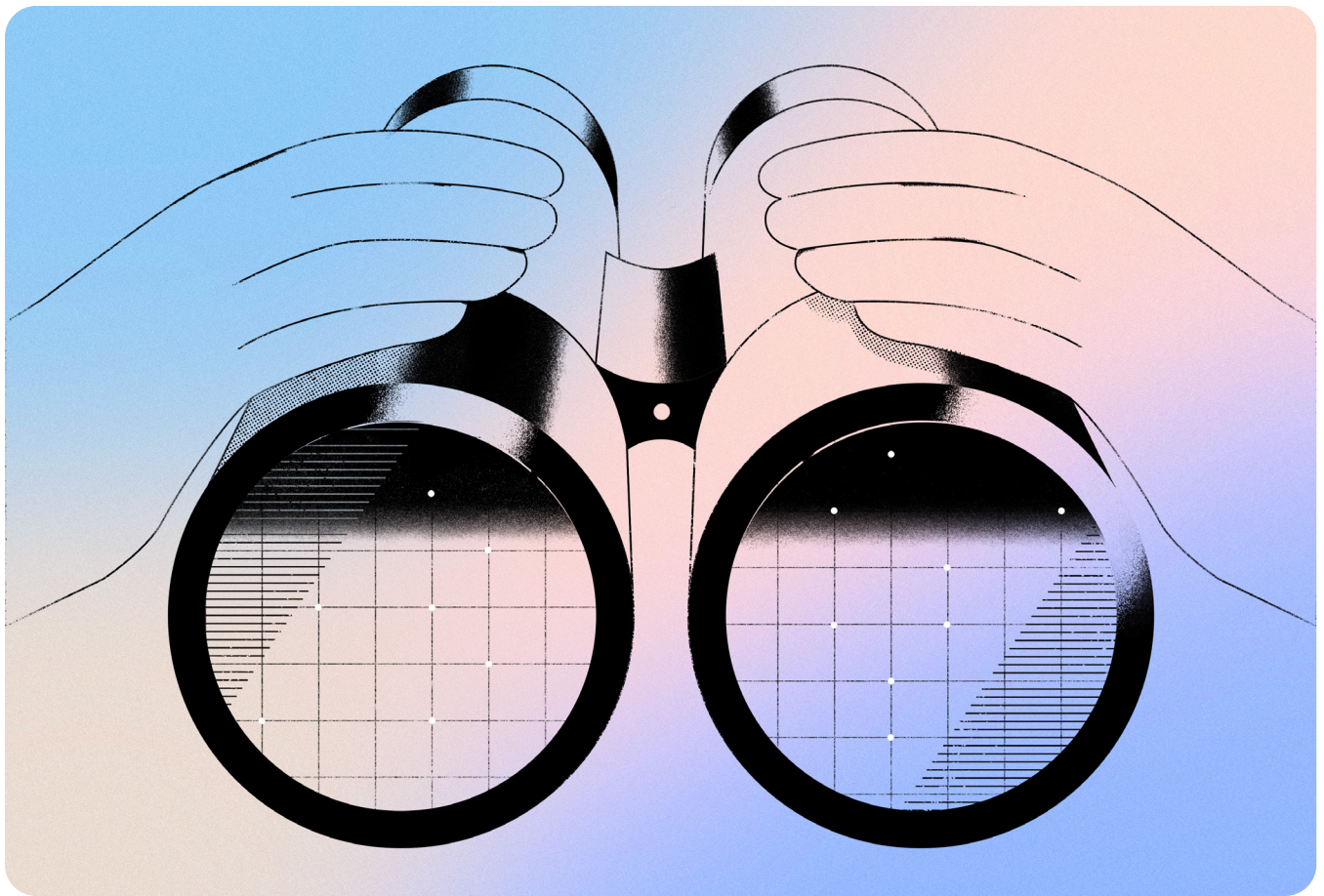


A great example of this is the doc writing process at Amazon. Regardless of role or seniority, there is an expectation that when you have a good idea, that you'll put pen to paper and craft a compelling narrative. When it's ready, we get together, read silently and take notes, then discuss. The process forces everyone to be present—to focus on the task at hand. As we continue to increasingly rely on technology in our day-to-day, we can expect [more organizations to adopt similar strategies](#) that prioritize deep thought and critical thinking.

Innovators are taking notice. A new wave of purpose-driven devices is emerging, designed to foster intentional use and encourage us to enter a state of flow—or “the zone”—rather than divert our attention. e-Readers, such as the Kindle, [have long encouraged immersive reading without interruptions](#). Now, we are witnessing this trend on a much larger scale, with the emergence of minimalist phones that offer little more than call and text functions, [cameras that emphasize the craft of taking a photograph](#) not on sharing, and standalone music players that let us enjoy music without the constant barrage of messages and notifications.

Don't get me wrong—this shift doesn't mean abandoning digital connectivity, but rather being mindful of how devices can augment our intentions instead of simply grabbing our attention. It's about striking a delicate balance. Personally, I dedicate one afternoon a week to learning, turning off my phone and email to focus on reading academic papers or exploring the latest AWS services. Similarly, high-performing executives have been known to [exclude phones from the first hour of their days](#) to boost cognitive power, a practice supported by [Stanford Lifestyle Medicine experts](#).

These practices align with the Dutch concept of “niksen”—purposeful idleness, or the art of doing nothing. For Americans, the closest thing that comes to mind is meditative daydreaming. This approach recognizes that in our increasingly complex world, embracing simplicity can realign technology with our core values and mental health. With a return to intentionality, we can elevate our relationship with technology, ensuring it empowers us rather than distracts us.



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