

3RD ANNUAL—2023

PRESENT AND FUTURE OF WORK IN ENGINEERING AND ARCHITECTURE

Our latest report on the state of the talent market, plus insights about how best-in-class organizations are coping with talent shortages, turnover, and disengagement.



New research from ActionsProve and the Engineering Management Institute uncovers how organizations must evolve to compete for top talent amidst shortage.

A survey of over 400 engineers and architects in North America explores industry challenges—including employee disengagement, stress, and burnout—and offers advice to organizations about inspiring, engaging, and developing talent.

AN INDUSTRY EXPERIENCING GROWING PAINS

Research shows the engineering and architecture industry is growing—even in the face of a potential economic recession. Yet structural problems in hiring and motivating employees exacerbate the talent shortage.

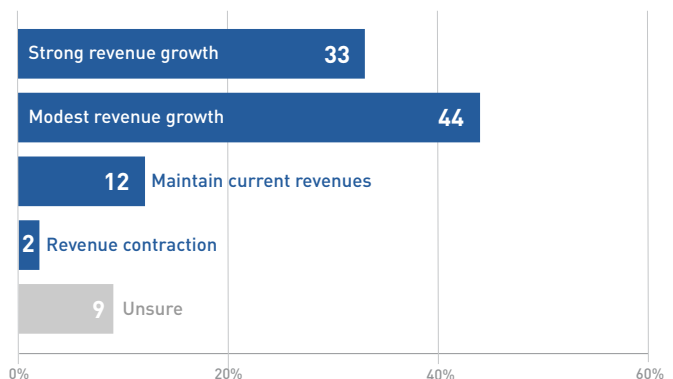
Many analysts and research groups expect uneven growth for the industry in 2023. Spending on residential construction is predicted to decline 2% in 2023, while spending on nonresidential building and nonbuilding structures is projected to rise 8% this year, according to FMI's first quarter 2023 report.¹ The US economy is expected to grow 3.1% this year, according to figures from the US Congressional Budget Office.²

Our research shows engineers and architects are optimistic about their company's growth prospects; more than three in four expect their company's revenue will grow in 2023. Yet talent shortages inhibit growth for many organizations. Among industry leaders we surveyed, 96% say shortages will restrain their company's growth in the coming year. An analysis from McKinsey underlines this point: Spending increases related to the Infrastructure Investment and Jobs Act (IIJA) will cause a shortfall of 40,000 engineering and technical-services workers in 2027 and another 40,000 in 2028.³

The problem: Though more students pursue engineering degrees, the increases cannot make up for the fast-growing demand. The National Science Foundation reports that nearly 30% of all engineering and science graduates in the labor force are over 50 years old, meaning they will likely retire in the next 15 years.⁴

Figure 1 EXPECTATIONS FOR GROWTH IN 2023

1 in 3 expect strong growth



Q. What is your company's revenue outlook for 2023?

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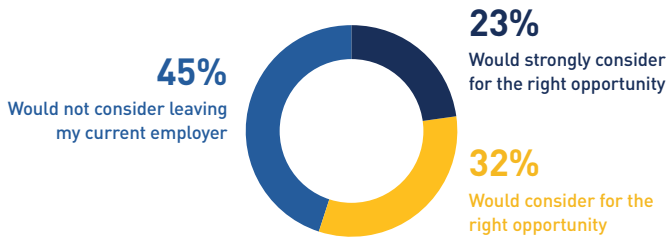
To make matters worse, companies still grapple with historically high turnover. More than half (55%) of engineers and architects say the Great Resignation still pervades the industry, and among younger employees and technical professionals, that percent is significantly higher. And 55% would consider leaving their current employer for a new opportunity (down 6 points from 2022 but still high).

Given the dismal state of talent availability in the industry, alarm bells should sound.

>3 in 4 engineers and architects expect their company's revenue will grow in 2023.

Figure 2 **POTENTIAL TURNOVER REMAINS HIGH**

55% would leave current job for a new opportunity



Q. If the right opportunity arose, would you consider leaving your current employer in the next 12 months?

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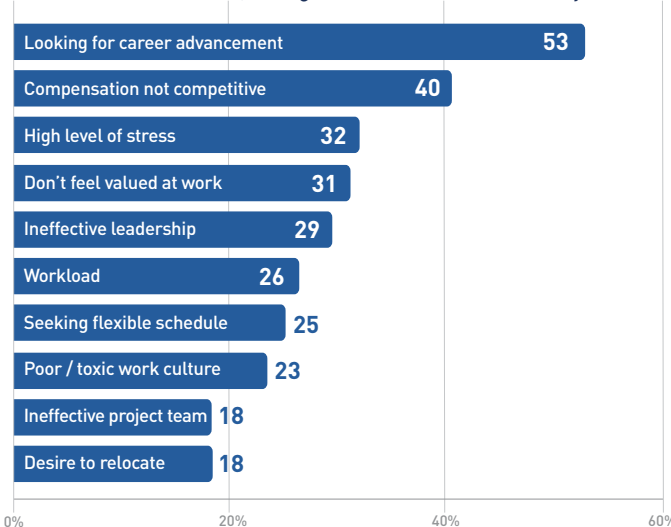
An industry paradox

If organizations are desperate for talent, why do so many struggle to retain talented individuals? And even more: Why is the reported quality of work life for in demand engineers and architects so low?

Many assume professionals leave their employer in search of higher wages, but the answer is more nuanced. The most common reasons are a search for career advancement (53%), followed by a more competitive salary (40%). But nearly one in three say quality-of-life factors like stress and not feeling valued at work would drive them to resign. And one in four seek a more flexible schedule.

Figure 3 **WHY DO PROFESSIONALS RESIGN?**

Career advancement is #1, but high stress levels drive 1 in 3 away



Q: What factors do/would influence you to consider leaving?

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A large share of engineers and architects simply feel disconnected from their work: burned out, stressed, and unengaged. Here is just a handful of the troubling statistics:

- **Low level of engagement:**

Fewer than half (46%) of engineers and architects say they are highly engaged at work.⁵ Those engagement figures are higher than general findings from Gallup in November 2022—when 33% of US employees were engaged at work—but the results are still concerning, especially when we consider the highly attractive and unique nature of our work.⁶

For some roles and subparts of our industry, engagement levels are far worse. For example, in public-sector jobs, just 29% say they're highly engaged with their work. And 37% of managers report the same (more on that to come).

- **Few advancement opportunities:**

Just 26% “strongly agree” they see a path for advancement at their company. (Remember, career advancement is the No. 1 driver of turnover.)

- **Burnout and stress are common:**

The majority of engineering and architecture professionals say they are stressed at work. Fifty-eight percent say the stress affects their physical and mental health, and 49% say it affects how they interact with family and friends.

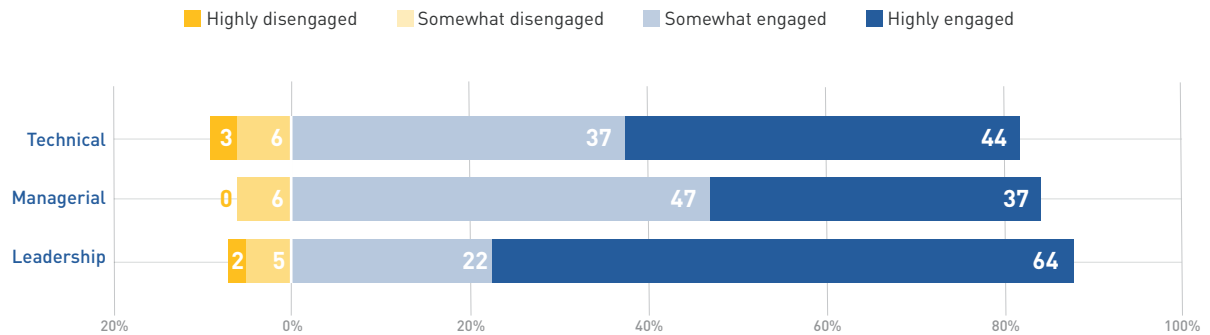
Leaders are aware of the negative impacts; 71% say stress and burnout restrain growth at their companies.

- **Independent careers seen as escape from industry challenges:**

28% say they're highly interested or actively pursuing an independent career—meaning they want to work independently as contract or freelance professionals. While slightly more than one in four is not an overwhelmingly large group, 50% of those with five to nine years' experience are highly interested or currently pursuing independence. The option is attractive because they want greater control over their projects and hours.

Figure 4 **WORKFORCE ENGAGEMENT**

Managers feel least highly engaged at work



Q. How “engaged” do you feel at work? [Engagement in this context means feeling energized by their work and invested in positive organizational outcomes.]
 Note: Bars do not add up to 100 because we removed “neutral” responses.

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The evidence is overwhelming: Factors like stress, burnout, overworking, and work-life imbalance pull at the fabric of the engineering and architecture professions.

“We can’t keep talking about a talent shortage without taking a serious look at why many firms have ongoing high turnover,” says Peter C. Atherton, P.E., president and founder of ActionsProve. “The work world has undergone a massive shift: Many professionals want greater flexibility to exercise more agency over their time and energy. So far, a sizable number of industry leaders still seem less willing to part with many of our most limiting traditional practices. Our 2023 research spells out the consequences from this type of real or perceived inflexibility.”

In February and March 2023, we surveyed 435 professionals in engineering and architecture to understand issues like professional satisfaction, engagement, training, workload, and many other factors. Aside from taking the pulse of individuals’ professional lives, we wanted to know how hiring companies cope with talent shortages, and how highly attractive firms compete for and retain top talent.

For more information about the study demographics, see page 15.

55% of engineers and architects would consider leaving their current employer for a new opportunity

DESTABILIZING FORCES

Professionals tell us they're burned out, disengaged, and in search of a higher quality of life. Yet many leaders seem unwilling to change the status quo.

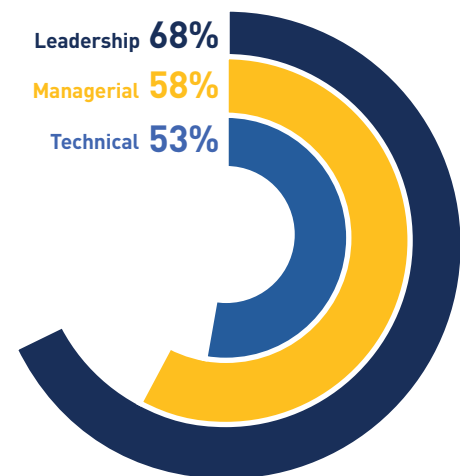
Jobs in engineering and architecture have long been subject to stress: managing large and complex projects, meeting tight deadlines, and sometimes dealing with unreasonable clients. Yet something significant changed in recent years. A growing share of professionals will no longer sacrifice their personal well-being to meet their employers' demands.

Something significant has changed in recent years. A growing share of professionals will no longer sacrifice their personal well-being to meet their employers' demands.

Dozens of engineers and architects we surveyed voiced frustration with their working conditions and stress levels. They report a pay-your-dues mentality is still rampant in the industry (58% believe they need to "pay dues" to advance); even so, a rising tide of younger employees tell us the attitude is unsustainable at best, and toxic at worst.

For many engineers and architects, particularly those under 50, the traditional work compact—professionals work long, grueling hours in exchange for advancement and eventual partnership—does not hold up. Fifty-four percent of professionals early in their careers (under 5 years of experience) are willing to pay their dues compared to 62% of those who have 20-plus years of experience. As one younger engineer shares, "Overworking to 'pay your dues' is something I will never do. No job is worth the degradation of my quality of life."

Figure 5 "I AM WILLING TO WORK LONG HOURS TO 'PAY MY DUES' AS AN ENGINEER/ARCHITECT."



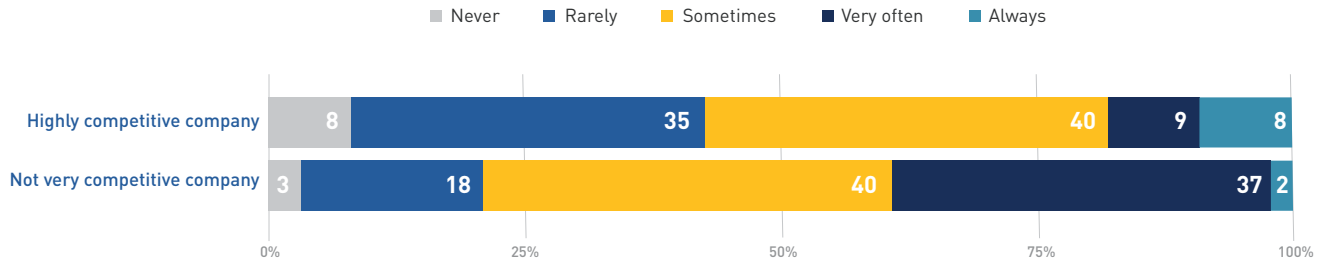
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WHAT WOULD YOU CHANGE ABOUT THE A&E INDUSTRY?

“Why do we force young engineers to work many hours of overtime even though they are salary employees? Since I'm older (63), I have dropped back to a 40-hour work week to preserve my health and happiness.”

Figure 6 **BURNOUT: A SERIOUS PROBLEM IN THE INDUSTRY**

Overall, one in four say they “very often” or “always” feel burned out



Q: Is burnout a problem for you at work? Note: To stratify respondents into competitive groups, we asked, “Consider your company’s ability to attract and retain talent. Which of the following most accurately describes your current position re: talent competitiveness?” Survey takers could choose: Highly competitive, moderately competitive, or not very competitive. Moderately competitive not shown.

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Quality-of-work-life indicators

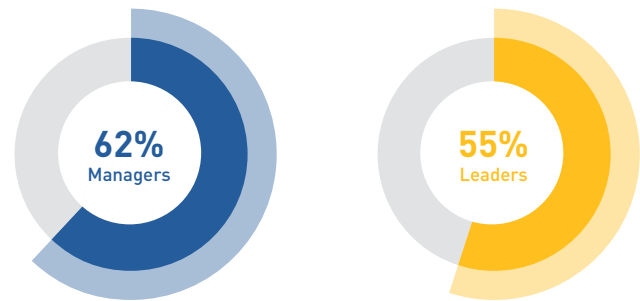
Why so much pushback from employees on long hours and oversized workloads if they’ve been common features of the job for decades? Because the fallout from overworking (e.g., stress, burnout) is rampant in engineering and architecture. More than one in four professionals surveyed say they “often” or “always” feel burned out.

Specific subgroups have even worse rates of burnout.

- Mechanical and electrical engineers: 38% and 37% (compared to 23% for civil/structural engineers and 26% for building architects)
- Public sector employees: 49% (compared to 24% for consulting/design firms)

Professionals who experience high levels of stress and burnout are not effective employees, and their descent toward burnout-induced disengagement and new (or developing) negative outlooks can be contagious—even for high achievers. Engineers and architects say the amount

Figure 7 **WORK STRESS AFFECTING PHYSICAL AND MENTAL HEALTH**



Q: Work stress is affecting my physical and/or mental health. (Showing those who chose “agree” or “strongly agree.”) Survey takers self-selected as technical, managerial, or leadership. Technical not shown.

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of work they are responsible for is the biggest driver of burnout, followed by challenging clients and unrealistic deadlines. And well over half (58%) say work stress affects their physical and/or mental health.

1 in 4 engineering and architecture professionals say they “often” or “always” feel burned out.

Figure 8 **WORKLOAD A CRITICAL DRIVER OF BURNOUT**

Managers also point to challenging clients

	TECHNICAL	MANAGERIAL	LEADERSHIP
Amount of work	47	57	60
Unrealistic deadlines	34	40	23
Long work hours	33	33	32
Ineffective colleagues	30	30	42
No time for leisure activities	30	29	23
No time for self-improvement	30	29	23
Challenging clients	24	48	32
Ineffective manager(s)	24	19	26
No boundary between work and home	23	29	37
Pressure from manager / leadership	20	22	17
Unable to take time off	19	12	15

Q: What makes you feel burned out? Survey takers self-selected as technical, managerial, or leadership. Technical not shown.

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Disconnects from within

Conventional employee engagement methods are no longer enough. Engineers and architects have found their voice; they want greater personal agency to decide how, when, and where they work. Employers are still trying to boost engagement by focusing on forging emotional connections or improving supervisor relationships. These are worthwhile efforts, but they don't address the underlying needs articulated by engineers and architects post-pandemic.

Younger professionals, in particular, are redefining what "winning" means. It's no longer a work-specific achievement; they want to win at work *and life* (a trend we first reported on as part of our 2022 research report). Work is just one aspect of individuals' goals, fulfillment, and satisfaction.

WHAT WOULD YOU CHANGE ABOUT THE A&E INDUSTRY?

“ There should not be a sense of pride for working very long hours or staying at your office for more than 24 hours/only taking a nap or forgetting to eat lunch or generally working more than anyone else. And those behaviors should not be rewarded or encouraged.”

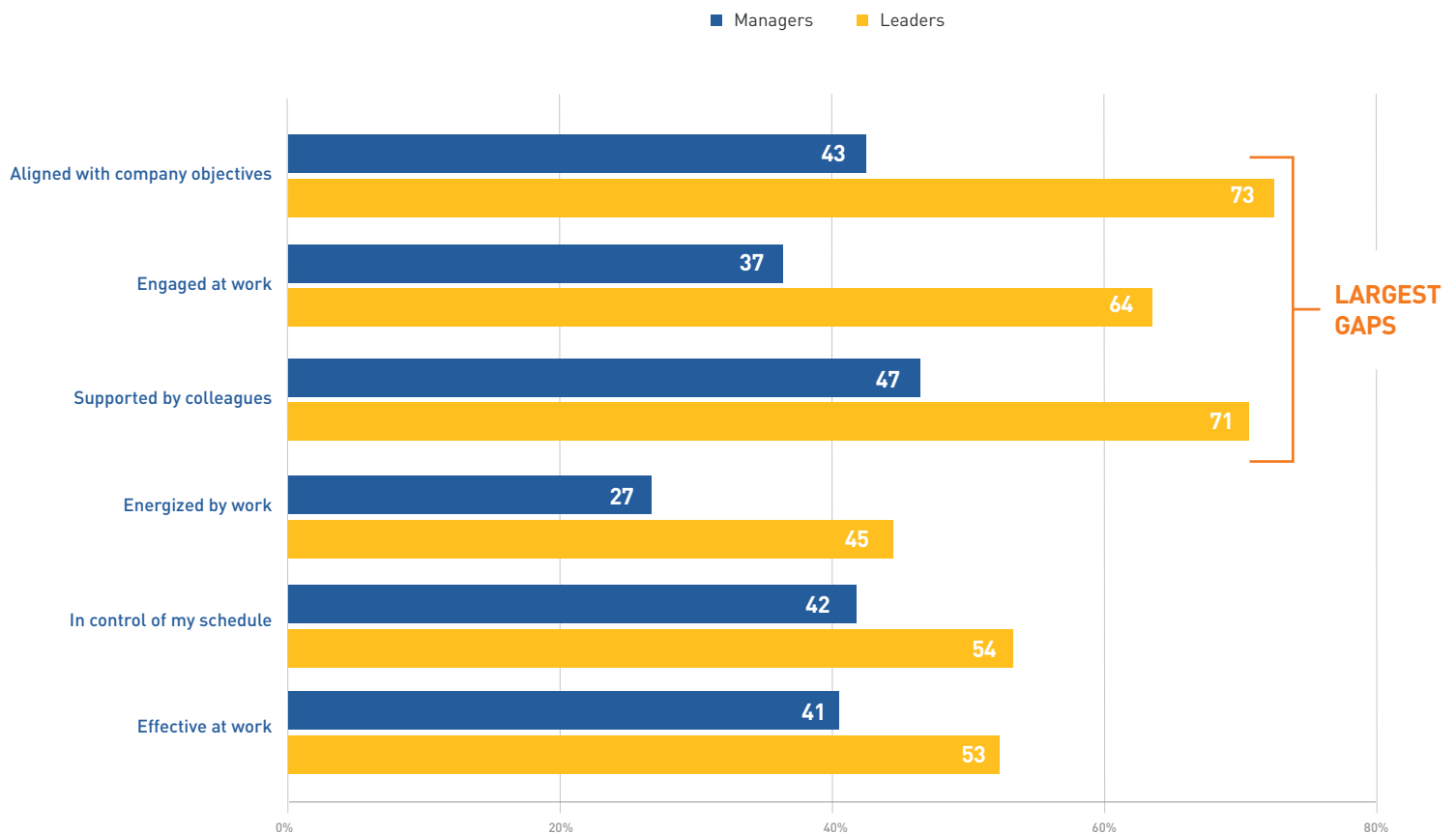
MANAGERS AT RISK

Our research shows managers in engineering and architecture are more likely to suffer with stress and burnout compared to their colleagues (and keep in mind, mid-career, experienced professionals are also the most difficult to recruit).⁷

62% of managers say work stress affects their physical or mental health (compared to 55% of leaders). For managers, workload and dealing with challenging clients act as big sources of tension and burnout.

Figure 9 **MANAGERS REPORT WORSE EXPERIENCE AT WORK**

Managers feel less engaged, less supported



Q. Respondents were asked to report how often they felt this way in the last 30 days. This chart only shows those who answered "frequently." Survey takers self-selected as technical, managerial, or leadership. Technical not shown.

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Rather than fight against it, employers should try to support their employees' outlook, paying attention to:

- *Work-life alignment*: Help employees to achieve and fulfill goals, interests, and passions.
- *Belonging*: Create workplaces and spaces that inspire connections, performance, and achievement.
- *Autonomy*: Define new and more flexible guidelines for work—the how, when, and where—and focus on output rather than hours.

- *Pathways*: Remove obstacles and friction that prevent employees from advancing in work and life. Even more: Design career ladders to reduce the number of employees who feel they have to leave the organization in order to advance.

Leaders naturally and traditionally enjoy greater alignment, sense of belonging, autonomy, and work flexibility—64% of leaders surveyed report being highly engaged. This figure, however, falls precipitously for managers (37%) and practitioners (44%)—a disconnect that must be better understood and addressed for organizations to transform from within.

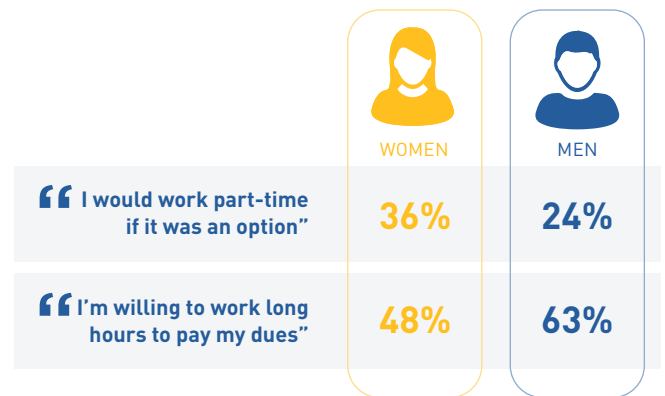
THE CHANGE IMPERATIVE

Younger employees and women of all ages have different attitudes about the role work plays in their lives—and these beliefs will transform the industry over the next decade.

Are long work hours required in the industry? Or is there room for a new paradigm? The choice may be a foregone conclusion. That’s because attitudes about workload, schedules, and work-life balance are changing quickly—and as long as engineers and architects are in high demand, they will find the professional life that suits them (and “walk” when an employer’s offer doesn’t match their needs).

These changes are not unique to engineering and architecture. Overall, US professionals worked fewer hours in 2022 compared to 2020.⁸ Fewer hours at work pays dividends, both personally and professionally. When asked what they look for in a new employer, engineers and architects put “better quality of life” nearly on par with “generous financial package.”

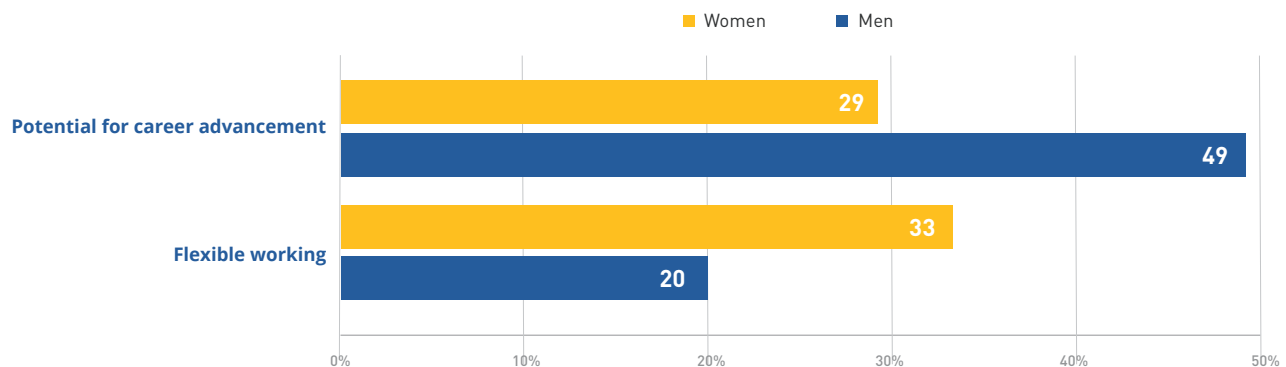
Andrew Barnes, author of several books about work life, explains the impact of requiring fewer hours from employees: “What you’re really saying to people [is] I am going to give you something that you cannot put a price on, it’s that precious. It’s more time. More time to do whatever you want. And all you have to do is rethink how you do things.”⁹



Retaining women engineers and architects

Allowing employees to work flexibly and do it in fewer hours is an imperative for companies competing over scarce talent—particularly if organizations are serious about recruiting and retaining more women. Women are much more focused on flexible schedules and fewer hours than their male counterparts.

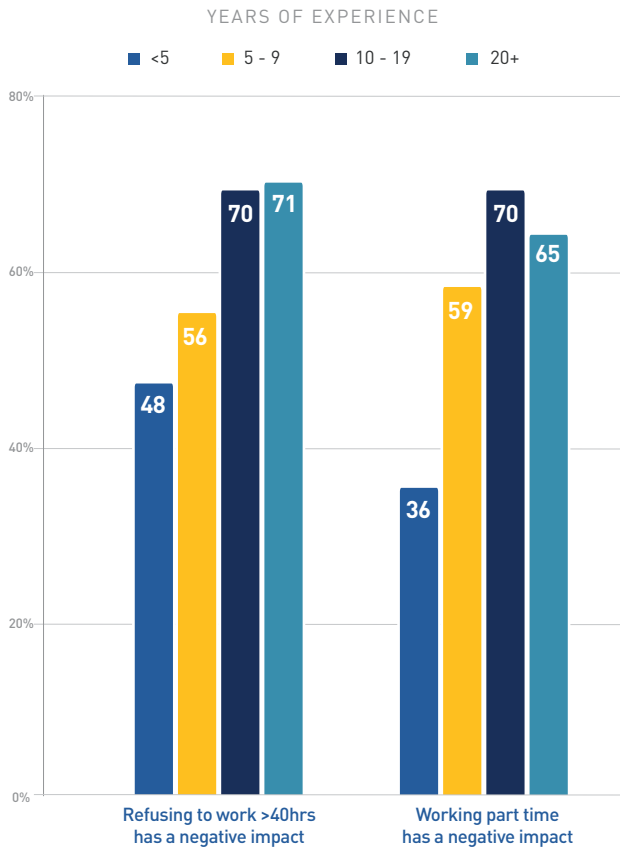
Figure 10 PRIORITIES WHEN EVALUATING A NEW EMPLOYER



Q: What factors do / would influence you to consider leaving your current employer? (Showing results for two responses only.)

Figure 11 DEEP GENERATIONAL DIFFERENCES DIVIDE THE WORKPLACE

Professionals disagree about how fewer hours affect careers



Q1: When an engineer/architect refuses to work more than 40 hours a week, does it impact their career advancement? Q2: When an engineer/architect works part-time, does it impact their career advancement?

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Rethinking “output” and overwork

Engineers and architects we surveyed say they work an average of 44 hours per week, and spend slightly more than one quarter of those hours working remotely (approximately 12 hours per week). Yet they would *prefer* to work 38 hours in total—a sizable six-hour difference ... nearly one full day. This difference applies almost uniformly across roles (e.g., technical, management, leadership).

The concept of a four-day workweek is getting traction in many areas of so-called “knowledge work,” particularly among software engineering and other tech jobs. Many professionals in our survey mentioned the four-day workweek specifically as a pressure-release valve for burnout and stress. One notes, “If you can get a full week’s work done in four days, you should be commended for that. Instead you are looked down on as someone who isn’t committed to the field. That culture needs to change.”

A UK study found companies with four-day workweeks reported productivity levels remained the same (due largely to curbing meeting time) and 39% of employees reported less stress and half reported improved mental health.¹⁰

The industry, however, is still far away from embracing the concept of a four-day workweek or the idea that a career-minded professional might choose to work part time. Sixty-three percent of people we surveyed say working a less-than-full-time schedule impacts career advancement in the industry. (Though the figure drops to 48% among people with less than five years of experience—perhaps a sign that norms are changing for new recruits.)

CAN REDUCING WORK HOURS COMBAT STRESS AND BURNOUT?

“If you can get a full week’s work done in four days, you should be commended for that. Instead you are looked down on as someone who isn’t committed to the field. That culture needs to change.”

“Move to a four-day workweek. Technology has increased productivity, but companies—not workers—have reaped all the benefits from it. It used to take weeks to draft blueprints by hand; now it can be done in a fraction of the time.”

Disagreement about the impact of virtual work

Engineering and architecture professionals tell us they work virtually approximately 12 hours a week—and most people say the option has had a positive impact. Among those with less than five years of experience, 57% report a positive impact on job satisfaction and 79% say they’ve experienced a positive or neutral impact on their sense of belonging at work. And among women, 54% report virtual working drives satisfaction (compared to 44% of men).

The notable exception is workers with 20-plus years of experience—older, mid-to-late career professionals. Just one in three say virtual work helps with job satisfaction, and half says virtual working has had a negative impact on their sense of belonging at work.

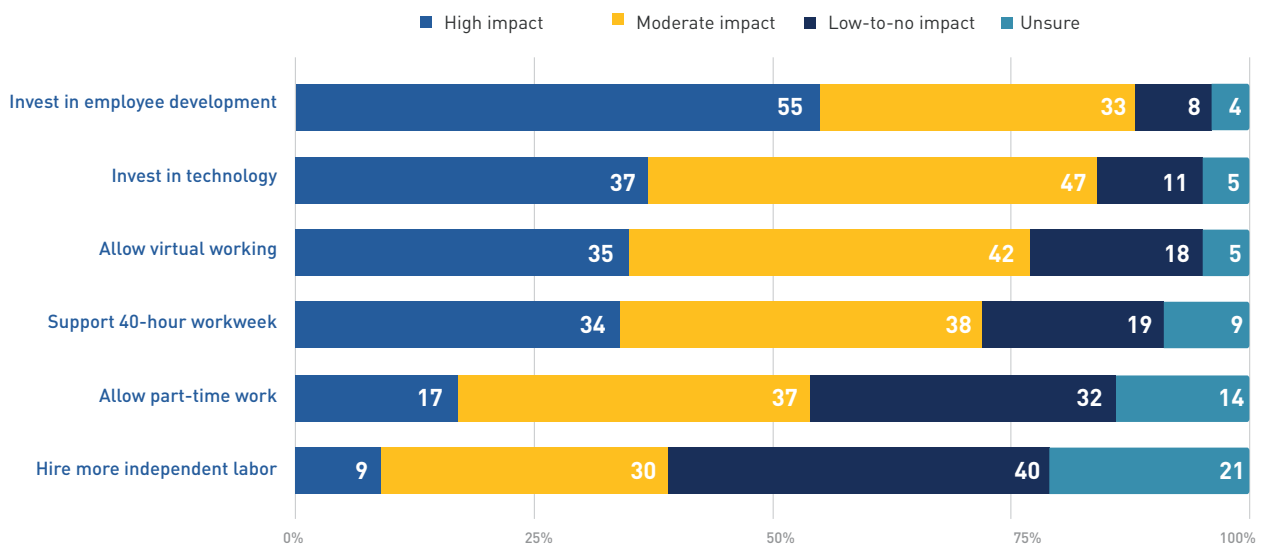
For many, virtual work is a release valve, a way to spend more time with family and friends, and less time commuting. Clearly, younger professionals and women value the option. As with the issue of overwork, organizations will likely need to compromise, or work through and innovate around this issue, if they want to remain competitive when recruiting scarce talent.

WHAT TALENT-RELATED FACTORS POWER GROWTH?

We asked engineers and architects what steps companies can take to sustain the companies’ growth, balanced against individuals’ priorities and career goals. Their answers fall into three primary categories:

- 1. Invest in development and training:** More than any other issue, these professionals believe training can have an outsized impact on growth. When asked what type of training they would most want, project management (59%) and people management/leadership (66%) topped the list.
- 2. Invest in tech:** 84% believe technology can have a positive impact. Generative-AI tools like ChatGPT will upend the industry, making teams more efficient and effective—but organizations need time to train the AI tools and adapt to new modes of working.¹¹ AI can deliver answers to technical questions and even offer real-time recommendations—for example, the preferred materials for a project based on constraints such as cost or weight. These are not futuristic ideas; recent developments in AI suggest they will become the norm at organizations both small and large.
- 3. Support quality-of-life measures:** Engineers and architects say allowing employees to work virtually and making a 40-hour workweek the norm (if not the recommended maximum) are important steps to sustain growth.

Figure 12 ACTIONS THAT HELP COMPANIES SUSTAIN GROWTH



Q: To what extent can the following actions help companies sustain growth?

WHAT DO GREAT TALENT COMPANIES DO DIFFERENTLY?

We asked professionals to rate their company's ability to attract and retain talent—and used their answers to understand what successful, *people-first* organizations do differently to recruit, engage, and retain high-value employees.

When a sizable share of employees report high levels of burnout and stress—stress so high that it impacts their mental health—the industry should take notice. For organizations to drive growth, they must treat employees as long-term assets. And people-first organizations help us understand the specific areas that are key to maintaining employees' health and engagement.

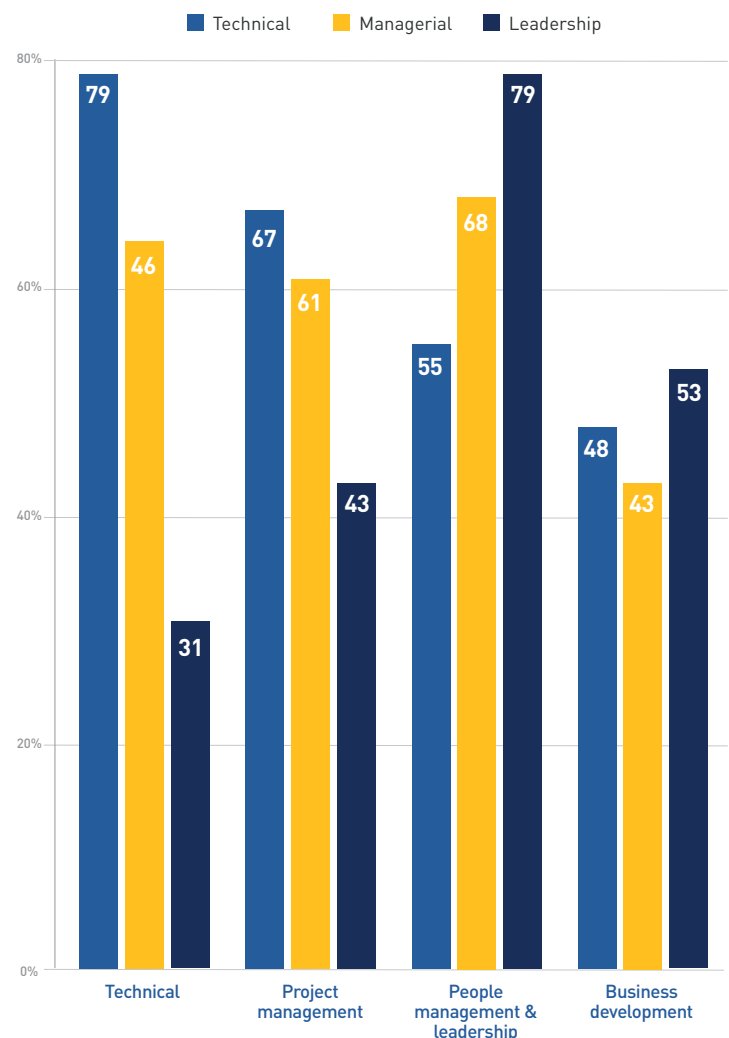
Offer strong support for professional training and career development

Eighty-three percent of professionals at high-performing organizations say their company supports their career development (compared to 51% at lower-performing organizations); and 79% say they see a clear path for career advancement—55% higher than lower performers.

“Investing in professional development programs not only builds competence internally, it makes your organization a destination company for talent,” says Anthony Fasano, P.E., president of the Engineering Management Institute. “Our research shows again and again that engineers and architects seek out organizations that offer high quality training and development—not just technical training, but soft-skills development such as team management and leadership training.”

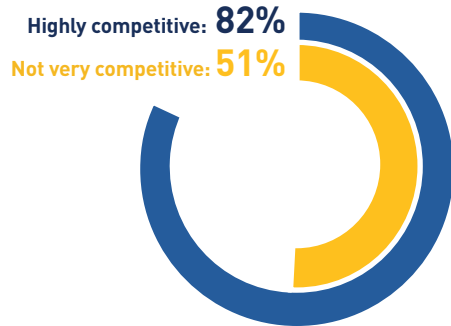
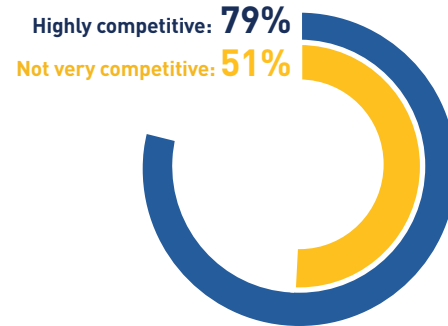
Keep in mind: Even in highly competitive people-first organizations, just one in four rate their training programs as excellent. This means organizations can truly differentiate themselves with best-in-class training.

Figure 13 TRAINING NEEDS AT EACH CAREER STAGE



Q. In your current role, which of these types of training would be valuable?

Figure 14 HOW COMPETITIVE IS YOUR COMPANY WHEN HIRING TALENT?

My company supports my career development**I see a path for career advancement at my company**

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Align employees behind a shared mission and strong set of values

Inside high-performing organizations, 86% say they feel aligned with their organization's mission, vision, and values. Compare this to just 47% of those who say their company is not talent-competitive.

"Defining an organization's mission, vision, values, and purpose for existence in the context of our changing times is critical for creating the conditions for employee engagement—and its more powerful form, employee *opt-in*," says Peter C. Atherton, P.E., president and founder of ActionsProve.

Not surprisingly, 59% of employees at talent-competitive companies say they feel highly engaged at work, compared to only 19% of those at less-competitive organizations—that's three times more! Remember that engaged employees are more activated at work, more productive, and less likely to seek out new job opportunities.

View part-time workers and independents as a strategic tool

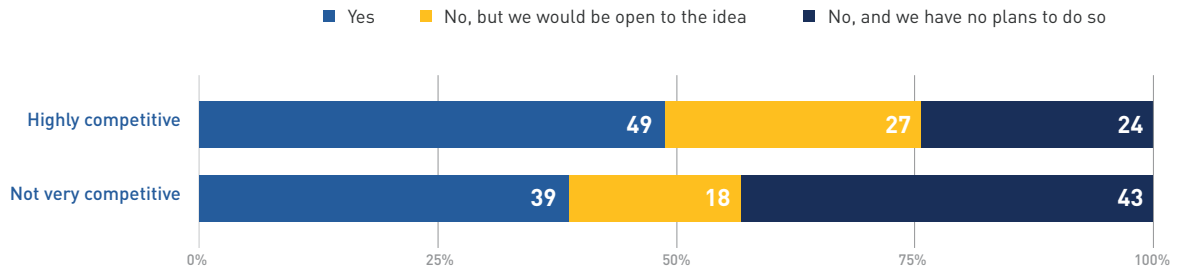
Talent-competitive companies are much more likely than others to use independents to supplement their workforce; 49% already do, and another 27% are willing to consider the idea.

Our research also shows that more than one in four professionals would work part-time if it was an option at their company (and more than one in three women say this). Allowing part-time work—and making it possible for part-timers to enjoy fruitful careers—may be one way to reduce burnout and attrition, particularly among women.



My company has a lot of training videos on company culture, but my department has very-little-to-no training. It relies on people learning in the field. This makes new employees a net burden for a long period of time and restricts their development."

Figure 15 **HIGHLY COMPETITIVE COMPANIES ARE MORE LIKELY TO USE INDEPENDENT PROFESSIONALS**



Q: Does your company currently hire independent contractors / freelancers in engineering or architecture positions?

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“We often consult with organizations about how they can maximize their attractiveness and expand their talent pool,” says Atherton. “Creating the types of systems and teams where part-time and independent professional freelancers can meaningfully contribute and thrive is an investment strategy that can pay dividends immediately and for decades to come.”

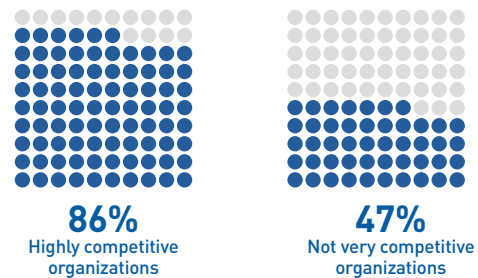
Invest in employees’ whole lives

People-first organizations sustain their competitive position by investing in talent. The differences in quality of work life between highly-competitive companies and less-competitive organizations are eye-opening.¹²

Professionals at less-competitive organizations are nearly three times more likely to report frequent work stress compared to highly competitive companies, and they’re two times more likely to say they’re frequently overloaded with work. It should come as no surprise that they are significantly less likely to say they feel effective and energized at work.

By reducing stress and unreasonable workloads, high-performing organizations drive up engagement, productivity and retention. (Burnout in highly competitive firms is less than half that of less attractive firms – 17% and 39%, respectively.) Long work hours and high stress are not required for productivity; our research shows they’re not even desirable. As one person shared, “Architecture can be labor intensive, but long working hours can be curbed by effective planning and management.” Another explained, “Too many industry leaders measure productivity by hours instead of output.”

Figure 16 **“I FEEL ALIGNED WITH MY ORGANIZATION’S MISSION, VISION, AND VALUES”**



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Authors



Peter C. Atherton, P.E.

President and Founder of ActionsProve

ActionsProve serves the engineering, architecture, and construction (AEC) industry through strategic planning and advisory, executive coaching, leadership and management team development, performance-based employee engagement, and corporate impact design. Learn more and check out the *AEC Leadership Today* podcast at www.ActionsProve.com.



Anthony Fasano, P.E.

Founder of The Engineering Management Institute

Engineering Management Institute helps consulting firms build professional development systems to attract, develop, and retain an engaged workforce, including people leadership and project management development programs. To learn more about their proven process, call 800-920-4007 or visit EngineeringManagementInstitute.org.

Methodology

This research was sponsored by ActionsProve, LLC, and the Engineering Management Institute, and produced by Ravn Research. The survey was fielded from January 29 to March 17, 2023, and 435 professionals in engineering and architecture completed the survey.

GENDER

Male	70%
Female	30%

YEARS OF EXPERIENCE

<5 years	19%
5 - 9	23%
10 - 19	27%
20+	31%

DISCIPLINE

Civil & Structural Engineering	41%
Mechanical Engineering	12%
Electrical Engineering	10%
Plumbing Engineering	2%
Instrumentation & Controls Engineering	2%
Building Architecture	16%
Landscape Architecture	1%
Land Surveying	3%
Other:	13%

Endnotes

¹ 2023 Engineering and Construction Overview: First Quarter | FMI

² The Economic Outlook for 2023 to 2033 in 16 Charts | Congressional Budget Office

³ Addressing the US construction labor shortage | McKinsey

⁴ The America Works Report: Industry Perspectives | U.S. Chamber of Commerce

⁵ In our survey, we defined engagement as “feeling energized by their work and invested in positive organizational outcomes.”

⁶ How to Improve Employee Engagement in the Workplace - Gallup

⁷ Engineering’s Talent Strategy Needs an Upgrade | IndustryWeek

⁸ Is the Tight Labor Market Due to Fewer Workers — or Fewer Hours Worked?

⁹ The Phenomenon of the Four-Day Workweek

¹⁰ After Testing Four-Day Week, Companies Say They Don’t Want to Stop - WSJ

¹¹ AI Enhances Engineering Efficiency with ChatGPT | by Konstantinos Gkizinos | Geek Culture | Feb, 2023 | Medium

¹² The survey asked, “Consider your company’s ability to attract and retain talent. Which of the following most accurately describes your current position re: talent competitiveness?” Respondents could choose “highly competitive,” “moderately competitive,” or “not very competitive.” In this section, we compare the top and bottom cohorts.