



For Engineers,

It's Not All About the Money

- WITH SALARIES UP, WHERE DO YOU STAND?
- KEEPING UP WITH TECHNOLOGY
- THE IMPACT OF OUTSOURCING
- TOP FACTORS IN JOB SATISFACTION
- PREPARING FOR THE INTERNET OF THINGS

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Editorial

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How Do You Stack Up?

Welcome to this year's annual compensation survey. In surveying our audience across our family of brands, we found similar findings from *Electronic Design* to *Microwaves & RF*, *Machine Design*, *Hydraulics & Pneumatics*, and *Global Purchasing*. Among the major trends were more focus and interest on the Internet of Things (IoT) and Industrial Internet of Things (IIoT)/Industry 4.0. Engineers are increasingly working on products and solutions for the IoT, while they and procurement professionals and management are also looking at how the IoT will impact the way they do their jobs.


Job satisfaction is currently very high. Engineers, for example, feel well compensated for their work and are generally happy with their career paths. They also feel optimistic about the state of the engineering industry, although some concerns remain about the economy, outsourcing, and IoT adoption. Among our Machine Design and Hydraulics & Pneumatics audiences, for example, there is some concern over manufacturing jobs being minimized or even phased out with IoT adoption.

For engineers, one of the biggest challenges remains staying up to date on the latest technologies. To accomplish this goal, our audience cites many online resources, ranging from white papers and e-books to webcasts and videos. They of course contend with time-to-market challenges and other job pressures, but by and large, they get a lot of satisfaction from overcoming those challenges. Interestingly, when they need to take

a break and clear their heads, they most commonly shared that they go for a walk.

Across the industries we reach, more individuals are relying on smartphones to tie up business at the end of the day or prepare for what faces them in the morning. They also are paying more attention to social-media outlets like LinkedIn, Twitter, and Facebook. Some cite that they use Twitter (and Facebook, but to a lesser extent) to stay updated, while LinkedIn continues to reign as the career-networking resource.

What about the future? Across the board, we continue to see the majority of responses pointing to concern over the next generation. The consensus is that, despite today's efforts to bring more students into technology fields of study and careers, we're facing an engineering shortage. It follows that specialized areas, like the microwave and radio-frequency (RF) market, are facing an even bigger chasm as companies look to the next generation. Many of the people that laid the groundwork for today's technical breakthroughs have retired or are nearing retirement. While they brought in talent behind them, most do not think it is enough to bridge the gap.

Hopefully, all of today's technical-outreach efforts will increasingly produce interest from the next generation. In the meantime, don't forget to evangelize engineering and technology-related fields in your own circles. The majority of survey respondents said that they would recommend their professions, so why not start if you haven't already? And don't forget to take a deeper look at how people in your industry are compensated to see where you stand. 

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2015 ENGINEERING SALARY SURVEY: It's Not All About the Money


According to the nearly 3,000 electrical engineers that participated in *Electronic Design's* 2015 Salary and Opinion Survey, the engineering professions is in a period of transition. On the one hand, companies are still in the process of recovering from the economic recession and risk-averse corporate culture. On the other hand, the Internet of Things (IoT) is slowly maturing into a reality for technology companies and igniting demand—and competition—for engineering expertise.

With priorities shifting out of cost management and into developing new technologies for an IoT ecosystem, the employment outlook for engineers improved slightly over the last year. In general, companies are increasingly motivated to hire experienced engineers and provide slightly higher compensation to keep them. But at the same time, concerns about working conditions, job security, outsourcing, and continuing education have grown more entrenched in the psyche of the typical engineer.

The majority of engineers anticipate that their companies will either maintain or increase hiring next year. But approximately 51% of respondents—a percentage that has been steadily rising over the last five years—noted that their companies were having difficulty finding qualified candidates, especially in embedded and software design. “Extreme specialization in engineering makes job mobility difficult on the technical path,” said one respondent, “and many employers seem to be unwilling to hire or train people who are merely close enough. The glut of engineers seeking work allows employers to be extremely choosy in hiring candidates.”

According to this year's survey, almost two-thirds of engineers think a career in engineering and the potential for salary advancement is as promising as it was five years ago. In terms of total compensation, engineers reported an average compensation of \$108,560, with bonuses and other incentives included, in 2015. (In contrast, the average compensation was \$103,680 in 2010 and \$106,482 in 2014).

Even though many respondents are concerned that compensation is not keeping pace with workflow, almost two-thirds of engineers felt that they were adequately compensated for their work this year. At the same time, in contrast to questions about compensation, the vast majority of engineers reported that they feel satisfied and intellectually challenged in their current positions.

In general, the engineering profession appears to be moving in a positive direction. However, many engineers may have to adjust their opinions slightly to what constitutes a positive employment outlook, especially as the industry becomes more engrained in the global economy. The U.S. Labor Department Bureau of Labor Statistics (BLS) predicts that electrical and electronics engineers will have around 318,700 jobs in 2022—almost 50,000 more than in 2014, but also about 17,000 fewer jobs than the bureau recorded in 2013. Perhaps most importantly, many engineers remain satisfied with a profession that affords them the opportunity to get paid for indulging in their passions. 

JAMES MORRA, associate content producer at *Electronic Design*, wrote this report. Data conducted and compiled by Jay McSherry.

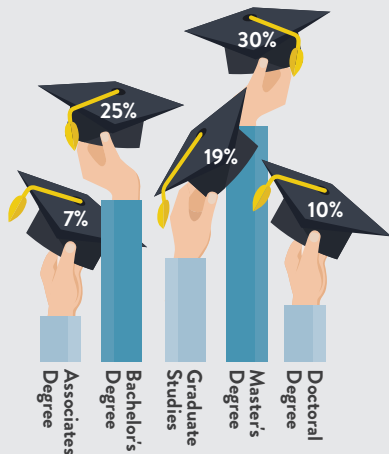
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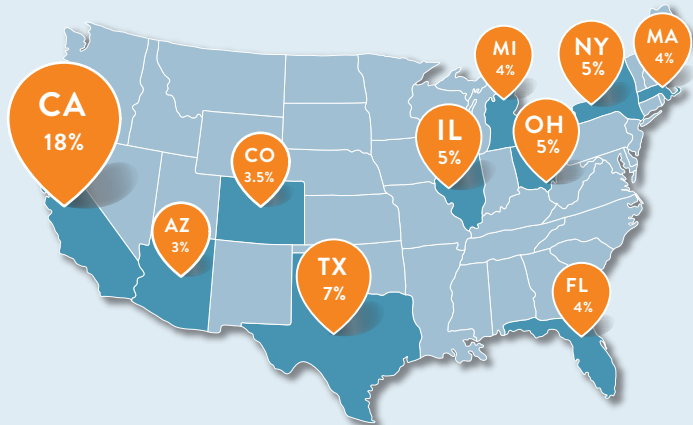
THE TYPICAL ENGINEER

Highest education level

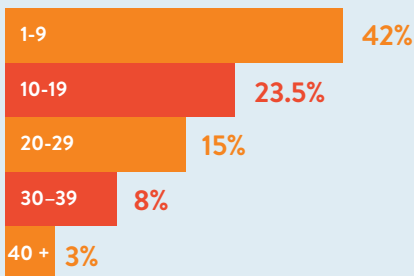


"To remain in the technical path, you have to be a life-long learner. Employers are looking for skills that a college education itself does not provide."

Work locations

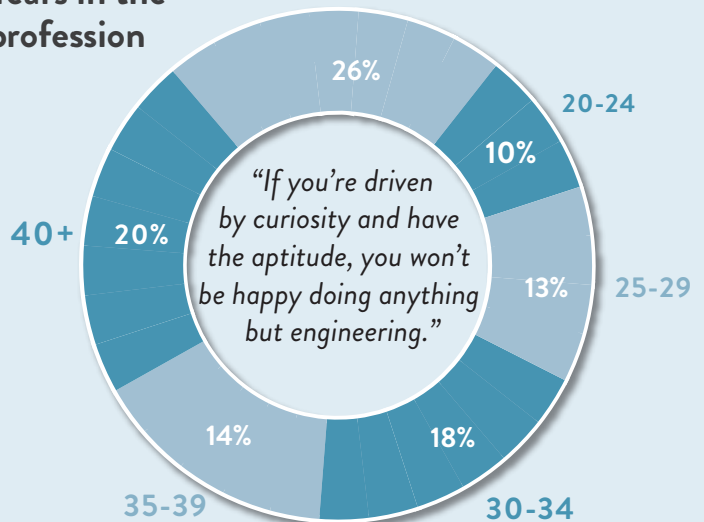


Years at present company



Years in the profession

Under 20



Age

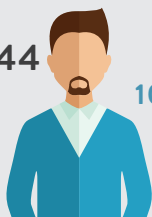
The typical engineer is growing older and edging closer to retirement age. "Engineers from the baby-boomer generation are retiring faster than engineers are graduating from college," lamented one respondent. Most engineers are of the opinion, however, that retiring engineers have not mitigated the intense competition for engineering expertise. At the same time, "new people are needed," said one respondent, "and a lot of technological opportunities exist."

25-34



6%

35-44



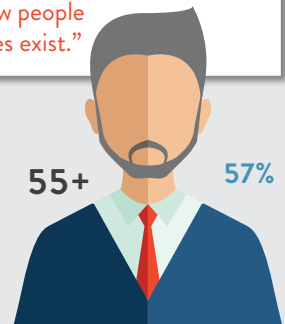
10%

45-54



25%

55+



57%



Average Compensation

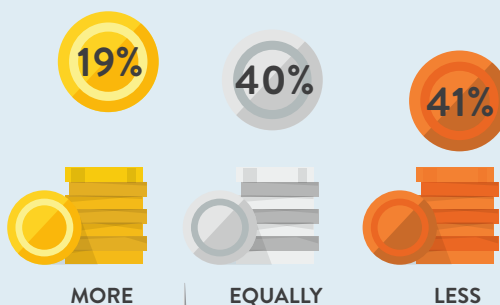
\$ 108,503

Average compensation increase



COMPENSATION

How competitive is the average engineer's compensation?



Average bonus

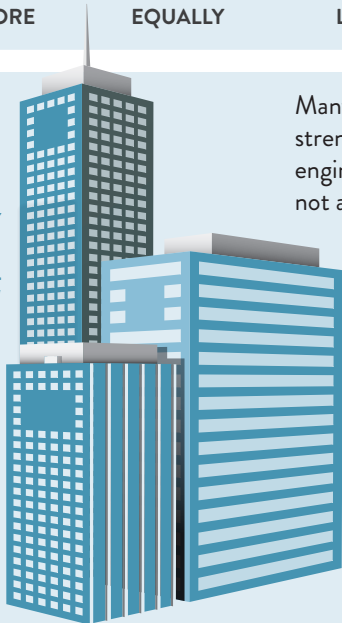
Cash \$3,880
Stocks/options \$2,616
Other \$2,500



In general, engineering salaries have not changed significantly in recent years, with many engineers referring to a "glass ceiling" on compensation rates and downward pressure from cost-averse corporations and H-1B workers. While compensation varies widely based on geographic location and job function, the average compensation rate grew more from last year than it has in almost five years.

30%
SAY
HIRING
WILL
GROW

11%
SAY
HIRING
WILL
REDUCE



Many engineers are optimistic that technological advancements will strengthen demand for their expertise going forward. But many of the same engineers also think that they are increasingly viewed as "commodities" and not as "valued contributors," as one respondent noted.

EMPLOYMENT OUTLOOK

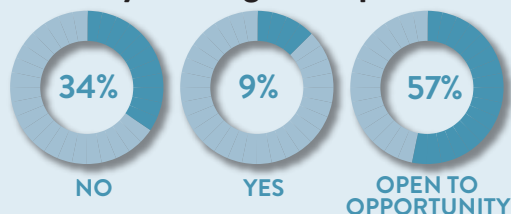
58%
SAY
HIRING
WILL
MAINTAIN

Is an engineering career as promising today as it was five years ago?

62%
SAY YES

"Things are better now than five years ago with the recession, but overall engineering careers have been on a downward trend for a while, in my opinion."

Actively seeking a new position



Is your organization more focused on employee retention this year?



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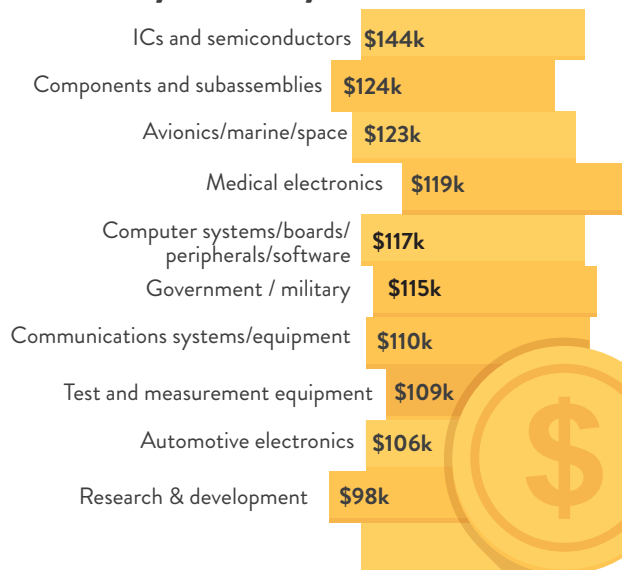


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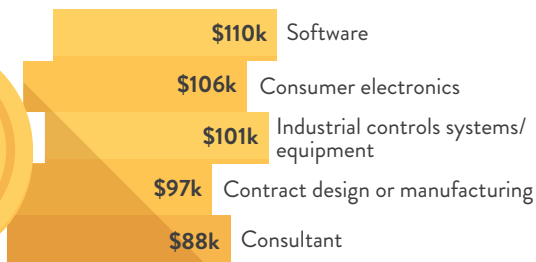
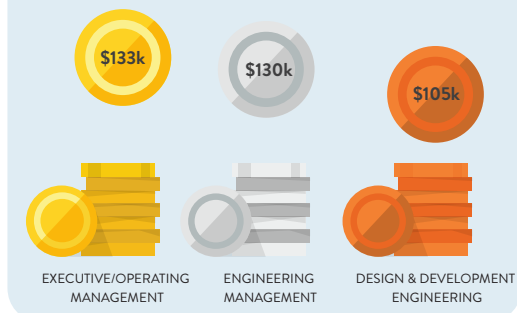


COMPENSATION BREAKDOWN

By industry



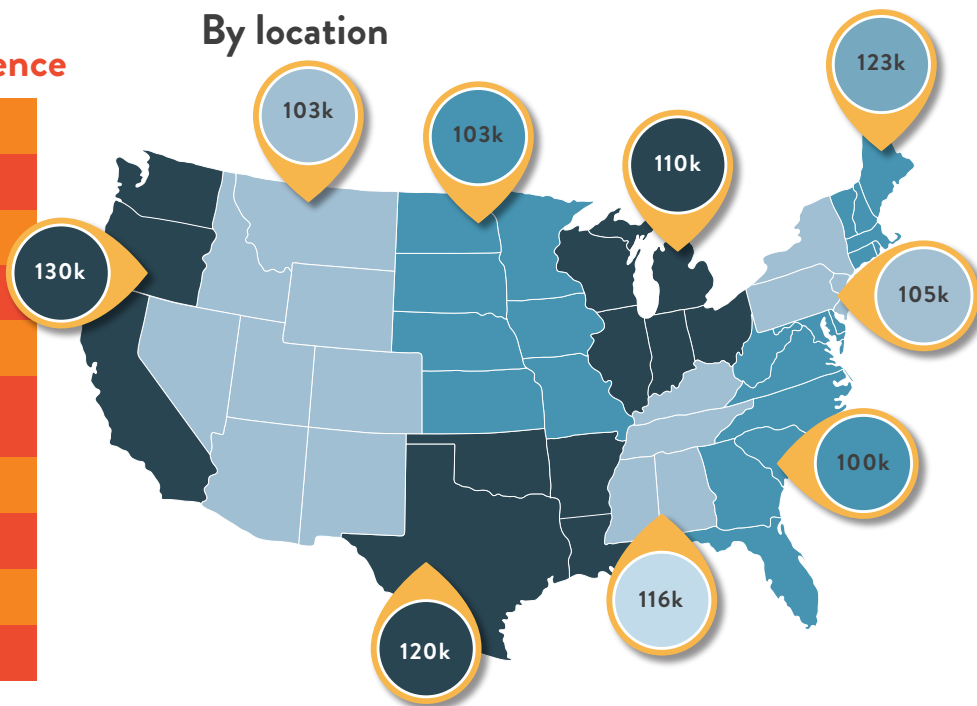
By job function



By years of engineering experience

35-39 years	\$123,212
25-29 years	\$116,623
30-34 years	\$115,780
20-24 years	\$112,053
15-19 years	\$105,917
40 years or more	\$105,766
10-14 years	\$90,093
5-9 years	\$84,754
1-4 years	\$68,100
Less than 1 year	\$60,389

By location

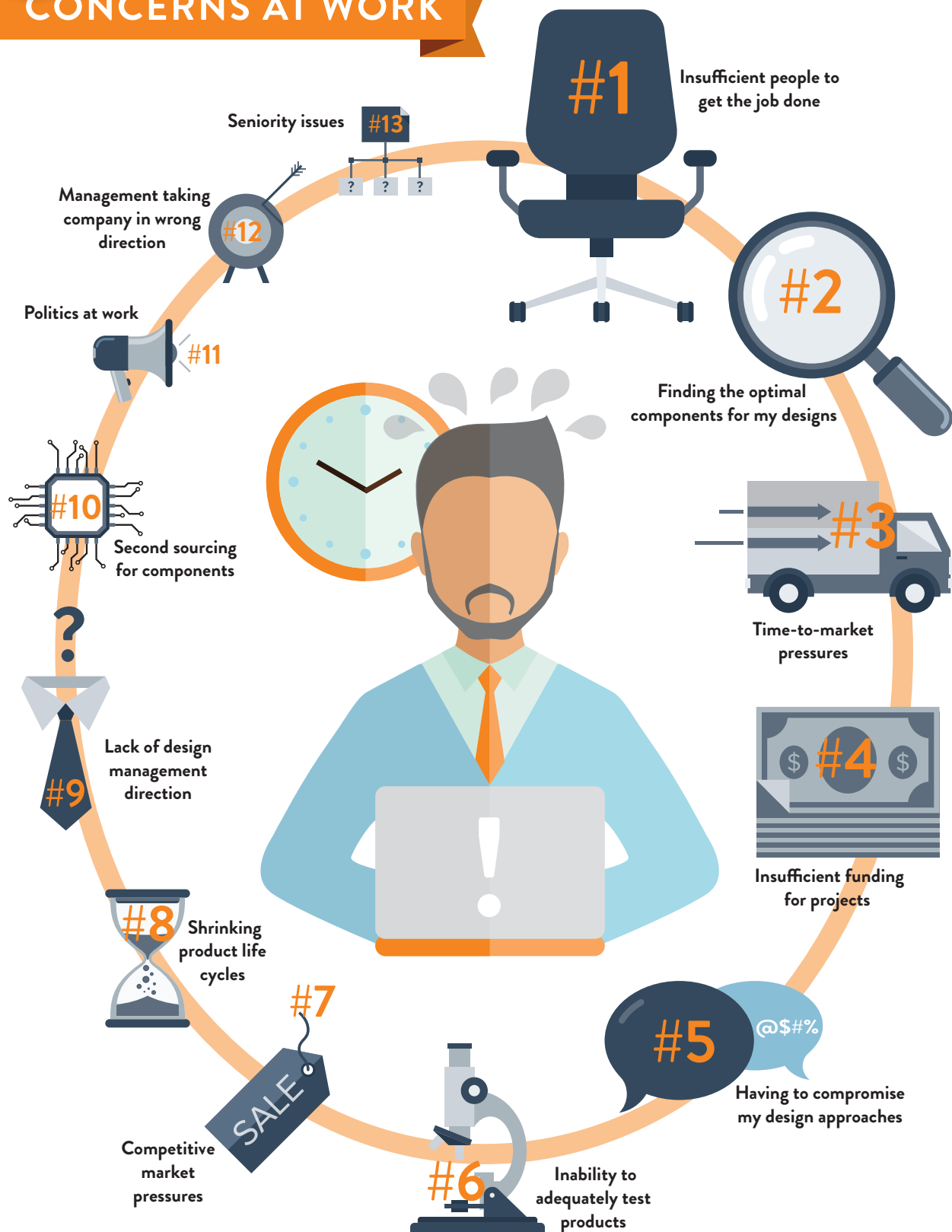


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CONCERNS AT WORK





JOB SATISFACTION



The majority of engineers work for long hours under significant pressure from employers, but rarely view their compensation as the spoils of war. On the contrary, most engineers are satisfied with their personal circumstances, feel sufficiently challenged in their current position, and believe they are adequately compensated. "Engineering is a career where you get out of it exactly what you put into it," opined one respondent.

The average engineer works **54 hrs/week** at the office and at home and other locations

Reasons engineers would leave the profession

No further chance for advancement	16%
Do something less stressful	22%
Do something more fulfilling	23%
Curious about other opportunities	31%
Start a business	22%
Switch to teaching	12%
Ready to retire	19%

64%

Feel adequately compensated



Feel compensation should increase on average by **21%**

Job Satisfaction

Extremely satisfied	21%
Very satisfied	32%
Satisfied	35%
Not very satisfied	10%
Not at all satisfied	2%
Have considered leaving the profession	34%

"Engineering has lost a lot of its passion as evidenced by the lack of commitment engineers are making to their employers, due to the lack of commitment from the employers themselves."

Most important factors in job satisfaction

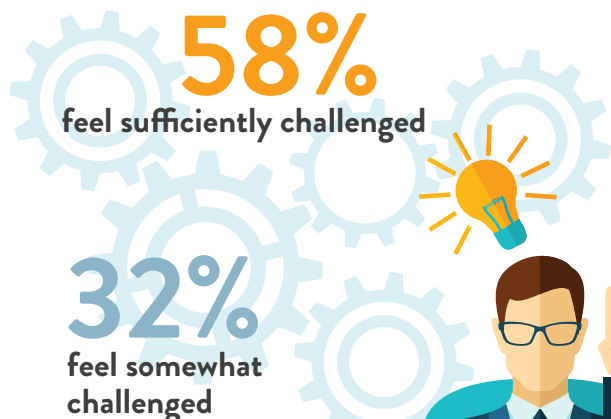
1. Challenges that accompany the design of new products
2. Researching potential design solutions
3. Opportunity to design products that can benefit society
4. The compensation you receive for the work you do
5. Working in team situations with peers
6. Working independently of others
7. The recognition you get from others for the work you do
8. The pressures associated with solving design problems



ENGINEERS TALKING FROM THE PULPIT

"My career has offered me great flexibility personally and professionally—this is somewhat dependent on the company you work for, but the pay is good, and the challenge of solving tough problems is very rewarding."

"An engineering profession, if done properly, can keep you mentally sharp, diversifies your skills, and keeps you abreast of technological advancements. Engineers are likely to be well suited to move into many new professions, if their motivations drift in other directions."



89%
would recommend the profession to a young person



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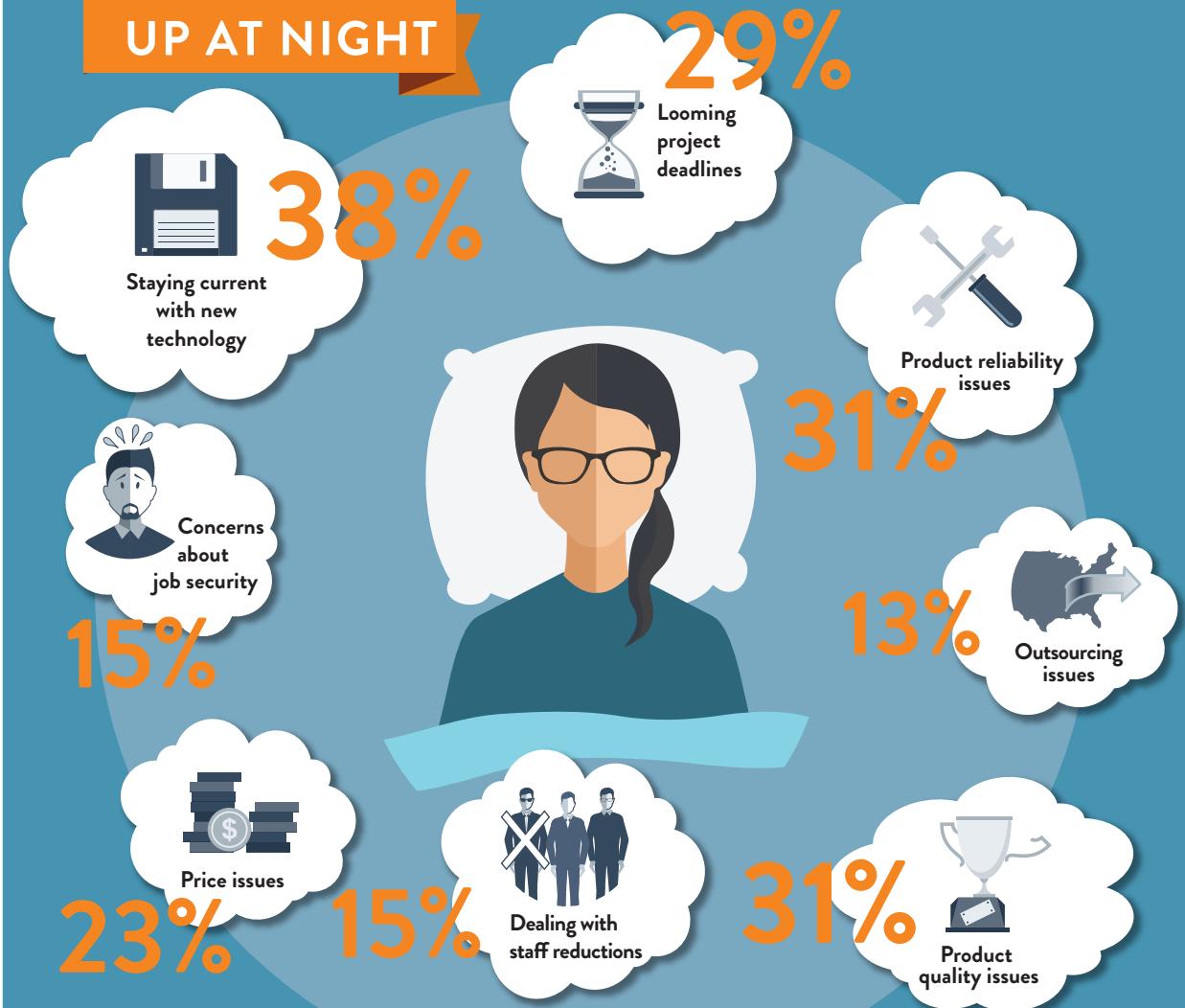


ISSUES KEEPING

ENGINEERS

UP AT NIGHT

The majority of engineers point to time constraints as the root of their professional concerns, especially as engineering jobs are reduced and the people left behind are forced to assume more responsibilities on shorter deadlines.



ENGINEERS TALKING IN THEIR SLEEP

"It is impossible to stay current; there is too much information and not enough time. It is not possible to have any knowledge depth on new technologies."

"What worries me is the rapidly changing expectations of experience. Employers do not want to hire you for a position where you will have to learn new skills."

"It doesn't matter how efficient we become if we are not supported to test our products. Testing is an afterthought, and quality is long-gone."

"Unfortunately, the prevailing reason for outsourcing is purely economical, not technical, which jeopardizes the quality of products."

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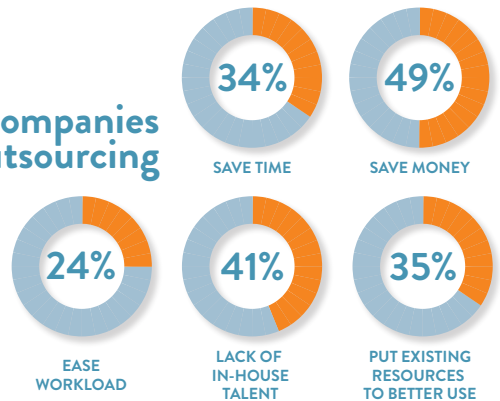


THE NECESSARY EVIL OF OUTSOURCING

OPINIONS ON OUTSOURCING

FEWER ENGINEERING JOBS AVAILABLE	42%
LOWER EMPLOYEE MORALE	41%
FEWER OPPORTUNITIES FOR ADVANCEMENT	35%
NEW HIRES AT REDUCED SALARIES	34%
SKILLS VALUED LESS	30%
SALARY REDUCTIONS FOR EMPLOYEES	24%
OPPORTUNITY FOR MORE INNOVATIVE PROJECTS	23%
IMPORTANT ASPECT TO BUSINESS GROWTH	16%
SKILLS VALUED MORE	14%
NEW HIRES TO SUPPORT OUTSOURCING EFFORTS	12%

Reasons companies are outsourcing



Where jobs are going



JOBS BEING OUTSOURCED

SOFTWARE ENGINEERING/DEVELOPMENT	52%
MANUFACTURING/ASSEMBLY	48%
DESIGN	38%
SOFTWARE VERIFICATION/TEST	22%
R&D	21%
CAD/CAE	21%
DESIGN VERIFICATION	16%
DRAFTING	12%
PCB LAYOUT	12%
FINAL TEST	17%

52%

OF COMPANIES
OUTSOURCE WORK

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CONTINUING

EDUCATION



Staying current with new and emerging technologies remains a central issue among engineers, especially as it becomes more important in the eyes of employers. Heavy workloads, productivity pressures, and inadequate support from short-sighted management are among the main obstacles to continuing education, according to survey results. “The biggest challenge,” said one respondent, “is to convince the management that staying current is an investment in the future that might not pay off immediately.”

#1 obstacle to staying current with information:

Finding the time.

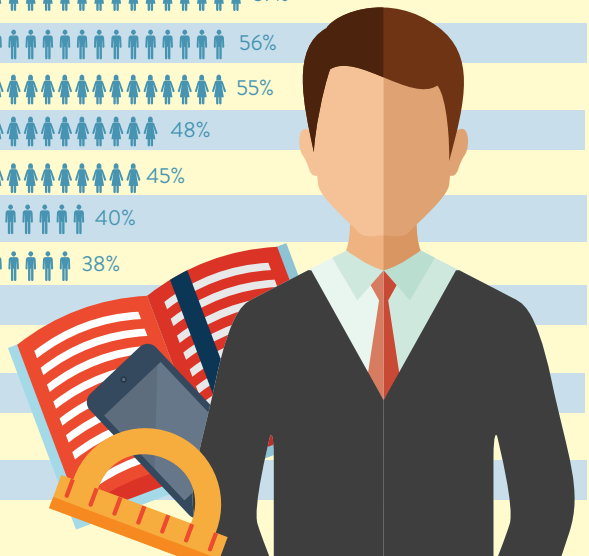


For which of these forms of education does your company reimburse costs to engineers?

Trade shows/conferences	55%
Seminars	54%
College tuition	38%
Engineering textbooks	35%
Engineering association dues	27%
Certifications	26%
Publication subscriptions	26%
Online training	25%

How engineers are keeping up

White papers	69%
Engineering/technology publications	68%
Webcasts	63%
Engineering videos	57%
Engineering/technology websites	56%
Seminars	55%
Engineering textbooks	48%
Vendor-sponsored education	45%
Trade shows/conferences	40%
E-books	38%
Engineering association-sponsored meetings	22%
Online discussion forums	22%
Online college courses	21%
User group meetings/Meetups	19%
In-house educational programs	18%
In-classroom college courses	11%



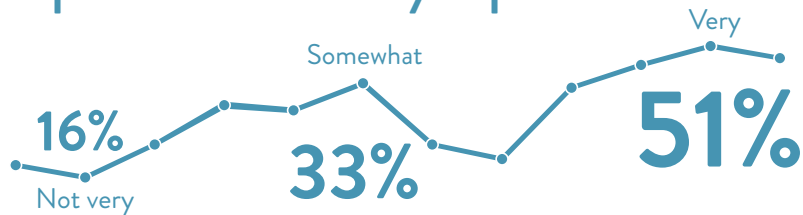
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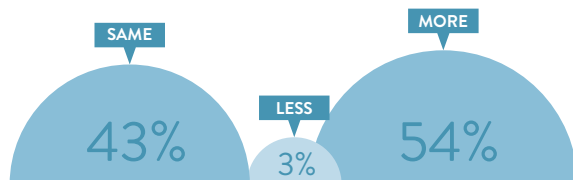
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PREPARING FOR THE INTERNET OF THINGS

Importance of security in products



How important will security be in future products?



Companies that will produce connected products



43%

The Internet of Things is expected to change the way in which individuals interact with technology and engineering companies design their products. Many companies are preparing for this paradigm shift with strategic acquisitions of analog and mixed-signal chipsets, in addition to Wi-Fi technologies. These maneuvers are being reflected in the engineering specialties that are currently in high demand. . . .

51%

of organizations have difficulty finding qualified candidates



26%

RF

27%

DIGITAL

EMBEDDED

37%

POWER

27%

SOFTWARE

40%

40%

ANALOG

24%

MECHANICAL DESIGN

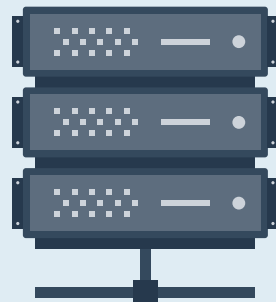
33%

SYSTEMS ENGINEERING

TEST AND MEASUREMENT

62%

Think their company
invests sufficiently in
test equipment



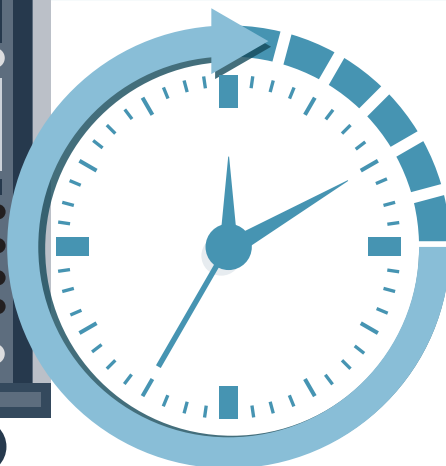
17%

Companies that have
replaced box test instruments
with modular solutions



62%

Think their company
offers sufficient training
and documentation



65%

Think testing is a
significant challenge
in terms of time
consumption