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ELECTRONICS INDUSTRY JOBS & RECRUITING IN 2022

HR EDITION

Electronics in Europe

Where Are the Jobs in 2022?

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The Global Workplace	
Average FTE Hours Per Week	41.36 hours
Percentage of Workers Reporting Stress	44%
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Percentage of Workers Positive About the Job Climate	45%

COLOPHON

Elektor Magazine,
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EDITORIAL

C. J. Abate

Director of Content, Elektor

Elektor Helps: HR in Turbulent Times

The idea for this special edition of *Elektor Magazine* came during one of our Elektor Helps sessions. After hearing from clients that staffing issues have been a real concern over the past several months (i.e., the issues have held back projects and products), we wanted to create a platform for electronics companies to easily reach engineers that normally are not on job platforms. Do give us your feedback as *Elektor* will continue to do everything to help!

In this "Human Resources" issue, we take a close look at the 2022 employment situation, and we investigate the HR-related opportunities and challenges facing engineers and the companies interested in attracting them. We aim to help a wide range of readers with this magazine:

- Job-hunting engineers looking for new jobs.
- Happily employed engineers who are unaware of new job opportunities.
- Students who will soon enter the labor market.
- HR managers and recruiters trying to fill high-tech positions.
- Executives and leaders looking to grow their engineering teams.

As with every edition of *Elektor*, we feature a wide variety of content on several relevant topics. This edition covers: 2022 employment/HR data, details about a new remote work model, insights from working engineers, and much more. Whether you are an engineer, a recruiter, a student, or an executive, you are sure to find this edition informative and inspiring during these turbulent times. We wish you good luck, and we encourage you share your experiences and stories with our entire community in the near future.

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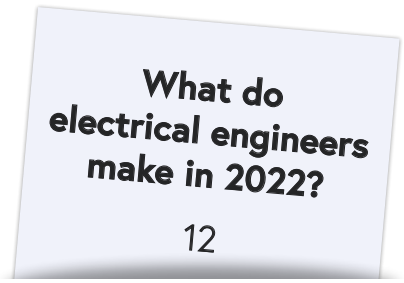
THIS EDITION

Regulars



Articles

Engineers at Work

Three Perspectives on Engineering in 2022

By C. J. Abate and Brian Tristam Williams (Elektor)

There is no such thing as a "typical" electronics engineer these days. Some EEs are working long hours on design teams at big tech companies, some are building innovative start-ups, and others are pursuing grad degrees in cutting-edge fields like artificial intelligence. One thing is for sure: there is a lot of opportunity out there. Here are some insights from three creative engineers at different stages in their journeys.

Source: Google

The Google Engineer: Peter Csaszar

Cupertino, USA

Peter Csazar's creative engineering work first caught our eye the back in 2007 when we learned about his PIC-based nixie tube propeller clock project. Since that time, he has gone on to work at some of the world's top companies, including Apple and Google.

C. J.: What's it like working as a software engineer in 2022?

Peter: It is a great time to be a software engineer in 2022, with excellent opportunities and a long-term positive outlook. While the media have a tendency to overhype terminologies such as social media, artificial intelligence, machine learning, the Internet-of-things, etc., there is serious scientific background, creative ingenuity and application demand supporting the various fields of software engineering; in other words, we are not talking about passing fads here.

C. J.: You have worked for two of the most influential tech companies in history, Apple and Google. Did you set out to land those jobs, or did they find you?

Peter: Both of these companies reached out to me through LinkedIn, confirming my point above regarding the importance of social networks, for example. In both cases, the recruiters were looking for specific skills in my background, and because of this, the new positions were remarkably good fits.

C. J.: Tell us about your current position. What's your title? What do you do? What are your responsibilities? Which types of technologies do you work on?

Peter Csaszar

At Google, I am working on the different generations of Pixel phones, in an area referred to as debug and trace (D&T).

Peter Csaszar

Peter: My title is software engineer, but the more precise description of my role (albeit less commonly used outside the industry) would be firmware engineer. At Google, I am working on the different generations of Pixel phones, in an area referred to as debug and trace (D&T). In essence, D&T is a collection of technologies, all geared towards finding out what root-causes lie behind undesired occurrences on a device, such as erroneous behavior or crash. This is a very exciting role, requiring a strong puzzle-solving (even forensic investigator) mindset; it is also quite challenging, as I need to be familiar with the various firmware and software pieces powering the entire system.

C. J.: Describe your "average workday" at Google.

Peter: This role is highly technical, which means that the majority of my time is spent on feature architecting and code development. The remaining time is taken up by code reviews, documentation and essential meetings. I am also enjoying the different amenities on the Google campus that encourage employees to take short breaks and move around. This helps staying productive throughout the day.

C. J.: How many hours per week do you typically work?

Peter: It varies based on the priorities and urgencies at any given time. The work does not follow a clock-in-clock-out, 40-hour schedule, but with the level of technical thinking involved in the job, much longer hours through an extended period of time do not occur, as they would only lead to quick burn-out.

C. J.: Looking back, are you happy that you studied electrical engineering and computer science? If you had to do it all over again, would you change anything?

Peter: As clichéd as it may sound, if I could start all over again, I would be following the exact same path. I should probably mention that another area of science that I find fascinating is molecular biology, studying the amazing and mysterious complexity of individual cells, and how they can give rise to multi-cellular organisms, all the way up to sentient human beings. However, my true passion still lies with electronics and computing, and I am happy to be part of these rapidly developing fields.

C. J.: How has your work changed the start of the COVID-19 pandemic (i.e., pre-March 2020)?

Peter: The lockdowns that ensued when COVID-19 started to mushroom into a pandemic dealt a major blow to the global economy; however, in many areas, such as the high-tech industry, this disruption was surprisingly short-lived. Companies and their employees quickly figured out how to adapt to the new conditions, by expanding the work-from-home model that had previously been limited in scope. The success of this transition, even in areas where working with hardware was involved, encouraged many companies (Google included) to embrace a hybrid model going forward, where on certain days of the week employees continue to work from home. This turned out to be a real boon for the industry, as engineers can once again collaborate effectively, but also take advantage of the increased flexibility.

C. J.: Do you have advice for other software engineers looking to get jobs at top companies like Google and Apple?

Peter: As the many articles and books written on the topic suggest, firm knowledge of the foundations of computer science and proficiency in contemporary programming languages are a must. However, my advice to aspiring software engineers is to look beyond these technicalities, and ensure that they have an unrelenting devotion to the field; this is the real key to a successful and happy career.

The Founder and CEO: Tobias Pohl

Munich, Germany

Tobias Pohl is the Founder and CEO of Celus (www.celus.io), a Munich, Germany-based pioneer in electronics engineering automation. The company's engineering platform uses artificial intelligence (AI) to automate the processes of generating schematics, PCB design, and embedded software.

CELUS

Source: CELUS

Brian: What is your typical workday like? As a founder, do you still get any hands-on time, or are you in meetings and delegating all day?

Tobias: One-third, at least, of my time is operational activity such as engaging with customers and even

Tobias Pohl

soldering demo boards every now and then. One-third is internal meetings and external meetings with partners, investors, press, for example.

Brian: How many hours per week do you typically work?

Tobias: 50-80 hours per week on average. Depends on many factors and can vary quite a bit.

Brian: Where did you develop your skillset?

Tobias: Technology is in the family. My brother and co-founder Alex and I both studied engineering, but the curiosity and interest in anything technical is a trait we have always had and the major learnings we have had since starting the company came by "figuring it out" — learning on the job.

Brian: What was the main problem you wanted to solve, and what's the core technology you built as a solution to that problem?

Tobias: Electronics engineering is most often a manual and tedious process, and we wanted to automate it to free up time for the engineers to be more creative and innovative.

Brian: Do you have any advice for an engineer who's thinking of launching a company?

Tobias: Find co-founders. Don't do it alone. And if you really believe in your idea, just try.

The Grad Student: Jean de Dieu Nyandwi

Kigali, Rwanda

Jean de Dieu Nyandwi is a Kigali, Rwanda-based graduate student working toward an MS in Engineering Artificial Intelligence (MSEAI) at Carnegie Mellon University Africa. His interests include AR/VR, IoT, and machine learning.

C. J.: How did you become interested in machine learning, deep learning, and computer vision? Will you focus your career on AI?

Jean: That's a great question. When I started college in 2017, I was roughly doing the things I did in high school (Electronics and Telecommunication). I somehow felt that I am repeating things and I decided to do a part-time job and started exploring new technologies. For three years out of four years of undergraduate studies, I worked as a program associate at ASEF (African Students' Education Fund). Around 2018-19, I tried learning web development, virtual and augmented reality (VR/AR), the Internet of Things (IoT), and machine learning. I also started attending local community meetups about those topics. I liked machine learning more than I liked other things, so I kept attending its meetups, and took online courses on Pluralsight, Udemy, Udacity, and Coursera. As I kept learning, I liked the idea of using data to make decisions and automate things, and I have been in that since then.

C. J.: Do you also work while studying at university?

Jean de Dieu Nyandwi

Electronics engineering is most often a manual and tedious process, and we wanted to automate it to free up time for the engineers to be more creative and innovative.

Tobias Pohl

Jean: No, I do not work. Grad schools are pretty demanding. It's hard to get time for doing extra work. I am thinking about taking some work; but for now, I am a full-time student

C. J.: Tell us about the Complete Machine Learning Package on your website. What is it?

Jean: Complete Machine Learning Package (www.nyandwi.com/machine_learning_complete/) is a comprehensive repository that provides interactive and practical tutorials for learning machine learning. The Package covers various data science topics such as data visualization, data analysis, data cleaning, classical learning algorithm, neural networks, computer vision, and natural language processing. It also covers machine learning various tools such as NumPy, Pandas, Seaborn, Matplotlib, Scikit-Learn, Keras, and TensorFlow. I also plan to include MLOPs (Machine Learning Operations) executive guide, but that's a future project.

C. J.: Are there many AI-related job opportunities in your area? Do you think you will have to relocate for work after graduation?

Jean: Definitely, there are jobs in startups and public institutions here. Obviously, it cannot be compared to places that are at the forefront of AI, but I think opportunities are increasingly becoming available. I have no idea where I am going after my graduation, but I will let my interests decide which are open-source, education, and research.

C. J.: Outside of university courses, what sort of resources do you and other young engineers use to learn about AI ad machine learning? Online courses? Meetups?

Jean: We are fortunate to have many AI educational resources such as MOOCs on platforms like Coursera and high-quality YouTube courses from world-class academic institutions. There are also many online groups around research and open source.

C. J.: Do you have any advice for engineering students who might want to focus on AI?

Jean: The advice I can give to fellow engineering students who are interested in AI is to take a few AI courses that are reasonably good, do personal projects, and contribute to the community either through open-source or volunteering to organize community meetups. There are many communities that students can participate in such as DeepLearning.AI (www.deeplearning.ai) PIE & AI Events, and Google Developer Students Clubs, among others.

220534-01

Electronics in Europe

Where Are the Jobs in 2022?

By Simon Troupe (European Recruitment)

Looking for an electronics-related job in Europe? You might want to focus your search in one of the following areas: semiconductors, automotive, cybersecurity, crypto, or consumer technology.

As a recruitment business with a specialisation in niche technology globally, we have seen the market remain highly competitive for companies wishing to secure top engineering talent. The current market remains strong, and candidates can expect multiple options across varying sectors depending on skillset. Key areas for growth we have outlined below.

The global semiconductor market amounts to about $500 billion, with forecasts that it will reach $1 trillion by 2030.[1] There has been a great deal of investment in this sector globally. [2] In the United States, companies like Samsung and Intel, bolstered by government subsidies, which include a $50 billion congressional spending package, have announced massive expansion plans. The EU has targeted an increase in its share of the global semiconductor industry from 9% to 30% by 2030. [3] With mounting pressure of US sanctions against China, EU, US and other Asian semiconductor chip manufacturers are all competing for highly skilled and specialised engineers.

In tech hubs in Germany (e.g., Stuttgart, Munich, Nuremberg and Dresden), as well as across Austria (e.g., Villach and Graz) and elsewhere in Europe (e.g., France, the Netherlands, Belgium, Scandinavia), there is a huge number of open vacancies for design engineers, embedded software engineers, verification engineers, as well as sales and support functions who often also require engineering qualifications within the semiconductor industry. Clients previously only able to hire engineers within the EU and with working visas are going above and beyond to secure top talent from across the world to try and meet the demand that universities and research institutes simply cannot turn out quick enough.

Elsewhere, as cars and the automotive sector become more digitised with a focus on EV technology and autonomous driving, the demand for researchers is increasing

with skillsets in AI and machine learning, high performance computing, behaviour prediction, MBSE, computers, robotics, and many more.

In the gaming sector, Hamburg is a hotspot for young studios, as well as across Sweden and Poland. The sector has been quick to adopt remote working, sourcing some of their engineering talent from Latin America, Europe, and Asia on a 100% remote working basis. A developer with a few years of experience can expect up to 60,000 euros a year, if not more, depending on the role.

The business overall continues to see high demand across a range of automotive, cybersecurity, crypto and consumer tech with roles available on lucrative long-term contracts and permanent roles that can be on-site, hybrid and remote. Engineering candidates with skill sets in these sectors will find themselves in the favourable position of having great opportunities available to them to advance their careers across multiple European locations.

Engineering candidates with skill sets in these sectors will find themselves in the favourable position of having great opportunities.

220443-01

About the Author

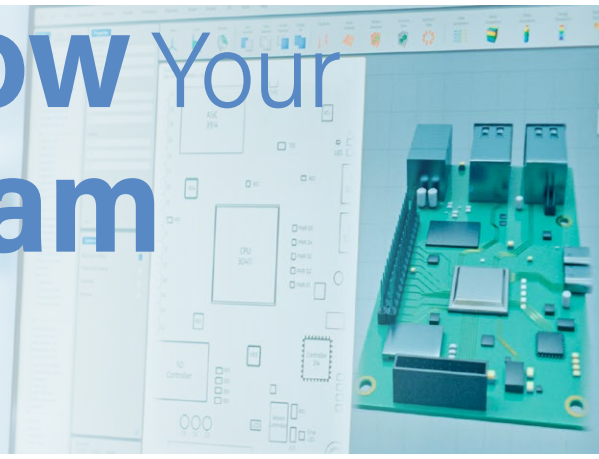
Simon Troupe is European Recruitment's business director, specialising in the Semiconductor, Automotive and Communications sector across Europe, the USA, and Asia.

Being partnered with some of the world's most recognisable companies and with over 12 years' experience in niche tech markets, European Recruitment (https://eu-recruit.com/) is well placed to close the loop in the hiring process, be it for clients looking for candidates or candidates looking for their next career step.

WEB LINKS

[1] A. Pelé, "Semiconductor Industry Needs to Close Talent Gap," EETimes, July 8, 2021: https://bit.ly/semico-talent
[2] T. Culpan, "ASML Faces a Much Bigger Problem Than a Chip Glut," Bloomberg, July 20, 2022: https://bloom.bg/3qm1yaa
[3] F. Scheper, "A Revitalized Semiconductor Industry Will Power Europe's Digital Future," World Economic Forum, September 2, 2022: https://bit.ly/wef-semico

How to Safely Grow Your Engineering Team with Freelancers



By Chris Oddy (KO2 Embedded Recruitment Solutions Ltd)

Would you like to grow your engineering team in the coming months? Hiring freelance electronics engineering talent can be a great option. You might be able to expand your workforce without taking the same risk that comes with hiring a full-time employee.

The electronics engineering industry is currently facing numerous macroeconomic challenges. The aftershocks of the COVID-19 pandemic are still being felt by businesses, there are plenty of supply chain issues in a variety of sectors, and the looming recession is making many people nervous about the financial security of their future. In uncertain times, safe business growth is a priority for companies that are taking on more business but want to be able to weather any potential storms in the future without too much of an impact on their revenue. Hiring freelance electronics engineering talent is a great option for team leaders, CTOs or startup founders that want to expand their workforce without taking the same risk that comes with hiring a full-time employee.

As a specialist recruitment agency in the electronics and embedded systems engineering sector, we understand the benefits but also the limitations of this approach to growing your engineering team. In this article, we'll share our advice on how to successfully approach building out your workforce with freelancers, along with some of the benefits and potential limitations of this approach.

Recruiting Freelance Engineers: How Does it Work?

Traditional recruitment in the embedded and electronics industry involves screening and interviewing candidates, offering them a full-time position and often providing training and onboarding support that can take months to complete. An alternative solution that more and more team leaders are starting to experiment with is hiring freelancers on a contract basis, which can help to quickly solve capacity problems and bring in much-needed insight for new projects.

With a rising trend in employees valuing remote work and many electronics engineers, embedded systems developers and HW/SW designers wanting to be in control of their own workload and working hours, there's much more of a market for freelancers in this industry than there was several years ago. In fact, sourcing and recruiting talented full-time candidates has become an increasing struggle for many businesses, whilst the number of freelancers available continues to grow.

When you hire a freelancer to help grow your team, you'll be bringing in an individual that will work as part of your organisation on a contract basis. Depending on the nature of the contract, they may work a set number of hours each week with your team or work independently towards a final, agreed-upon deliverable. This work might continue for a set number of months or their contract might end when a project goal is reached.

Recruiting freelancers is a fantastic option for tech and engineering companies that want to expand the geographic reach of their hiring pool, bring in talent from different countries and backgrounds, or just manage their workforce on a project-by-project basis. Being able to grow your team when needed is also a useful approach for smaller companies that need to carefully manage their budget and don't want to risk expanding their team more than is necessary.

What Are the Benefits of Hiring Freelancers?

One of the key benefits of recruiting freelancers to grow your engineering team is that it gives you much more flexibility than a full-time hire. Whilst we hope that businesses taking in new clients will see a steady increase in work, this may not always be the case, and freelancers allow you to manage fluctuating workloads without investing in permanent employees.

It's also a really great option if you're working on a project that you feel would require specialist skill or insight, as you can hire a freelancer with relevant experience that you might not be able to get from an existing team member. It's often easier to get an expert to join your team on a contract basis than a permanent one, providing the support you need for a project without any long-term commitment. Freelancers also don't tend to require the same level of

training that a new hire needs and can hit the ground running, which is much more cost-effective.

Considering contract and freelance employees can significantly increase the hiring pool you select candidates from, especially if the work can be done remotely. This not only makes it easier to find exceptionally talented engineers and developers, but can also bring fresh and diverse perspectives to your work.

Finally, as we've already touched upon, hiring freelance workers can be a safer financial bet and allows smaller companies in particular to bring in the necessary workforce without committing to paying multiple full-time salaries. As economic uncertainty remains an ever-present reality, this approach is well worth-considering to avoid having to make cuts to your full-time team in the future.

What Are the Limitations?

Whilst there are plenty of benefits to this approach, we appreciate that hiring freelancers isn't always a perfect solution for engineering leaders and that it might not work for some companies. For one thing, whilst the overall cost of hiring a freelancer tends to be less than a full-time employee, the hourly rates tend to be higher which might not be an option for smaller startups.

Freelancers will often want more control over how they work, and some may want to work outside of the hours of the rest of your team, which can impact how smoothly a project progresses. It can also be harder to monitor a freelancer's progress and chasing updates can get tricky, which again can sometimes cause delays.

If your company has a strong culture and other employees have been chosen to complement this, hiring a freelancer who also fits in can sometimes be difficult. Getting someone up to speed on group dynamics, values and ways of working is time-consuming and may be redundant if the freelancer is only contracted for a couple of months, so it's worth considering how much culture fit matters to you and how you might handle bringing in an outsider.

Recruiting freelancers is a fantastic option for tech and engineering companies that want to expand the geographic reach of their hiring pool, bring in talent from different countries and backgrounds, or just manage their workforce on a project-by-project basis.

Top Tips for Building a Team of Freelancers

Whilst growing your team with freelancers isn't a one-size-fits-all solution, it's definitely worth considering if you're taking on new clients and projects or looking for ways to bring specific skills and experience to your team. Here are some of our top recruitment tips if you think this approach is right for you.

Hire to Meet a Specific Need

Whilst you can give or take certain skills or requirements when making a full-time hire to expand a team, you need to be much more precise when choosing a freelancer. Before you start recruiting, make a list of all the specific experience, insight and abilities that your new team member will need, and be sure that all of these bases are covered in your chosen candidate.

Find Candidates Through Networking

Whilst you can find freelancers through traditional recruitment methods like advertising a role and using a recruitment agency, freelancers can also be found simply by networking. Start making connections at industry events and taking note of names you keep hearing, as these people are often the most talented freelancing candidates and are more likely to want to work with you if you already have a relationship.

Consider Your Benefits

One of the benefits of working as a freelancer is more control over your work and time, which means that these candidates can be choosy when picking which job offers to accept. Consider the benefits and flexibility you can offer as part of your team and be willing to adapt your initial offer to work with the freelancer's requests.

Be Clear in the Contract

Issues in freelance work often come from a lack of clarity and communication about what is actually expected of the candidate. Take the time to make your contract clear, discuss it in detail with the freelancer, and use it as a reference point if any problems arise.

Maintain a Positive Relationship

Finally, maintaining a good relationship with freelancers is important if you want to continue using this approach to growing your team. Not only are they more likely to recommend you to other industry freelancers if they have a good experience, but it also means you can call on them in the future if a similar project comes along, and skip the recruitment stage altogether.

It's Easier than You Think

There isn't just one answer to the question: 'How can I grow my engineering team with freelancers?' and we understand that. Everyone's circumstances are different, and you may need several attempts at this approach before you discover how you can make it work best for you.

However, we think that the benefits make it an incredibly valuable option for businesses in the engineering industry, especially now. Having the option to grow your team quickly and cost-effectively can be instrumental in the success of a small business or startup, and with more freelancers than ever on the market right now, it's easier than you think to make it happen.

220537-01

About the Author

Chris Oddy is an award-winning recruitment consultant at KO2 Embedded Recruitment Solutions Ltd (www.ko2.co.uk) who has specialised in the electronics and embedded systems sector since 2008. Chris is passionate about technology and customer service.

Elektor infographic

By The Elektor Editorial Team

EU Unemployment Rates During COVID-19

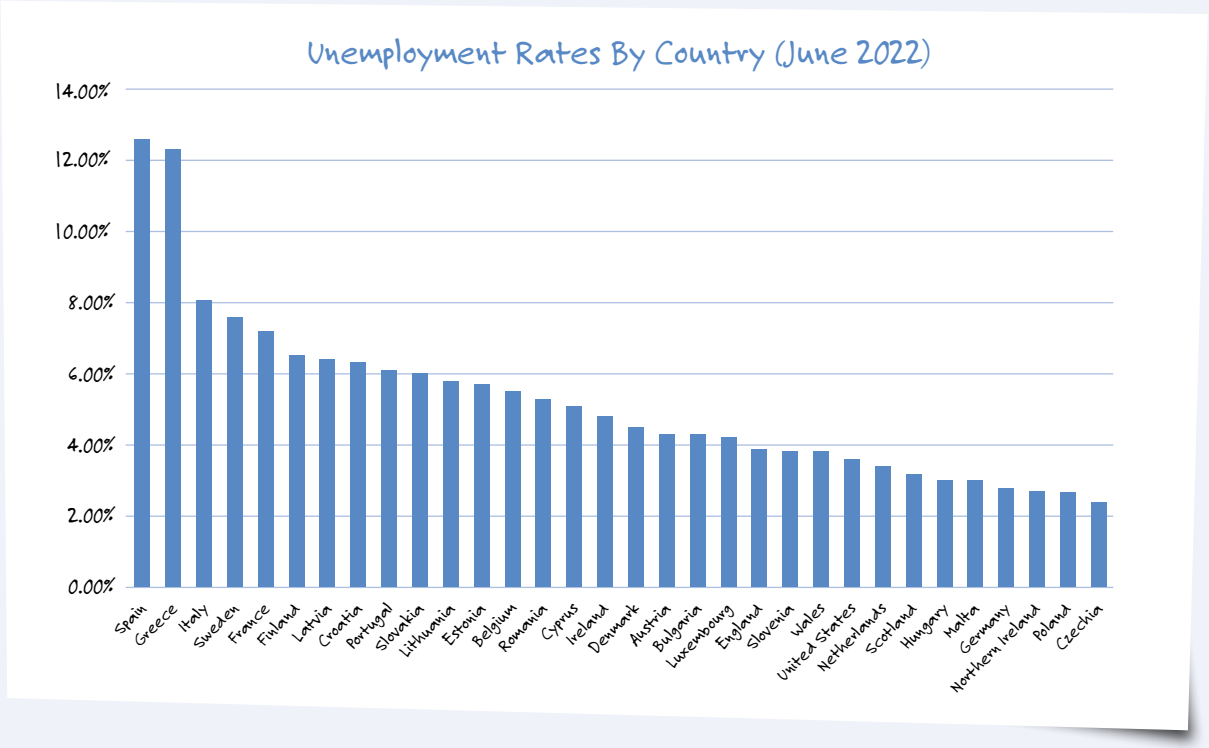
Unemployment was just one of the many challenges resulting from the COVID-19 pandemic. So, when did workers in the European Union (EU) start feeling the pain? Although the pandemic was making headlines in early 2020, it really got media attention in March 2020 when the World Health Organization (WHO) declared coronavirus a pandemic. As you can see in the nearby graph, the EU unemployment rate jumped quickly after March 2020. It was not until July 2021 that it dropped under 7%.

(Sources: Statista - https://bit.ly/EU-unemployment, AP News - https://bit.ly/who-pandemic)

EU, UK, and US Unemployment Rates by Country (June 2022)

Employment opportunities vary widely by country, as well as by industry and region — and this has been especially true during the COVID-19 pandemic. How has your country fared compared to others? What about your town or city in comparison to the rest of your country? Spain, Greece, and Italy have clearly struggled more than other nations in terms of employment, as shown by the nearby snapshot for June 2022.

(Sources: Statista - https://bit.ly/eu-june2022, Bureau of Labor Statistics - https://www.bls.gov/cps/)



What Do Electrical Engineers Make in 2022?

	Netherlands	Germany	France	US	UK
Average Annual EE Salary	€57,600	€44,100	€47,500	€89,600	€81,700
EE Salary Men (vs Women)	5%	6%	4%	5%	4%
Percentage of EEs Earning a Bonus	53%	61%	56%	52%	55%
Location with Highest Average EE Salary	Amsterdam	Hamburg	Paris	Chicago	Leeds

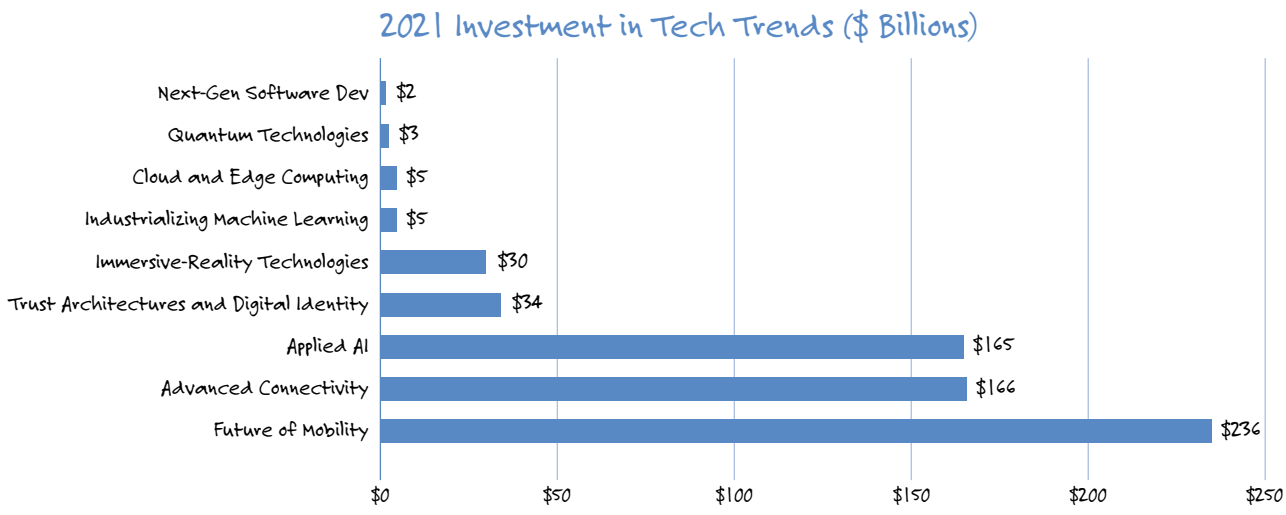
The salaries of electrical engineers (EE) vary widely from country to country. We pulled some data about a few key countries, including the main countries where many Elektor members live and work: Germany, The Netherlands, France, US, and UK. Plus, we checked the pay differences between men and women in these locations. Interestingly, Dutch electrical engineers are making more annually than their peers in Germany, and France.

(Source: Salary Explorer 2022 - http://www.salaryexplorer.com/)

Follow the Money: Where's the Investment in Tech Trends?

Would you like to work in a growing segment of tech? One smart approach might be to find a job in a segment that investors are betting on. Follow the money to make money! For instance, forward-thinking investors have recently dumped big money into companies developing mobility products, advanced connectivity technologies, and applied artificial intelligence (AI) solutions. Perhaps it is time to update your resume and start hunting for opportunities relating to these technologies. Good news: Elektor publishes news items and technical articles about the products and technologies in these areas.

(Source: McKinsey - https://mck.co/3CKS5Rg)



A Little Perspective: The State of the Global Workplace in 2022

What does it mean to be a full-time employee (FTE) in 2022? Are employees generally happy, and do they feel engaged at work? Do employees experience a lot of daily stress? Do they feel positive or negative about the general job climate? Take a look at the nearby data, and then ask yourself the same questions. Can you relate to other workers around the globe?

(Source: Gallup - https://bit.ly/gallup-workplace22)

The Global Workplace	
Average FTE Hours Per Week	41.36 hours
Percentage of Workers Reporting Stress	44%
Percentage of Workers Feeling Engaged	21%
Percentage of Workers Positive About the Job Climate	45%

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A Swissbit more You

Swissbit and Hyperstone empower the digital and connected world by reliably storing and protecting data for demanding applications in the industrial, NetCom, IoT and automotive sector. The values that drive us: trust, accountability, respect and curiosity. Do they also drive you?

We are hiring

> Development
> Technical & Application Support
> Sales
> Marketing
> IT System

That's us

> Electronics industry
> Made in Germany
> Over 450 employees
> 5 Sites in Europe: Berlin, Dusseldorf, Konstanz, Munich and Bronschhofen (CH)

Say "Yes sure" to us, if you

> want to tackle things today rather than tomorrow
> want to take leaps you've never taken before
> do not pretend and show yourself as you are
> enjoy working in an attractive work environment with flexible hours & hybrid working

Ready for the next step?

APPLY NOW !!

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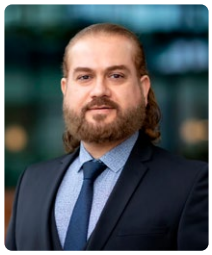
Tomorrow's Workforce: What Can **Graduating Engineering Students** Expect?

Edited by C. J. Abate (Elektor)

Studying for a degree in electrical engineering (and in related fields) is a difficult yet rewarding experience for thousands of young people. What can they expect as they leave university and step into the workforce in the coming weeks and months? Elektor asked a few notable professors for their thoughts on the top challenges facing EE students as they enter the 2023 job market.



Professor Shihab Al-Daffaie
Eindhoven University of Technology (The Netherlands)
www.tue.nl/en/research/researchers/shihab-al-daffaie/

The electronics engineering sector is highly connected to industry and is undergoing great changes. Eager R&D teams in the electronics engineering sector around the world are focused on better ways to produce and use electronic devices. With significant progress being made in recent years, the industry shows no signs of slowing down. I think the top innovative trends that will guide us into the future of electronics, where things are expected to become more user-friendly, effective, and economical. Innovation is at the forefront of the electronics industry. Discovering the right business solution to stay ahead of the curve is essential in electronics engineering and related industry.

The main challenge in engineering, in general, is to bridge the gap between physics and mathematics and to do something useful or marketable in the real world. Among many challenges facing graduating engineering students, I would like to address the main three I see connected to the electronics engineering students as they enter the 2023 job market.

- Transitions from college to real world: Transitioning from college to an engineering career is highly complex and critical for graduating engineers, especially for very rapidly-developing fields such as electronics, which is connected to every technological device around us. As fast as this development goes, the larger the gap between the universities and industry,

and it makes it harder for graduate students year after year to keep up with the technology. The optimum way to overcome this gap is by either continuous revisions of education curricula or to get more training from the industrial sector.

- Managing frustrations: During the last years, through the COVID-19 pandemic and energy crises, many graduating students have the fear of not having enough time, talent, or money to chase their dreams of a future promising career in the field of electronic engineering. Managing this feeling needs knowledge and support through motivational programs.

- Responsibility: As your tasks get more complex, your responsibility gets bigger. You quickly find yourself working long hours and overtime to do your best, but then finding a good work-life balance becomes a challenge. Driving a career through responsibility is a challenge that all graduating students need to be prepared for and manage smartly.

One thing I can guarantee to all graduating electronics engineering students: they will never be jobless if they take their studies seriously and develop themselves as good professionals in this ever growing sector.

Professor Sven G. Bilén
Pennsylvania State University (USA)
www.sedtapp.psu.edu/~sbilen

As they enter the 2023 job market, graduating electronics engineers will find themselves working in a world with fraying supply chains and their management working to onshore manufacturing. Newly minted engineers might be tasked to scour the globe for a $2.37 chip to keep assembly lines open, asked to redesign a board to use more local content, or look for alternatives to and secondary sources of materials in short supply. Global supply chains will still drive designs, but their limitations will need to be considered and addressed in any new or updated designs. It will be some time before supply chains are back to "normal" — if ever! Graduates will also need to manage their professional development from day one. They will need a mindset for continual learning and training; leveraging webinars to stay up-to-date with the latest devices and components coming on the market; and being tenacious in looking for opportunities to earn new credentials, from short courses and microcredentials to advanced degrees.

220519-01

Ethical Employees You Want to Keep

An Interview with Stephanie Angelo

Stephanie Angelo

By Priscilla Haring-Kuipers (Elektor)

Stephanie Angelo is a human resource speaker, trainer and consultant. She invented the Company Culture board game and has worked with companies like Faist GreenTec, Intel and Raytheon and has spoken at numerous conferences.

Priscilla: What ethics-related topics are you are working on?

Stephanie: When I do trainings, we talk about people's different definitions of ethics. What does it mean to do right by other people? I talk a lot about values. Company leaders have to demonstrate ethical behavior, because everybody is looking to them to set the example. But employees also have to demonstrate those ethical behaviors in everything that they do. That way it becomes the culture, with values shared by the whole organization.

Priscilla: What is the most important ethical question in your field?

Stephanie: There was a study that said that 80% of employees would leave a company if they didn't see it as ethical. That's a huge number, and it's an encouraging number. If you have employees that just don't care if they are violating ethical policies, sometimes, you have to get rid of them because they will destroy the whole company with their poor behavior. You're much better off keeping the really great people you have by getting rid of the ones

The Trolley Problem

Imagine there is a trolley running down a track that is about to run over five people, and you happen to be standing next to a lever that can flip it to another track. On this track is one person that will die if you do. What do you do?

Priscilla: An impossible choice... The meta-trolley question: What is the correct answer to the trolley problem? Is it A) You pull the lever, B) You do not pull the lever, or C) you should never answer the trolley problem.

Stephanie: A. I would pull the lever so we only lose one person. Even though you're next to the lever and no one is forcing you, it's still your decision to make.

that are liable to be destructive to those good people.

Priscilla: What would you like to include in a Code of Ethics?

Stephanie: I always tell companies you need to have an ethics code *and* a resulting guideline that follows from your organization's mission statement. You cannot have something in writing that is going to prepare you for every single thing that could happen. But you can make sure that you are living by the ethical standards that you have set while respecting all of your stakeholders. Stakeholders are your employees, the leadership, the managers, the c-suite and investors. Some pretty bad ethical violations that I've seen were because a company is only pandering to one of the stakeholders, like the investors, and is forgetting about their employees and other people involved in the organization. Having procedures and an ethics code are two different things, but they sort of blend together. It is also important to have training on a regular basis so that people are consistently reminded of it. You should do anonymous surveys so that people can give you their opinions without feeling like everybody is going to know. And you also need mechanisms for whistleblowers to comfortably and safely speak up when they see wrong-doings or ethical violations.

220577-01

WORLD ETHICAL ELECTRONICS FORUM

Interested in ethics and electronics? The World Ethical Electronics Forum (WEEF) inspires global innovators with open discussions and publications about ethics and sustainable development goals. Visit www.worldethicalelectronicsforum.com for additional information and to register for the WEEF newsletter.

About Stephanie Angelo

Stephanie Angelo (www.stephanieangelo.com) works with organizations that want to create great company cultures to outlive, outlast and outperform the competition. Her training, speaking and consulting helps clients develop strong, built-to-last cultures with customized programs that motivate employees to work better, decrease turnover and create a high-engagement organization. Her HR career spans 30 years. Stephanie is an eSpeakers Certified Virtual Presenter and a professional member of National Speakers Association

SENSIRION

One Top Employer, **50+ Open Positions**

Contributed by Sensirion AG

From 800 to 1,000 employees in one year. This is just one of the impressive numbers that characterize Sensirion. A few other examples: more than 50 open positions, double-digit annual sales growth — and a ranking among the top 10 employers in Europe. The Swiss high-tech company is leading the world, yet still driven by the pioneering spirit of a start-up.

Are there currently 52, 57 or even more vacancies? "That's changing all the time," says Heiko Lambach, Vice President Human Resources at Sensirion. The company he works for is a success story that can be measured in numbers. Double-digit revenue growth in 2021 compared to the previous year, and 2022 figures continue to show an upward trend. The workforce also grew from 800 to 1,000 in just one year.

"The main focus now is on specialists and graduates who are full of drive to make a difference," explains Heiko Lambach. The reasons for this growth are deeply rooted in the company's innovative spirit. Sensirion got its start in 1998 as an ETH Zurich start-up and is now one of the world's leading developers and manufacturers of sensors and sensor solutions.

First-Class Sensor Technology in Demand Around the World

The company is setting new standards in sensor technology with its cutting-edge technological intelligence. Its products can be found in vehicle air conditioning systems — one out of every three cars manufactured in the world today is fitted with a sensor from Sensirion — as well as in medical technology, building technology, urban air quality measurement stations, industrial process automation and household appliances ranging from refrigerators to air purifiers.

Now the company based on the shores of Lake Zurich is urgently looking for new specialists. With such a diversified base, the company is largely unaffected by the economic fluctuations of individual sectors in international markets. Even during the COVID-19 pandemic, the company's growth continued unabated. Sensors for monitoring air quality in rooms were now particularly in demand. And because Sensirion's sensor technology

also makes it possible to use heating energy more efficiently, it also helps reduce CO_2 emissions.

Mission: "Making the Impossible Possible"

How does Sensirion manage such rapid growth in on a day-to-day basis? Heiko Lambach smiles: "We have always kept our entrepreneurial spirit. What that means in practice, for example, is flat hierarchies, encouraging employees, giving them responsibility, sharing ideas and developing new solutions in a short space of time — from the idea to market maturity."

Talks with long-standing employees within the company underscore the point: People are eager to learn, seek out challenges, are passionate about overcoming even the seemingly impossible and feel like they're part of family. Every week, for example, people come together — voluntarily, of course — for a Friday beer on the rooftop of the building overlooking Lake Zurich. There's a drone flying club, board-game evenings, skiing days and many other activities organized by the employees themselves.

Recognized as a "Great Place to Work®"

For all the fun and games, Sensirion is by no means a non-stop party with the freewheeling spirit of its student founding days. It is a professionally run company. But you don't have to take our word for it. Great Place to Work®, a leading global institute for job satisfaction research in companies, named Sensirion one of the 10 most attractive and popular employers in Europe in 2021. The certification of its workplace culture is based on anonymous employee surveys and analysis of personnel measures. In Switzerland, Sensirion was even named the second-best employer, full stop, in the Large Company category with more than 250 employees.

The certification is a point of pride for the company — but also an incentive not to rest on its laurels. Heiko Lambach: "We're really driven to find the perfect

We're looking for competent people who are passionate, think for themselves and want to drive things forward — all over the world.

answer for every task that can be simplified by sensor technology. For every conceivable application and in every possible industry, we ask ourselves: Isn't it possible to make things better, simpler, faster and more efficient? And then we get to work."

Making the World a Better Place

The company's professionalism is also reflected in the fact that Sensirion has been listed on the Swiss Stock Exchange since 2018. Employees can also acquire shares in the company, which further strengthens the tangible entrepreneurial spirit within the ranks. With the exception of the CEO and a few Vice Presidents, all members of the management team work among colleagues in the open-plan office. Employees can approach the CEO with a simple knock on the door, and anyone can have a casual chat with the upper management at lunch in the in-house cafeteria. Everyone is on a first-name basis.

At Sensirion, we're always about making the world a better place. In medicine, for example, flow sensors in ventilators that provide patients with the right amount of air and minimize the risk of suffocation. Or with sensors for smart inhalers. Particulate matter, CO_2, formaldehyde and gas sensors, in turn, monitor the air quality in ventilation systems and air purifiers and thus reduce exposure to pollutants.

Sensor technology monitors the climate in smart home applications. It controls the ventilation in residential and commercial buildings according to actual requirements, thus reducing energy consumption. The sensors also enable heating systems to adapt to the actual use of indoor spaces, allowing residents and employees to enjoy greater comfort. In vehicles, Sensirion's humidity and temperature sensors reduce the energy consumption of air conditioning systems.

A Wide Range of Open Positions, from Internships to Engineering Jobs

With the wide range of sensor solutions and topics Sensirion is addressing, it is no surprise that we have such a large number of vacancies. The company is currently seeking interns, for example, to work in process development, the production of optical gas sensors and the development of the latest sensor technology with vibroacoustics. We're looking for a process engineer for the transformation from prototypes to high-volume production, a control engineer for the machine control of production facilities, a product design engineer for sensor module design from the idea to product maturity, or a business development manager for the development of a water quality sensor portfolio.

Heiko Lambach breaks off with a laugh: "It would be a bit much to list all the vacancies here. There are so many of them, and as I said, the vacancies are constantly changing. But one thing always stays the same: We're looking for competent people who are passionate, think for themselves and want to drive things forward — all over the world."

Regardless of how many there are at any given moment, all current vacancies at Sensirion can be found here: www.sensirion.com/career.

220606-01

Not Just a Company a Community

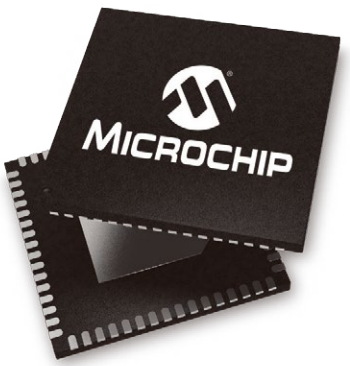
Microchip Technology Inc. is a leading provider of smart, connected and secure embedded control solutions. Its easy-to-use development tools and comprehensive product portfolio enable customers to create optimal designs, which reduce risk while lowering total system cost and time to market.

At Microchip, we design jobs and provide opportunities promoting employee teamwork, productivity, creativity, pride in work, trust, integrity, fairness, involvement, development, and empowerment. We base recognition, advancement, and compensation on an employee's achievement of excellence in team and individual performance.

Our company is structured to give our team members the most autonomy, and we encourage each employee to be creative and take initiative. With us, you will enjoy meaningful opportunities to grow in your career.

SMART | CONNECTED | SECURE

The company's solutions serve more than 120,000 customers across the aerospace and defense, automotive and transportation, consumer, data centers and computing, industrial, Internet of Things and medical markets. Headquartered in Chandler, Arizona, Microchip offers outstanding technical support along with dependable delivery and quality.



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Using Our Own Energy Sensibly

EA Elektro-Automatik develops power electronics for the energy transition

EA Elektro-Automatik group (EA) is helping to electrify the world and thus making a valuable contribution to responsibly shaping the future. As Europe's leading manufacturer in the field of power electronics, we research, develop and manufacture programmable and bidirectional power supplies, high-performance power supplies and electronic loads with more than 300 employees in the German headquarters in Viersen/NRW. Supplying the energy transition with energy excites the entire team – and more and more customers. EA is growing rapidly!

The EA team is full of energy

From its location in Germany, EA manages a global distribution network because the high-tech devices are used all over the world in a wide range of applications. Engineers use the programmable power supply units to test, for example, batteries, fuel cells and photovoltaic systems or simulate their use in advance under real conditions. Electrolysis plants run fail-safe with the powerful electricity supplies from EA. In addition, used batteries from e-cars can be completely discharged for recycling purposes with the electronic loads or prepared for second-life use. At the same time, the loads themselves work regeneratively.

Growing and outgrowing

The dynamic of high-tech and responsibility for the planet motivates employees to always go beyond themselves. "The world is electrifying itself", says CEO Markus Schyboll, "at EA, we experience first-hand how the world is changing and offer new employees the chance to contribute to a CO_2-neutral world and experience energetic teamwork." Schyboll invites interested people: "Join us! Let your ideas flow and bring in your personality and creativity."

Benefits. Safety. Values.

As a company based on values, EA also offers attractive benefits: Your workplace is future-proof and internationally oriented in a rapidly growing, globally active company. Sustainability and active participation in the energy transition guide our daily business. Appreciation, freedom for ideas and a high degree of autonomy in shaping your own work, flat hierarchies and flexible working hours create modern framework conditions. EA actively promotes professional and personal development.

Technological excellence for the requirements of tomorrow

The foundation of the company in 1974 was marked by innovation, which continues as a tradition to this day. What began with the development of simple power supply units is expressed in the current mission statement of technology leadership. EA is shaping the future and performance electronics — technologically excellent and focused on resource conservation and energy saving.

Electrifying tasks

High-tech for the electrification of the world — this is electrifying! At EA, interested persons can usefully release their energy in many areas – from development to production, sales and warehouse to the commercial departments.

220655-01

WEB LINK

[1] Careers @ EA Elektro-Automatik: http://www.elektroautomatik.com/career

A New Remote Work Model

By Ryan Cousins (CEO & Cofounder, krtkl inc.)

Millions of workers around the world went remote in 2020 due to the COVID pandemic — even hardware engineers. What does this mean for the future?

The broad, sudden shift to remote work has produced some exciting growth opportunities and challenges for us. Given krtkl's (www.krtkl.com) location — perhaps the most expensive city in the world, San Francisco — scaling has always been a struggle. Competing with the likes of Google and Facebook on compensation and benefits alone is generally a fool's errand. However, thanks to the recent changes to the nature of work, not only have we been able to reach talented people from across the country, but we can offer something the big technology companies largely can't or won't: 100% remote.

We were fortunate in that we've been working with remote contractors for years — both in the United States and abroad — so the concept of a distributed workforce wasn't entirely foreign to us. However, it is admittedly different building and scaling a team and the associated company culture with new people who regularly interact with each other via email, chat, text, phone, etc., but never meet face-to-face. We're still figuring out how to build a stronger sense of camaraderie and collaboration without resorting to lame group icebreaker games over video calls, so that's a work in progress.

Thanks to the recent changes to the nature of work, not only have we been able to reach talented people from across the country, but we can offer something the big technology companies largely can't or won't: 100% remote.

And while not the first thing you'd necessarily think of, the IT infrastructure buildout is a non-negligible hurdle to overcome. Fortunately, we are in an era where almost all work can be performed on cloud-hosted virtual machines and with tools that are distributed and collaborative by design. However, lacking dedicated IT resources on such a small team, the setup, configuration, and maintenance of these systems takes more time than we'd like. Ensuring 100% uptime, addressing cybersecurity — the list goes on.

Another challenge: krtkl is a hardware company, which means not all work can be done remotely — at least not very easily. While this isn't as big of an issue for products already in production, products under development often require a significant degree of probing, debugging, reworking, etc., all by sufficiently trained people using special (see: expensive) equipment. It's not an insurmountable problem by any means, but there are certainly logistical considerations a 100% software-focused company wouldn't have to deal with.

One key consideration for companies considering this model is that having a largely remote workforce requires a large degree of trust and accountability — on both the company and employee sides. We've been very fortunate in that we've really found some great people who are all honest, hardworking, and determined to solve hard problems as a team. I believe the trust we've placed in all our people is reflected in the quality of their work and an overall sense of belonging.

Every company is going to be different in how they approach work — whether it be remote, in-person, hybrid, or "something else." Obviously, there is still (and may forever be) a significant percentage of jobs that require in-person positions. From a "technology company" perspective though, it seems smaller/new companies have an advantage over larger/established companies when it comes to transitioning to fully remote. Old habits die hard and, for many, breaking the paradigm of in-person collaboration, management, etc., may be seen as too disruptive, costly, or threatening to accept.

krtkl is still early in the process and the new remote work model will certainly be tested in the years to come as our teams grow larger and new issues arise. Nevertheless, we are dedicated to making it work and excited about the future. Considering the rollercoaster ride the company has been on over the last several years, this is one challenge we will embrace with open arms.

220559-01

About the Author

Ryan Cousins is Cofounder and CEO of krtkl inc. ("critical") in San Francisco. He earned a mechanical engineering degree from the University of California, Los Angeles (UCLA). Cousins has worked as a mechatronics engineer, medical device sales manager, VP of engineering (embedded systems), and volunteers as a mentor for entrepreneurial youth in Oakland, California.

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