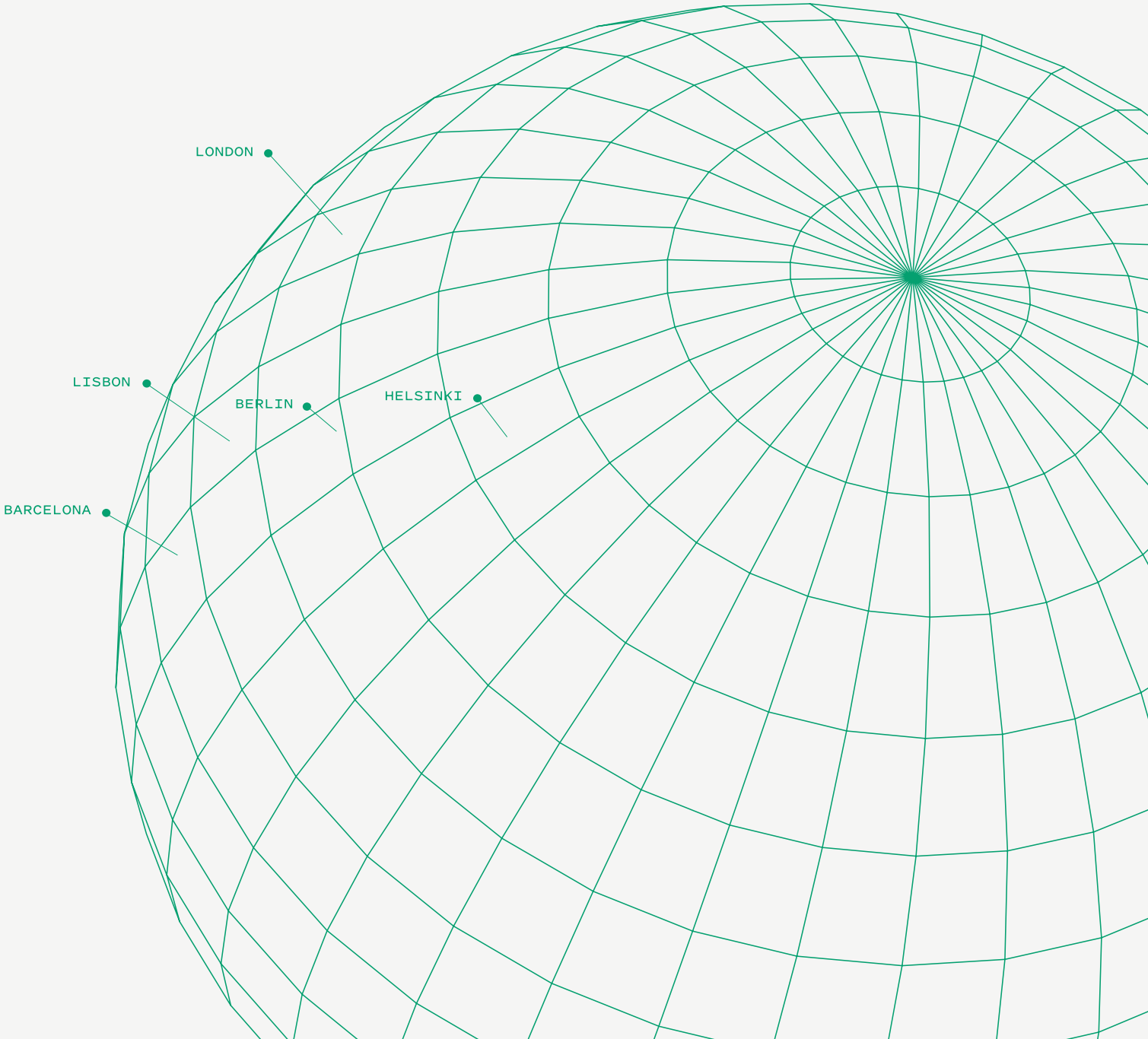
SEQUOIA

Atlas

Sequoia's guide to Europe's technical talent

JUNE 2023



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Executive Summary

Europe presents an increasingly complex tech-talent landscape. The continent boasts a growing pool of engineers, but talent is more geographically dispersed than ever and not evenly distributed.

60%

of companies in our survey have permanent distributed teams and nearly two-thirds expect to have more remote employees in the coming years

78%

of those with distributed teams say their engineers are distributed—more than other teams by over 20 percentage points

To make sense of this competitive landscape, Sequoia created Atlas, a multimodal research and data-visualisation programme. This interactive tool for tech founders and recruiters highlights 24 cities with outlier talent density across 14 engineering skill areas.

Atlas findings expose key European tech trends:

- Hybrid work is the new norm. The majority of companies in our survey have permanent distributed teams (especially in their engineering division) and nearly two-thirds anticipate more remote employees in the coming years. Nonetheless, the location of talent still matters, with around three-quarters of recruiters citing specialist skills in other cities—particularly in front-end and DevOps—as a driving factor in going remote.

- Increasingly, high-calibre engineers can command similar fees, regardless of where they live. The large majority of respondents agree that pay differentials are levelling out between and within countries. Saving on compensation is thus a declining motivation for remote hiring, with fewer than half citing it as a factor.

- Ukraine's renowned tech talent has proved resilient in the face of the war. Global tech employers have scrambled to retain Ukrainian employees, with coordinated drives to link this talent with work. The large majority of Ukrainian IT professionals and software developers continue to work full time, despite most having had to relocate.

- Employers' top criteria for potential employees are ownership, agency and culture fit. But for engineers and students, these factors rank last when choosing employers, behind salary, work-life balance and job security. In a competitive recruiting environment and uncertain economic climate, tech startups and job candidates must reconcile these expectations.

- Europe is poised to become a global AI leader. The region has a standout concentration of dedicated AI practitioners relative to its total engineering talent pool: 30% higher than in the U.S. and three times as high as in China—and these engineers are highly educated and experienced.

Atlas identifies 24 cities with outlier talent density in 14 key specialities. Dublin ranked first in per-capita density for five of these—more top placements than any other city. However, outlier cities span the region and offer a diverse range of talent profiles, cultures and regulatory considerations:

- **AI**: Dublin and Zurich have the highest per-capita density of AI engineers, but cities across Europe show momentum, including Athens, Berlin and Paris.
- **Application development:** While many cities are well supplied with talent in this speciality, Lisbon, Barcelona and Porto emerge as a top cluster.
- **Databases:** Portugal is a hotspot, with Lisbon and Porto home to the highest concentration of engineers in this area.
- **Data science:** Dublin stands out as a clear leader, boasting almost double the average European concentration. Berlin follows in second place.
- **DevOps:** Amsterdam and Dublin have the densest supply of these engineers.
- **Finance:** Dublin has the greatest concentration in this area, followed closely by Berlin and Athens.
- **Front-end frameworks:** The densest clusters are in the east. In Vilnius and Tallinn, the density is 60% higher than in the average European city.
- **Gaming & graphics:** Helsinki is rich in this speciality, followed closely by Vilnius and Stockholm.
- **Hardware:** Cambridge and Bristol have the have an outlier density of hardware engineers, followed by Munich and Stuttgart.
- **Mobile:** Barcelona has the highest density of mobile engineers—1.5 times the average European city—with Berlin coming a close second.
- **Robotics, drones & autonomous vehicles:** Germany is the frontrunner, with Munich and Stuttgart each boasting double the average European concentration of talent.
- **Security:** Dublin leads the pack here, with Tallinn not far behind.
- **Server & cloud:** Dublin is a clear leader in this speciality, with a secondary cluster comprising Amsterdam, Berlin and Lisbon.
- **Systems:** Gothenburg is an outlier for systems engineers, with a local talent concentration roughly 1.5 times that of the average European city; Stuttgart's density is almost as great.

Bristol, Bucharest, Cambridge, Edinburgh, Kraków, Madrid, Prague and London round out our list of 24 cities, each boasting above-average density in one or more specialities.

For founders and hiring managers, navigating this nuance is critical to finding the right talent, especially in a labour market that's remained competitive despite headline-grabbing layoffs. To aid the search, Sequoia created Atlas, a multimodal research and data-visualisation programme. It surfaces 24 cities with outlier talent density across 14 key engineering skill areas, as well as wider trends in the tech-talent landscape. Data analysis is based on sources including SeekOut, Dealroom.co, Remote.com and Ledgy. The inputs for this project included:

125
recruiters and hiring managers surveyed at European startups in the early and growth stages

809
engineers surveyed, including working engineers and those preparing to enter the workforce

226
STEM graduates surveyed, preparing to enter the workforce

17
early-stage founders and recruiters participated in qualitative interviews

01

Introduction

Europe is home to a rich supply of engineering talent across a range of tech hubs. Atlas helps you explore this dynamic landscape.

The European tech-talent landscape[1] is increasingly complex for founders and recruiters to navigate. The region is home to world-leading universities and nearly three million engineers, but talent has clustered across many dimensions. Companies increasingly recruit from across the region: six in ten European startups now have geographically distributed teams. With such widespread talent, it can be difficult for founders and recruiters to know where to focus. Some startups may seek volume, while others may want to hire where there's depth in a particular speciality.

London, with robust investment and a vibrant tech ecosystem, continues to offer the largest talent pool for every speciality analysed. However, many other cities across the region demonstrate a higher per-capita density of talent in specific skill areas. For example, Barcelona is a mobile-tech hotspot, while the densest concentration of robotics engineers is in Munich.

Atlas brings these findings together with wider trends shaping the ecosystem into an interactive tool and content resource that founders, recruiters and hiring managers can use to find the pockets of talent their companies need to succeed. Whether you're looking for a single remote hire, setting up an engineering hub, or considering where to base your company, this data can help.

Cities at a glance

All skills combined

Total engineers	City in Europe	Share of talent
269,700	London	9.99%
74,000	Paris	2.74%
52,600	Madrid	1.95%
47,400	Amsterdam	1.76%
47,241	Berlin	1.75%
46,900	Stockholm	1.74%
45,000	Manchester	1.67%
42,344	Copenhagen	1.57%
40,800	Zurich	1.51%
40,400	Brussels	1.50%
40,300	Munich	1.49%
39,361	Budapest	1.46%
36,200	Milan	1.34%
34,637	Barcelona	1.28%
31,950	Warsaw	1.18%
Total engineers	**2,600,000**	

[1] This project focused on studying countries within the European Economic Area, while also including Switzerland, the United Kingdom and Ukraine in its scope. The European Economic Area (EEA) includes all EU countries as well as Iceland, Liechtenstein and Norway which are part of the EU's single market. Switzerland is not an EU or EEA member but is part of the single market.

Speciality densities

Cities with the highest per-capita density of engineers in each specialisation area

Key
- Top
- Standout
- Noteable

AI
- Dublin
- Zurich
- Athens
- Berlin
- Paris
- Edinburgh

Application Development
- Lisbon
- Barcelona
- Porto
- Madrid
- Berlin
- Dublin
- Krakow
- Prague
- Bucharest
- Stockholm
- Paris

Databases
- Lisbon
- Porto
- Prague
- Dublin
- Barcelona
- Madrid

Data Science
- Dublin
- Berlin
- Paris
- Athens
- Zurich
- Munich
- Madrid

DevOps
- Amsterdam
- Dublin
- Berlin
- Helsinki

Finance
- Dublin
- Berlin
- Athens
- Tallinn
- Lisbon
- London
- Vilnius
- Paris
- Madrid

Front-End Frameworks
- Vilnius
- Tallinn
- Dublin
- Athens
- Bristol
- Barcelona
- Berlin
- Bucharest
- Amsterdam
- Lisbon
- Porto
- London
- Madrid
- Krakow
- Helsinki
- Edinburgh

Gaming & Graphics
- Helsinki
- Vilnius
- Stockholm
- Edinburgh
- Berlin
- Barcelona
- Tallinn
- Bucharest
- Cambridge
- Dublin
- Bristol

Hardware
- Cambridge
- Bristol
- Munich
- Stuttgart
- Gothenburg
- Stockholm
- Helsinki

Mobile
- Barcelona
- Berlin
- Porto
- Madrid
- Lisbon
- Dublin

Robotics, Drones & Autonomous Vehicles
- Munich
- Stuttgart

Security
- Dublin
- Tallinn
- Bristol
- Athens
- London
- Zurich
- Edinburgh
- Amsterdam
- Cambridge
- Paris

Server & Cloud
- Dublin
- Amsterdam
- Berlin
- Lisbon
- Barcelona
- Madrid

Systems
- Gothenburg
- Stuttgart
- Dublin
- Munich
- Stockholm
- Athens
- Berlin
- Paris

02

Insights

Sequoia's research highlights key trends that impact tech recruiting in the complex landscape of post-COVID Europe. Our results affirm that location is still a crucial variable—even as hybrid work remains ascendant and compensation converges within and between countries. This analysis paints a picture of a dynamic AI scene, explores the resilience of Ukrainian talent, and reveals a gulf in expectations between employers and talent. Familiarity with these dynamics will be essential for founders and tech recruiters navigating this rapidly evolving region.

Hybrid is on the rise

Key takeaways

- Variability of hybrid and distributed work arrangements is on the rise—and here to stay.
- But location still has a big impact on hiring decisions.

31%

of tech companies say they have mostly remote workers; 59% have distributed teams

78%

of companies with distributed teams say engineering is distributed vs 52% for sales, 48% for marketing, and 47% for customer support

74%

of companies with remote employees say accessing specialist skills in other cities is a primary driver

For many, office space is starting to feel outdated. But especially in our age of hybrid work, location is still crucial to recruiting the right talent.

Hybrid is on the rise, our survey confirms the large majority of tech companies are already comfortable with remote operation, fully or in part. Three in ten recruiters at European startups reported that most of their employees are off-site, and double that said that most of their workforce have hybrid roles.

A related phenomenon is the rise of distributed teams—groups of colleagues who work out of different locations. Three fifths of recruiters in our survey reported that their organisation operates fully distributed teams, with team members physically separated. Of these organisations, 78% said they operate distributed engineering teams while around half said they have distributed teams in sales, marketing and customer support.

However, in the age of hybrid work, location still matters. Salaries remain variable across Europe, although the gaps are narrowing. And recruiters may not have a ready supply of talent for a given role in their backyard—increasingly, they are tapping other cities to find the skills they're seeking. Around three quarters of companies that employ remote workers or operate distributed teams say this gives them access to specialist skills in other locations. We see this playing out in the quest for front-end developers and DevOps engineers—the hardest to recruit due to demand, respondents told us. Around 70% of employers with distributed teams source these skills remotely, far more than they do for any other skill (Figure 1)

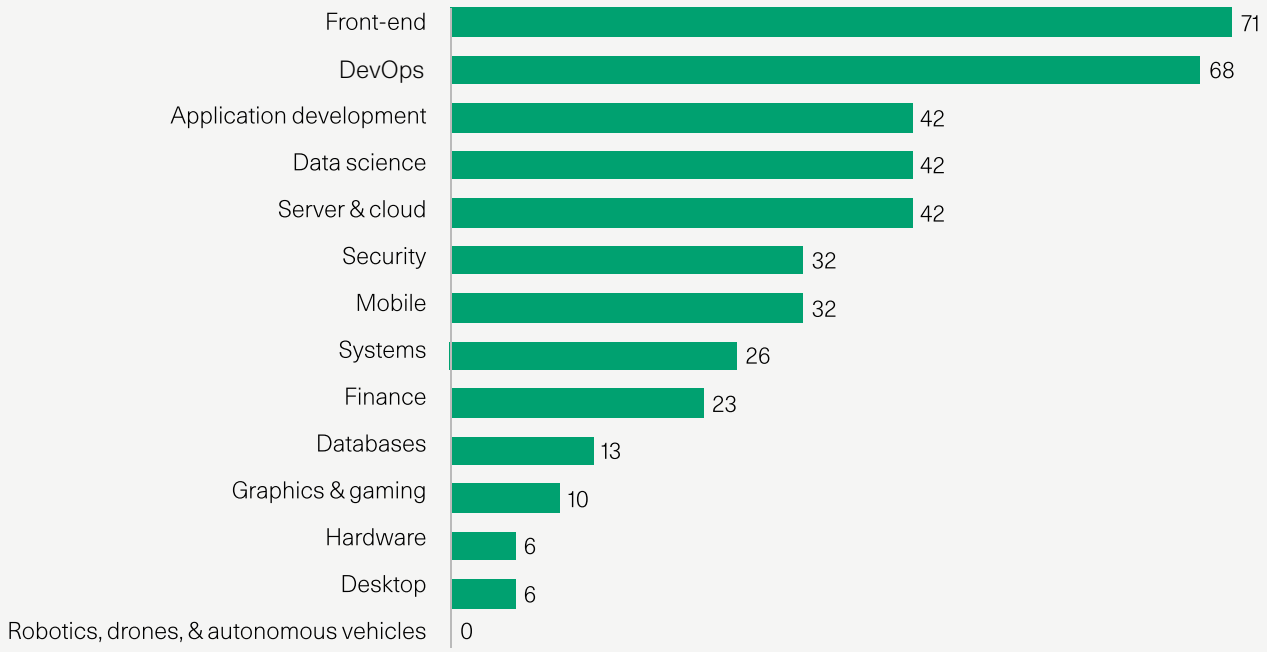
Many companies are reporting the advantages of locating remote hubs in cities where they can find the talent they need. Engineers often prefer to be remote from HQ, but still enjoy being able to meet with their immediate colleagues in person.

Europe's varied locations offer recruiters a wealth of choice. For specific requirements, it helps to know where to look. In Dublin, 14% of the tech talent has DevOps skills, the highest per-capita concentration in Europe. Amsterdam is close behind with 13%, well above the continental average of 8%. When it comes to front end, Eastern Europe is the place to start the search. Vilnius and Tallinn have the highest concentrations of this talent, at around a quarter of the local talent pool each—a good 10% higher than average.

FIGURE 1

Looking afield for in-demand skills

Specialities sourced remotely, %



Q What skills/roles do you tend to source remotely?; n = 125; Source: Sequoia recruiter survey, 2022.

"Our reason for going fully remote is to attract talent. There's no good reason to force people into offices—especially engineers and designers, who generally prefer to work remotely."

—FOUNDER AND CEO OF A LONDON-BASED TECH COMPANY

Variable overheads

While fewer recruiters reported hiring distributed talent in order to save on costs, it was a motivating reason for just under half. One important factor in this equation is the variable cost of office space. While compensation is increasingly equalising across the region, rent is not—so this is one overhead where big savings are possible. The difference can be substantial, particularly when comparing cities in Eastern and Western Europe. In 2022, one could rent prime office space in Bucharest, Romania, for €19/m^2 per year. In Paris it was four times that; in London's West End, almost six times. For companies based in pricier cities, it makes financial sense to reduce the home-town physical footprint and hire remotely or establish additional hubs elsewhere.

What talent wants

Improved productivity and reduced overheads are incentives for going remote, with nearly half the businesses surveyed flagging these factors. But importantly, remote and distributed work makes sense because, on the whole, employees like it. Around 80% of recruiters that employ remote workers or operate distributed teams said "employee preference" drove this decision. That accords with our talent survey: over half the students and engineers we engaged said they'd rather work remotely most of the time. It's a particularly popular choice in Western Europe, where 62% preferred to be out of office. Of all European countries surveyed, the UK had the highest preference for remote work at 71%, with Croatia coming in lowest at 37%.

That said, six in ten recruiters reported their workers had mostly hybrid roles and most were still regularly present at HQ. But a similar percentage expected to employ more off-site workers in the next two years—suggesting that today's remote trend won't be abating anytime soon.

More and more tech employees prefer remote or hybrid work arrangements and distributed teams. That creates important opportunities for startups—to access specialist skills from across Europe, and to build hubs in the most relevant cities.

"Having a remote workforce allows us to cast the net wide when it comes to recruitment."

—DEBORAH RIPPOL, PEOPLE AND TALENT LEAD AT ZEFIR

Navigating Divergent Priorities

Key takeaways

- In a competitive labour environment, startups face a potential mismatch in priorities with candidates.
- Founders value candidates who demonstrate a cultural fit and a self-starter mindset.
- Candidates prioritise salaries and benefits, job security and work-life balance.
- Both can win by considering opportunities in a wider range of locations to find the best fit.

50%
of students believed that the tech sector offered better job security and work-life balance

65%
anticipated better salaries and benefits compared to other industries

#1
Both engineers and students ranked salary and benefits their top priority

Tech startups and job candidates have an opportunity to understand each other's hiring priorities and reconcile diverging expectations.

In a competitive recruiting environment, founders and hiring managers at early-stage tech startups face particular challenges. In our research, Sequoia found that recruiters' top hiring criteria for potential employees—more even than technical ability—were a sense of ownership, agency and the capacity to fit in with company culture. But for engineering candidates, these factors ranked last when choosing employers.

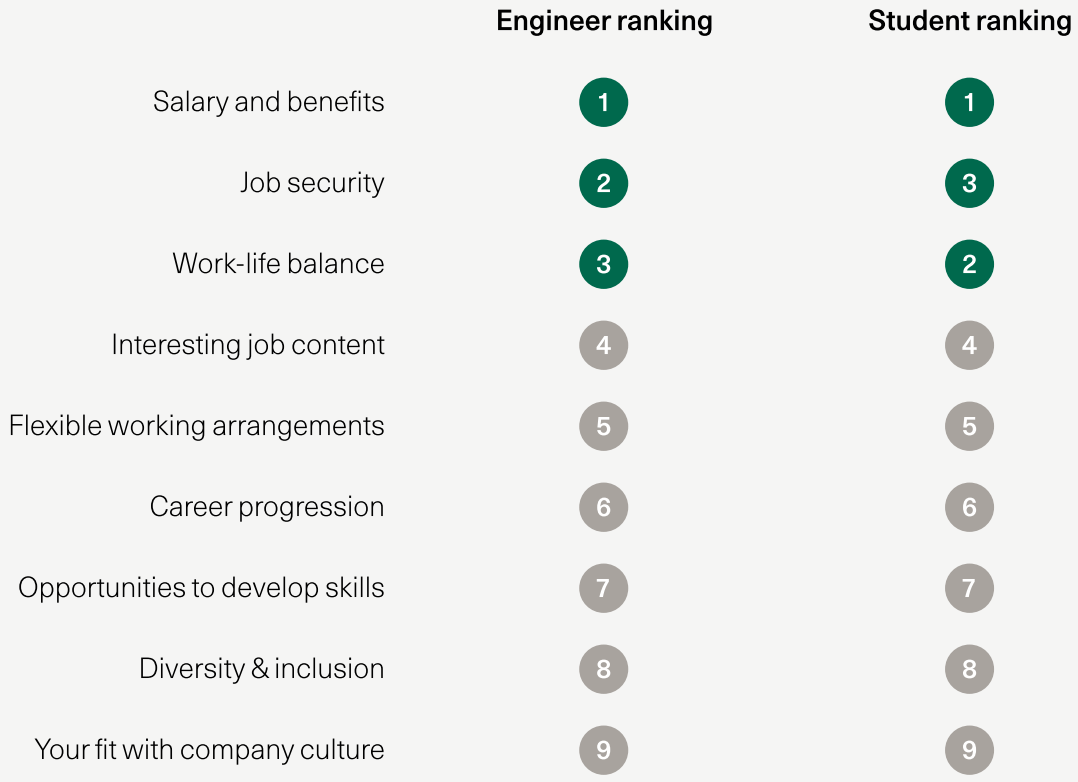
Sequoia surveyed 1,035 tech workers and graduating STEM students about how they weighed job opportunities. The top three factors influencing their decisions were: salary and benefits, work-life balance and job security. This was true for both current engineers and students. For all, fitting with company culture came dead last (Figure 2).

It's worth noting that our survey was conducted in 2022, as the market turned down and layoffs picked up: financial security was surely on candidates' minds.

But the undeniable reality is that companies and candidates have diverging priorities. In the current labour environment, both companies and candidates are under pressure: recruiting is competitive as unemployment remains low, yet candidates feel the looming spectre of tech layoffs and rising inflation. In this climate, there's a risk of companies and candidates overlooking their differences in their eagerness to hire and be hired. However, the increase in location flexibility means companies and candidates alike have access to a

FIGURE 2

Candidates value culture less than founders might like



Q What is most important to you when it comes to choosing an employer? Please click and rank the following from most important to least important.; n = 1,035; Source: Sequoia tech talent survey, 2022.

larger pool of options and can cast a wider net to find the right fit. For workers, this may mean a balance of passion and stability. For companies, it might mean finding engineers who fit the team culture, regardless of location.

A London-based tech CEO told us that company culture remained an important component of attracting talent: “Companies with strong culture find it easier to hire. Top-down, micromanaging businesses will find it harder.” Sequoia’s Zoe Hewitt notes that exceptional companies tend to create cultures that encourage an entrepreneurial mindset and draw in outlier talent. This also plays a vital role in retaining key employees.

To attract candidates, some companies are exploring non-traditional sources of talent, our research found. The self-directed qualities recruiters seek may be found, for example, in self-taught engineers without university degrees, who might be overlooked in traditional recruiting pipelines.

Despite the challenges, tech startups have an advantage when recruiting the next generation of engineers. In our research, student candidates finishing STEM degrees ranked the tech industry as more promising than other industries in every dimension except diversity and inclusion. When considering the factors most important to this cohort, over half of these students believed that the tech sector offered better job security and work-life balance, while 65% anticipated better salaries and benefits compared to other industries (Figure 3).

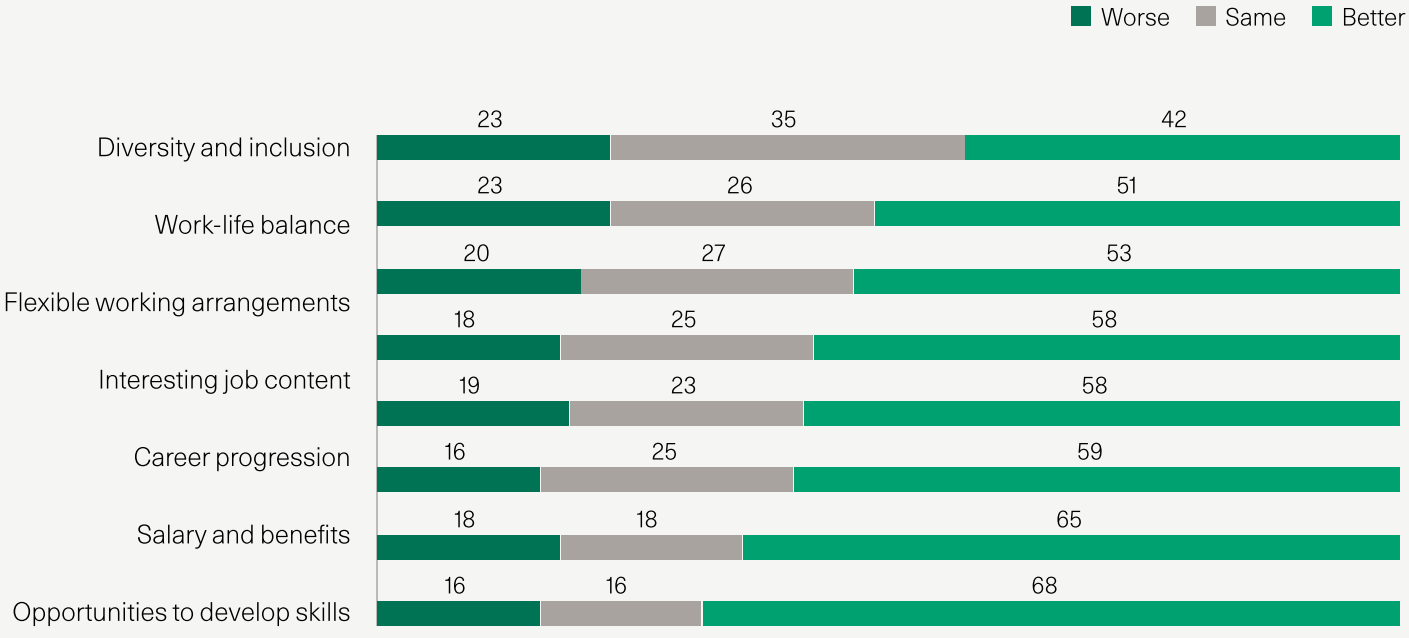
In a competitive hiring environment, companies and candidates may have misaligned priorities. To close the gap and find the right match, startups could consider candidates from a wider range of locations, looking beyond the traditional—and nearby—talent pool.

Looking to hone your search? Use our interactive map to find outlier concentrations of talent for the role you’re filling.

FIGURE 3

STEM students view tech more favourably than other sectors

Students’ impression of the technology sector as compared to other sectors, %



Q What are your impressions of the technology sector? Compared to other sectors, how does it compare in the following areas?; n = 226; Source: Sequoia tech talent survey, 2022.

A Talented Home for AI

Key takeaways

- AI tech is growing at a rapid pace, and skill-rich Europe is investing in innovation.
- London holds the most engineers with AI experience, but Dublin is a talent hotspot.
- The field is set to benefit from billions in annual EU funding, plus other incentives.
- The University of Edinburgh has proved to be an AI talent-building powerhouse.

70%
of AI experts have an MSc or PhD degree (vs 45% for general engineers)

72%
of AI experts have >10 years of experience (vs 64% for general engineers)

17%
of Dublin's engineers have AI experience, more than double the European average

With a concentration of talent and innovative policies, Europe is positioning itself as a global leader in AI.

AI is surging in Europe, with world-class research and rapid innovation by leading tech companies. The availability of skilled engineers has helped. But a closer look reveals complexity: talent is concentrated in certain cities, and hiring and policy patterns are in flux.

A regional wealth of expertise

Europe is an attractive environment for AI firms looking to scale and for companies just starting to explore the technology. It offers a breadth of talent, with nearly 200,000 engineers having some experience with AI.

However, it's a core of around 43,000 dedicated practitioners who are really driving the region's AI revolution. Europe's software-engineering talent pool includes a per-capita concentration of AI experts 30% higher than in the U.S. and almost three times as high as in China (Figure 4). This is an unusually educated and experienced group. Seven in ten have a master's degree or PhD and slightly more have over a decade of experience—well above the figures for engineers as a whole.

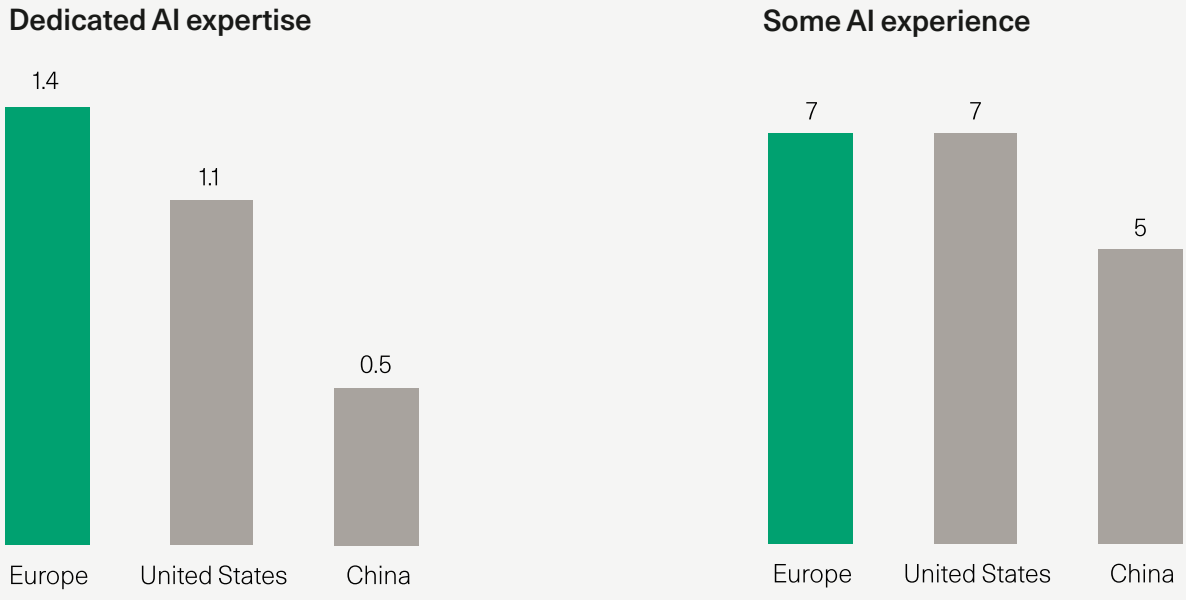
The universities nurturing this expertise span the region. The University of Edinburgh is a particularly productive seedbed, having trained 1.3% of Europe's 43,000 AI experts (with the Technical Universities of Madrid and Munich, the University of Amsterdam and international online learning platform Udacity also making meaningful contributions). Udacity is also the biggest contributor to the broader group of 195,000 AI engineers in Europe, educating 1.2% of the pool.

So where should founders and recruiters seek AI talent? Engineer-rich London—the birthplace of Alan Turing—might seem the obvious hunting ground. It's home to around 20,000 engineers with some AI expertise, more than double any other European city; that's about 9% of London's technical talent. Google DeepMind continues to be a significant AI employer.

But when we zoom in on the data, it's Dublin that stands out for its high density of AI talent—comprising 17% of all software engineers in the area, more than double the average for European cities. Zurich is also a standout at 14%, driven by the quality of the Max Planck ETH Center for Learning Systems, as well as Google's decision in 2016 to locate its European machine-learning research group in this city. Athens, though it's a smaller community, is

FIGURE 4

Global concentrations of talent: AI practioners as % of software-engineer populations



Source: SeekOut (accessed 2022); Sequoia analysis.

not far behind at 13%. The Athens Roundtable—an annual conference convening policymakers, legal experts and stakeholders from big tech firms like Google, Amazon and Microsoft—attracts more than 3,600 attendees from all over Europe to discuss ethical and legal developments in AI.

The larger talent pools of Berlin, Paris and Edinburgh also feature notable concentrations of AI talent—around a tenth of those cities' engineers—with University of Edinburgh additionally producing a pipeline of AI computer science grads.

Tech giants dominate the AI employment landscape

One factor driving the outlier concentration in Dublin is that the city has proved a friendly base for tech giants. Meta, Google and Microsoft—among the top five companies hiring AI talent globally—have built a considerable presence here, taking advantage of Ireland's attractive tax regime for research and development.

While Dublin stands out, this pattern is developing across Europe. Google and Amazon are building up large teams of expert talent; each currently has nearly twice the share of expert AI engineers than any other company in the region. And this consolidation is intensifying: dedicated AI practitioners at the largest companies now greatly outnumber former employees with these skills—a pattern not seen at smaller firms (Figure 5).

However, startup recruiters need not feel that the AI talent they need is inaccessibly locked up in tech-giant employment. Rather than exclusively recruiting experts, many companies will find that the larger pool of engineers who have some AI experience can add significant value—especially because modern AI APIs make it easier for developers to plug into the tech. Indeed, our study shows that smaller employers utilise a more even mix of dedicated and general AI experience.

Mapping the future

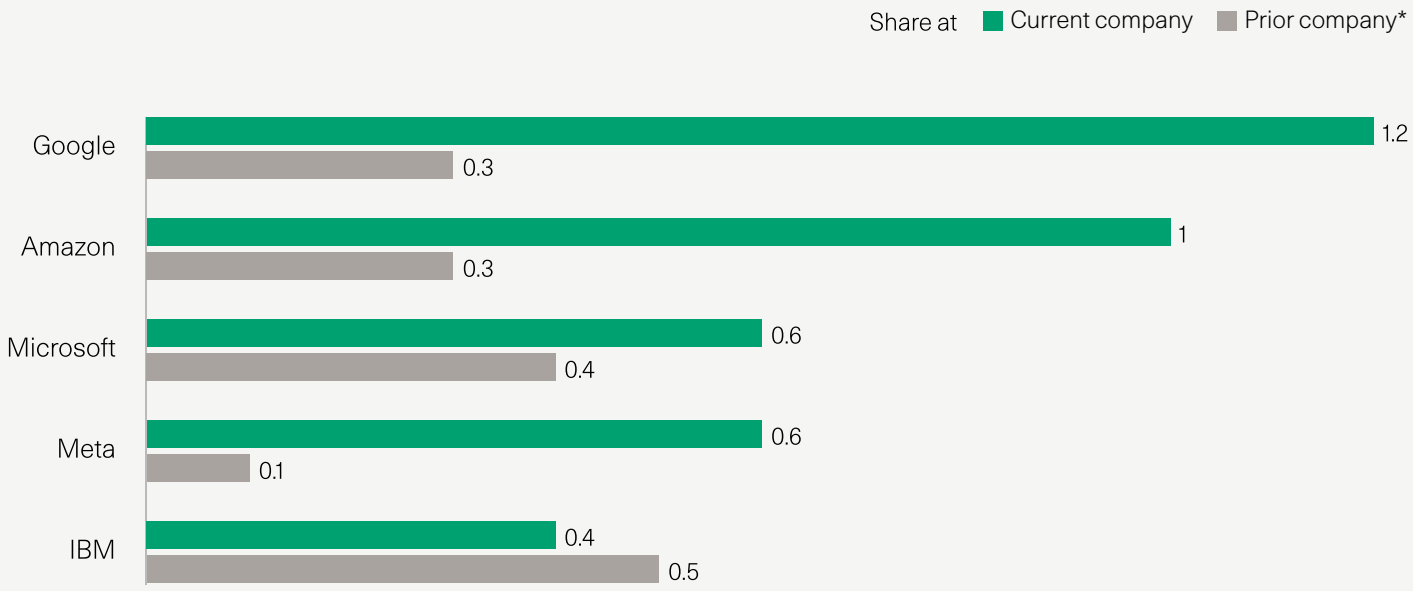
Cities matter, but so do bigger political groupings: EU membership has a powerful influence on the tides of tech development. AI is a major focus of the EU's Digital Decade programme—a raft of policies to keep new tech accessible and safe and establish Europe as a strategic leader.

In the most recent (2021) update of its Coordinated Plan on Artificial Intelligence, the European Commission proposed that the Union invest at least €1 billion in AI per year, gradually increasing public and private investment to a total of €20 billion annually over the course of

FIGURE 5

Tech giants have captured specialised AI talent

Software engineers specialised in AI, %



* "Prior company" refers to an employee's most recent prior employer; Source: SeekOut (accessed 2022); Sequoia analysis

"We're at an exciting moment where Europe's top AI practitioners are realising they can fulfil their potential by joining a startup rather than academia or a large tech giant. Early-stage companies offer the same opportunity to be at the frontier of innovation, but with more direct, immediate impact. Founders can recruit top AI talent with a compelling vision that chimes with candidates' desire to impact the world."

–ZOE HEWITT, SEQUOIA TALENT DIRECTOR

this decade. However, the industry will also likely be constrained to some degree by the EU AI Act. This aims to protect the safety and rights of consumers of these systems by regulating the development and adoption of AI in the region.

Meanwhile, non-EU countries are developing and executing their own AI policies. The UK's National AI Strategy, in contrast to the EU's heavy state involvement, proposes a looser regulatory environment, with innovation as its chief aim. (Although the UK will not escape some knock-on impact from the EU Act, despite Brexit). With London as the biggest pool of AI talent in Europe, these strategic moves to hold the competitive lead will continue to influence the AI landscape over the coming decade.

With its wealth of talent, Europe is positioning itself as a leader in the accelerating world of AI. While talent is amassing at the tech giants, these talent pools become "aircraft carriers" as entrepreneurial employees inevitably depart to start their own companies, generating yet more demand for AI skills. With assertive policy incentives in the pipeline, anyone with a stake in AI is keeping their eyes on the region.

Ukrainian Talent Proves Resilient

Key takeaways

- Ukraine has a reputation for producing excellent engineering talent.
- Only 16% of tech companies lost more than 10% of their customers; 52% managed to retain them all.
- Overall, the industry has proved resilient and continues to provide talent to the world.

85%
of Ukrainian developers have managed to keep working full-time, in Ukraine or abroad

2%
of Ukrainian IT companies have been forced to shut down due to the war

In Ukraine, a country renowned for tech talent, engineers have found ways to keep working despite the war.

While data regarding the Ukrainian tech scene amid the ongoing war is sparse and subject to fluctuations, a few undeniable facts illustrate the remarkable resilience of the country's tech industry and its workforce. Despite the upheaval, only a fraction of the tech workforce, approximately 16%, has departed the country. The majority of IT professionals and software developers, more than 70% and 80% respectively, continue to work full-time. In the face of adversity, they have adapted and relocated to comparatively safer regions such as Kyiv and Western Ukraine.

In smaller companies, employing up to 200 staff members, around 20% of specialists have joined the ranks of the army. A notable 5% of IT experts are deeply engaged in the information front, contributing their skills to state cybersecurity and the maintenance of critical infrastructure facilities. Remarkably, there exist companies where nearly all tech specialists are currently serving in cyber forces. These statistics are sourced from a survey of 30 IT companies that collectively employ 34,000 IT professionals, all members of the Association of IT Ukraine.

Ukraine is a substantial source of talent—in 2020, 20% of Fortune 500 companies had remote development teams in Ukraine. According to the IT Ukraine Association, the country exports $6.8 billion of services a year—about 4% of the country's GDP. With an education system that has long prioritised mathematics and science, Ukraine has proved a tech-talent outsourcing powerhouse. Although neither Kyiv nor Odesa emerged in our study as cities with outlier density for specific skills, both can claim robust all-round tech talent.

Indeed, for some years Ukrainian workers have played important roles in the US and European tech ecosystems. The Igor Sikorsky Kyiv Polytechnic Institute, in particular, has produced impressive numbers of graduates working across Europe. Our research shows that the university contributes significantly to the tech workforce in major cities, including Warsaw, Kraków, Tallinn and Berlin. It has also produced the second-largest number of current female tech grads of any university in Europe—surpassed only by The Open University in the UK. On the whole, Ukraine's record for gender diversity in tech is relatively good: Ukrainian software developers are 25% female, versus a European average of 16%. In addition, two thriving tech businesses, Grammarly and Gitlab, were founded in the country.

Global employers have scrambled to retain and protect their Ukrainian employees and ensure their safety in these difficult times. There have been coordinated drives to link Ukrainian talent with remote work, providing much-needed security. Remote.com, for example, offers resources to help Ukrainians find work and link them with recruiters. Remoteworkukraine.com, too, has helped war-impacted Ukrainians. Countries like Poland and Lithuania have adapted their visa regulations to allow Ukrainians to set up within their borders.

These are mostly temporary measures, but they've been surprisingly successful. The internet is full of stories of tech workers who escaped the horrors of the war and found safe haven and employment outside the country or in domestic safe spaces.

This resilience extends beyond individual workers. Only 2% of Ukrainian IT companies have been forced to shut down due to the war. And only around 16% of Ukrainian tech companies lost more than a tenth of their customers; more than half (52%) managed to retain them all. Overall, in 2022, the country's IT industry yielded 5.8% more in export revenues than in 2021.

Still, Ukrainian tech practitioners continue to adapt. Approximately 60% of tech employees continue to work within Ukrainian borders, despite being displaced from their homes, while a mere 14% of those displaced have chosen to leave the country opting for safer areas. Central and Eastern European countries, where several cities offer highly amenable conditions for remote work, have proved popular destinations.

Compensation: The Great Levelling

Key takeaways

- With the ubiquity of remote work, salaries are converging across Europe.
- 81% of recruiters say pay differentials are being eroded within countries.
- This frees up companies to focus on building their culture rather than focusing only on price.

73%
of recruiters say pay differentials are being eroded between countries

61%
of tech workers in Western Europe are satisfied with the cost of living

58%
of companies surveyed report that remote and HQ workers were paid the same

With the ubiquity of hybrid work, salaries are converging across Europe.

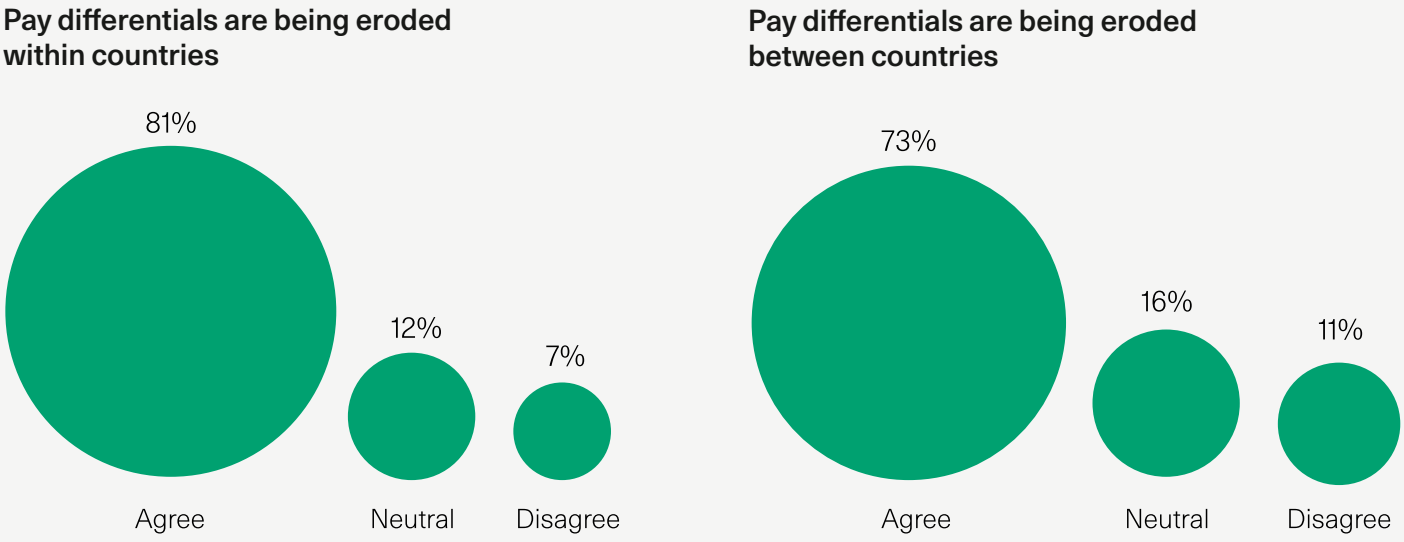
It used to be that cost efficiency was the driving factor in companies hiring remote talent. Then the pandemic hit, making remote work the norm. In the process, compensation began decoupling from location. Now, the trend is for the market rate for a given skill to transcend borders: increasingly, high-calibre talent can command similar fees, regardless of where they live.

Sequoia research confirms this insight. In our survey, over four-fifths of recruiters said that pay differentials are being eroded within European countries (between metro and rural areas), while almost three-quarters see this pattern between countries (Figure 6).

Among the recruiters surveyed, 58% felt there was no disparity in remuneration between remote engineers and those in similar roles at headquarters. Interestingly, 3% even stated that remote engineers earn a minimum of 25% more than their counterparts in on-site positions (Figure 7).

FIGURE 6

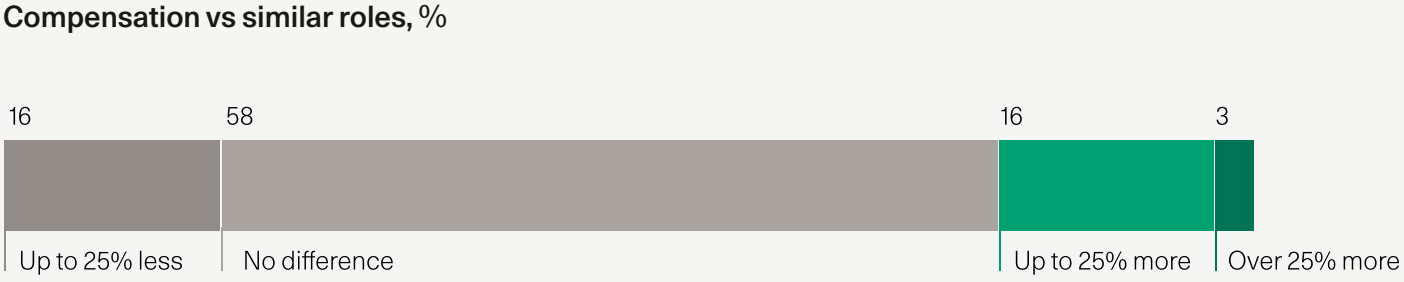
Pay differentials are declining



Q To what extent do you agree or disagree with the following statements?; n = 125; Source: Sequoia recruiter survey, 2022.

FIGURE 7

Compensation of remote engineers vs those at HQ location



Q Broadly speaking, how does the compensation (i.e. base salaries, bonus and other benefits) of your remote engineering workers compare to that of employees in similar roles in (Q4)? Are they ... n = 125 Source: Sequoia recruiter survey, 2022.

Still, levelling is not the same as level. One recruiting executive acknowledged this trend but told us that a 15 or 20% regional difference in compensation continues to be important. Across a set of hires, this difference may mean being able to hire an additional employee in another location, which is especially significant for smaller companies.

Although price is not as important a consideration for recruiters as access to talent (74%), it is still important to nearly half of the surveyed group (45%).

One factor to be aware of when recruiting from other locations is that cost of living is still strikingly variable. It tends to be higher in cities in Western Europe, followed by Southern and then Eastern Europe. Engineers could opt to work remotely while benefiting from living in a more affordable city.

It's perhaps surprising, then, that engineers are not moving en masse to cheaper regions. Our research indicates that residents of pricier cities are more likely to rate their cost of living as "satisfied" while those in more affordable cities report an "unsatisfied" cost-of-living experience (Figure 8).

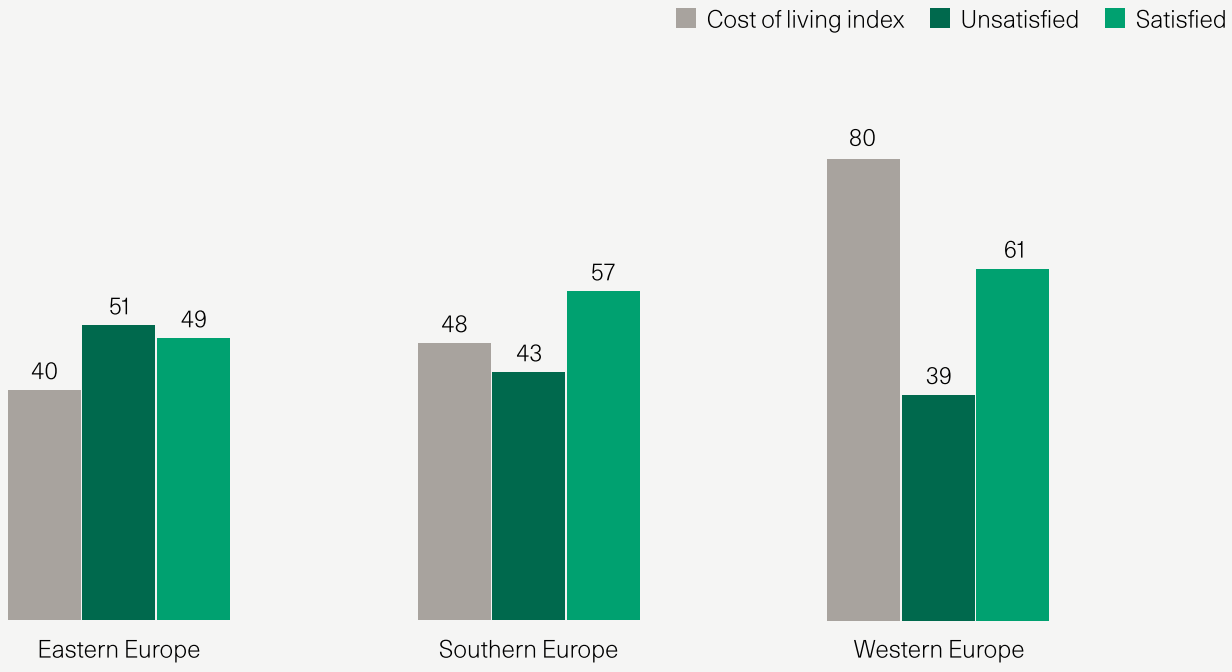
Regional cost-of-living rating

We see the same pattern on a country level. The UK has the lowest levels of cost-of-living satisfaction, with only 33% of talent ranking it "good." Sweden leads here by a long shot, with 92% approval. These two countries have relatively similar costs of living, but talent in Sweden is happier with what their money can buy (Figure 9). The lesson for founders and hiring managers: don't assume that tech talent in Eastern Europe, or relatively low cost-of-living cities, will be satisfied with smaller compensation packages.

FIGURE 8

Happily spending more in Western Europe

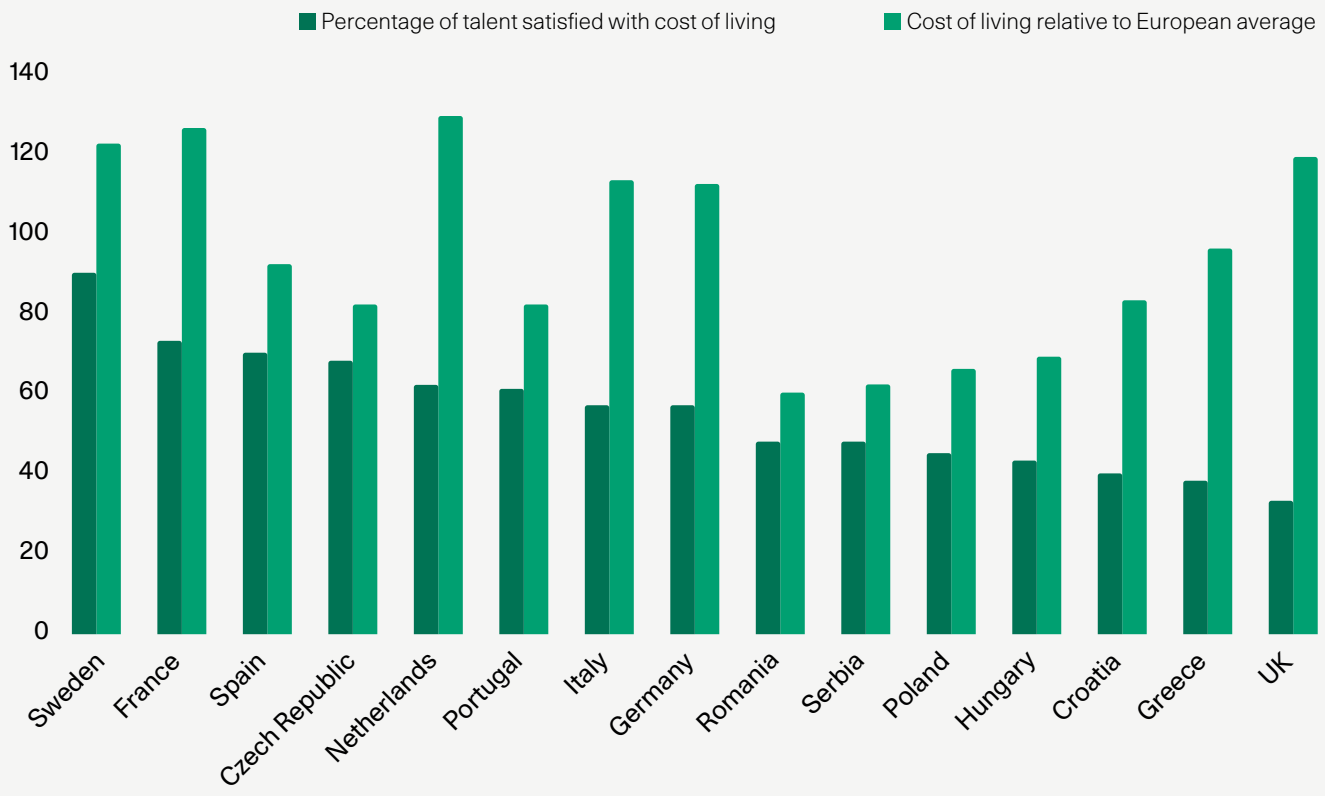
Regional trends in satisfaction with cost of living, %



The cost-of-living index indicates the relative prices of consumer goods like groceries, restaurants, transportation, and utilities. It excludes accommodation expenses such as rent or mortgage. The index is relative to New York City (NYC), with a baseline index of 100% NYC.; Source: Sequoia tech talent survey (n = 1,035); Numbeo (accessed 2022); Sequoia analysis, 2022.

FIGURE 9

Cost of living satisfaction by city



Source: Sequoia tech talent survey (n = 1,035); Numbeo (accessed 2022); Sequoia analysis, 2022.

With the normalisation of remote work, tech salaries are converging across the continent. This creates challenges for recruiters. Engineers—commanding London or Paris salaries while working in Athens or Zagreb—increasingly hold an advantage in recruitment negotiations. But this shift could be a net positive: recruiters can now spend less time on gaming the regional talent arbitrage and more time focusing on company needs, like skills, culture fit, and where (or if) they want to establish hubs for distributed or in-office teams.

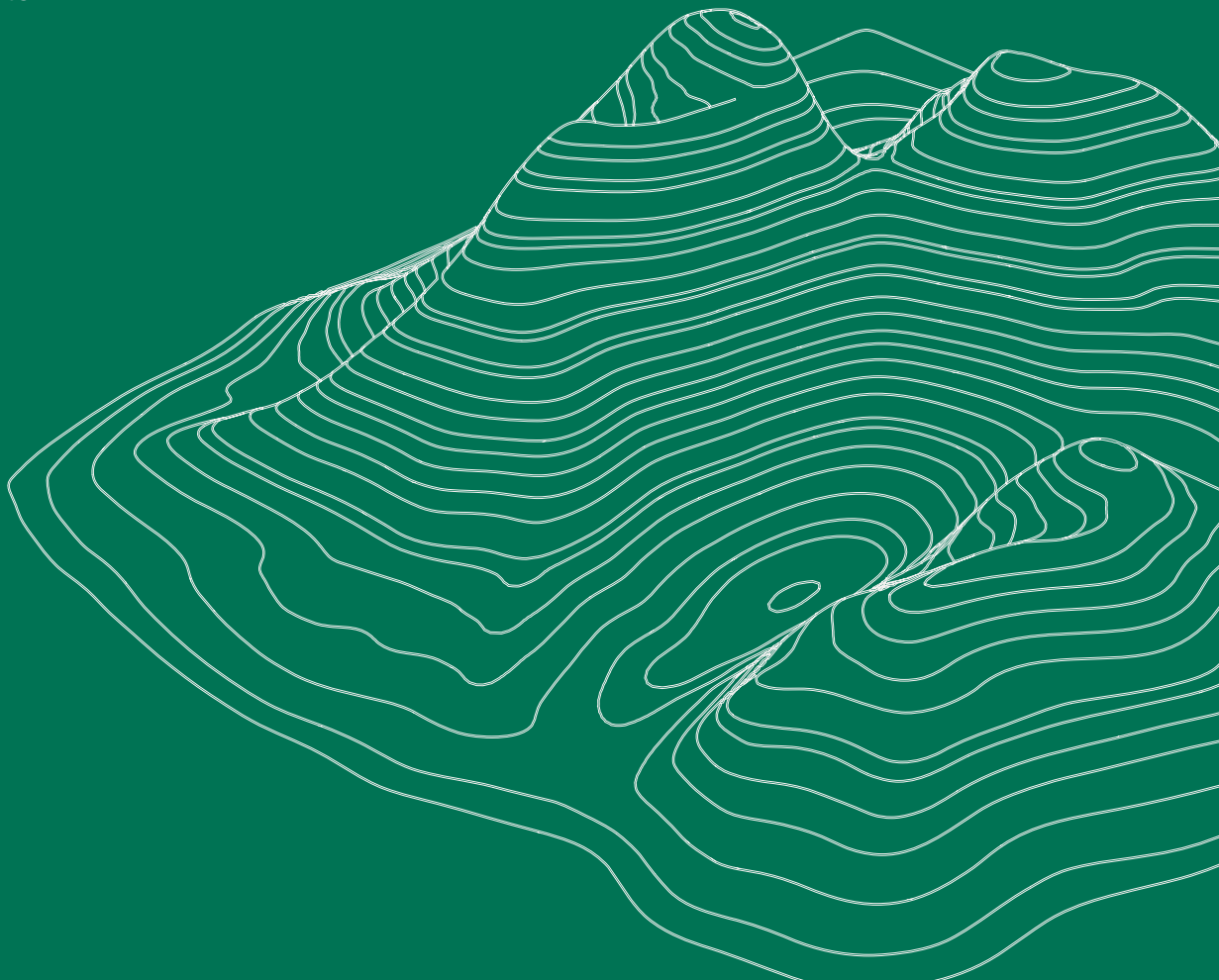
"Many engineers can get a San Francisco salary no matter where they are, even if they're based in Spain or Poland. It's becoming more of a global marketplace, which is a challenge on the engineering side."

—HEAD RECRUITER BASED IN PARIS

03

Europe's Tech Hubs

Every European city offers a unique blend of talent, infrastructure and opportunity. The following 24 cities offer outlier per-capita density in different skillsets. They form meaningful specialisation clusters where startups may want to look for technical talent. Explore this list to understand the talent pools, major employers, universities, hiring dynamics and business climates that define each city's tech ecosystem.



Amsterdam

Home to a third of Europe's data centres and the birthplace of the Python programming language, Amsterdam has the largest pool of DevOps experts outside London and Paris.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT[2]
±47,400	DevOps	Front-End Frameworks, Security, Server & Cloud	15%

Home to more than 47,000 engineers and developers, Amsterdam is a major European tech hub. Its in-city density of DevOps engineers is the highest in Europe (15% of the talent pool) and it offers the third-highest share of DevOps talent Europe-wide by volume. Amsterdam is home to a standout density of front-end framework developers, and a notable density of security and server & cloud engineers.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€201.4 billion	€10.3 billion	2,822	40

MAJOR EMPLOYERS

Booking.com, ING

Amsterdam is a hotbed of startup activity, with 40 accelerators and nearly 3,000 startups. Of these, 15 have achieved unicorn status, including fintech player Mollie and software firm Mambu. The city's tech sector has attracted at least €10.3 billion of venture capital funding since 2015, contributing to a total ecosystem value of €201.4 billion.

Amsterdam's two largest tech employers are Booking.com and ING. The balance of the tech talent pool is spread fairly evenly across other employers, reflecting the competitive hiring environment.

Booking.com, one of the world's largest online travel agencies, utilises Amsterdam's density of front-end frameworks developers. ING, a multinational banking and financial services corporation draws on the city's abundant security tech talent, as do newer entrants like Mollie and Mambu.

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[2] For all cities, the European average for female talent is 16%

Universities contributing to local talent

AMSTERDAM UNIVERSITY OF APPLIED SCIENCES:	UNIVERSITY OF AMSTERDAM (UVA):	VRIJE UNIVERSITEIT AMSTERDAM:
8.3%	**8.3%**	**5.9%**

Amsterdam is a technology-education powerhouse, with several internationally recognised universities. Established in 1993 to support the growing demand for professional training and practical education, the Amsterdam University of Applied Sciences is now a leading institution in this city.

Hiring

- Technology workers in Amsterdam are curious and flexible, with 14% open to new roles—two percentage points more than the European average.
- The notice period for termination in the Netherlands is dependent on the duration of employment: one month for five years or less at the company, scaling up to four months for more than 20 years.
- Employees are required to give at least one month's notice when resigning.
- Equity is usually structured around a standard 4 years with a 1-year cliff.. The vesting interval averages 2.2 months.
- Recruiters may note that the cost of living in Amsterdam is eight percentage points above the European average

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Business landscape

- Employers must pay up to 21.55% of gross salary in insurance and employee-benefits contributions—slightly higher than the 20% average total contribution for Europe.
- The corporate income tax rate in the Netherlands is 25%, which is 3 percentage points above the European average.
- There is no tax-favoured scheme in the Netherlands, so entrepreneurs often grant options to employees using the standard tax framework. As of 2018, 25% of capital gain can be tax-free up to €50,000, after which gains are taxed as income at 8.9 to 52%. In addition to that, social tax is applied at 27.65%, up to an annual contribution of €33,791.
- The average monthly rental in office space in Amsterdam is €40 per square metre, just above the European average of €39.

Athens

As one of southern Europe's burgeoning startup ecosystems, this ancient city is becoming a centre of innovation, creativity and entrepreneurship.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±6,200	**Front-End Frameworks, Security**	**AI, Data Science, Finance, Systems**	**16%**

Athens has a thriving startup scene, fuelled by a talented, ambitious and youthful workforce. Though the city offers a relatively small pool of 6,200 software engineers, their talent composition boasts high densities on a per-capita basis across a few skill areas. Recruiters on the hunt for front-end, data-science, finance, security, systems, and AI talent will find it in this ancient city. It also hosts the Athens Roundtable, an annual international conference on AI and the Rule of Law.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€3.4 billion	**€529 million**	**443**	**3**

MAJOR EMPLOYERS

Netcompany-Intrasoft, Accenture Greece

The technology ecosystem in Athens is valued at €3.4 billion and has attracted €529 million in venture-capital funding since 2015. The city has cultivated 443 startups, three accelerators, and one unicorn: Viva Wallet, valued at over €1.8 billion. Viva Wallet is the first entirely cloud-based European Neobank and is present in 24 European countries.

Interestingly, there are more self-employed engineers in Athens than engineers working for any one company. The major hirers, Netcompany-Intrasoft and Accenture Greece, focus on IT services and solutions.

Universities contributing to local talent

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS:	NATIONAL TECHNICAL UNIVERSITY OF ATHENS:	UNIVERSITY OF PIRAEUS:
13%	**13%**	**12%**

Three universities contribute almost equally to the technology talent pool in Athens; together, they have trained over a third of the city's tech workforce. The National Technical University of Athens is the top-rated university in Greece, with schools dedicated to civil engineering, mechanical engineering, and electrical and computer engineering. The Athens University of Economics and Business also offers degrees in computer science and information systems.

Hiring

- Athenian tech workers are relatively conservative when it comes to changing employment: only 6% are open to new roles, half the European average.
- Notice periods for termination depend on the employee's tenure with the organisation. One month is required for employees serving up to two years, after which there's a range from two to four months for employees with two-plus to ten years under their belts.
- The notice required for resignation is not legally regulated but is determined by the contract between the employee and employer.
- The average vesting cliff for Athens employees is 8.8 months, slightly shorter than the industry standard of one year. The average vesting interval after the cliff is 2.6 months, and the average vesting duration is 38 months, ten months shorter than the industry standard.
- Recruiters should be aware that employees deal with a relatively high cost of living in Athens: nine percentage points higher than the European average.

Business landscape

- Social contributions are 22.3%, a little higher than the European average of 20%.
- The corporate income tax rate is 24%, above the European average of 22%.
- Any sale of employees' equity is taxed as a 5% to 15% capital gain for early-stage startups, well below many European countries.
- The average monthly rental for office space is €26 per square metre, favourable when compared to the European average of €39.

Barcelona

With 2,000 tech companies and 210 technology parks, Barcelona is a well-established home for startups and talent alike—and has the investment funding to match.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±34,600	**Mobile, Application Development**	**Front-End Frameworks, Graphics & Gaming, Databases, Server & Cloud**	**15%**

Barcelona hosts one of Europe's most dynamic technology startup ecosystems, primarily focusing on mobile, life sciences and software. It is home to more than 2,000 technology companies, 210 technology parks, and nine international facilities, including the Barcelona Supercomputing Center. It's no coincidence that the Mobile World Congress, the largest conference of mobile developers globally, makes its home in Barcelona.

Glovo, the largest employer of engineers in Barcelona, is a testament to the city's tech talent. As one of the five unicorns in the city (acquired by Delivery Hero for €2.4 billion in 2022), the delivery platform is one of the fastest-growing "super app" companies in Europe. Since its founding in 2014, the company has tapped into the city's abundant mobile talent to staff its headquarters here while expanding into 1,300 cities across the world.

Barcelona has the highest density of mobile engineers among European cities, with 26% of the city's talent pool experienced in mobile, followed by Berlin. This is significantly more than the average European density for mobile at 16%.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€34.5 billion	**€5.7 billion**	**2,319**	**32**

MAJOR EMPLOYERS

Glovo, eDreams, Amazon

The city has a strong entrepreneurial spirit, with a higher-than-average share of self-employed technology talent. Barcelona is home to thousands of startups supported by dozens of accelerators, such as Conector Startup Accelerator—which helped Glovo to scale and become the city's largest tech employer.

Barcelona has many unicorns waiting in the wings: promising startups include TravelPerk, a fast-growing travel platform, and Factorial, which delivers solutions that automate human resources processes. Given the breadth of the city's startup scene, along with the presence of global giants such as Amazon, Barcelona's tech employment is highly distributed.

Barcelona is particularly appealing to global tech talent thanks to Spain's new digital nomad visa. Announced at the beginning of 2023, this visa allows any citizen from outside the EU to live and work in Spain if they work remotely for companies based elsewhere. Given the culture and beauty of Barcelona, it's no surprise this new legislation makes the city a compelling spot for tech talent and the companies that want to hire them.

"I've found Spain and Portugal to be great for IT, they have really good developers."

–SOFIA EFRAIMIDOU, HEAD OF HR & RECRUITMENT AT NETDATA

Universities contributing to local talent

BARCELONATECH (UPC):	OPEN UNIVERSITY OF CATALONIA (UAB):	AUTONOMOUS UNIVERSITY OF BARCELONA (UAB):
23.3%	**9.3%**	**9.3%**

Look for graduates from Barcelona's three academic powerhouses—almost half of the city's talent comes from these universities. BarcelonaTech is the largest engineering university in Catalonia and has been ranked within the top 15 universities for computer science in Europe.

Hiring

- 15% of Barcelona's technology talent says they're open to new roles; a higher proportion than most other European cities. Companies looking to recruit from the city's dense mobile engineering talent may find candidates more receptive here than in other places.
- The notice period for employers depends on the nature of the contract, with a 15-day period for dismissals due to economic factors.
- For employees, there is generally a two- to three-week resignation notice, depending on the contractual agreement.
- Equity is usually structured at a standard 4 years with a 1-year cliff.. The vesting interval averages once every 2.7 months.
- The cost of living in Barcelona is 7 percentage points above the European average.

Business landscape

- In Spain, social security contributions are capped monthly at a base of €4,139 per year per employee.
- The corporate income tax rate is 25%, the fifth highest in Europe.
- Many tech companies in Spain opt for virtual share options (VSOs) as Spanish law does not allow most companies to grant stock options. Employees are taxed at the sale of their VSOs, and the tax rate can be anywhere between 19-45%, with lower rates when the employee has held onto the VSO for more than two years.
- The average monthly rent for office space in Barcelona is €28 per square metre, much lower than the European average of €39.

Berlin

Germany's capital in the heart of Europe is rich in culture and cutting-edge technology. With its international network and varied tech landscape, it's a magnet for remote workers and startups.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±47,200	**Mobile**	**Application Development, AI, Data Science, DevOps, Finance, Front-End Frameworks, Graphics & Gaming, Server & Cloud, Systems**	**17%**

Located in the heart of Europe, with a vibrant open-source scene and home to the most engaged GitHub users of any European city, Berlin has become an established tech hub. Sequoia's research shows that the city has significant talent density in numerous fields of tech expertise. For example, it has one of the highest densities of mobile talent in Europe, at a 25% per-capita concentration. It is also a standout city for data science with 27% of the talent pool skilled in this area and has a notable density across a wide range of skills, from DevOps and finance to AI and graphics & gaming.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€149.8 billion	**€33.7 billion**	**4,322**	**90**

MAJOR EMPLOYERS

Zalando SE, Delivery Hero, Amazon

The city's tech ecosystem is worth €149.8 billion and has attracted €33.7 billion in venture capital funding since 2015. There are more than 4,000 startups and 90 accelerators in Berlin, which have yielded 34 unicorns so far. These include Trade Republic, a tech-based investment company, and Enpal, a solar energy company.

The largest employers of tech talent in Berlin are Zalando SE, Delivery Hero and Amazon. Zalando SE and Amazon both focus on e-commerce, requiring server & cloud and mobile experts to craft effective shopping experiences.

Universities contributing to local talent

TECHNICAL UNIVERSITY BERLIN (TU BERLIN):	HTW BERLIN – UNIVERSITY OF APPLIED SCIENCES:	FREE UNIVERSITY OF BERLIN:
28%	**10%**	**10%**

Berlin has one of the most educated tech workforces in Europe: 60% are STEM graduates, compared to a European average of 52%. Recruiters should keep a lookout for graduates of TU Berlin, which has contributed over a quarter of the city's tech graduates—perhaps not surprising, as the university is listed in the top 100 universities for engineering in the world. Two other universities have produced a large share of Berlin's tech graduates—HTW Berlin and the Free University of Berlin.

Hiring

- In Berlin, 12% of the workforce is open to new roles, the same as the European average.
- The notice period for an employer to give an employee depends on the duration of employment, with a minimum of four weeks for those employed less than nine months and up to seven months for those employed for more than 20 years.
- Employees are required to give four weeks' notice to employers should they wish to terminate their contract, regardless of how long they have been at the company.
- Equity is usually structured at a standard 4 years with a 1-year cliff.. The vesting interval averages every 2.2 months.
- The average cost of living is relatively high, at 12 percentage points above the European average.

Business landscape

- Employers must pay up to 24% of gross salary towards employee benefits and insurance, which is 4 percentage points above the European average.
- The corporate income tax rate in Germany is high at 29.9%, compared to the European average of 22%.
- Virtual stock option plans are preferred over traditional options in Germany due to the lack of a tax-advantage scheme and the high administrative burden associated with real options. At the point at which the employee receives the cash benefit, virtual stock options are taxed heavily—stocks are taxed as income, at 14-45%. Social security contributions are also applied, at 20%, along with a solidarity surcharge of 5.5% of the income tax, and church tax, which is 8-9% of income tax.
- The average monthly rental for office space is €43 per square meter, above the European average of €38.

Bristol

Regarded as one of the UK's most exciting creative hubs, Bristol is a magnet for self-employed talent, startups and large corporations.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±19,500	**Front-End Frameworks, Hardware, Security,**	**Graphics & Gaming**	**15%**

Creatives and tech whizzes rub shoulders in Bristol, considered one of the most forward-thinking, innovative and dynamic cities in the UK. Its fast-growing technology sector comprises a range of industries, including creative media, electronics and aerospace. The city hosts Europe's second-highest per-capita density of hardware engineers and the third-highest density for security tech talent, comprising 7% of the local talent pool—nearly double the European average of 4%.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€9.5 billion (£8.36 billion)	**€2.2 billion (£1.94 billion)**	**581**	**3**

MAJOR EMPLOYERS

Nationwide Building Society, Dyson, CGI

Bristol is home to the largest number of high-growth technology companies in South West England and is also a hub for self-starters. Self-employment accounts for a bigger proportion of talent than any single company. Two notable startups launched out of the city include Vertical Aerospace, an aerospace manufacturer based in the city which specialises in decarbonising air travel, and Graphcore, a semiconductor company which develops accelerated processors for artificial intelligence and machine learning. Meanwhile, Bristol's high concentration of security talent is put to good use by numerous large firms, including financial institution Nationwide Building Society, one of the city's biggest hirers.

This vibrant technology hub is a base for both heavyweights and startups. Amazon, Nokia and SN Systems (a startup now part of Sony) operate alongside many startups and three accelerators. Bristol's technology ecosystem is valued at £8.36 billion and has attracted £1.94 billion in venture capital funding since 2015.

Universities contributing to local talent

UNIVERSITY OF THE WEST OF ENGLAND (UWE BRISTOL):	CARDIFF UNIVERSITY:	UNIVERSITY OF BRISTOL:
14%	**10%**	**9%**

Three universities are the key sources of the city's technology talent. The University of Bristol has been ranked within the top 10 universities in the UK and the top 50 in Europe overall and hosts a strong engineering faculty that conducts its teaching and research in close collaboration with the local world-leading engineering industry. UWE Bristol is an anchor partner in the West of England Institute of Technology and offers courses in advanced engineering, digital and high technology, and health and life sciences.

Hiring

- Bristol's tech talent appears content in their current positions, with only 7% open to new roles—close to half the European average of 12%.
- The statutory notice period for redundancies is the same as the rest of the UK and depends on employment length: one month for up to four years of employment; one week is added to the one month's notice for every year of continuous employment for five to 11 years of employment; and three months for more than 12 years.
- Employees wanting to resign have a statutory minimum of one week's notice, but many companies may opt for longer notice periods contractually.
- Equity is usually structured at a standard 4 years with a 1-year cliff and the vesting interval averages once every two months after the cliff.
- The cost of living in Bristol is 13 percentage points higher than the European average.

Business landscape

- Employers in the United Kingdom pay up to 19.55% of gross salary towards employee benefits and insurance, which is just below the 20% European average.
- The UK corporate income tax rate is 19%, below the European average of 22%.
- The Enterprise Management Incentive (EMI) scheme is a popular choice for tech startups in the UK. Employees with equity in companies with the EMI scheme are given a €15,245 (£11,700) Capital Gains Tax Allowance when they sell their equity, after which they are taxed at 20%. If EMI options are held for more than two years between receiving the option and selling it, the tax rate is reduced to 10%.
- The average monthly rental for office space in Bristol is €43 (£38) per square metre, which is slightly higher than the European average of €38.

Bucharest

With its relatively low cost of living, low taxes and high proportion of female tech talent, Romania's capital is making a name for itself as an emerging tech hub.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±21,800	**Front-End Frameworks**	**Application Development, Graphics & Gaming**	**21%**

A regional hub in Eastern and Southeastern Europe, bustling Bucharest has a mix of influences in its architecture and culture. Sprawled around nine lakes, Bucharest is well suited for remote and freelance work due to its low cost of living.

The city's technology talent pool is young, dynamic and diverse, and includes more women than almost any other European centre—21% compared to the European average of 16%. Of its nearly 22,000 engineers and developers, 13% are open to new roles and 26% have five or fewer years of experience, 11 percentage points higher than the European average.

Bucharest doesn't have a top-tier density for one particular specialisation, but does offer a standout proportion of front-end framework talent (19% of its talent pool are skilled in this area) and also has notable densities in application development and graphics & gaming.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€2.8 billion	**€400 million**	**713**	**10**

MAJOR EMPLOYERS

Luxoft, Endava, Adobe

Worth €2.8 billion, Bucharest's burgeoning tech ecosystem has attracted €400 million in venture capital funding since 2015. The city is home to ten accelerators and has produced 713 startups, with UiPath—a global software firm specialising in robotic process automation software founded in Bucharest in 2005—the first to achieve unicorn status in 2018.

Luxoft, a subsidiary of DXC Technology headquartered in Zurich which offers a full spectrum of technology services, has the biggest hiring clout in the city. Software firm Endava and design giant Adobe follow close behind, though no single company dominates employment in Bucharest.

"There are some new hubs that are becoming well known: Bucharest, Warsaw, Krakow."

—TOMCZUK PAWEL, FOUNDER AND CEO OF TECHTREE

Universities contributing to local talent

POLITEHNICA UNIVERSITY OF BUCHAREST:	BUCHAREST UNIVERSITY OF ECONOMIC STUDIES:	UNIVERSITY OF BUCHAREST:
27%	**13%**	**13%**

Three universities dominate the tech talent pool in Bucharest, with the Politehnica University of Bucharest, which offers the only job placement agency at a Romanian university, producing over a quarter of the talent, followed by Bucharest University of Economic Studies and the University of Bucharest.

Hiring

- Bucharest's tech workers are slightly more curious about opportunities than those in other European hubs, with 13% being open to new roles.
- Employees need at least 20 working days' notice before termination.
- For resignations, employees must give 20 days of notice before leaving an executive-level position, or 45 days for a management position, meaning Romanian talent has one of the longer separation lead times in Europe.
- The average vesting interval in Bucharest is significantly higher than the global standard at 3.6 months (compared to a 2.7-month European average interval). The average vesting duration is the industry standard of 48 months, while the average vesting cliff is 10.1 months, below the standard of 12 months.
- The cost of living is 14 percentage points below the European average.

Business landscape

- Employers in Bucharest must pay up to 10.25% of gross salary towards employee pensions and labour insurance. The average total contribution for employers in Europe is 20%.
- The corporate tax rate is 16%, which is well below the European average of 22%.
- Romania's taxation of equity is particularly low, at only 10% capital-gains tax when an employee sells their shares.
- The average monthly rental for office space is €19 per square metre; roughly half the European average of €39.

Cambridge

Known as ‘Silicon Fen’, picturesque Cambridge has spawned six unicorns and is a hotbed for gifted talent thanks to its unrivalled pedigree in university education.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±12,600	**Hardware**	**Graphics & Gaming, Security**	**16%**

Situated on the River Cam in the East of England, Cambridge is home to the world-renowned University of Cambridge—and has the highest per-capita density of hardware engineers in Europe. The city’s rich culture, employment mix and established technology sector make it an attractive hub for a diversity of talent.

Mainly known for hardware, with a per-capita density for this skill area three times higher than the average European city and the highest density on the continent, Cambridge is considered one of the region’s original technology hubs.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€59.8 billion (£45.9 billion)	**€5.3 billion (£4.1 billion)**	**642**	**10**

MAJOR EMPLOYERS

Arm, Amazon, Tata Consultancy Services, University of Cambridge

Cambridge’s technology ecosystem is worth £45.9 billion and has attracted £4.1 billion in venture capital funding since 2015. There are 642 startups, 10 current accelerators and six unicorns, including CMR Surgical, a company that builds surgical robots. Arm, a leading maker of chips for smartphones and consumer devices, is the primary employer of the city’s technology talent.

Universities contributing to local talent

IMPERIAL COLLEGE LONDON:	UNIVERSITY COLLEGE LONDON:	UNIVERSITY OF CAMBRIDGE:	UNIVERSITY OF HERTFORDSHIRE:
7%	**7%**	**6%**	**6%**

Cambridge has a stellar academic history and has produced some of the world's greatest minds, including the late theoretical physicist, Professor Stephen Hawking, who received his doctorate at Trinity Hall College and spent his career at Gonville and Caius. Between Cambridge's world-famous university and the city's close proximity to other globally competitive universities across the UK, it's unsurprising that the talent pool is made up of alumni from a wide range of universities, with Imperial College London and University College London sharing the biggest proportion.

Hiring

- Cambridge's tech talent is not opposed to new roles, with 12% saying they would try something new, which is in line with the European average.
- The statutory notice period for redundancies in the UK depends on employment length: employers must give employees one month for up to four years of employment; an additional one week for every year of continuous employment for five to 11 years of employment; and three months for more than 12 years.
- Employees wanting to resign have a statutory minimum of one week's notice, but many companies may opt for longer notice periods contractually.
- Equity is usually structured at a standard four-year duration with a one-year cliff. The vesting interval after the cliff averages once every 3.1 months for Cambridge employees, which is longer than the one-month interval standard in many cities.
- The cost of living in Cambridge is 19 percentage points above the European average.

Business landscape

- Employers contribute 19.55% of employees' salaries to social costs such as pensions and insurance. The average total contribution for employers in Europe is 20%.
- The corporate income tax rate is 19%. The European average is 22%.
- The Enterprise Management Incentive (EMI) scheme is a popular choice for tech startups in the UK. Employees with equity in companies with the EMI scheme are given a €15,245 (£11,700) capital-gains allowance when they sell their equity, after which they are taxed at 20%. If EMI options are held for more than two years between receiving the option and selling it, the tax rate is reduced to 10%.
- The average monthly rent for office space in Cambridge is €53 (£41) per square metre, well above the Europe average of €38 (£29).

Dublin

The “Silicon Valley of Europe”, Ireland’s laid-back capital is a hive of activity, attracting tech players big and small—lured in part by the country’s forgiving tax scheme.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±17,500	**AI, Data Science, Finance, Security, Server & Cloud**	**Application Development, Databases, DevOps, Front-End Frameworks, Graphics & Gaming, Mobile Systems,**	**22%**

Dublin, which hosts the European headquarters of tech giants like Google and Meta, is a unique city in the EU where the majority of the population speaks English as their first language. The Republic of Ireland’s freedom of movement with the UK further adds to its appeal, making Dublin an outstanding location for both startups and established firms.

Dublin offers a wide array of technology skills. It ranks first in per-capita density for more engineering skills than any other city in our study. It ranks first in talent density for data science, AI, finance, security and server & cloud specialists. It also has standout density for systems, DevOps, front-end frameworks and application development. It is no surprise that tech giants in Dublin, such as Amazon and Microsoft, are building out their AI teams using the city’s pool of AI talent.

Dublin is highly engaged with GitHub, a collaboration platform for software developers, with 73% of the city’s technology talent listed on the database. Three percent of them are listed as 5-star and 18% as 4-star. The European averages for these ratings are 2% and 10% respectively.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€106.7 billion	**€5.7 billion**	**2,091**	**10**

MAJOR EMPLOYERS

Amazon, Microsoft, Mastercard, Google

Technology giants are the biggest hirers in Dublin. The might and muscle of these companies have sparked a thriving startup ecosystem worth €106.7 billion, with 2,091 startups in Dublin, 1,305 of which were founded in the last decade. It has attracted €5.7 billion in venture capital funding since 2015. The city has created six unicorns, including LetsGetChecked—a medtech company that has taken advantage of the city’s solid server and cloud talent. And, of course, giants such as Amazon and Google have tapped into Dublin’s abundant data science and DevOps talent.

“Dublin has a lot of technology talent, but there are also a lot of technology companies including some giants, so there is a fair bit of competition.”

—RECRUITING LEAD AT A FRENCH STARTUP

Universities contributing to local talent

UNIVERSITY COLLEGE DUBLIN:	NATIONAL COLLEGE OF IRELAND:	DUBLIN CITY UNIVERSITY:
9%	**9%**	**7%**

A notable 73% of Dublin’s technology talent holds a STEM degree, with three universities producing a sizable portion of these graduates in the city. University College Dublin has contributed the highest proportion of talent, followed by the National College of Ireland and Dublin City University. University College Dublin is known for its School of Computer Science, which offers a wide range of speciality areas like cybersecurity and advanced software engineering. Also keep an eye out for graduates from Trinity College, the country’s oldest university that was established in 1592 and is the top-rated university in Ireland—6% of the tech talent in Dublin went to university here.

Hiring

- Dublin’s technology talent is typically content in their jobs, with only 7% open to new roles—well below the 12% European average..
- The legally required notice period depends on how long the employee has worked for the company: one week for up to two years of employment; two weeks for between two and five years at the company, four weeks for five to ten years, six weeks for 10 to 15 years and eight weeks if the employee has been at the company for more than 15 years.
- The statutory minimum notice period for employees who wish to resign is just one week, but employers may opt for requiring a longer notice period and work this into the employment contract.
- Equity is usually structured at a standard 4-year duration with a 1-year cliff and the vesting interval averages once every 1.3 months after the cliff.
- The cost of living in Dublin is 35 percentage points higher than the European average.

Business landscape

- The employer's social contributions are lower than in most countries, standing at 11.05% of the employee's salary for weekly earnings above €441. The average total contribution for employers in Europe is 20%.
- The corporate income tax rate is 12.5%, which is just over half the European average (22%).
- Employees are taxed quite heavily when selling equity—at the point of sale, gains in excess of the annual capital gains allowance (€1,270) are subject to capital gains tax of 33%.
- The average monthly rental for office space is €59 per square metre, which is roughly 50% higher than the Europe average.

Edinburgh

Melding the old and the new, the Scottish capital's cobbled alleys are a hub of tech talent with a wide range of skills.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±16,600	**AI, Front-End Frameworks, Graphics & Gaming, Security**	**n/a**	**23%**

Edinburgh is home to one of the most diverse tech workforces in Europe: 23% of its technology workers are women, 16% are Asian and 3% are Black—all well above European averages. It hosts a notable density of AI, graphics & gaming, security and front-end talent.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€9.12 billion (£7 billion)	**€1.6 billion (£1.2 billion)**	**677**	**6**

MAJOR EMPLOYERS

University of Edinburgh, Lloyds Banking Group, Amazon, Tata Consultancy Services, NatWest

Edinburgh's technology ecosystem is worth £7 billion and has attracted £1.2 billion in venture capital funding since 2015. The city has 677 startups, six accelerators, and has produced two unicorns: sports-tech entertainment company FanDuel and the metasearch engine and travel agency, Skyscanner. Two of Edinburgh's five biggest hirers are banks, which make use of the strong pool of security talent, while the University of Edinburgh is the top employer.

Universities contributing to local talent

EDINBURGH NAPIER UNIVERSITY:	UNIVERSITY OF EDINBURGH:	HERIOT-WATT UNIVERSITY:
14%	**13%**	**8%**

With several reputable universities in and around Edinburgh, there's no one dominant university feeding the talent pipeline, but strong technology-focused programmes at several local universities bolster the available talent in the city. Edinburgh Napier University has been named an upcoming UK university for computer science, and its undergraduate Cybersecurity & Forensics course is the first such course in the UK to be certified by the National Cyber Security Centre (NCSC). The School of Informatics at the University of Edinburgh is the largest Computer Science department in the UK and one of the largest in Europe, and the university is consistently ranked as one of the UK's top ten universities for engineering.

Hiring

- Technology workers in Edinburgh are not overly keen on a job change right now: only 7% are open to new roles, well below the 12% European average.
- The notice period for redundancies depends on employment length: one month for up to four years of employment; one week for every year of continuous employment from five to 11 years; and three months of notice is required for more than 12 years.
- Resigning employees must comply with a statutory minimum of one week's notice, but many companies may opt for longer notice periods contractually.
- Equity is usually structured at a standard 4 years with a 1-year cliff.. The vesting interval averages at 4.3 months.
- The cost of living in Edinburgh is four percentage points above the European average.

Business landscape

- The same employment regulations apply across the UK. Edinburgh's employers must pay up to 19.6% of gross salary towards employee benefits and insurance—average for Europe.
- The corporate income tax is 19%, just three percentage points below the European average.
- The Enterprise Management Incentive (EMI) is a highly advantageous stock option scheme which is used by most tech startups. At the point of sale, if gains exceed an employee's annual capital gains allowance (€15,245 or £11,700), the gains are taxed at capital gains rates (20%). If EMI options are held for more than two years a reduced tax rate of 10% is applied.
- The average monthly rent for office space in Edinburgh is €52 (£40) per square metre, just above the Europe average of €38 (£29).

Gothenburg

Birthplace of Volvo, Sweden's second-largest city grew from a maritime hub to a leader in transport innovation and attracts over a third of Sweden's private R&D investment.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±19,100	**Systems**	**Hardware**	**18%**

Named the world's most sustainable city by the Global Sustainability Index (GDS) four times in a row, Gothenburg's technology sector has seen rapid growth in employment, value creation and number of startups. The city has the highest density of systems experts in Europe, with 27% of the local talent pool focused on this skill.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€26 billion	**€1.9 billion**	**565**	**13**

MAJOR EMPLOYERS

Volvo Car Group, Ericsson, Volvo Group

Gothenburg's technology ecosystem has allowed young tech firms like Juni to grow alongside global companies such as Volvo, Ericsson, AstraZeneca and Beyond Gravity. The tech ecosystem fosters innovation in the region's key sectors: automotive, life sciences, and IT. The city's technology ecosystem is worth €258 million and has attracted €53.2 million in venture capital funding since 2015. There are 565 startups in the city, 13 accelerators and 2 unicorns.

Three companies absorb much of the technology talent pool in Gothenburg, two of which are under the Volvo brand family: Volvo Car Group manufactures automobiles and industrial drive systems, while Volvo Group produces everything from trucks and buses to marine drive systems, tapping into the presence of hardware engineers.

Universities contributing to local talent

CHALMERS UNIVERSITY OF TECHNOLOGY:	UNIVERSITY OF GOTHENBURG:
43%	**20%**

Nearly half of all tech talent in Gothenburg attended Chalmers University of Technology, which ranks in the top 130 universities in the world and is considered one of Europe's leading technical and engineering universities, as well as being consistently ranked among the top engineering universities in the world. The University of Gothenburg is also a major contributor to the talent pipeline in the city, is rated in the top 200 universities globally, and has a highly-regarded joint department of computer science and engineering that collaborates closely with businesses and industries in the city.

Hiring

- Gothenburg's technology talent is dynamic, with 14% open to new roles, above the European average of 12%.
- In Sweden, notice periods depend on the employment contract, but the standard practice is for employers to give employees three months' notice.
- Employees must give one month of notice if resigning from a company they have been at for less than two years. If they have been there for longer than two years, two months' notice is needed.
- Equity vests over 48 months at Gothenburg startups but has a long cliff of two years vs the typical one year, and vests every six months after the cliff.
- The cost of living in Gothenburg is five percentage points above the European average.

Business landscape

- Employers must pay total payroll taxes of 31.42%, a much higher contribution than the European average of 20%.
- The corporate income tax is 20.6%, just under the European average.
- A favourable tax scheme (QESO) introduced by the Swedish government allows stock options to be exercised without triggering income tax to employees or social security tax to companies. (Companies must be 150 employees or fewer and have been operating for less than 10 years.) Capital gains tax between 25% and 30% is applied to employees' shares at the time of sale. QESO also applies to board directors who are granted options.
- The average monthly rental for office space in Gothenburg is €56 per square metre, notably higher than the European average of €38.

Helsinki

Helsinki has a long-standing tradition of design and technology innovation. With one million inhabitants in its metropolitan area, it is abuzz with talent.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±28,900	**Graphics & Gaming**	**DevOps, Front-End Frameworks, Hardware**	**17%**

Recruiters open to flexible arrangements will find ready talent in Helsinki. Finland's Working Hours Act allows employees to adjust their days by up to four hours earlier or later than standard business hours. This flexibility also makes it a good location for remote workers.

Helsinki has the highest in-city density of graphics & gaming developers, with 4% of technology talent in the city experienced in this area—twice the European average. It also has a notable density of DevOps—one of the hardest roles to fill across Europe, according to our recruiter survey.

Helsinki's strengths in technology talent are bolstered by the city of Espoo, home to Aalto University. Espoo is only a 20-minute train ride away and forms part of Helsinki's talent ecosystem.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€38.4 billion	**€4.7 billion**	**1,527**	**23**

MAJOR EMPLOYERS

Nokia, CGI, OP Financial Group

Helsinki has a vibrant startup ecosystem, with 1,527 companies, and a combined value of €38.4 billion. The city has birthed four unicorns—Supercell, Rovio, Relex Solutions and Aiven—and is home to 23 accelerators. It's attracted venture capital funding of €4.7 billion since 2015.

Nokia, headquartered in Espoo, is the largest employer of technology talent in the Helsinki metropolitan area. The telecommunications and electronics giant benefits from local graphics & gaming and DevOps expertise. CGI, the global branding solutions company that provides design, production, and installation services, also benefits from the wealth of graphics experts in Helsinki.

Universities contributing to local talent

AALTO UNIVERSITY:	UNIVERSITY OF HELSINKI:	METROPOLIA UNIVERSITY OF APPLIED SCIENCES:
22%	**11%**	**11%**

Helsinki's technology talent is a well-educated group, with 62% holding STEM degrees—a full 10 percentage points higher than the European average. Look out for graduates from Aalto University in Espoo, established in 2010 as a merger of three major Finnish universities: the Helsinki University of Technology, the Helsinki School of Economics and the University of Art and Design Helsinki, which counts nearly a quarter of greater Helsinki's tech talent as alumni.

Hiring

- Helsinki's technology workers tend to view their career paths quite flexibly, with 14% open to new roles—two percentage points above the European average.
- In Finland, notice periods depend on the length of employment. To terminate an employee of a year's employment requires 14 days' notice, increasing to one, two, four and finally six months' notice for those with over 12 years of tenure.
- Employees are required to give a minimum of 14 days' notice if they've been at the company for five years or less; one month if longer.
- Equity usually has a standard 4 years with a 1-year cliff. The vesting interval averages out at 1.1 months.
- Recruiters should note that employees may wish to negotiate as the cost of living is 12 percentage points
- above the European average.

Business landscape

- The employer cost in Helsinki is 19% of the employee's salary, which is close to the European average of 20%.
- The corporate income tax in Finland is 20%. The European average is 22%.
- There is no tax-advantage scheme in Finland and equity is taxed heavily. Stock options are taxed as income at the point of exercise (7.8% up to 55%) and as capital gains at the point of sale (30%–34%). On exercise, the company must pay 20% of the gains as social charges.
- The average monthly rental for office space in Helsinki is €20 per square metre, notably lower than the European average of €38.

Kraków

In Poland's second-largest city, the tech scene has grown and matured—Kraków is poised to become a tech powerhouse.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±29,300	Application Development, Front-End Frameworks	n/a	14%

As Poland's second-largest city and a major academic, economic, cultural and artistic centre in the country, Kraków has become a world-class technology and business hub. In addition to its rich history and picturesque scenery, Kraków also offers a cost of living that's 16 percentage points below the European average. This affordability contributes to an attractive environment for both tech employers and employees.

With a robust student population providing a pipeline of young talent, Krakow has a well-rounded talent pool with a broad range of expertise. In particular, the city houses a notable density of app developers, with 63% of tech workers proficient in this area.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€9.1 billion	€360 billion	364	7

MAJOR EMPLOYERS

Motorola Solutions, EPAM Systems

Respondents identified Kraków as an emerging hub for technology talent. The city's fast-growing technology ecosystem has already produced 364 startups and 7 accelerators. The two biggest employers of tech talent in the city are Motorola Solutions, which benefits from the high density of app development talent available in the city, and the software engineering service company EPAM Systems.

Universities contributing to local talent

AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY:	JAGIELLONIAN UNIVERSITY:	CRACOW UNIVERSITY OF TECHNOLOGY:
39%	12%	10%

Focusing on technology innovation and engineering programmes, AGH University of Science and Technology regularly ranks as the top technical university in Poland and contributes the lion's share of the city's local tech talent.

Hiring

- Recruiters will encounter less flexibility in Kraków, where only 2% of talent is open to new roles—significantly less than the European average (12%).
- In Poland, employees on a contract are entitled to a notice period that depends on the length of employment. If an employee has worked for over three years, termination notice is three months; one month for employment between six months and three years. Notice of three days to two weeks must be given during the probation period.
- The notice period for resigning employees is determined by their contract.
- Equity is usually structured around a standard 4 years with a 1-year cliff. The vesting interval averages 1.3 months.
- It's useful for recruiters to note that the cost of living in Kraków is well below the European average (by 16 percentage points).

Business landscape

- Employers in Poland must pay up to 22.14% of gross salary towards employee benefits and insurance, slightly higher than the European average of 20%.
- The corporate income tax rate is 19%. The European average is 22%.
- Equity is taxed at the point of sale at 19% on capital gains.
- The average monthly rental for office space in Kraków is €24 per square metre, notably lower than the European average of €38.

Lisbon

Portugal's capital was named the number-one emerging source of engineering talent by startup founders and recruiters surveyed by Sequoia.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±25,800	**Application Development, Databases**	**Finance, Front-End Frameworks, Mobile, Server & Cloud,**	**14%**

Lisbon has the highest per-capita density of both application development and database specialists in Europe, with 68% and 60% of the local talent pool proficient in these areas, respectively. It is also home to a notable density of server & cloud, finance, mobile and front-end framework engineers. The city was named the number-one emerging source of engineering talent by startup founders and recruiters surveyed by Sequoia.

With its good transport infrastructure and varied work opportunities, Lisbon attracts remote workers and entrepreneurs. A digital nomad visa introduced in 2022 provides an onramp for remote workers from outside the EU to stay for the five years it takes to become eligible for permanent residency in Portugal.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€2.5 billion	**€840 billion**	**935**	**45**

MAJOR EMPLOYERS

Critical TechWorks, Microsoft, Siemens, OutSystems

Lisbon's technology ecosystem is worth €2.5 billion and growing. Of the 935 startups in the city, 608 were established in the past ten years, with support from 45 accelerators. Venture capital funding expanded in tandem, with a tenfold jump from €35 million invested in 2015 to €388 million in 2022. Lisbon has birthed two unicorns—cloud contact centre company Talkdesk and app development platform OutSystems—both of which have relocated their headquarters to the U.S.

"Poland, Spain, Portugal, and Romania have a lot of talent who are used to working for VC-backed technology companies. Ten years ago, there were lots of technology talent in software houses for big banks and other large corporates. Now, they work in smaller companies or team extensions of fast-growth companies."

—TOMCZUK PAWEL, FOUNDER AND CEO OF TECHTREE

Universities contributing to local talent

INSTITUTO SUPERIOR TÉCNICO:	NOVA UNIVERSITY LISBON:	ISCTE - UNIVERSITY INSTITUTE OF LISBON
20%	**6%**	**6%**

Instituto Superior Tecnico, a public research institution that's part of the University of Lisbon, is the standout source of tech talent in Lisbon. It is the largest engineering, science and technology school in Portugal and has been ranked as one of the leading universities for engineering in Europe.

Hiring

- Lisbon's technology talent is relatively mobile, with 13% open to new roles, slightly higher than the European average of 12%.
- The notice period in Portugal depends on the duration of employment. If an employee has worked for less than six months, the notice period is 15 days. This increases over time to a maximum of 75 days' notice for employees with more than a decade's service.
- Employees wishing to resign must give 15 days' notice if they have worked at the company for less than six months, increasing stepwise to 60 days if they have worked at the company for more than two years. This means talent working in Portugal has one of the longest exit times in Europe.
- Equity is usually structured around a standard 4 years with a 1-year cliff. The vesting interval after the cliff is 4.3 months, substantially longer than the industry standard.
- The cost of living in Lisbon is five percentage points below the European average.

Business landscape

- Employers are required to pay an amount equivalent to 23.75% of an employee's gross salary to social security, higher than the European average of 20%.
- The corporate income tax rate is 21% in Portugal—one percentage point below the European average. SMEs with annual revenues under €50 million pay a reduced tax rate of 17%.
- Virtual stock-option plans are most common in Portugal because there is no tax-favoured scheme and non-voting shares are not possible. Virtual options are taxed as capital gain at 28% at the point of sale.
- The average monthly rental for office space in Lisbon is €26 per square metre, significantly lower than the European average of €39.

London

Europe's super-skilled tech frontrunner is a magnet for culture, academia and finance—and some of the world's most famous startups and unicorns.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±269,700	**Finance, Front-End Frameworks, Security**	**n/a**	**18%**

London is the leading technology ecosystem in Europe, with a world-class talent pool. The UK also serves as a convenient base for US-based companies looking to hire, owing to the shared language and its favourable time zone, which is only five hours ahead of New York.

London has the highest number of engineers and developers in any European city, by a wide margin, in every field of technical expertise. It is home to one in every ten of Europe's engineers, with 14% of the European total for security experts, 13% of all finance tech talent, and 12% of AI and server & cloud talent. On a per capita basis, London also has a notable density of engineers skilled in finance, front-end frameworks, and security.

"London has by far the most depth when it comes to FinTech."

—GLENN MURPHY, PARTNER AT RIVIERA PARTNERS

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€804.6 billion (£617.5 billion)	**€132,3 billion (£101.5 billion)**	**19,000**	**188**

MAJOR EMPLOYERS

Meta, Tata Consultancy Services, Amazon

Thousands of new firms are incorporated into the ecosystem each year, while the hub has attracted more than £70 billion in venture capital funding since 2015. London has 19,000 technology startups, 85 unicorns—including fintechs Monzo and Revolut, and metaverse company Improbable—along with 188 startup accelerators, showing tremendous growth potential.

London's tech sector is also one of the most demographically diverse in Europe. Its engineering workforce of 269,700 is 18% female, 18% Asian, and 4% Black—all figures significantly above the European averages.

Given the size and breadth of the ecosystem, London's tech talent is spread across many major companies—none of which employs more than 1% of the city's engineers. London's largest tech employers include US-based tech giants Amazon, Google, Meta, and Microsoft; consulting firms Accenture, Capegemini, and Tata; and media company Sky. It's a competitive hiring environment, and London-based tech engineers are significantly less likely to be open to new roles than their peers in other cities.

Universities contributing to local talent

IMPERIAL COLLEGE LONDON:	UNIVERSITY COLLEGE LONDON:	UNIVERSITY OF CAMBRIDGE:
7%	**6%**	**6%**

With so many competitive universities in the UK, including the renowned University of Cambridge a train ride away, no one institution stands out as a dominant producer of technology graduates among London's engineering workforce. Many of London's technology graduates come from globally high-ranking universities, making them highly educated and motivated hires.

Hiring

- In London, only 7% of the technology talent is open to new roles, which is five percentage points below the European average.
- When it comes to redundancies, the statutory notice period depends on the duration of employment. For up to four years of employment, employers must give their employees no less than one month's notice. For between five and eleven years of work, the notice period is one extra week's notice for every year of continuous employment. Above twelve years, the required notice is three months.
- Employees wishing to resign must give a minimum of one week's notice, but many companies opt for a long notice period in the employment contract.
- Equity is usually structured at a standard 4 years with a 1-year cliff. The vesting interval after the cliff averages every 3.4 months.
- The average cost of living in London is high at around €1,300 (£1,000) a month, rent excluded, making it 17 percentage points above the European average.

Business landscape

- Employers in the United Kingdom pay up to 19.55% of gross salary towards employee benefits and insurance, which is just below the 20% European average.
- As of April 2023, the corporate income tax rate for businesses with annual profits below €65,160 (£50,000) is set at 19%. This rate increases gradually, reaching 25% for profits up to €325,750 (£250,000). The European average is 21.5%.
- The Enterprise Management Incentive (EMI) is a highly advantageous stock option scheme which is used by most tech startups. At the point of sale, if gains exceed an employee's annual capital gains allowance (€15,245 or £11,700), the gains are taxed at capital gains rates (20%). If EMI options are held for more than two years a reduced tax rate of 10% is applied.
- The average monthly office rental is €86 (£66) per square metre per month, nearly double the European average.

Madrid

Spain's embrace of remote working, including the newly introduced digital nomad visa, has sparked a thriving tech scene in the country with a diversified workforce.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±52,600	**Application Development**	**Databases, Data Science, Finance, Front-End Frameworks, Mobile, Server & Cloud**	**17%**

Madrid hosts the largest pool of engineers in Europe behind London and Paris—slightly more than Amsterdam or Berlin. Recruiters interviewed by Sequoia identified Madrid as a hub to watch for quality talent. The city has a standout density of app development engineers while being a notable spot for mobile, server & cloud, data science, front-end and database engineers.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€34.6 billion	**€4.8 billion**	**2,506**	**79**

MAJOR EMPLOYERS

Indra, Amazon, Telefonica

Madrid's tech ecosystem is valued at €34.6 billion and has attracted €4.8 billion in venture capital since 2015. The city has produced 79 accelerators and 2,506 startups; four have achieved unicorn status, including Cabify and Jobandtalent.

Amazon chose Madrid as the home of its southern European operations, and Google opened one of its startup campuses in the city. Local IT and defence behemoth Indra has tapped into Madrid's diverse skill areas, hiring close to 15% of the city's tech talent.

Universities contributing to local talent

POLYTECHNIC UNIVERSITY OF MADRID (UPM):	COMPLUTENSE UNIVERSITY OF MADRID (UCM):	CHARLES III UNIVERSITY OF MADRID (UC3M):
25%	**11%**	**8%**

Competitive institutions in Madrid contribute to the technology talent pool, with nearly half of all engineers in the city coming from three universities: UPM, UCM, and UC3M. UCM is one of the oldest universities in the world, dating back to 1293, and is the largest and one of the most prestigious public research universities in Spain. UPM is considered the best technical university in Spain, especially its engineering schools, which are among the best in Europe.

Hiring

- 13% of Madrid's tech talent is open to new roles, slightly higher than the European average.
- The notice period for dismissals depends on the nature of the contracts, with a 15-day period for terminations due to economic factors.
- For employees, there is generally a two- to three-week resignation notice, depending on the contractual agreement.
- The average equity vesting duration for employees in Madrid is 44.1 months, just below the 48-month standard. The average vesting cliff is 12 months, and the average vesting interval is 3.2 months—above the industry standard.
- Recruiters may note that the cost of living in Madrid is three percentage points below the European average.

Business landscape

- Employer social-security contributions are capped monthly at €4,139.40.
- The corporate income tax rate in Spain is 25%, three percentage points above the European average and level with Austria, Belgium and the Netherlands.
- In 2013, the Spanish government approved the "Ley de Emprendedores" law, which encourages startup creation by providing access to funding and credit, tax incentives and by streamlining the paperwork required to incorporate. Stock options cannot be granted in the most common type of business entity (SARL), so startups usually grant virtual stock options (SARs).
- Employee equity is taxed as income between 19% and 45% at the point of sale. A social-security tax contribution of 6.35% is also applied. If SARs are held for more than two years, discounted tax rates are available.
- The average monthly office rental in Madrid is €37 per square metre, just shy of the European average of €39.

Munich

Home to several tech giants, this vibrant scene hosts young talent in systems and robotics, drones & autonomous vehicles. One startup even builds flying taxis.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±40,300	**Robotics, Drones and Autonomous Vehicles**	**Data Science Hardware, Systems,**	**17%**

Munich is the third-largest city in Germany and one of Europe's biggest technology hubs. It is a bustling, competitive and innovation-focused city, ideal for young professionals eager to contribute their skills and talents to some of the world's most recognisable brands, including BMW, Amazon, Google and Allianz.

Munich has the densest concentration of robotics, drones & autonomous vehicle engineers of any city in Europe with just over 8% of its talent focused on this area. Neighbouring Stuttgart is a close second—both cities are around twice the average density for robotics engineers in Europe. Munich also has the third-densest supply of technical talent in the adjacent hardware field, ranks number four on density for systems engineers and features a notable density of data science talent.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€76.5 billion	**€11.3 billion**	**1,972**	**30**

MAJOR EMPLOYERS
BMW, Google

Munich has solid tech credentials, including being chosen as the home of Apple's European Silicon Design Centre. Amazon is also present and is busy constructing a new sorting complex in Munich. Munich's technology ecosystem is valued at €76.5 billion and has attracted €11.3 billion in venture capital since 2015. There have been 1,972 startups and 30 accelerators, and the city has produced a notable 12 unicorns, including Celonis, a data processing company, Personio, which provides HR software for companies, and FlixBus, an intercity bus service.

The largest employer of technology talent in Munich is BMW, which benefits from the city's strength in robotics and autonomy engineers, followed by Google, which benefits from the high density of systems engineers.

Universities contributing to local talent

TECHNICAL UNIVERSITY OF MUNICH (TUM):	LUDWIG-MAXIMILIANS UNIVERSITY OF MUNICH (LMU):
41%	**11%**

Munich is home to many excellent academic institutions, but TUM accounts for, by far, the largest share of tech talent alumni. The university has a global reputation and is ranked among the top 50 universities in the world. Seventy-eight startups were launched at TUM in 2022, and nine unicorns have emerged from the institution. It is also the only technical university in Germany to have been consistently named a University of Excellence by the German government. Munich's second biggest university, LMU, is also acknowledged as a global leader, ranking in the top 250 universities for engineering and technology courses.

Hiring

- Of Munich's technology talent, 10% is open to new roles, which is below the European average of 12%.
- The notice period for an employer to give an employee depends on the duration of employment, with a minimum of four weeks for those employed less than nine months and up to seven months for those employed for more than 20 years.
- Employees are required to give four weeks' notice to employers should they wish to terminate their contract, regardless of how long they have been at the company.
- Equity is usually structured at a standard 4 years with a 1-year cliff. The vesting interval averages once every 1.8 months.
- The cost of living in Munich is 16 percentage points above the European average.

Business landscape

- Employers pay close to 23% to social contributions such as pensions, health insurance, and unemployment insurance. The average total contribution for employers in Europe is 20%.
- The corporate tax in Germany is 29.9%, well above the 22% European average, and is the second highest in Europe.
- Virtual stock option plans are preferred over real options in Germany due to the lack of a tax-advantaged scheme and the high administrative burden associated with real options. At the point at which the employee receives the cash benefit, virtual stock options are taxed heavily—stocks are taxed as income, at 14-45%. Social security contributions are also applied, at 20%, along with a solidarity surcharge of 5.5% of the income tax, and church tax, which is 8-9% of income tax.
- The average monthly rental for office space in Munich is €43 per square metre, higher than the European average of €38.

Paris

Second only to London in the number of engineers in almost every category, Paris is also the home of Station F, the world's largest startup campus.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±74,000	**AI, Application Development, Data Science, Finance, Security, Systems**	**n/a**	**15%**

Paris is second only to London in the total number of engineers in Europe and accordingly has the second-highest absolute share of talent for nearly every speciality. Among that pool, the city has a notable per-capita density of talent in data science, AI, systems, security, finance and application development. Paris is home to highly qualified and experienced technology workers, with 43% of engineers and developers in the city holding master's degrees and 64% having more than a decade of experience. But this does not mean the city's talent pool is static: 15% of technology workers in Paris are open to new roles, which is higher than the European average.

"Paris is a surprisingly good source of senior candidates, and it also has high numbers of strong companies and founders."

—GLENN MURPHY, PARTNER AT RIVIERA PARTNERS

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€185.2 billion	**€34.3 billion**	**8,341**	**71**

MAJOR EMPLOYERS

Thales, Steria, Dassault Systems

Paris has produced more than 27 unicorns, including Alan, Meero, Qonto, Ledger and Shift Technology. Worth €185.2 billion, the city's tech ecosystem has attracted €34.3 billion in venture capital funding since 2015, with the most-funded technologies including AI and deep tech. The city is home to 8,000 startups and 71 accelerators including Station F, Antler France and PlugAndPlay. Station F, which bills itself as the world's largest startup campus, houses over 1,000 startups, including incubator programmes from Microsoft and Meta, and boasts co-working and even co-living spaces for early-stage startups.

Paris' biggest employer of technology workers is electrical systems and aerospace company Thales, followed by software-development firm Steria, and CAD software maker Dassault Systèmes. The abundance of data science and systems engineers is clearly an asset for these companies. The local concentration of AI talent is powering established AI-backed companies like Meero, an on-demand photography company, and Shift, which helps insurers automate and improve decision-making.

Universities contributing to local talent

ECOLE CENTRALE PARIS:	PIERRE AND MARIE CURIE UNIVERSITY (UPMC):
9%	8%

University education in Paris is outstanding on an international scale. Because of this, technology graduates in Paris are spread relatively evenly across 25 universities. The two biggest producers of technology graduates are Ecole Centrale Paris and the UPMC (Paris VI).

Hiring

- Paris' tech talent is keen on change, with 15% saying they're open to new roles, a higher proportion than most other cities in Europe.
- Employers must give employees one month's notice if the employee has worked for six months to two years, while two months' notice is required for employment over two years.
- There is no legally stipulated notice period in France for employees to give their employers should they wish to resign. The notice period is defined in the employment contract.
- Equity is usually structured at a standard 4-year duration with a 1-year cliff and the vesting interval after the cliff averages once every 2.6 months.
- The cost of living in Paris is more expensive than most European cities, 40 percentage points above the European average.

Business landscape

- Employers must pay up to 31.3% of gross salary towards employee insurance and benefits, higher than Europe's average total contribution of 20%.
- France has the third highest corporate tax income rate in Europe at 28.4%.
- Employees with equity in companies where they have worked for more than three years are taxed at 19% on gains, and 30% if less than three years.
- The average monthly rental for office space in Paris is €80 per square metre, more than double the Europe average of €38.

Porto

Laid-back and with cheaper living costs than many other European cities, scenic Porto is a lure for experienced digital nomads as well as young talent.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±18,600	**Application Development**	**Databases**	**13%**

With its high standard of living and scenic beauty, Porto is becoming a hub for a range of talent. This trend is likely to grow, as Portugal introduced a digital nomad visa in 2022. The influx of these workers has energised this historic city. Furthermore, recruiters surveyed by Sequoia identified Porto as a city to watch for tech talent.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€950 million	**€270 million**	**488**	**24**

MAJOR EMPLOYERS

Farfetch, Critical Techworks

Boasting many historical buildings in its historic centre (a UNESCO world heritage site), Porto is nevertheless a thoroughly modern city with a growing technology hub of 488 tech startups and 24 accelerators. Around €270 million in venture capital has flowed into the industry since 2015, lifting its value to €950 million. Critical Techworks, a partnership between BMW and Critical Software, has tapped Porto's engineers, elevating the city's reputation as an emerging hub for technology talent. Porto is also a top-tier city for app development specialists, with 66% of the local talent pool skilled in this area.

Farfetch, the biggest employer of tech talent in Porto, is the creation of local José Neves, who studied at the University of Porto. Although headquartered in London, Farfetch draws much of its talent from Porto, particularly mobile tech specialists, to support its online shopping product. Over half of Porto's talent has more than 10 years of experience in the field, which aligns with established hirers such as Farfetch, now 15 years old. But there is also a growing contingent of young tech talent, with 12% of Porto's talent having less than two years of experience, compared to the European average of 9%.

Universities contributing to local talent

POLYTECHNIC INSTITUTE OF PORTO (PIP):	UNIVERSITY OF MINHO:	UNIVERSITY OF PORTO:
19%	**19%**	**17%**

A trio of city universities supplies most of Porto's technology graduates, with the PIP and the University of Minho each contributing 19%, and the University of Porto, the second largest university in Portugal by number of students, contributing 17%.

Hiring

- At 11%, talent in Porto is slightly less open to new roles than the European average of 12%.
- The notice period in Porto depends on the duration of employment. If an employee has worked for less than six months, the notice period is 15 days. This increases over time to a maximum of 75 days' notice for employees with more than a decade's service.
- Employees wishing to resign must give 15 days' notice if they have worked at the company for less than six months, increasing stepwise to 60 days if they have worked at the company for more than two years. This means talent working in Portugal has one of the longest exit times in Europe.
- The cost of living in Porto is 11 percentage points below the average cost of living in Europe.

Business landscape

- Employers are required to pay an amount equivalent to 23.75% of an employee's gross salary to social security, higher than the European average of 20%.
- The corporate income tax rate is 21% in Portugal. SMEs with annual revenues under €50 million pay a reduced tax rate of 17%.
- Virtual stock-option plans are most common in Portugal because there is no tax-favoured scheme and non-voting shares are not possible. Virtual options are taxed as capital gain at 28% at the point of sale.
- The average monthly office rental in Porto is €25 per square metre, notably below the European average of €39.

Prague

Czechia's picturesque capital attracts millions of tourists annually; but among its famous Gothic spires is a hub of hypermodern tech startups.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±28,000	**Databases, Application Development**	**n/a**	**11%**

In Prague, recruiters will find a rich pool of expertise in app development and databases attracted as much by the culture and atmosphere as the innovative business environment. With a total talent pool about half the size of Berlin's or Amsterdam's, Prague boasts the third-highest per-capita density for database engineers in Europe.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€20.6 billion	**€1.1 billion**	**892**	**11**

MAJOR EMPLOYERS

Microsoft, Barclays

Prague, with its unique blend of social, economic and geographical benefits, stands as a magnet for entrepreneurs, startups and investors. Specifically, its prime location at the heart of Europe facilitates seamless collaboration with colleagues across the region. The city's vibrant social scene, competitive cost of living and business-friendly environment further contribute to its appeal as a hub for innovation and enterprise. Its technology ecosystem is valued at €20.6 billion and has attracted €1.1 billion in venture capital since 2015. This fertile environment has nurtured 892 startups and 11 accelerators.

Recruiters will find Prague's tech talent an independent group, with a large proportion of the workforce self-employed. Microsoft is nevertheless the largest employer, taking advantage of the dense pool of database engineers. Barclays is another major employer in the city as it shifts increasingly towards digital services, tapping into Prague's app-development talent.

Universities contributing to local talent

CZECH TECHNICAL UNIVERSITY IN PRAGUE:	CHARLES UNIVERSITY:	BRNO UNIVERSITY OF TECHNOLOGY:
29%	**13%**	**9%**

Prague's academic landscape consists of a few heavy hitters, with just three universities contributing more than 50% of talent to the city's tech workforce. Charles University is the country's oldest and largest university, while the Czech Technical University in Prague and the Brno University of Technology rank first and second in the country for engineering, respectively.

Hiring

- Tech talent in Prague is somewhat open to new roles at 13%, only slightly more than the European average.
- An employee must receive at least two months' notice before termination—a period that begins officially on the first day of the ensuing month.
- Employees are required to give two months' notice when resigning; this period also begins on the first day of the following month, making for one of the longer exit times in Europe.
- Equity is usually structured around the standard 4 years with a 1-year cliff. The vesting interval averages out at 3.3 months after the cliff.
- Prague's cost of living falls in the middle of the European spectrum.

Business landscape

- The employer's cost is 33.8% of an employee's salary, notably higher than the 20% European average.
- The corporate income tax rate in Czechia is 19%. The European average is 22%.
- There is no tax-favoured scheme and virtual stock-option plans are almost always offered. At the point of sale, the stock options are taxed at a rate of 20%–23%, and social security and health insurance contributions are taxed at 11%.
- The average monthly office rental is €29 per square metre, lower than the European average of €38.

Stockholm

Sweden's capital, built on an archipelago in the Baltic Sea, is famous for its 50 bridges, but its modern reputation is built on its dynamic tech-industry network and startups like Spotify.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±46,900	**Graphics & Gaming**	**Application Development, Hardware, Systems**	**18%**

Home to the third-highest density of graphics & gaming talent in Europe, as well as a notable concentration of application developers and hardware and systems engineers, Stockholm has a lot to offer to the tech world. The local tech scene boasts a robust talent pool thanks to a blend of top-tier universities, local and international engineers and a diverse array of companies from emerging startups to global powerhouses. However, factors such as stiff competition for talent, unique challenges in the housing market and steep taxation add complexity. Despite these, the high education level, ease of connectivity and appealing Scandinavian lifestyle contribute to the long-term retention of relocated talent. Stockholm also hosts some of Europe's biggest tech conferences, such as Brilliant Minds and the Data Innovation Summit.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€172.3 billion	**€21.3 billion**	**2,504**	**22**

MAJOR EMPLOYERS

Ericsson, Scania, Spotify

Stockholm has a sizable tech ecosystem, valued at €172.3 billion, and has brought in €21.3 billion in venture capital since 2015. It is a big market, with 22 accelerators supporting 2,504 startups, and talent is hired across a wide range of companies. The biggest hirer, Ericsson, is a telecommunications company that is over 145 years old. Stockholm's app developers and hardware engineers come in handy for this established company. Spotify and Klarna are among the best-known startups to emerge on the world stage.

“There can be a misunderstanding when candidates compare seemingly lower compensation packages to those offered by other European tech hubs.”

—MAGNUS SLIND-NÄSLUND, VP OF ENGINEERING AT TEYA

Stockholm has appeals that may not be immediately obvious to tech talent. “The allure of the Scandinavian lifestyle and strong social welfare system can draw a diverse pool of candidates for relocation to Sweden,” says Magnus Slind-Näslund, VP of Engineering at SMB payments company Teya. “However, at first glance, there can be a misunderstanding when candidates compare seemingly lower compensation packages to those offered by other European tech hubs. It’s important for recruiters and hiring managers to clearly articulate the full benefits of the Swedish welfare system. Attracting families might be easier due to extensive childcare subsidies, but it’s often more challenging for a younger, single demographic. Individuals who do relocate usually settle in Sweden for the long term, with citizenship typically attainable after five years.”

Universities contributing to local talent

KTH ROYAL INSTITUTE OF TECHNOLOGY:	STOCKHOLM UNIVERSITY:	UPPSALA UNIVERSITY:
25%	**16%**	**15%**

The KTH Royal Institute of Technology produces a quarter of all tech talent in Stockholm and is recognized as one of the top 100 universities in the world. Engineering degrees in cybersecurity, embedded systems, and interactive media technology attract tech talent from around the world.

Hiring

- Stockholm’s technology talent is dynamic, with 14% open to new roles, above the European average of 12%.
- In Sweden, notice periods depend on the employment contract, but the standard practice is for employers to give employees three months’ notice.
- Employees must give one month of notice if resigning from a company they have been at for less than two years. If they have been there for longer, two months’ notice is needed.
- Equity is usually structured around the standard 4 years with a 1-year cliff. The vesting interval averages out at 2.9 months after the cliff.
- In negotiations with prospective hires, recruiters may take note that the cost of living in Stockholm is 23 percentage points above the European average.

Business landscape

- Employers must pay total payroll taxes of 31.42%, a much higher contribution than the European average of 20%.
- The corporate income tax is 20.6%. The European average is 22%.
- In Sweden, the taxation on employee equity typically stands at a hefty 30%, applicable both at the point of exercising and selling the equity. However, the Swedish government has introduced a favourable tax scheme, known as QESO, which permits the exercising of stock options without triggering income tax for employees or social security tax for companies. It's important to note that this scheme is only applicable to a select subset of businesses—those with 150 or fewer employees and those that have been in operation for less than a decade. A capital gains tax, ranging between 25% and 30%, is levied on employees' shares upon sale. The QESO provision also extends to board directors who are granted options.
- The average monthly rental for office space in Stockholm is €59 per square metre, notably higher than the European average of €38.

Stuttgart

Nestled in vineyards and forests, the “cradle of the automobile” is home to Mercedes-Benz, Porsche and mobility-minded engineers.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±31,000	**Robotics, Drones and Autonomous Vehicles, Systems**	**Hardware**	**15%**

One of southern Germany’s major cities and a significant manufacturing hub, Stuttgart attracts professionals from across the country and the world. The university city of Tübingen, just 44 km away, forms part of Stuttgart’s talent ecosystem. The economy of metropolitan Stuttgart is varied, with an emphasis on science, research, financial services, high technology, information and communication. The tech talent in Stuttgart is slightly younger than the European average, with 18% holding less than five years of experience, above the European average of 15%.

The Stuttgart-Tübingen ecosystem—along with Munich—has a larger share of its technical talent in robotics, drones and autonomous vehicles than anywhere in Europe, with 8% of the total talent pool skilled in this area, double the average European density. Metropolitan Stuttgart also has a top density of systems engineers, with over a quarter of local tech talent having systems experience, as well as a notable density of hardware engineers.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€10.8 billion	**€2.5 billion**	**864**	**8**

MAJOR EMPLOYERS

Bosch, SAP, Mercedes-Benz

Stuttgart’s technology ecosystem is worth €10.8 billion and has attracted €2.5 billion in venture capital funding since 2015. Although the city is home to over 800 startups, they make up a smaller proportion of the ecosystem than many other European tech hubs.

In Stuttgart, established companies predominate. The largest employers of technology talent in the city and its surrounds include engineering and technology behemoth Bosch, which was founded here in 1886, Mercedes-Benz, and SAP. Unsurprisingly, Bosch’s mobility and industrial pipelines thrive in Stuttgart, as they tap into the amassed expertise in robotics, drones & autonomous vehicles, hardware and systems.

Universities contributing to local talent

UNIVERSITY OF STUTTGART:

8%

KARLSRUHE INSTITUTE OF TECHNOLOGY:

6%

Stuttgart is home to two leading tech universities. The University of Stuttgart is ranked in the top 125 universities in the world for engineering and technology. The next biggest contributor to Stuttgart's pool of engineers is Karlsruhe Institute of Technology, which has ranked in the top 100 technology and engineering universities globally every year over the past decade. The University of Tübingen also produces technology talent skilled in app development, systems, and data science.

Hiring

- Stuttgart's technology workers are relatively open to new roles, at 11%, very close to the European average of 12%.
- The notice period for an employer to give an employee depends on the duration of employment, with a minimum of four weeks for those employed less than nine months and up to seven months for those employed for more than 20 years.
- Employees are required to give four weeks' notice to employers should they wish to terminate their contract, regardless of how long they have been at the company.
- Equity is usually structured at a standard 4 years with a 1-year cliff. The vesting interval averages once every 1.9 months.
- The cost of living in Stuttgart is six percentage points above the European average.

Business landscape

- Employers pay around 24% in employment taxes, which is two percentage points above the European average.
- Germany's corporate tax rate is 29.9%—the second highest in Europe and almost eight percentage points above the European average.
- Virtual stock option plans are preferred over real options in Germany due to the lack of a tax-advantage scheme and the high administrative burden associated with real options. At the point at which the employee receives the cash benefit, virtual stock options are taxed heavily—stocks are taxed as income, at 14-45%. Social security contributions are also applied, at 20%, along with a solidarity surcharge of 5.5% of the income tax, and church tax, which is 8-9% of income tax.
- The average monthly rental for office space is €33 per square meter, below the European average of €38.

Tallinn

Skype, Wise and Bolt call the Estonian capital home, cementing the Baltic city's reputation as a hotbed for innovation and young talent.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±4,400	**Front-End Frameworks**	**Finance, Graphics & Gaming, Security**	**18%**

As one of the most tech-savvy cities in the world, Tallinn is home to a healthy stream of talent. Though it has a relatively small pool of local tech talent, it has the second-highest in-city density of experts in front-end frameworks in Europe, with 23% of its tech workers skilled in this area. Tallinn also has the second-highest density of security-tech experts, with 7% of engineers listing this as a skill set.

Tallinn is home to a fast-growing tech ecosystem predominantly inhabited by new tech startups, which is mirrored in its talent. Around 30% of the city's tech talent (double the European average) has less than five years of experience.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€14 billion	**€3.1 billion**	**1,136**	**16**

MAJOR EMPLOYERS

Bolt, Microsoft, Twilio

Tallinn has earned a reputation for being a tech innovation hub, benefitting from Estonia's place at the cutting edge of the digital revolution. This is reflected by the fact that Estonia has the most startups per capita in the world, at around 1 per 1,000 people. The country was the first to declare internet access a fundamental human right, the first to accept digital signatures for most transactions, and the first to institute online voting. Backed by a high-speed 5G network, Tallinn's technology ecosystem is valued at €14 billion, and has attracted €3.1 billion in venture capital since 2015. The city has produced 16 accelerators and 1,136 startups, of which ten have achieved unicorn status, including Bolt and Pipedrive.

Tallin's abundant pool of front-end framework and security experts provides talent for a wide range of companies including Bolt, Microsoft and Twilio.

Universities contributing to local talent

TALLINN UNIVERSITY OF TECHNOLOGY (TALTECH):	UNIVERSITY OF TARTU:
30%	**15%**

With over 45% of all engineers working in the city coming from these two universities, TalTech and the University of Tartu are the institutions to watch for fresh talent. TalTech's well-regarded school of engineering is the university's largest faculty, while the prestigious University of Tartu is the oldest and largest higher education institution in Estonia.

Hiring

- Tallinn's technology talent is not as open to changing jobs as talent in other places, with just 7% open to new roles—considerably lower than the European average of 12%.
- The notice period in Estonia depends on employment duration and must be provided in writing well in advance of termination. At least 15 days' notice is required for less than one year of employment, while 30 days, 60 days and 90 days are required for one to five years, five to 10 years, or over 10 years, respectively.
- Equity is usually structured around 50 months with a 9.3-month cliff. The vesting interval averages out at 1.1 months after the cliff.
- The cost of living in Tallinn is one percentage point above the European average.

Business landscape

- Employers must pay health insurance (13%), pension insurance (20%), and unemployment insurance (0.8%), well above the average total contribution for employers in Europe of 20%.
- Estonia has an attractive tax set-up—there is no corporate income tax for all profits that are reinvested and retained. All distributed profits are taxed at 20%, itself below the European average of 22%.
- Employees pay a 20% capital gains tax on the sale of stock options, but no tax at the point of grant or exercise.
- The average monthly rental in office space in Tallinn is €18 per square metre, less than half the European average of €39.

Vilnius

With its friendly regulatory and tax environment, Lithuania's capital city is a magnet for startups, business hubs and accelerators.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±3,800	**Front-End Frameworks**	**Finance, Graphics & Gaming**	**18%**

In Vilnius, coders and developers are as much part of the landscape as scenic castles. It is home to the highest density of front-end framework engineers in Europe, at 24% of the local talent pool, and the second-highest density of graphics & gaming talent. These experts serve a variety of sectors, from banks and software to online games.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€9.3 billion	**€1.2 billion**	**759**	**6**

MAJOR EMPLOYERS

EPAM Systems, Danske Bank, Wargaming.net

A wide range of tech companies call this 700-year-old city home, spanning cybersecurity, fintech, medtech, energy and sustainability. Valued at €9.3 billion, Vilnius's technology ecosystem has attracted €1.2 billion in venture capital investment since 2015. This, along with the city's seven accelerators, has provided a leg-up to 759 startups. Three have achieved unicorn status, including Vinted and Nord Security.

A trio of companies absorb a large proportion of the talent pool. EPAM Systems specialises in software engineering and digital product design services; Danske Bank is a multinational banking and financial-services corporation; and Wargaming.net is an online game developer and publisher. All three depend on front-end framework experts, and Wargaming.net taps into the city's abundant graphics & gaming talent.

Universities contributing to local talent

VILNIUS UNIVERSITY:	VILNIAUS GEDIMINAS TECHNICAL UNIVERSITY:
20%	**13%**

The educational landscape in Vilnius is dominated by two big universities that have produced a third of the tech talent in the city: Vilnius University and Vilnius Gediminas Technical University.

Hiring

- Recruiters will find the city's tech talent relatively set in their ways: just 7% are open to new roles, against the European average of 12%.
- One month's notice of termination is required if an employee has worked for a company for more than a year; two weeks if less. Employees with special circumstances are entitled to three times the standard notice period.
- Employees must give 20 days' notice should they wish to resign.
- The average vesting duration is a standard 48 months, with an average cliff of 9.7 months, below the average of 12 months. The average vesting interval in Vilnius is the industry standard of 2.7 months.
- The cost of living in Vilnius is five percentage points below the European average.

Business landscape

- Social-security contributions in Lithuania are particularly low, at 4.26% of employee salary—a little over one-fifth of the European average.
- The tax environment is favourable, with a corporate tax rate of 15%—well below the European average of 22% and the third-lowest in Europe.
- In February 2020, new legislation came into effect for stock options in private and public limited companies. This makes capital gains tax less onerous, and more in line with European standards, as it is applied only on the difference between the sale and strike price and not the total amount received. The rate is 15% or 20%, depending on bandings. If options are exercised less than three years after the grant, the equity sale is taxed as income at the point of sale and social contributions are included in tax deducted from the sale.
- The average monthly rental for office space in Vilnius is €17 per square metre, notably lower than the European average of €38.

Zurich

The largest city in Switzerland, Zurich is a global centre for banking and finance—and an incubator for the tech talent these industries increasingly rely on.

Talent

TOTAL ENGINEERS	PRIMARY SKILL(S)	SECONDARY SKILL(S)	FEMALE TALENT
±40,800	AI	Data Science, Security	13%

Switzerland may be known for banking, but these days it is making a name for itself as a tech hotspot. This is in no small part due to the growing field of fintech, with banks increasingly going digital. Zurich is home to the second highest density of AI talent in Europe, at 14% of the city's local talent pool. It also has a notable density of data science and security engineers.

Ecosystem

TECH ECOSYSTEM VALUE	VENTURE CAPITAL FROM 2015	NUMBER OF STARTUPS	NUMBER OF ACCELERATORS
€43.2 billion	€5.6 billion	1,634	7

MAJOR EMPLOYERS

Google, UBS, Credit Suisse

Zurich's strong economy and international connectivity have created a thriving tech ecosystem, valued at €43.2 billion. Since 2015, the city has attracted €5.6 billion in venture capital. With seven accelerators supporting 1,634 startups, the tech playing field is competitive and varied, with tech giants like Google and Amazon setting up shop alongside local entrepreneurs.

Google is the biggest hirer of Zurich's tech talent, followed by two of the big Swiss financial institutions: UBS and Credit Suisse, which announced in early 2023 that they would combine following Credit Suisse's liquidity issues.

Universities contributing to local talent

ETH ZÜRICH:	UNIVERSITY OF ZURICH:	UNIVERSITY OF APPLIED SCIENCES AND ARTS NORTHWESTERN SWITZERLAND (FHNW)
28%	10%	7%

ETH Zurich is rated as one of the top ten best universities in the world, with alumni of the calibre of Nobel laureates including Albert Einstein and Felix Bloch. It offers postgraduate studies in nuclear engineering, microsystems and nanosystems, biomedical engineering, and robotics, systems and control. More than a quarter of the city's talent attended this university.

Hiring

- At 12%, tech workers score right in the middle for Europe when it comes to willingness to take on new roles.
- There are no legal requirements for notice periods, so notice periods for both employers and employees are specified in the contract. The average notice period is between one and three months.
- Equity is usually structured around 38 months with an 11.7-month cliff. The vesting interval averages out at 8.6 months after the cliff.
- Famously the most expensive city in Europe, the cost of living in Zurich is a staggering 112 percentage points above the continent-wide average. This will impact recruiters' negotiations.

Business landscape

- Employers pay between 11% and 19.4.% in employment taxes, depending on pension contributions. The European average is 20%.
- Switzerland's corporate tax rate is 19.7%, slightly below the European average of 22%.
- Equity gains are taxed at income-tax rates (40%). Employee social contributions of 5.1% and pension tax of 7.8% are then applied.
- The average monthly rental for office space is €68 per square metre, well above the European average of €38.

04

Methodology

The objective of this project is to generate a comprehensive representation of the tech-talent landscape across Europe. This project focused on studying countries within the European Economic Area, while also including Switzerland, the United Kingdom, and Ukraine in its scope.[3]

Qualitative and quantitative data collection methods were employed, including two quantitative surveys, 17 in-depth interviews, analysis of data from SeekOut, Dealroom.co and Ledgy (who consented to share their data for the purposes of this study), as well as supporting desk research.

Recruiter survey

The recruiter survey was completed by 125 recruiters at European tech companies of various sizes in cities across the region (Figure 10). All responses were gathered online between July and September 2022. The large majority (89%) of respondents held recruitment and talent positions in their companies, while the rest were founders or occupied C-suite positions. Respondents were contacted directly by Sequoia.

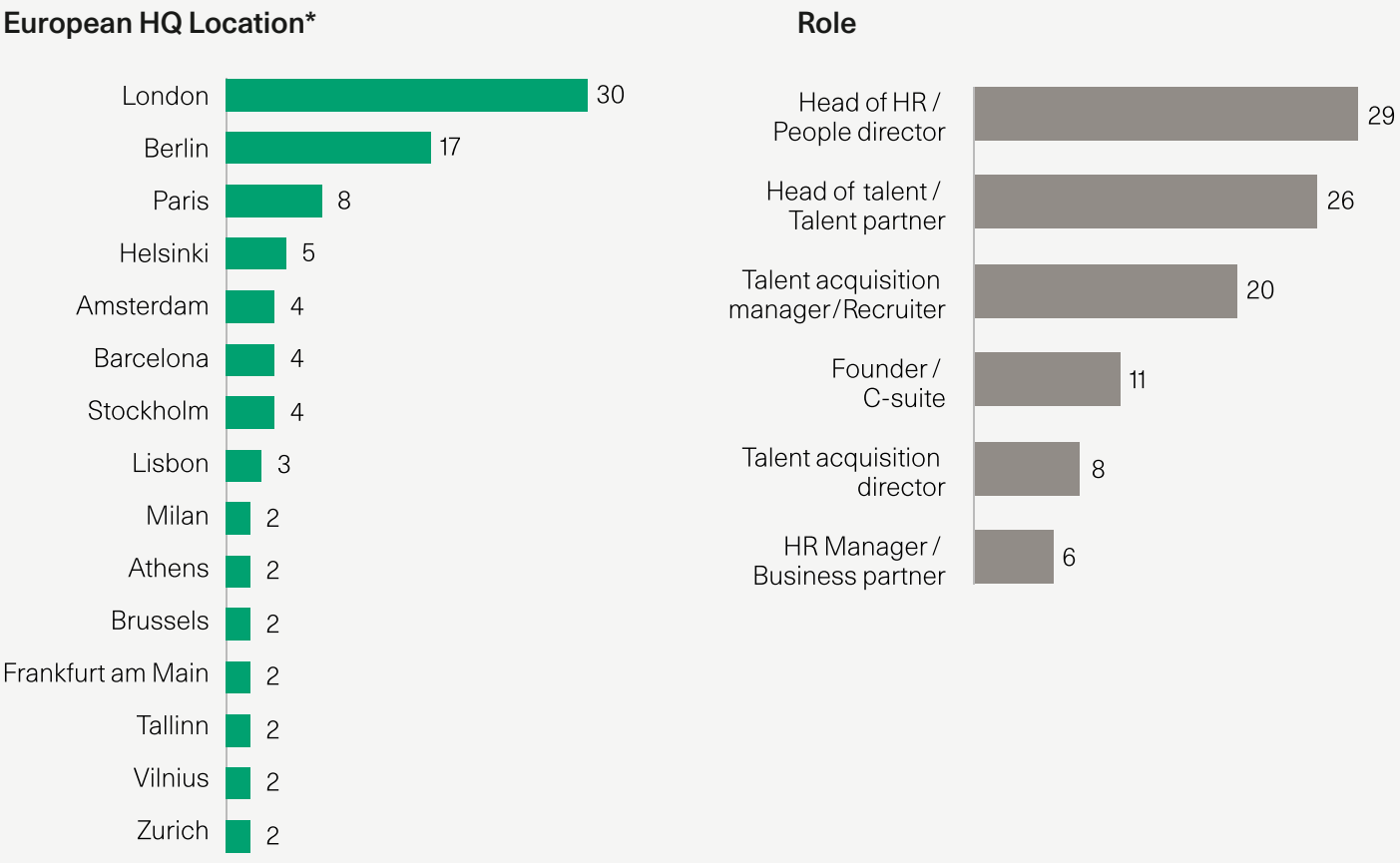
Talent survey

The talent survey was completed in August 2022 by 1,035 participants across 15 countries: a mix of STEM university students (22%) and software engineers (78%). Cint research survey software was utilised (Figure 11).

Data platforms

To identify fourteen unique areas of technological expertise, labelled in this report as "specialities," general desk research was conducted and insights from industry experts were sought. Each of these specialities is associated with a specific set of foundational technical skills. Via

FIGURE 10
City location and role of surveyed recruiters

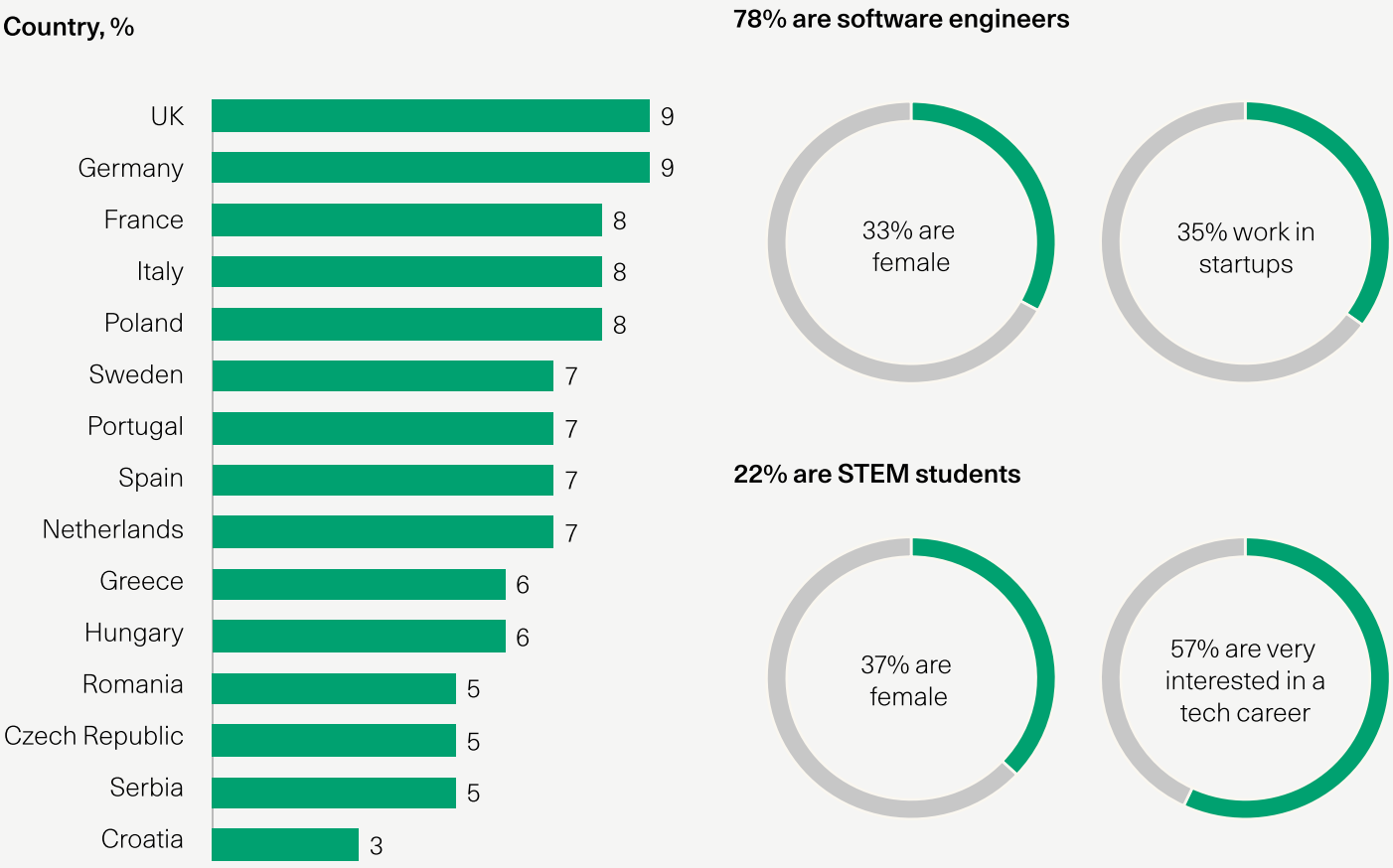


*Other locations include: Basel, Birmingham, Bordeaux, Copenhagen, Dublin, Eindhoven, Goeteborg, Istanbul, Lille, Madrid, Munich, Prague, Tampere, Toulouse, Ukraine, Valencia, Wroclaw n = 125 Source: Sequoia recruiter survey, 2022

[3] The European Economic Area (EEA) includes all EU countries as well as Iceland, Liechtenstein and Norway, which are part of the EU's single market. Switzerland is not an EU or EEA member but is part of the single market.

FIGURE 11

Country and role of surveyed talent



Source: Sequoia tech talent survey, 2022

SeekOut, these skills were used to identify 2.7 million software engineers and developers in cities across Europe.[4] In each city, the density of engineers in each speciality was calculated as a percentage of that city's total engineering population.

For each speciality, a list of the 50 cities with the highest concentration of talent was produced. Using these rankings, certain cities were identified as being "Top", "Notable" or "Standout" reservoirs of a particular speciality talent (Figure 12). These are the 24 cities featured in Atlas, accompanied by in-depth write-ups containing insights gleaned from further analysis and investigation.

For each speciality, the range of the city set (difference between the highest and lowest concentration) was divided into decile brackets. When the coefficient of variation (CV) was calculated, different specialities displayed varying dispersion.[5] Thus, two distinct methodologies were devised: a broader criteria was applied to specialities exhibiting less variability in concentration and a narrower one for those with more variability, allowing talent-rich cities to be identified with the necessary accuracy, fairness and granularity.

The study adopted an iterative method, utilising both extensive desk research and insights from tech industry professionals to ensure the selected geographical radii accurately depicted the relevant cities and metro areas. Depending on the specific context, either a broader radius incorporating nearby towns and cities was chosen, or a more concentrated approach was preferred. For example, a narrow radius around Edinburgh avoided pulling in engineers from nearby Glasgow, which are clearly separate cities. In the case of Stuttgart, the similarity of the skill profile of Tübingen (44 km away) suggested including both within a wider radius. Similarly, Espoo is included within the greater Helsinki area for the purposes of this project.

4 SeekOut data was collected over a three-month period from September 2022 to December 2022. SeekOut scrapes data from public social-media sources; as such, the data captured is variable and changes over time.

5 CV is a statistical measure that expresses the standard deviation of a dataset as a percentage of the mean of the same dataset. It is used to assess the degree of variation or dispersion in a dataset relative to its mean.

FIGURE 12

	CV < 30%	CV >= 30%
Top	1st decile	1st decile
Standout	2nd decile	2nd and 3rd decile
Notable	3rd and 4th decile	4th, 5th and 6th decile
	For specialities with a CV less than 30%, the 1st decile was assigned 'Top' and the 2nd 'Standout', and the 3rd and 4th were grouped as 'Notable'. With less dispersion, only four deciles were needed to create an accurate representation. The skills that fall into this category are Application development, DevOps, Data science, Databases, Finance, Robotics, drones & autonomous vehicles, Server & cloud, Systems and Mobile.	For specialities with a CV greater than or equal to 30%, cities in the 1st decile were designated 'Top', the 2nd and 3rd deciles were grouped as 'Standout', and the 4th to 6th deciles were grouped as 'Notable'. The skills that fall into this category are Graphics & gaming, Front-end frameworks, Hardware, Security and AI.

Dealroom.co was utilised to gather data on venture capital, the financial value of the tech ecosystem, and the number of startups, accelerators and unicorns in each city. This platform sources and processes data from various avenues, including news articles, public filings, company and investor websites, proprietary research and partnerships with over 80 governments. To ensure data accuracy and regular updates, Dealroom.co employs a blend of automated systems and manual research carried out by its analyst team. It also offer features such as the HQ filter and founding location filter, which allows for more accurate tracking of companies that may shift their headquarters over time.

For our analysis, we used the HQ filter, with the caveat being that companies that have relocated their headquarters may not be included in the founding city's data. Dealroom.co maintains a record of "unicorns," counting those companies currently valued at $1 billion or more, as well as those that previously realised a valuation of $1 billion or more via acquisition or IPO even if their current valuation has declined. Furthermore, Dealroom.co tracks the presence of accelerators, regardless of their current operational status. The platform encourages user contributions and update suggestions, further enhancing the accuracy of its datasets. This feature also provides entrepreneurs with the opportunity to verify and suggest updates, ensuring a more comprehensive representation of the tech ecosystem.

This data was supplemented by several other sources:[6]

- Remote.com supplied details on hiring processes for each city.
- Ledgy offered data on equity-vesting schedules for each city.
- Numbeo.com was used to obtain the cost of living for each of the 243 European cities. From this, the European average was calculated and assigned a value of 100%; all other cities were adjusted accordingly to create a comparable metric. The Cost of Living Index (excluding rent) serves as a comparative gauge of the average expenses related to consumer goods, encompassing areas like groceries, dining out, transportation, and utilities. This index does not consider housing costs, such as rent or mortgage.

6 All relevant currency conversions were performed on 23rd March, 2023.

- BNP Paribas Real Estate data for the 2021 Q2 to 2022 Q2 period was gathered via Statista.com to determine office rental costs across cities. An average rental price for Europe was calculated using the 31 cities in the available Statista dataset. Furthermore, some rent data have been supported by Knight and Frank's research.

Interviews

Seventeen in-depth interviews were conducted with recruiters and founders of tech startups across Europe, all carried out online via Zoom or Teams. A thematic analysis was performed on the transcripts of these interviews, resulting in the emergence of four themes: recruitment, remote working, compensation and culture. These themes informed the content of the Insights articles on these and other topics.

05

Conclusion

Getting technical talent right can become a founder's most time consuming responsibility, especially early on. Key to getting it right is knowing where to look in Europe's thriving technology ecosystem. We hope Atlas will provide a useful guide for your hiring efforts.

Be sure to consult the interactive Atlas website which makes it that much easier to zero in on your recruiting targets.

Acknowledgements

We are indebted to all the survey participants—founders, recruiters, hiring managers, engineers and grad students—who lent us their time, insight and expertise.

Thank you also to SeekOut, Dealroom.co, Ledgy and Remote.com for access to their datasets.

Appendix

Cities with the most engineers in each speciality

Application Development

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
1,492,000	**Europe**	
142,300	London	9.54%
44,600	Paris	2.99%
34,400	Madrid	2.31%
30,500	Berlin	2.04%
28,300	Stockholm	1.90%
27,600	Amsterdam	1.85%
24,500	Copenhagen	1.64%
23,500	Brussels	1.58%
23,300	Zurich	1.56%
23,200	Barcelona	1.55%
21,700	Budapest	1.46%
21,600	Munich	1.45%
21,500	Manchester	1.44%
20,800	Milan	1.39%
18,649	Warsaw	1.25%

Artificial Intelligence

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
200,200	**Europe**	
24,600	London	12.29%
7,624	Paris	3.81%
5,800	Zurich	2.90%
5,300	Berlin	2.65%
4,464	Madrid	2.23%
4,000	Amsterdam	2.00%
3,795	Munich	1.90%
3,223	Barcelona	1.61%
3,200	Stocklholm	1.60%
3,061	Dublin	1.53%
3,000	Brussels	1.50%
2,800	Copenhagen	1.40%
2,700	Manchester	1.35%
2,600	Stuttgart	1.30%
2,487	Milan	1.24%

Data Science

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
441,500	**Europe**	
53,600	London	12.14%
19,000	Paris	4.30%
12,700	Berlin	2.88%
12,300	Madrid	2.79%
10,500	Amsterdam	2.38%
9,900	Zurich	2.24%
9,700	Munich	2.20%
7,800	Barcelona	1.77%
7,600	Stockholm	1.72%
6,500	Copenhagen	1.47%
6,400	Brussels	1.45%
6,400	Stuttgart	1.45%
6,200	Milan	1.40%
6,000	Manchester	1.36%
5,400	Dublin	1.22%

Databases

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
1,098,000	**Europe**	
109,400	London	9.96%
28,500	Paris	2.60%
24,800	Madrid	2.26%
19,900	Amsterdam	1.81%
19,200	Berlin	1.75%
18,600	Stockholm	1.69%
18,000	Copenhagen	1.64%
17,500	Milan	1.59%
16,700	Brussels	1.52%
16,700	Manchester	1.52%
16,700	Budapest	1.52%
16,400	Barcelona	1.49%
15,500	Lisbon	1.41%
14,300	Zurich	1.30%
14,300	Prague	1.30%

DevOps

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
219,100	**Europe**	
28,800	London	13.14%
8,300	Paris	3.79%
7,200	Amsterdam	3.29%
5,800	Berlin	2.65%
5,100	Madrid	2.33%
4,400	Stockholm	2.01%
4,100	Manchester	1.87%
3,900	Zurich	1.78%
3,700	Copenhagen	1.69%
3,400	Munich	1.55%
3,400	Helsinki	1.55%
3,200	Brussels	1.46%
3,200	Barceleona	1.46%
2,854	Warsaw	1.30%
2,500	Budapest	1.14%

Finance

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
183,000	**Europe**	
24,900	London	13.61%
6,500	Paris	3.55%
4,800	Berlin	2.62%
4,600	Madrid	2.51%
4,100	Amsterdam	2.24%
3,200	Manchester	1.75%
3,200	Zurich	1.75%
3,100	Milan	1.69%
3,000	Barcelona	1.64%
2,700	Munich	1.48%
2,700	Brussels	1.48%
2,600	Stockholm	1.42%
2,400	Lisbon	1.31%
2,231	Warsaw	1.22%
2,200	Rome	1.20%

Front-End Frameworks

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
386,100	**Europe**	
41,700	London	10.80%
9,900	Paris	2.56%
9,500	Berlin	2.46%
9,100	Amsterdam	2.36%
8,100	Madrid	2.10%
7,200	Manchester	1.86%
7,000	Barcelona	1.81%
6,100	Stockholm	1.58%
5,400	Copenhagen	1.40%
5,200	Milan	1.35%
5,000	Brussels	1.30%
4,500	Lisbon	1.17%
4,400	Krakow	1.14%
4,321	Warsaw	1.12%
4,200	Bucharest	1.09%

Hardware

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
35,900	**Europe**	
3,600	London	10.03%
1,000	Paris	2.79%
991	Munich	2.76%
826	Copenhagen	2.30%
810	Stockholm	2.26%
725	Madrid	2.02%
665	Stuttgart	1.85%
608	Eindhoven	1.69%
592	Milan	1.65%
540	Barcelona	1.50%
522	Brusseks	1.45%
500	Manchester	1.39%
483	Berlin	1.35%
473	Bristol	1.32%
465	Helsinki	1.30%

Graphics & Gaming

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
58,200	**Europe**	
6,100	London	10.48%
1,600	Stockholm	2.75%
1,400	Berlin	2.41%
1,400	Manchester	2.41%
1,400	Copenhagen	2.41%
1,200	Helsinki	2.06%
1,100	Paris	1.89%
1,100	Amsterdam	1.89%
955	Barcelona	1.64%
830	Madrid	1.43%
729	Budapest	1.25%
630	Warsaw	1.08%
602	Munich	1.03%
590	Bucharest	1.01%
578	Prague	0.99%

Mobile

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
436,900	**Europe**	
42,000	London	9.61%
13,600	Paris	3.11%
11,800	Berlin	2.70%
11,500	Madrid	2.63%
9,000	Barcelona	2.06%
8,900	Amsterdam	2.04%
7,600	Copenhagen	1.74%
7,500	Stockholm	1.72%
6,300	Milan	1.44%
6,200	Munich	1.42%
5,900	Manchester	1.35%
5,351	Warsaw	1.22%
5,300	Brussels	1.21%
5,300	Zurich (M)	1.21%
5,300	Budapest	1.21%

Robotics, Drones and Autonomous Vehicles

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
109,000	**Europe**	
9,900	London	9.08%
4,100	Paris	3.76%
3,300	Munich	3.03%
2,500	Stuttgart	2.29%
2,400	Zurich	2.20%
2,300	Berlin	2.11%
2,300	Madrid	2.11%
1,800	Barcelona	1.65%
1,800	Milan	1.65%
1,700	Krakow	1.56%
1,600	Amsterdam	1.47%
1,500	Brussels	1.38%
1,500	Eindhoven	1.38%
1,400	Stockholm	1.28%
1,400	Manchester	1.28%

Server and Cloud

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
778,000	**Europe**	
95,600	London	12.29%
24,400	Paris	3.14%
18,900	Amsterdam	2.43%
18,800	Madrid	2.42%
18,700	Berlin	2.40%
15,100	Stockholm	1.94%
13,700	Manchester	1.76%
13,700	Copenhagen	1.76%
12,600	Barcelona	1.62%
11,800	Brussels	1.52%
11,200	Milan	1.44%
10,900	Zurich	1.40%
10,400	Munich	1.34%
10,100	Lisbon	1.30%
10,030	Warsaw	1.29%

Security

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
113,100	**Europe**	
16,400	London	14.50%
3,700	Paris	3.27%
2,700	Manchester	2.39%
2,500	Amsterdam	2.21%
2,300	Madrid	2.03%
2,200	Zurich	1.95%
2,000	Berlin	1.77%
1,800	Munich	1.59%
1,800	Brussels	1.59%
1,600	Stockholm	1.41%
1,500	Copenhagen	1.33%
1,500	Rome	1.33%
1,400	Milan	1.24%
1,400	Dublin	1.24%
1,300	Barcelona	1.15%

Systems

NUMBER OF ENGINEERS	CITY IN EUROPE	SHARE OF TALENT
461,000	**Europe**	
45,500	London	9.87%
15,700	Paris	3.41%
10,600	Stockholm	2.30%
10,300	Munich	2.23%
10,200	Berlin	2.21%
9,000	Copenhagen	1.95%
8,400	Madrid	1.82%
8,100	Stuttgart	1.76%
7,900	Zurich	1.71%
7,800	Amstedam	1.69%
6,800	Milan	1.48%
6,500	Brussels	1.41%
6,200	Eindhoven	1.34%
5,800	Barcelona	1.26%
5,800	Helsinki	1.26%

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