Software developers in Europe & the world

A study on the attractiveness of top tech cities for software developers

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2018

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Exec Summary

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Exec Summary

About this research

In this study we try to understand and grasp the current state of the developer ecosystem, with a focus on Europe. We analysed 28 cities by metrics like developer wages, cost of living, and more to define the attractiveness of cities for developers.

Additionally we analysed the number of tech startups, top software and consulting firms as well as the number of software developers, in order to understand the demand and supply patterns on the IT job market.

Next to the top tech cities Paris, Berlin or London, we also took a look at less popular cities like Bucharest, Warsaw, Kiev or Lyon, where the software developer dynamic is quite vibrant.

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Software Developers worldwide and in Europe

According to *Evans Data Corp.'s* regular in-depth surveys, … (25)

There were 22 million developers worldwide in 2017.

By 2022, they are projected to be 26 million.

6.5 million developers are using AI or ML in there development.
5.8 million plan to implement some form of it within 6 months.

9.9 million devs are involved with optimising security solutions.
16.5 million devs are in orgs that have a formal DevOps strategy.

According to Stack Overflow, Europe's developer pool size lies at 5.5 million. (27)

Top 20 European Countries ranked by number of Software developers (26)

#	Country	Developers	#	Country	Developers
1	Germany	837,398	11	Switzerland	144,382
2	United Kingdom	813,500	12	Turkey	123,206
3	France	467,454	13	Belgium	108,626
4	Russia	368,291	14	Romania	105,170
5	Netherlands	310,048	15	Czech Republic	96,324
6	Italy	292,586	16	Denmark	95,391
7	Spain	268,149	17	Austria	92,772
8	Poland	254,682	18	Finland	82,874
9	Sweden	175,794	19	Norway	79,112
10	Ukraine	172,219	20	Hungary	79,075

North America is still leading with San Fransisco obviously at first place.

Selected cities ranked by number of Software developers		
City	**Number**	**Comments**
San Francisco	300,000+	Silicon Valley. Around 70% of SF's developers were born outside of the US
London	250,000+	We will stick to Stack Overflow estimates, backed by LinkedIn data
Paris	150,000+	We see the difference between Paris and Amsterdam is around 2 times
New York	120,000+	Based on latest DAXX numbers
Seattle	100,000+	-
Singapore	100,000+	+- 42.000 IT professionals needed in Singapore over next 3 years
Berlin	90,000+	-
Madrid	90,000+	-
Tel Aviv	90,000+	According to expert estimates Tel Aviv accounts for 1/3 of all developers in the country
Boston	85,000+	-
Amsterdam	80,000+	This confirms our estimate on the number of tech startup's number in these cities
Toronto	80,000+	Randstadt's estimates of 20.346 developers in the city is too conservative
Warsaw	75,000+	-
Munich	75,000+	-
Kiev	65,000+	Kiev is one of the IT outsourcing capitals in the world, this estimate is correct
Sydney	65,000+	Conservative estimate
Stockholm	60,000+	-
Dublin	60,000+	-
Barcelona	57,500+	-
Bucharest	55,000+	In Romania, the number of software developers increase by 7.000 per year
Zurich	55,000+	Many developers work for IT multinationals, i.e. Google (800), as well as banks
Copenhagen	50,000+	
Milan	50,000+	-
Lyon	50,000+	Lyon French Ticket gives 50.000 digital jobs and Lyon has 1/3 of Paris developers
Helsinki	30,000+	Finland has a huge deficit in software developers and it's growing rapidly
Brussel	28,000+	-
Geneva	15,000+	No reliable data, we used in our estimate extrapolation with Zurich
Luxembourg	10,000+	No reliable data, we take into account - the # of tech startups/tot software firms in LU

About Europe's developer shortage

- In 2014, the *European Commission* warned that by the year 2020, Europe will be up to 900.000 coders short. [28] Later, the German consultancy firm *Empirica* adjusted the figure down to 500.000.[29, 30]

- Our findings confirm that many cities suffering from the software developer shortage are located in Europe:

  - **Amsterdam** [31] — tech startups consist of about 70% foreigners (mainly from Brazil, France, Turkey, Ukraine and India).[32]

  - **Helsinki** — Finland currently lacks over 7.000 software developers (most in the capital). The need is estimated to grow to 15.000 unfilled positions in 2020.

  - **Copenhagen** — the Danish government estimates that by 2030, Denmark will be 19.000 IT & electronics specialists short, most of them in Copenhagen.[34]

  - **Munich** – there is a serious shortage of IT professionals, a problem that manifests itself in almost all regions of Germany. In Munich and Cologne, the problem is most crucial.

  - **Ukraine** — with its large pool of well-educated software developers, Ukraine is becoming an increasingly valuable option for German companies struggling to find talent locally.[35]

  - **Milan** — in Italy, more than 30.000 of all vacancies for software developers and analysts were unfilled in 2016, with Milan accounting for 20%+.[36]

  - **Singapore** — 42.000 IT professionals will be needed over next 3 years.[38]

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City Attractiveness

	Selected Cities ranked by their Attractiveness for Developers*					
Rank	City	Gross Salary	Net Salary	Cost of Living	Rent	Net Earnings
#1	Seattle	€93k	€ 68.8k	€10.780	€13.225	€44.800
#2	Boston	€ 89k	€ 65.8k	€10.290	€16.735	€38.775
#3	San Francisco	€ 97k	€ 71.8k	€12.025	€24.450	€35.325
#4	Tel Aviv	€ 66k	€ 54.3k	€9.577	€10.960	€33.765
#5	New York	€ 90k	€ 66.6k	€12.365	€20.740	€33.500
#6	Zurich	€ 79k	€ 57.8k	€15.520	€16.110	€26.440
#7	Sydney	€ 58k	€ 43.8k	€9.775	€13.670	€20.335
#8	Geneva	€70k	€ 51.2k	€14.440	€17.210	€19.550
#9	Toronto	€ 55k	€ 38.0k	€8.950	€11.300	€17.750
#10	Copenhagen	€59k	€ 37.8k	€10.630	€10.715	€16.455
#11	Stockholm	€ 48k	€ 36.0k	€9.535	€11.100	€15.365
#12	Luxembourg	€ 53k	€ 37.5k	€11.244	€13.200	€13.300
#13	Berlin	€ 48k	€ 28.8k	€9.150	€7.515	€12.135
#14	Kiev	€ 23k	€ 18.5k	€3.180	€3.840	€11.480
#15	Munich	€ 56k	€ 33.6k	€9.890	€12.720	€10.990
#16	Warsaw	€ 29k	€ 21.8k	€5.835	€5.330	€10.635
#17	Helsinki	€ 44k	€ 30.7k	€10.190	€9.960	€10.550
#18	London	€ 48k	€ 36.8k	€10.520	€16.165	€10.115
#19	Barcelona	€ 33k	€ 26.0k	€8.070	€8.550	€9.380
#20	Lyon	€ 35k	€ 24.8k	€9.624	€10.300	€9.275
#21	Bucharest	€ 27k	€ 17.6k	€5.345	€3.000	€9.255
#22	Madrid	€ 30k	€ 23.7k	€7.800	€7.130	€8.770
#23	Amsterdam	€ 44k	€ 30.6k	€10.287	€13.225	€7.090
#24	Dublin	€ 43k	€ 30.4k	€10.227	€13.200	€6.970
#25	Brussel	€ 39k	€ 23.2k	€9.405	€7.405	€6.390
#26	Singapore	€ 39k	€ 30.8k	€9.675	€14.765	€6.360
#27	Paris	€ 40k	€ 28.3k	€10.500	€13.000	€4.800
#28	Milan	€ 27k	€ 18.6k	€9.156	€9.110	€334

*   *The higher the net Earnings, the higher the estimated attractiveness.*
    Net Earnings = Net Salary - Cost of Living - Rent.

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A focus on Europe...

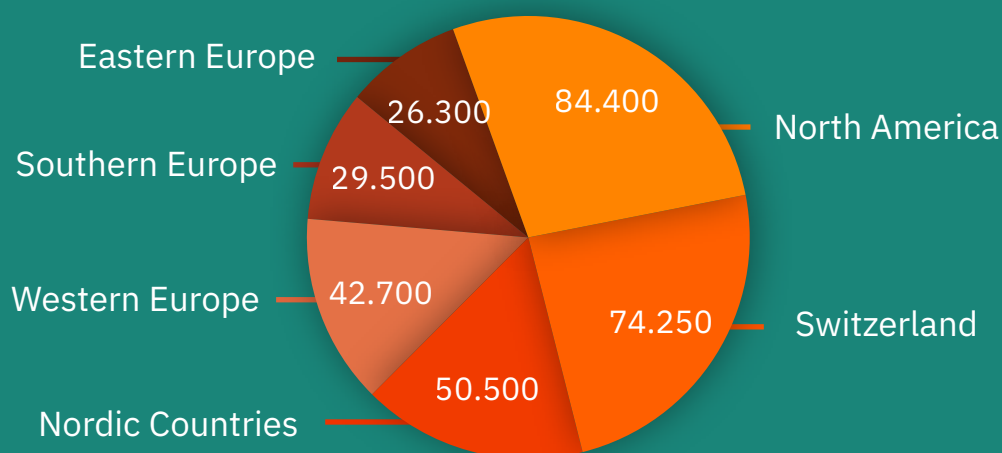|	European Cities ranked by their Attractiveness for Developers					
Rank	**City**	**Gross Salary**	**Net Salary**	**Cost of living**	**Rent**	**Net Earnings**
#1	**Zurich**	€ 79k	€ 57.8k	€15.520	€16.110	€26.440
#2	**Geneva**	€70k	€ 51.2k	€14.440	€17.210	€19.550
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#10	**Helsinki**	€ 44k	€ 30.7k	€10.190	€9.960	€10.550
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#17	**Dublin**	€ 43k	€ 30.4k	€10.227	€13.200	€6.970
#18	**Brussel**	€ 39k	€ 23.2k	€9.405	€7.405	€6.390
#19	**Paris**	€ 40k	€ 28.3k	€10.500	€13.000	€4.800
#20	**Milan**	€ 27k	€ 18.6k	€9.156	€9.110	€334

Main conclusions and findings

- Based on the criteria above, **Seattle is the best city** to work and live in for tech talent. Not surprisingly the headquarters of Amazon and Microsoft are located in Seattle.

- Tel Aviv is ranked #4, at the same level than New York.

- In Europe, the **most attractive country** to work and live in is **Switzerland**. Zurich and Geneva are ranked #6 and #8, respectively.

- Copenhagen and Stockholm are the leaders of E-28 countries, with **Luxembourg not far behind**.

- The most attractive city in Eastern Europe for software developers is Kiev with net earnings around € 11.480, which is higher than in many Western European cities. This is why **we don't see massive emigration** of Ukrainian software developers.

- High renting costs makes it **hard to attract foreign tech talent to Paris**. Therefore we don't observe much migration of developers from other countries to the french capital. To lure external and retain local tech talent, the salaries in Paris need to increase.

- The most unattractive city for developers is Milan, as net earnings are barely above 0. This is a possible reason why **Italy is lagging behind** other countries regarding tech innovation.

Average wages in €

A discrepancy between wages is a possible explanation for developer migration.

Eastern Europe — 26.300
Southern Europe — 29.500
Western Europe — 42.700
Nordic Countries — 50.500
North America — 84.400
Switzerland — 74.250

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Total employer cost

Rank	City	Total Cost for Employer	Gross Salary	Net Salary
#1	Bucharest	€ 27.7k	€ 27k	€ 17.6k
#2	Kiev	€ 28.1k	€ 23k	€ 18.5k
#3	Warsaw	€ 35.1k	€ 29k	€ 21.8k
#4	Milan	€ 35.1k	€ 27k	€ 18.6k
#5	Madrid	€ 39.9k	€ 30k	€ 23.7k
#6	Barcelona	€ 42.9k	€ 33k	€ 26.0k
#7	Singapore	€ 45.6k	€ 39k	€ 30.8k
#8	Brussel	€ 49.7k	€ 39k	€ 23.2k
#9	Lyon	€ 50.8k	€ 35k	€ 24.8k
#10	Dublin	€ 50.9k	€ 43k	€ 30.4k
#11	Amsterdam	€ 52.4k	€ 44k	€ 30.6k
#12	Helsinki	€ 53.7k	€ 44k	€ 30.7k
#13	London	€ 54.6k	€ 48k	€ 36.8k
#14	Paris	€ 55.0k	€ 40k	€ 28.3k
#15	Berlin	€ 57.6k	€ 48k	€ 28.8k
#16	Luxembourg	€ 58.8k	€ 53k	€ 37.5k
#17	Toronto	€ 59.0k	€ 55k	€ 38.0k
#18	Copenhagen	€ 59.0k	€59k	€ 37.8k
#19	Stockholm	€ 63.1k	€ 48k	€ 36.0k
#20	Munich	€ 67.2k	€ 56k	€ 33.6k
#21	Tel Aviv	€ 71.3k	€ 66k	€ 54.3k
#22	Geneva	€ 74.2k	€70k	€ 51.2k
#23	Sydney	€ 74.6k	€ 58k	€ 43.8k
#24	Zurich	€ 83.7k	€ 79k	€ 57.8k
#25	Boston	€ 95.8k	€ 89k	€ 65.8k
#26	New York	€ 96.9k	€ 90k	€ 66.6k
#27	Seattle	€ 100.1k	€93k	€ 68.8k
#28	San Francisco	€ 104.4k	€ 97k	€ 71.8k

Table title: Selected Cities ranked by Total Cost for Employers

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The Software developer market at a glance

Overview of different data sets per city					
City	# of Software Developers	Software Dev wages in € / year	IT Job Advertisings	# of IT Software & Consulting Firms	# of Startups
Amsterdam	80,000+	€ 41-46k	2,500+	300-500	2,200+
Barcelona	57,500+	€ 29-35k	450+	100-200	1,200+
Berlin	90,000+	€ 46-50k	1,500+	150-300	2,500+
Boston	85,000+	€ 83-95k	7,400+	300-500	2,750+
Brussel	28,000+	€ 37-41k	825+	75-150	700+
Bucharest	55,000+	€ 25-29k	550+	100-200	200-400
Copenhagen	50,000+	€ 58-62k	120+	100-200	400-700
Dublin	60,000+	€ 41-46k	1,350+	300-400	800+
Geneva	15,000+	€ 66-74k	150+	50-100	100-200
Helsinki	30,000+	€ 41-46k	150+	50-100	500-700
Kiev	65,000+	€ 21-25k	2,000+	100-200	150-300
London	250,000+	€ 46-50k	7,400+	500-1000	6,500+
Luxembourg	10,000+	€ 46-50k	125+	25-50	75-150
Lyon	50,000+	€ 33-37k	240+	100-150	300-500
Madrid	90,000+	€ 25-29k	350+	150-250	1,000+
Milan	50,000+	€ 25-29k	750+	100-200	250-500
Munich	75,000+	€ 54-58k	1,750+	150-250	400-700
New York	120,000+	€ 83-95k	10,000+	350-700	7,000+
Paris	150,000+	€ 37-41k	2,000+	250-500	4,000+
San Francisco	300,000+	€ 91-104k	8,750+	500-1000	13,000+
Seattle	100,000+	€ 87-99k	6,700+	150-300	2,000+
Singapore	100,000+	€ 37-41k	2,000+	250-500	1,600+
Stockholm	60,000+	€ 46-50k	500+	150-250	600-900
Sydney	65,000+	€ 54-62k	1,350+	200-300	1,500+
Tel Aviv	90,000+	€ 62-70k	1,000+	250-500	1,100+
Toronto	80,000+	€ 49-58k	3,200+	250-350	3,000+
Warsaw	75,000+	€ 27-31k	300+	150-200	250-500
Zurich	55,000+	€ 74-83k	1,000+	150-250	300-500

Key Findings and conclusions

- Enormous rise of the software industry for the last two decades resulting in an **ever growing demand of IT skills**.

- Despite the 5.5 million developers in Europe, EU-28 countries are still estimated to suffer **a shortage of 500.000** software engineers by 2020.

- **This shortage will not be distributed evenly**. Countries with the biggest gaps between software developer demand and supply are Germany, Italy, Switzerland, as well as the Nordic and Benelux countries

- On the other hand, there is an **relative oversupply of tech talent** in Eastern and Southern Europe, which is reflected by lower salaries in these regions.

- For the moment, France and UK have a **balanced supply & demand** ratio of tech talent.

- In the near future we will see even more **talent sourcing in Eastern Europe**, as well as more moves from leading tech startups to establish R&D centres in Southern Europe (especially in Spain), similar to what UK P2P lender Zopa did in Barcelona.[50]

- Additionally, big foreign (US/Chinese/South Korean) IT multinationals will continue to entrench themselves in Western Europe, especially in France. They will **try to benefit from cheaper tech salaries**, as well as the high expertise in demanding fields like artificial intelligence and machine learning.

- As a result of that, we predict that salaries of senior software specialists/developers in these fields as well as some others (i.e. data science and blockchain technology) will soon increase in Western Europe.

Research Methodology

A few words about the methodology we used during the research.

City Attractiveness

We compared cities by gross/net salaries, the total employer's cost and the cost of living including average rent. Based on these numbers we calculate net earnings for software developers per city which we then ranked. Sources were *OECD* for employee taxing, *KPMG* for employer taxing, *Numbeo* for cost of living and *Expatistan* for median rent. Also, in some cases we used local and other relevant sources.

Software developers

There is a significant discrepancy in the number of developers. In our report we stick to the latest DAXX and Stack Overflow data, and if they didn't provide exhaustive information, we relied on local and regional sources.

It is important to note that the number of developers is based on those who de-facto work in these cities. This partially explains the relatively high number of developers in some of the smaller cities (by population).

Tech Salaries

We used data for software engineer/developer salaries from *PayScale, Indeed, Glassdoor,* as well as some local and industry sources. After aggregating all of the data we give our estimate. Please note the salary estimate is average tech salaries. It includes senior, junior software engineers as well as others, i.e. mobile app developers.

Tech Startups

Besides the findings established through the *2017 Global Startup Ecosystem* Report and Teleport data, we also analysed the number of tech startups on AngelList as well as the data from local sources. After aggregating all the data, we concluded an educated estimate.

Top IT Software/Consulting Firms

Regarding the major IT consulting firms (30+ people), we mainly used data from consultingcase101.com. The criteria to evaluate top IT companies was the number of employees (we only included firms with 100+ employees). Also, we included IT multinationals and big IT outsourcing companies (100+ employees) working in any particular city. To find such data we analysed many local sources and put the estimated data in our final table.

IT Job Advertisings

Our findings are based on the aggregation of leading job sites such as *Indeed, Glassdoor, LinkedIn, Simply Hired* and *Monster*, as well as some local IT job websites.

Sources

(1)   http://fortboise.org/top100mktcap.html
(2)   https://www.nasdaq.com/screening/companies-by-industry.aspx?industry=Technology&sortname=marketcap&sorttype=1
(3)   https://finance.yahoo.com/quote/BABA/
(4)   http://markets.businessinsider.com/stocks/tencent_1-stock
(5)   http://markets.businessinsider.com/stocks/samsung_adrs-stock
(6)   https://www.cbinsights.com/research-unicorn-companies
(7)   http://www2.itif.org/2017-technology-based-start-ups.pdf?_ga=2.208635282.1482348089.1511891291-735226115.1509988589
(8)   https://www.investopedia.com/articles/investing/021315/asias-tech-startups-are-next-big-thing.asp
(9)   https://fleximize.com/articles/004002/the-rise-of-the-startups
(10)   http://tech.eu/features/19532/next-station-europe-how-the-european-tech-startup-ecosystems-are-evolving-free-report/
(11)   http://softwareimpact.bsa.org/eu/pdf/EU_Economic_Impact_of_Software_Report_en.pdf
(12)   http://tech.eu/features/19532/next-station-europe-how-the-european-tech-startup-ecosystems-are-evolving-free-report/
(13)   http://d1i53wesras4r4.cloudfront.net/reports/GlobalStartupEcosystemReport2017.pdf
(14)   https://medium.com/@danhynes/there-s-no-tech-talent-shortage-in-europe-there-s-a-smart-hiring-shortage-f9fab43a761e
(15)   https://www.linkedin.com/pulse/sweden-finland-denmark-facing-mass-tech-talent-shortage-kokina/
(16)   https://www.swissinfo.ch/eng/apprentices-needed_switzerland-faces-shortage-in-it-staff/42563274
(17)   https://www.computerweekly.com/news/4500269840/Fears-of-software-skills-shortage-in-Germany-and-the-Netherlands
(18)   https://www.michaelbaileyassociates.com/news/it-and-ict-technology/tech-skills-shortages-continue-in-the-netherlands
(19)   https://www.hrmonline.ca/hr-news/hr-technology/toronto-emerges-as-global-tech-hotspot-234725.aspx
(20)   http://lattin.ca/2018/04/23/toronto-waterloo-tech-corridor-among-top-20-worldwide/
(21)   https://www.rockstart.com/blog/closer-look-luxembourgs-startup-ecosystem/
(22)   https://www.siliconluxembourg.lu/travelsify-raises-2-million-euros/
(23)   http://lsbc.lu/luxembourg-fintech-startup-of-the-year-governance-io-raises-e2m-in-funding-round/
(24)   http://tech.eu/brief/simpleshow-funding/
(25)   https://evansdata.com/reports/viewRelease.php?reportID=9
(26)   https://www.daxx.com/article/software-developer-statistics-2017-programmers
(27)   https://2017.stateofeuropeantech.com/chapter/talent/article/europes-tech-workforce-and-dev-population-booming/
(28)   https://www.cbronline.com/news/european-commission-warns-of-coding-skills-shortage-4331339
(29)   https://euobserver.com/digital/137835
(30)   http://eskills-scale.eu/fileadmin/eskills_scale/all_final_deliverables/scale_e-leadership_agenda_final.pdf
(31)   http://blog.honeypot.io/amsterdam-tech-map/
(32)   https://www.computerweekly.com/news/450420894/Amsterdam-targets-tech-talent
(33)   http://nordic.businessinsider.com/finland-has-a-huge-deficit-in-software-developers-and-its-growing-rapidly-2017-6
(34)   https://nordic.businessinsider.com/denmark-growing-into-a-european-leader-in-software-development----19000-it-and-electronics-specialists-needed-by-2030-2016-12/
(35)   https://www.daxx.com/article/german-companies-outsource-developers
(36)   https://www.thelocal.it/20160406/why-italy-is-struggling-to-fill-76000-jobs
(37)   http://www.lequotidien.lu/economie/startcode-pallie-la-penurie-de-profils-it-au-luxembourg/
(38)   https://www.todayonline.com/singapore/42000-ict-professionals-needed-over-next-3-years-yaacob
(39)   http://www.ces.lafrenchtech.com/foreign-firms-in-france/
(40)   https://www.iamsterdam.com/en/business/key-sectors/ict
(41)   http://merrionpeople.com/the-tech-scene-in-dublin-and-ireland/
(42)   https://www.siliconrepublic.com/companies/dublin-office-market-tech-lisney
(43)   http://www.top1000.ie/industries/technology-business
(44)   https://www.swissinfo.ch/eng/statistics_foreign-multinationals-employ-about-one-in-ten/43772414
(45)   https://www.greaterzuricharea.com/en/detail/google-opens-its-new-offices-in-zurich/
(46)   https://www.blog.google/topics/google-europe/zurich-expanding-our-european-tech-hub/
(47)   http://www.greatplacetowork.lu/meilleures-entreprises/best-workplaces-luxembourg
(48)   http://www.tearsheet.co/culture-and-talent/goldman-sachs-foray-into-consumer-banking-is-getting-aggressive
(49)   https://www.kyivpost.com/technology/18-tech-companies-ukraine-among-worlds-top-outsourcers.html
(50)   https://barcelonastartupnews.com/starting-a-startup/setting-up-development-center-barcelona-story-zopa/

Appendix 1 - Number of startups per city

Selected cities ranked by number of startups		
City	**Number**	**Comments**
San Francisco	13,000+	San Francisco's startup number estimate includes SF Bay Area, if we take only the city, the Teleport number of 8,265 startups is more close to reality
New York	7,000+	Both Teleport and Global Startup Ecosystem report 2017 give close to reality the number of tech startups in the city
London	6,500+	We think Angel List (13.372) includes many non-tech startups, other estimates are more conservative and more close to reality as to us
Paris	4,000+	Some sources give 22.000+ , La French Tech gives 4,000+ we think La French Tech estimate is more close to reality
Toronto	3,000+	The Toronto-Waterloo Corridor has the second highest density of startups in the world and HQs of some of Canada's largest tech companies
Boston	2,750+	We give an average of Teleport (2,000) and Global Startup Ecosystem report 2017 (2,900-3,000) estimates, confirmed by other sources
Berlin	2,500+	In Berlin, we took Angel List numbers as a basis; Global Startup Ecosystem report 2017 (1.800-2.400) underestimated a little bit
Amsterdam	2,200+	In Amserdam, Global Startup Ecosystem report 2017 (2.300-3.500) gave a little bit overestimated numbers
Seattle	2,000+	In Seattle, all sources give tech startup's estimate in +/- the same range
Singapore	1,600+	-
Sydney	1,500+	64% of Australian tech startups are in Sydney
Barcelona	1,200+	Here, the situation is clear. All sources give approximately the same number
Tel Aviv	1,100+	We think that, Global Startup Ecosystem report 2017 (2.200-2.700) overestimated # of startups in Tel Aviv, we gave a consensus estimate
Madrid	1,000+	We see a consensus estimate among all sources
Dublin	800+	-
Brussel	700+	-
Stockholm	600-900	The Startup Ecosystem report 2017 estimate in Stockholm is absolutely correct, we will stick to it
Helsinki	500-700	We see a consensus estimate among all sources
Copenhagen	400-700	-
Munich	400-700	-
Zurich	300-500	-
Lyon	300-500	-
Milan	250-500	-
Warsaw	250-500	-
Bucharest	200-400	Bucharest is catching up with other Eastern European tech hubs, startup's growth is accelerating, was added 50+ per year during 2015-17
Kiev	150-300	Kiev is more IT outcourcing capital of Eastern Europe; however, more and more full-fledged globally competitive startups are appearing
Geneva	100-200	-
Luxembourg	75-150	There's been a 25% year over year increase in startups since 2014

Key Findings

- Predictably the San Francisco Bay Area has the most tech startups. However, New York and London are quickly catching up.

- Another interesting finding is the number of tech startups in Paris and Amsterdam. The *2017 Global Startup Ecosystem* Report estimated 2.000-2.600 for Paris and 2.300-3.500 tech startups for Amsterdam respectively. Our findings for Paris are much higher: 4.000+ for Paris and 2.200 for Amsterdam

- Also, it seems to us that the number of startups in Tel Aviv (2.200-2.700) were strongly overestimated. Our result after the analysis of all sources was 1.100+.

- The Toronto-Waterloo Corridor has the second highest density of startups in the world with headquarters of some of Canada's largest tech companies. The corridor benefits from the leading research at its 16 universities and colleges, which are internationally recognised for programs in computer science and engineering.[19, 20]

- Luxembourg is home to between 75-150 tech startups. We've seen a 25% increase per year in the number of startups since 2014. Some stand-out tech companies lifting the ecosystem are Doctena, JobToday, Etix Everywhere, Supermiro, All Square, Travelsify, Nexvia, Digicash Payments, governance.io, Simpleshow and Talkwalker.[21, 22, 23, 24]

Appendix 2 - IT Job Advertisings

Selected cities ranked by number of Job Advertisings			
City	Average	City	Average
New York	10,000+	Zurich	1,000+
San Francisco	8,750+	Tel Aviv	1,000+
London	7,400+	Brussel	825+
Boston	7,400+	Milan	750+
Seattle	6,700+	Bucharest	550+
Toronto	3,200+	Stockholm	500+
Amsterdam	2,500+	Barcelona	450+
Paris	2,000+	Madrid	350+
Singapore	2,000+	Warsaw	300+
Kiev	2,000+	Lyon	240+
Munich	1,750+	Geneva	150+
Berlin	1,500+	Helsinki	150+
Sydney	1,350+	Luxembourg	125+
Dublin	1,350+	Copenhagen	120+

Key Facts[48]

- New York beats the San Fransisco Bay area in the number of IT Job Advertisings, demonstrating a higher demand for software engineers/developers in this region. This can partially be explained by the move of big investment banks in retail/digital banking (i.e. 46% of Goldman Sachs jobs are now in technology).

- We think in cities such as London, Paris and Zurich, big banks and financial institutions account for a significant share of software developer demand.

- In Germany, Munich beats Berlin in software engineer demand.

- In Kiev, the demand for software developers is in line with Singapore and Paris. This is mostly caused by the activity of major IT outsourcing companies (18 tech companies operating in Kiev are among the world's top outsourcers) and the local software developer's price/quality ratio. [49]

- The demand for software developers in Luxembourg is in line with cities like Copenhagen, Helsinki and Geneva. This confirms an increased tech startup activity as well as the rise in tech demand from local IT software/consulting firms.

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Appendix 3 - Top IT software & consulting firms

Selected cities ranked by number of IT Software & Consulting firms		
City	**Number**	**Comments**
London	500-1000	Including IT sofware companies with 100+ employees
San Francisco	500-1000	Including IT sofware companies with 100+ employees
New York	350-700	Including IT sofware companies with 100+ employees
Amsterdam	300-500	Including 170 IT multinationals which have headquarters in the city
Boston	300-500	-
Dublin	300-400	250 Global Tech Companies have offices in Dublin
Paris	250-500	Absolute majority of Paris tech startups employ less than 30 people
Tel Aviv	250-500	Israel has 300 multinational R&D centers, many from which HQ-ed in Tel Aviv
Singapore	250-500	-
Toronto	250-350	-
Sydney	200-300	-
Berlin	150-300	-
Seattle	150-300	-
Madrid	150-250	-
Stockholm	150-250	-
Zurich	150-250	-
Munich	150-250	-
Warsaw	150-200	-
Barcelona	100-200	-
Bucharest	100-200	Romania in general and Bucharest in particular is popular IT outsourcing destination
Copenhagen	100-200	-
Milan	100-200	-
Kiev	100-200	18 tech companies in Ukraine among world's top outsourcers
Lyon	100-150	-
Brussel	75-150	-
Geneva	50-100	Most Swiss software companies are 5-25 people entities
Helsinki	50-100	-
Luxembourg	25-50	-

Key Facts

- Foreign tech investments in France really took off in 2015, when American multinational Cisco Systems pledged to invest $100 million in french startups and even doubling the figure later on.

- After that, Facebook announced it would create an AI research lab in Paris and then announced plans to be a corporate partner at the world's biggest start-up/tech campus *Station F* in Paris.

- Google has since followed with an AI R&D centre of its own in Paris.

- South Korea's Samsung invested in French startup Sigfox, then revealed it would create a Strategy and Innovation Centre in Paris.

- Marc Benioff, CEO of Salesforce, inaugurated a new R&D centre in Paris and announced that the company plans to invest $1 billion in France over the next five years.[39]

- There are roughly 578 international ICT companies in the Netherlands, together employing around 35.000 people. Around 170 of these companies chose Amsterdam for their headquarters.[40]

- 250 global tech companies have offices in Dublin[41] where, tech firms dominate the office market. Facebook and Google alone are on track to occupy 4% of all commercial office space in Dublin's city Centre in 2018[42]. 124 technology companies are among the 1.000 biggest companies in Ireland.[43]

- 11% of Switzerland's total workforce is employed by affiliates of foreign multinationals. Swiss affiliates were mainly active in trade, finance and administrative services, including information technology, management and consulting. These enterprises were primarily located around Zurich and the Geneva area[44]. Zurich is Google's most important development centre outside the US. Up to 5,000 people will eventually work in their new offices by 2020 (now 2.000) [45,46].

- Best workplaces in Luxembourg include some IT technology and consulting firms such as CTG Luxembourg PSF (290 employees), InTech (102 employees), Elgon S.A. / Ainos S.A. (79 employees), Agile Partner SA (55 employees), Pictet Technologies (51 employees), System Solutions Luxembourg SA (51 employees). [47]