Analysis of 5 Engineering Roles (S/W, Emb. S/W and Mechanical Design)
**Talent Stack:** Key Skills, Certifications and Tools associated with various job roles analysed in Engineering & Software / Technology Roles

### Roles Analysed

<table>
<thead>
<tr>
<th>Mechanical Engineer</th>
<th>Embedded Engineer</th>
<th>Data Science / ML</th>
<th>Analytics / BI / Big Data</th>
<th>Web/Mobile App development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Design</td>
<td>DSL Architecture Design</td>
<td>Natural Language Processing</td>
<td>Data Visualization</td>
<td>Shell Scripting</td>
</tr>
<tr>
<td>Simulation</td>
<td>RTL Design</td>
<td>Computational Linguistics</td>
<td>Data Mining / Clustering</td>
<td>Front / Backend Development</td>
</tr>
<tr>
<td>FEA</td>
<td>Physical Design &amp; Verification</td>
<td>Cognitive Computing</td>
<td>Predictive Analytics</td>
<td>System design and architecture building</td>
</tr>
</tbody>
</table>

### Skills

- **Mechanical Design**
- **Simulation**
- **FEA**

### Certifications

- **Professional Simulation Engineer**
- **FEA / FEM Certification**
- **Autodesk Certified Professional**

### Tools

- **CAD**
- **CATIA**
- **Solidworks**
- **C, C++**
- **Perl, Python**
- **Debugger**
- **Eclipse Deeplearning4j**
- **Accord.NET Framework**
- **Clojure**
- **Hadoop**
- **Mongo DB**
- **Splunk**
- **Angular / Node JS**
- **Java / JavaScript**
- **Wordpress**

*Listed skills, certifications and tools are a sample set and are not exhaustive*
Hotspots: Prague, Krakow, Warsaw, Bucharest and Budapest are top hotspots among the analysed Eastern European locations.

Poland: Highest presence of software and technology, mechanical engineering talent in the region. Mix of companies from different verticals

Romania: Hub for semiconductor and mechanical design/development talent. Significant presence of Automotive OEMs and Tier 1 companies

Czech Republic: Talent is concentrated in Prague. Installed Analytics/BI/Bigdata talent is higher than Poland and Romania

Hungary: Equal spread of mechanical and software/technology talent. Hungary has one of the lowest installed talent in the Eastern European region

Note: DRAUP's proprietary talent module was used to analyse jobs by locations and skill type
Talent Landscape: Precisely estimating the talent suited for information technology and engineering roles, involves several interviews and deeper understanding of technical stacks across resumes and profiles.

Total Talent: ~0.24 Million

*5 Job roles across Poland, Romania, Czech Republic, Hungary was analysed-
Mechanical Engineer, Embedded Engineer, Data Science/ML, Analytics/BI/BigData, Web/Mobile App Development

<table>
<thead>
<tr>
<th>Job Cluster wise talent distribution</th>
<th>Poland</th>
<th>Romania</th>
<th>Czech Republic</th>
<th>Hungary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineer (includes design &amp; simulation roles)</td>
<td>23,500</td>
<td>18,000</td>
<td>16,500</td>
<td>9,500</td>
</tr>
<tr>
<td>Embedded Engineer (Hardware &amp; Software)</td>
<td>6,000</td>
<td>28,500</td>
<td>4,500</td>
<td>2,200</td>
</tr>
<tr>
<td>Data Science/ML</td>
<td>2,750</td>
<td>1,700</td>
<td>1,500</td>
<td>800</td>
</tr>
<tr>
<td>Analytics/BI/BigData</td>
<td>9,000</td>
<td>2,850</td>
<td>4,500</td>
<td>2,000</td>
</tr>
<tr>
<td>Web/Mobile App development</td>
<td>57,000</td>
<td>22,000</td>
<td>18,500</td>
<td>11,500</td>
</tr>
</tbody>
</table>

Total Installed Talent For Analysed Roles: 98,250 | 73,050 | 45,500 | 26,000

Note: DRAUP’s Talent Simulation Module
Czech Republic
Czech Republic – Market Trends

1. Hub for shared services. Besides Prague, more companies are focusing on cities such as Ostrava and Olomouc, Brno.

2. ~60% of the 22 Million IT industry was exported in 2017. Opportunity in SaaS, Cybersecurity and Networking vertical will witness a high growth in the coming years.

3. Banking, Financial Services vertical has created ~17% of the total jobs in Czech Republic. While Software & IT vertical has created about 8.5% of the total jobs.

4. DELTA Programme – A major initiative by the Czech government in driving the technological innovations. A large number of technology giants are engaged in these initiatives.

5. Automotive is the largest industry in Czech Republic employing ~1,50,000 professionals. Czech automotive CoEs plays a key role not only in the European but also in the global perspective.

6. R&D centres in the Electrical / Electronics vertical is continuously increasing their headcount due to the increased adoption of digitalization.
• The Corporate tax rate in Czech Republic stands at **19%**
• Expenses on research and development projects can be deducted from tax base up to 100% and 110% of the expense respectively
• Research and development costs are claimed twice, because the cost of research and development project remains in the calculation of the tax base
• Investment incentives are available to both Czech and foreign investors in the areas like Technology centers, Business support services centers, shared-services centers, software-development centers and high-technology repair centers, call centers and data centers
• Investments incentives are provided in the following forms:
  - Income tax relief for up to 10 year and financial support for creation of new jobs, training and retraining new employees
  - Financial support in the case of strategic investments in manufacturing or in technology centers

Ease of doing Business

<table>
<thead>
<tr>
<th>Year</th>
<th>Rank</th>
<th>Rank 2015</th>
<th>Rank 2016</th>
<th>Rank 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>33</td>
<td>26</td>
<td>27</td>
<td>30</td>
</tr>
</tbody>
</table>

Rank on doing Business

- Starting a Business: 81
- Dealing with Construction Permits: 127
- Getting Electricity: 15
- Registering Property: 32
- Getting Credit: 42
- Protecting Minority Investor: 62
- Paying Taxes: 53
- Trading across Borders: 1
- Enforcing Contracts: 91
- Resolving Insolvency: 25
Czech Republic Economic and Talent indicator

### Economic Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth rate</td>
<td>4.3%</td>
</tr>
<tr>
<td>Political stability index</td>
<td>0.99</td>
</tr>
<tr>
<td>Cost of living index</td>
<td>49.4</td>
</tr>
<tr>
<td>Unemployment rate (2017)</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

### Talent & Ecosystem Overview

- **5.3 Million**: Total Working Population
- **5K+**: Installed Fresh Talent Pool (STEM)
- **3K+**: Startup Talent Pool (Tech Startups)

### Top Universities

- Charles University
- Czech Technical University
- Brno University of Technology

### Notable Start-ups

- Kiwi.com
- Apiary.io
- Survia

### Major Talent Hotspots

- Prague
- Brno
- Ostrava
Czech Republic – Installed Talent Pool Analysis

**45K+**

Installed Talent Pool

- **Mechanical Engineer**: 16.5K
- **Embedded Engineer**: 4.5K
- **Data Science/ML**: 1.5K
- **Analytics/BI/Big data**: 4.5K
- **Web/Mobile App development**: 18.5K

**Engineering Talent Analysis Across Verticals**

<table>
<thead>
<tr>
<th>Role</th>
<th>Median talent pool by experience levels (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-5</td>
</tr>
<tr>
<td>Mechanical Engineer (Includes design &amp; simulation roles)</td>
<td>4,774</td>
</tr>
<tr>
<td>Embedded Engineer (Hardware &amp; Software)</td>
<td>1,053</td>
</tr>
<tr>
<td>Data Science/ML</td>
<td>534</td>
</tr>
<tr>
<td>Analytics/BI/Big Data</td>
<td>1,341</td>
</tr>
<tr>
<td>Web/Mobile App development</td>
<td>7,036</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>14,737</td>
</tr>
</tbody>
</table>

**Most common technology roles in Czech Republic**

- Software Developer
- Information Technology Analyst
- Software Engineer
- Mechanical Engineer
- CAD/CAM Programmer
- CAD Design Engineer
- Mechanical design engineer
- FEM simulation Specialist
- Data Scientist
- Application developer
- Data Engineer
- System Programmer
- Back-End Developer
- Automation Developer
- CAE Engineer
- IT Architect

**Note**: DRAUP’s proprietary talent module was used to analyse jobs by skill type.
# Czech Republic – Top 5 employer analysis for technology talent

<table>
<thead>
<tr>
<th>Top Employers</th>
<th>Total Talent Headcount (Top 5)</th>
<th>Mechanical Engineer</th>
<th>Embedded Engineer</th>
<th>Data Science/ML</th>
<th>Analytics/BI/Big Data</th>
<th>Web/Mobile App development</th>
</tr>
</thead>
<tbody>
<tr>
<td>ČESKÁ společnost</td>
<td>~6000</td>
<td>27%</td>
<td>27%</td>
<td>2%</td>
<td>13%</td>
<td>31%</td>
</tr>
<tr>
<td>ŠKODA</td>
<td>~4000</td>
<td>69%</td>
<td>11%</td>
<td>1%</td>
<td>2%</td>
<td>16%</td>
</tr>
<tr>
<td>IBM</td>
<td>~3500</td>
<td>34%</td>
<td>15%</td>
<td>8%</td>
<td>5%</td>
<td>39%</td>
</tr>
<tr>
<td>Honeywell</td>
<td>~2500</td>
<td>46%</td>
<td>23%</td>
<td>5%</td>
<td>4%</td>
<td>22%</td>
</tr>
<tr>
<td>SAP</td>
<td>~1500</td>
<td>5%</td>
<td>3%</td>
<td>2%</td>
<td>4%</td>
<td>86%</td>
</tr>
</tbody>
</table>

Note: DRAUP’s proprietary talent module was used to analyse talents by skill type/roles.
### Peer Employer Dashboard: Automotive Industry

<table>
<thead>
<tr>
<th>Company</th>
<th>Headcount</th>
<th>Key Titles</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skoda Auto a.s.</td>
<td>3000 – 4000</td>
<td>• Mechanical Engineer</td>
<td>• Develop construction solutions for car body structure, creating 3D data of structural sheet parts, its assemblies and drawing, • Develop air conditioning and heating (EKC), design solutions in Catia V5, FEM model preparation and tuning and FEM seat testing simulation</td>
<td>~23K</td>
</tr>
<tr>
<td>Skoda Auto a.s.</td>
<td>500 – 1000</td>
<td>• Design Engineer</td>
<td>• Planning, managing and testing all in-vehicle and bench testing, electrically driven compressor control for Air Conditioners of Automobiles • Organize, schedule, workload and follow-up within the design teams with CAD design • Involve in Lighting/Signalling product design</td>
<td>~20K</td>
</tr>
<tr>
<td>Hyundai</td>
<td>400 – 500</td>
<td>• Design Engineer</td>
<td>• Involve in duplex CMM programming (BIW, parts, machinery), CMM results analysis • Basic reverse engineering, CAD construction and fixture creation for 3D Printing • Make concept design for technical review with customer or engineering team</td>
<td>~21K</td>
</tr>
<tr>
<td>Toyota Peugeot Citroen Automobile</td>
<td>200 – 300</td>
<td>• Mechanical Engineer</td>
<td>• Paint control systems management, optimizations and modifications, projects preparation and realizations, SW development, processes optimizations</td>
<td>~19K</td>
</tr>
</tbody>
</table>

**Note:** DRAUP's proprietary talent module was used to analyse jobs by top companies and skill type.
## Peer Employer Dashboard: Software/Internet

<table>
<thead>
<tr>
<th>Company</th>
<th>Headcount</th>
<th>Key Titles</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
</table>
| IBM         | 3000 – 3500| • Software Developer  
• Information Technology Analyst  
• Software Engineer  
• System Programmer  
• Software Specialist | • Developing Power Shell/batch/Python scripts to automate repetitive tasks.  
• Troubleshooting high complexity HW/SW incidents and Providing Root Cause Analysis  
• Managing and maintaining the OS/applications configurations  
• Development of automatic failover and Switchover scripts  
• Maintain, improve, and diagnose the HW/SW failures  
• Provide real-time monitoring of systems and applications | ~20K |
| SAP         | 1000 – 1500| • Software Developer  
• Senior Information Technology Architect  
• Associate Software Developer  
• SAP ABAP Developer | • Define and develop technical standards  
• Assist in testing to validate and provide operating controls to ensure development requirements are satisfied  
• Develops ABAP code in various routines - Start, End, Expert and Transfer routines  
• Design and develops various types of Generic Data Sources on SAP source systems | ~17K |
| Microsoft   | 600 – 700  | • Software Engineer  
• Software developer  
• Software Development Engineer  
• Technology Solutions Specialist | • Development/testing for database functionality(Postgres) and Azure services (C#, Azure)  
• Implementation of a Azure C# Cloud service which is responsible for denormalization of profile related data for our read-optimized contacts storage  
• Kiwi’s C++ core search engine development, Implementation of complex asynchronous systems, algorithmic research and prototyping  
• Creation of next-generation public transportation search engine, High-performance computing and low-level micro-optimization | ~28K |
| Kiwi.com    | 600 – 650  | • Software Developer  
• Back-End Developer  
• Automation Developer  
• Software Architect | • Development of new modules and bug hunting  
• Kiwi’s C++ core search engine development, Implementation of complex asynchronous systems, algorithmic research and prototyping  
• Creation of next-generation public transportation search engine, High-performance computing and low-level micro-optimization | ~15K |

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
## Czech Republic: Peer Employer extended list for technology talent pool

**Software/Internet**
- AVAST Software
- Winding Tree
- GoodVision
- Kentico Software
- GENERAL BYTES
- JetBrains
- Flowmon Networks
- GMC Software Technology
- Y Soft Corporation
- EmbedIT
- Abra Software
- Arbes Technologies
- Oksystem
- Brand Embassy
- ZONER software, a.s
- Productoo
- Smartlook
- GoodData
- Banking Software Company s.r.o
- CA Technologies
- Merz s.r.o
- Bohemia Interactive Simulations
- Cryptelo

**Automotive**
- Varroc Lighting Systems
- Grupo Antolin
- Volkswagen
- TATRA TRUCKS a.s.
- Louda Auto a.s.
- Magneti Marelli
- Continental
- Miba Group
- Chassix Inc.
- Robert Bosch GmbH
- Auto Kelly a.s.
- Mubea
- Mazda Motor
- Bright Box

**Industrial Automation**
- FOXON s.r.o
- Sewio Networks s.r.o
- ABO valve
- Bobcat EMEA
- TECHNICOAT s.r.o
- Arkon Flow Systems, s.r.o
- Rockwell Automation

**Others**
- Tatra banka
- MONETA Money Bank
- Worldcore
- Ceskoslovenska obchodni banka, a.s
- W.A.G. payment solutions, a.s
- O2 Czech Republic
- Vodafone
- T-Mobile Czech
- Nordic Telecom s.r.o
- Codasip
- ON Semiconductor
- NXP Semiconductors

*Others* - BFSI, Semi Conductor and Telecommunication
Talent cost by roles: Data Science/Machine learning are the highest paid roles in Czech Republic

Note: Salaries mentioned above are median salaries of roles clustered in particular domains
Note: DRAUP’s Talent Simulation Module analysed cost across job profiles
**Start-ups - Czech Republic:** Top tech start-ups have high focus on building Cyber Security solutions, Developer Platform, ML/AL, Big Data platforms

<table>
<thead>
<tr>
<th>Key Start-ups</th>
<th>Workload</th>
<th>Funding</th>
<th>Headcount</th>
<th>Key profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROI Hunter</td>
<td>Provide advanced performance marketing platform for Facebook and Instagram ads, designed by digital marketing and e-commerce experts, to automate and scale business</td>
<td>€4.4M</td>
<td>60+</td>
<td>Frontend Developer, DevOps Engineer, Customer Success Manager</td>
</tr>
<tr>
<td>Gamee</td>
<td>Provides Battle Gaming Network which connect friends in series of gaming challenges inside Messenger, Telegram, Viber, Kik Messenger and own apps</td>
<td>$2.8M</td>
<td>40+</td>
<td>Game Designer, UX Developer, Game Developer</td>
</tr>
<tr>
<td>SocialBakers</td>
<td>Provides marketing platform that leverages the power of machine learning to help brands make smarter investments on social media which enable brands to engage and grow their customer base by helping them deliver the right content to the right people at the right time</td>
<td>$34M</td>
<td>400+</td>
<td>Data Engineer, Software Developer</td>
</tr>
<tr>
<td>Avast</td>
<td>Provide next-gen cybersecurity products for businesses and consumers, protects hundreds of millions of people from threats on the internet and the evolving IoT threat landscape</td>
<td>$100M</td>
<td>800+</td>
<td>Mobile Threat Intelligence &amp; Security, System Engineer, Software Developer</td>
</tr>
</tbody>
</table>

**Tech Startups**

<table>
<thead>
<tr>
<th>Category</th>
<th>Approximate Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyber Security/Networking</td>
<td>~160</td>
</tr>
<tr>
<td>ML/Al/Big Data</td>
<td>~120</td>
</tr>
<tr>
<td>Open Source/Developer Platforms</td>
<td>~300</td>
</tr>
<tr>
<td>Other Tech start-ups</td>
<td>~320</td>
</tr>
</tbody>
</table>

**Total Start-Up Talent pool**

- **Start-ups**
  - ~900 Tech Startups
  - ~160 Cyber Security/Networking
  - ~120 ML/Al/Big Data
  - ~300 Open Source/Developer Platforms
  - ~320 Other Tech start-ups

**Note:** DRAUP’s Talent Simulation Module in Tel Aviv Based on Tech Startups
Universities: 80+ universities has a footprint in Czech Republic; These universities have limited supply of S/W talent cumulatively providing ~6,000 software graduates per year

Czech Republic Universities’ Landscape

Colleges and Universities in Czech Republic 80+
Total Graduates (Across All Courses In Czech Republic) 400K+
Total Graduates with Software Degree (Computer Science / Information Technology, Networking, Cybersecurity, AI, Robotics, Analytics, Data Science Courses) 6k+

Czech Republic Courses Adoption

<table>
<thead>
<tr>
<th>Course</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
<td>36%</td>
</tr>
<tr>
<td>Engineering &amp; Technology</td>
<td>32%</td>
</tr>
<tr>
<td>Maths</td>
<td>12%</td>
</tr>
<tr>
<td>Others – Vocational Courses</td>
<td>20%</td>
</tr>
</tbody>
</table>

Largest Universities in Czech Republic

- Charles University
- Brno University of Technology
- Czech Technical University

- Highest number of branches of study accredited in English is offered by the Czech Technical University in Prague
- During the past three years, the number of international students in the Czech Republic has increased significantly. In 2017, they shared 15 percent of the total enrolled students universities
- Among the foreigners, the strongest interest is seen in economic science, followed by technical science
- Enrolment rate in higher education is ~64%

Note: DRAUP’s Talent module analysed 80+ universities in Czech Republic to identify top universities and key courses
**Charles University** : One of the oldest and largest university in Czech focusing on Engineering and Technology related programs

<table>
<thead>
<tr>
<th><strong>Total Enrolment:</strong></th>
<th><strong>Key Programs Offered</strong></th>
<th><strong>Featured Research</strong></th>
<th><strong>Alumni Profiles</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>50K+</strong></td>
<td><strong>Bachelors</strong></td>
<td></td>
<td><strong>PROFILE 1</strong>&lt;br&gt;DESIGNATION: Mechanical Design Engineer at Honeywell</td>
</tr>
<tr>
<td><strong>32K+</strong></td>
<td>• Computer Science&lt;br&gt;• Computer/Software Engineering&lt;br&gt;• Information Technology&lt;br&gt;• Mathematical Methods of Information Security</td>
<td><strong>5th place in the EECA ranking</strong></td>
<td>Education: Bachelor’s degree in Software Engineering at Charles University&lt;br&gt;Current works: Works on R&amp;D of plastic parts for thermostats and controllers, gear boxes and die casted parts for actuators which are used in HVAC applications for the market of North American</td>
</tr>
<tr>
<td><strong>9K+</strong></td>
<td><strong>Masters</strong></td>
<td></td>
<td><strong>PROFILE 2</strong>&lt;br&gt;DESIGNATION: design engineer at Skoda Power</td>
</tr>
<tr>
<td><strong>7K+</strong></td>
<td>• Theoretical Computer Science&lt;br&gt;• Computational Linguistics&lt;br&gt;• Discrete Models and Algorithms&lt;br&gt;• Computer Graphics and Game Development&lt;br&gt;• Software and Data Engineering&lt;br&gt;• Software Systems&lt;br&gt;• Artificial Intelligence</td>
<td><strong>5th most demanded university within Eramus+ Programmes</strong></td>
<td>Education: Bachelor’s degree in Software Engineering at Charles University&lt;br&gt;Current works: Works with steam turbines for casings in design department. Check, approve and set up different parts of steam turbines in casings, rotors, glands</td>
</tr>
<tr>
<td><strong>Total Enrolment:</strong></td>
<td><strong>Doctorate Programmes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5th place in the EECA ranking</strong></td>
<td>• Mathematics&lt;br&gt;• Computer Science&lt;br&gt;• Physics</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8000+ International Students</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5th most demanded university within Eramus+ Programmes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>300+ graduate degree programmes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Top Rankings and Awards**
- Ranked 1 in Best Global Universities in Czech Republic
- Ranked 85 in Best Global Universities in Europe

**Marquee Alumni**
- Jakub Nesetril, VP Product Development at Oracle
- Tomas Honzak, Chief Information Security Officer at GoodData
- Martin Susta, Chief Information Officer at 2N TELEKOMUNIKACE a.s.

**Charles University**
One of the oldest and largest university in Czech focusing on Engineering and Technology related programs.
### Czech Technical University: One of the largest universities in Czech and oldest institute of technology in Central Europe

#### Charles University

<table>
<thead>
<tr>
<th>Key Programs Offered</th>
<th>Featured Research</th>
<th>Alumni Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bachelors</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| • Mechanical & Aerospace Engineering | • 18% of international Students | **PROFILE 1**  
DESIGNATION: Software developer at Messenger a.s.  
Education: Bachelor’s of Software systems at Czech Technical University  
Current works: Works on internal application, developing database application using MSSQL, core business logic and SOAP, Restful interface for customers. Working on the extension of the software to fully support computation on moving geometries |
| • General Engineering |                   |                 |
| • Electrical & Electronic Engineering |                   |                 |
| • Computer Science |                   |                 |
| • Informatics |                   |                 |
| **Masters**           |                   |                 |
| • Mechanical Engineering |                   | **PROFILE 2**  
DESIGNATION: Data Scientist/Engineer at DataSentics  
Education: Bachelor’s of Computer Science at Czech Technical University  
Current works: Analysis of the customer journey and attribution using digital channels, download of the data from GA API and data preparation in Python with dashboarding in QlikSense |
| • Automotive Engineering |                   |                 |
| • Aerospace Engineering |                   |                 |
| • Biomedical Engineering and Informatics |                   |                 |
| • Cybernetics and Robotics |                   |                 |
| • Electrical Engineering |                   |                 |
| • Informatics |                   |                 |
| **Doctorate Programmes** |                   |                 |
| • Mechanical Engineering |                   |                 |
| • Electrical Engineering and Information Technology |                   |                 |
| • Informatics |                   |                 |

#### Total Enrolment: 24K+

#### Top Rankings and Awards
- Ranked 2 in Best Global Universities in Czech Republic
- Ranked 186 in Best Global Universities in Europe

#### Marquee Alumni
- Ivo Musil, CTO at Corpus Solutions a.s.
- Ondrej Vlcek, EVP & GM, Consumer at Avast
- Radek Blecha, Chief Development Officer at Česká spořitelna, a.s.

#### Note:
DRAUP’s Talent Module analysed 80+ Czech Republic universities to identify top universities, key courses.
Hungary
A R&D tax relief through a tax allowance is provided in Hungary for the R&D centres, allowing them for a full exemption from social security contributions.

Contribution from the Information Technology vertical is growing at a rate of ~15% YoY. The total ICT industry size was ~11 BN in 2017.

Automotive Industry is the major contributor of Hungary’s economy. ~10% of the Hungarian GDP is from this vertical.

Budapest is the hotspot in Hungary. A majority of R&D centres in Hungary is concentrated in Budapest.

Debrecen is emerging as a key destination for mechanical and software roles. Low operational and functional cost in the city attracts MNCs to setup their business in Debrecen.

Shared Service centres in finance, accounting, HR and customer service and IT tech support has a large base in Hungary.
Ease of doing business

- Corporate Tax Rate in Hungary stands at 9%. Corporate Tax Rate in Hungary averaged 21.94% from 1989 until 2018, reaching an all time high of 50% in 1989 and a record low of 9 percent in 2016.
- Hungary ranks 5th among OCED and other major economies in terms of the total volume of government support for business R&D, equivalent to 0.31% of GDP.
- Tax incentives account for ~48% of total public support for business R&D in Hungary.

Ease of doing Business Ranking

<table>
<thead>
<tr>
<th>Year</th>
<th>Starting a Business</th>
<th>Dealing with Construction Permits</th>
<th>Getting Electricity</th>
<th>Registering Property</th>
<th>Getting Credit</th>
<th>Protecting Minority Investor</th>
<th>Paying Taxes</th>
<th>Trading across Borders</th>
<th>Enforcing Contracts</th>
<th>Resolving Insolvency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>40</td>
<td>79</td>
<td>110</td>
<td>29</td>
<td>29</td>
<td>108</td>
<td>93</td>
<td>1</td>
<td>13</td>
<td>62</td>
</tr>
<tr>
<td>2015</td>
<td>40</td>
<td>90</td>
<td>110</td>
<td>29</td>
<td>29</td>
<td>108</td>
<td>93</td>
<td>1</td>
<td>13</td>
<td>62</td>
</tr>
<tr>
<td>2016</td>
<td>41</td>
<td>79</td>
<td>110</td>
<td>29</td>
<td>29</td>
<td>108</td>
<td>93</td>
<td>1</td>
<td>13</td>
<td>62</td>
</tr>
<tr>
<td>2017</td>
<td>48</td>
<td>79</td>
<td>110</td>
<td>29</td>
<td>29</td>
<td>108</td>
<td>93</td>
<td>1</td>
<td>13</td>
<td>62</td>
</tr>
</tbody>
</table>
Hungary – Economic and Talent Indicator

**Economic Indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth rate</td>
<td>3.9%</td>
</tr>
<tr>
<td>Political stability index</td>
<td>0.71</td>
</tr>
<tr>
<td>Cost of living index</td>
<td>44.9</td>
</tr>
<tr>
<td>Unemployment rate (2017)</td>
<td>4.3%</td>
</tr>
</tbody>
</table>

**Ease Of Doing Business Global Ranking**

48

**Talent & Ecosystem Overview**

4.5 Million
Total Working Population

4K+
Installed Fresh Talent Pool (STEM)

2.5K+
Startup Talent Pool (Tech Startups)

**Top Universities**

University of Szeged
Eötvös Loránd University
University of Debrecen

**Notable Start-ups**

Prezi
LogMeIn

**Major Talent Hotspots**

- Budapest
- Miskolc
- Debrecen
- Szeged

**Peer Companies**

- IBM
- Microsoft
- Chevrolet
- Audi
- Tata Consultancy Services
- BOSCH
- Eosoft
- Valeo
Hungary – Installed Engineering Talent Pool Analysis

26K
Installed Technology Talent Pool

- Mechanical Engineer: 9.5K
- Embedded Engineer: 2.2K
- Data Science/ML: 800
- Analytics/BI/Big data: 2K
- Web/Mobile App development: 11.5K

Engineering Talent Analysis Across Verticals

- Computer Software/IT: 56%
- Automotive: 19%
- Telecommunication: 14%
- Industrial: 10%
- Semiconductor: 1%

Most common technology roles in Czech Republic

- Software Developer
- Application Developer
- Software Engineer
- Mechanical Engineer
- CAD Engineer
- Front-End Developer
- Mechanical design engineer
- Database Specialist
- Data Scientist
- Automotive Engineer
- Data Engineer
- System Programmer
- Back-End Developer
- Software Testing Architect
- System Engineer
- IT Architect

Note: DRAUP’s proprietary talent module was used to analyse jobs by skill type.
<table>
<thead>
<tr>
<th>Top Employers</th>
<th>Total Talent Headcount (Top 5) : ~12K</th>
<th>Mechanical Engineer</th>
<th>Embedded Engineer</th>
<th>Data Science/ML</th>
<th>Analytics/BI/Big Data</th>
<th>Web/Mobile App development</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM</td>
<td>~4000</td>
<td>31%</td>
<td>7%</td>
<td>2%</td>
<td>8%</td>
<td>52%</td>
</tr>
<tr>
<td>Telekom HU</td>
<td>~2500</td>
<td>42%</td>
<td>6%</td>
<td>3%</td>
<td>7%</td>
<td>43%</td>
</tr>
<tr>
<td>Vodafone</td>
<td>~2500</td>
<td>64%</td>
<td>11%</td>
<td>1%</td>
<td>3%</td>
<td>20%</td>
</tr>
<tr>
<td>Nokia</td>
<td>~2000</td>
<td>12%</td>
<td>11%</td>
<td>3%</td>
<td>10%</td>
<td>65%</td>
</tr>
<tr>
<td>Morgan Stanley</td>
<td>~2000</td>
<td>14%</td>
<td>6%</td>
<td>9%</td>
<td>14%</td>
<td>58%</td>
</tr>
</tbody>
</table>

Note: DRAUP’s proprietary talent module was used to analyse talents by skill type/Roles
## Peer Employer Dashboard: Automotive Industry

<table>
<thead>
<tr>
<th>Company</th>
<th>Headcount</th>
<th>Key Titles</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
</table>
| Continental   | 1000 – 1200 | • Mechanical Engineer  
• CAD Engineer  
• Mechanical Design Engineer  
• CFD specialist | • Design optimisation in terms of filling and cooling behaviour of the product  
• Support Prototype department by giving moulding parameters  
• Create 3D models, 2D drawings according to internal, customer requirements, guidelines and results of cooperation with EE, IE Teams | ~17K                    |
| Bosch Hungary | 1000 – 1200 | • Design Engineer  
• Mechanical Engineer  
• Mechanical Design Engineer  
• Automotive Engineer | • Simulations and analysis of engine control units regarding to the thermal and fluid mechanics domains, pre-processing, CAD modelling, geometry clean-up, evaluation and presentation of the results  
• 3D design, drawing, analytic calculation, programming in electric powered steering system | ~15K                    |
| Audi          | 700 – 800  | • Mechanical Engineer  
• Design Engineer  
• CFD simulation engineer  
• FEA Engineer | • Assist to create flexible car body cells for small series models  
• FEM simulation for adapters of robot tools  
• Fixture and subsidiary devices constructor to car-body lines  
• Robot grips and tool adapters designing | ~16K                    |
| Valeo         | 300 – 400  | • Design Engineer  
• Mechanical design engineer  
• CAD Design Engineer | • Design of moulded plastic and stamped metal parts (found in car dashboard or engine compartment)  
• Creating 3D models according to customer requirements, and package space restrictions  
• Creating technical drawings derived from the designed 3D data, tolerance analysis, and key customer characteristics defined in the SPPC | ~14K                    |

Note: DRAUP's proprietary talent module was used to analyse jobs by top companies and skill type.
## Peer Employer Dashboard: Software/Internet

<table>
<thead>
<tr>
<th>Company</th>
<th>Headcount</th>
<th>Key Titles</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
</table>
| **IBM**         | 2500 – 3000 | • Software Developer  
• Information Technology Architect  
• Software Engineer  
• Data Scientist  
• Data Engineer | • Developing integration solutions and services.  
• Creating and maintaining Functional Specifications, Release Notes, Production Implementation Plans, Unit & Integration Test Plans  
• Uses knowledge of web technologies to lead projects resulting in functional enhancements of web-based applications | ~19K                    |
| **EPAM Systems**| 1400 – 1500 | • Software Developer  
• Software Engineer  
• Front-End developer | • Develop multiple middle layer services on Node.js.  
• Development and maintenance of a web application which is based on AngularJS written in TypeScript  
• Develop websites for the financial sector  
• Develop and support an infrastructure for clickstream data collection and analysis. | ~20K                    |
| **TCS**         | 1200 – 1500 | • Software Engineer  
• Software developer  
• IT Analyst  
• System Engineer  
• System Software Engineer | • Presenting ideas for system improvements, including cost proposals  
• Produce detailed specifications and writing the program codes  
• Test the product in controlled, real situations before going live  
• Preparation of training manuals for users  
• Understanding business and technology needs and Design, analyze and implement efficient IT systems | ~23K                    |
| **Microsoft**   | 300 – 400  | • Software Developer  
• Database Specialist  
• Software Development Engineer  
• Software Testing Architect  
• Application developer | • Develop design environment for Dynamics AX  
• Creating the tools relying on generative programming concepts for the design, NAV design time environment (C/SIDE), the C/AL compiler and build database in SQL | ~18K                    |

*Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.*
Hungary: Peer Employer extended list for technology talent pool

<table>
<thead>
<tr>
<th>Software/Internet</th>
<th>Automotive</th>
<th>Industrial Automation</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prezi</td>
<td>Hyundai MOBIS</td>
<td>Cognex Corporation</td>
<td>GRANIT Bank</td>
</tr>
<tr>
<td>Dorsum</td>
<td>Festo</td>
<td>TURCK Hungary Kft</td>
<td>European Central Bank</td>
</tr>
<tr>
<td>Almotive</td>
<td>Hovány Kft</td>
<td>OnRobot</td>
<td>Barion</td>
</tr>
<tr>
<td>Attrecto Next Tech Digital Solutions</td>
<td>Citroën Magyarország</td>
<td>KUKA Robotics</td>
<td>Budapest Bank Zrt</td>
</tr>
<tr>
<td>GRAPHSOFT</td>
<td>Michelin</td>
<td>wenglor sensoric GmbH</td>
<td>OTP Bank</td>
</tr>
<tr>
<td>IT Services Hungary Kft</td>
<td>Magyar Suzuki Zrt</td>
<td></td>
<td>Invitel</td>
</tr>
<tr>
<td>OptiMonk</td>
<td>Opel</td>
<td>BorgWarner Inc.</td>
<td>Deutsche Telekom</td>
</tr>
<tr>
<td>Banzai Cloud</td>
<td>Daimler</td>
<td>Mazda</td>
<td>Ericsson</td>
</tr>
<tr>
<td>Grape Solutions Plc</td>
<td>Ford</td>
<td>Duna Autó Zrt</td>
<td>Magyar Telekom</td>
</tr>
<tr>
<td>Hiflylabs</td>
<td>Rába Automotive Holding Plc</td>
<td></td>
<td>Türk Telekom International</td>
</tr>
<tr>
<td>GRAPHSOFT</td>
<td>Mercedes-Benz Hungária Kft</td>
<td></td>
<td>Antenna Hungária Zrt</td>
</tr>
<tr>
<td>IdomSoft Zrt.</td>
<td>Duna Autó Zrt</td>
<td></td>
<td>Digi</td>
</tr>
<tr>
<td>Tresorit</td>
<td></td>
<td></td>
<td>UPC Magyarország Kft</td>
</tr>
<tr>
<td>Indivizo</td>
<td></td>
<td></td>
<td>Telenor</td>
</tr>
<tr>
<td>Bene Studio</td>
<td></td>
<td></td>
<td>Semilab Zrt</td>
</tr>
<tr>
<td>Areus Infocommunication Plc</td>
<td></td>
<td></td>
<td>NXP Semiconductors</td>
</tr>
<tr>
<td>KingSol Ltd.</td>
<td></td>
<td></td>
<td>Microchip Technology Inc.</td>
</tr>
<tr>
<td>BIG FISH Internet-technology Ltd</td>
<td></td>
<td></td>
<td>STMicroelectronics</td>
</tr>
<tr>
<td>BlackBelt Technology Kft</td>
<td></td>
<td></td>
<td>Nexperia</td>
</tr>
<tr>
<td>Asura Technologies Ltd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aliz</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: DRAUP's proprietary talent module was used to analyse jobs by top companies and skill type
Talent cost by roles: Data Science/Machine learning is the highest paid roles in Hungary

Note: Salaries mentioned above are median salaries of roles clustered in particular domains
Note: DRAUP's Talent Simulation Module analysed cost across job profiles
### Start-ups- Czech Republic:
Top tech start-ups have high focus on building Cyber Security solutions, Developer Platform, MI/AL, Big Data platforms

<table>
<thead>
<tr>
<th>Key Start-ups</th>
<th>Workload</th>
<th>Funding</th>
<th>Headcount</th>
<th>Key profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Almotive</strong></td>
<td>provider of camera-first, AI-powered, Level 5 self-driving technology engineered to answer all the challenges of autonomous mobility, powered by advanced artificial intelligence, simulation technology, and supporting hardware architectures</td>
<td>$47.5M</td>
<td>100+</td>
<td>Computer Vision Research Engineer, Software Developer</td>
</tr>
<tr>
<td><strong>Bitrise</strong></td>
<td>Provides platform for mobile app development which automate your daily app development tasks from building through testing to deployment</td>
<td>$3.5M</td>
<td>30+</td>
<td>Software Developer, Tooling Engineer, Backend Engineer</td>
</tr>
<tr>
<td><strong>Cellum Group</strong></td>
<td>Mobile wallet provider with security standards, security solutions cover all areas of m-commerce, including mobile commerce and payments, as well as NFC (contactless) technologies</td>
<td>$14M</td>
<td>40+</td>
<td>Software Tester, Software Engineer, Software Developer</td>
</tr>
<tr>
<td><strong>Shapr3D</strong></td>
<td>Provide CAD designed specifically for iPad Pro which enables fast, easy, precise and compatible with any major CAD tool and developing 3D solid body modeling CAD application</td>
<td>$1.3M</td>
<td>15+</td>
<td>Software Developer, UX Designer, iOS Developer</td>
</tr>
</tbody>
</table>

**Total Start-Up Talent pool**: ~800

**Tech Startups**
- ~800
  - ~140 Cyber Security/Networking
  - ~80 ML/Al/Big Data
  - ~270 Open Source/Developer Platforms
  - ~310 Other Tech start-ups

**Note**: DRAUP’s Talent Simulation Module in Tel Aviv Based on Tech Startups
Hungarian higher education has a dual system with colleges and universities. According to the binary pattern, colleges and universities grant Főiskolai Oklevél (College-level Degree) and universities grant Egyetemi Oklevél (University-level Degree).

Central European University and International Business School are one among the English speaking Universities.

Hungarian Universities Offers 500+ courses in English, German, French and other languages.

Enrollment rate in higher education is ~48%.

Largest Universities in Hungary:
- University of Szeged
- Eötvös Loránd University
- University of Debrecen

Note: DRAUP’s Talent module analysed 40+ universities in Hungary to identify top universities and key courses.
Eötvös Loránd University: One of the oldest and largest public research university in Hungary focusing on Engineering and Technology related programs

### Top Rankings and Awards
- Ranked 1 in Best Global Universities in Hungary
- Ranked 212 in Best Global Universities in Europe

### Marquee Alumni
- Tamás Locsei, CEO at PwC Hungary
- David Kiss, CTO at Aimotive
- Csongor Fekete, CEO at Grape Solutions Plc

### Key Programs Offered

<table>
<thead>
<tr>
<th>Degree</th>
<th>Program</th>
</tr>
</thead>
</table>
| Bachelors | Computer Science  
  Computer/Software Engineering  
  Information Technology          |
| Masters | Computer Science  
  Computer Science for Autonomous System  
  Computational and Cognitive Neuroscience  
  Information Technology  
  Applied Mathematics  
  Computer Programming          |

### Featured Research
- ~10% of International Students
- Bachelor’s Program 38  
  Master’s Program 96  
  Joint degree Programs 3

### Alumni Profiles

#### PROFILE 1
- DESIGNATION: Mechanical engineer at Semilab Zrt
- Education: Bachelor’s degree at Eötvös Loránd University
- Current works: Develop detailed 3D models and drawings and bill of materials of automatic measurement tools. Personalize built-in workflows and create custom workflows, write users’ documentation and work methods, create system objects and work out 3D data migration methods

#### PROFILE 2
- DESIGNATION: Software Engineer at Morgan Stanley
- Education: Master’s degree in Computer Science at Eötvös Loránd University
- Current works: Develop distributed and versioned data storage services, data pipelines and workflows, Server side developments, Software architecture design, complex workflow designs and configurations

### Total Enrolment:
- 25K+ Undergraduates
- 15K+ Post Graduates
- 7K+ Doctorate’s
- 1K+ ~10% of International Students

Note: DRAUP’s Talent Module analysed 40+ Hungary universities to identify top universities, key courses and partnerships in Information Technology.
**University of Debrecen**: One of the oldest continuously operating institution of higher education focusing on Engineering and Technology related programs

<table>
<thead>
<tr>
<th>University of Debrecen</th>
<th>Key Programs Offered</th>
<th>Featured Research</th>
<th>Alumni Profiles</th>
</tr>
</thead>
</table>
| **Total Enrolment:** 24K+ | **Bachelors** | ~16% of international Students | PROFILE 1  
DESIGNATION: Mechanical Engineer at KUKA Robotics Hungária Kft |
| | • Computer Science  
• Computer Science Engineering  
• Electrical and Electronic Engineering  
• Mechanical Engineering  
• Mechatronics Engineering  
• Chemical Engineering | **Popular university in Hungary among international students** | Education: Bachelor’s degree at University of Debrecen  
**Current works**: Create 3D models, 2D drawings according to customer requirements, creating technical drawings derived from the designed 3D data, tolerance analysis, 3D design, drawing, analytic calculation, programming in electric powered steering system |
| | **Masters** | 40+ programs in English with all major scientific fields | PROFILE 2  
DESIGNATION: Software Tester at Wanari |
| | • Mechanical Engineering  
• Mechatronics Engineering  
• Computer Science Engineering | | Education: Master’s Degree at University of Debrecen  
**Current works**: Interpret and offering opinions of specifications, testing time prediction, client-server based manual testing, supporting of internal developmental processes, writing and verifying change logs, making manual test on customers’ user acceptance test database and noticing defects |
| | **Doctorate Programmes** | | |
| | • Mathematics and Computer Science  
• Informatics  
• Neuroscience | | |

**Top Rankings and Awards**
- Ranked 2 in Best Global Universities in Hungary
- Ranked 255 in Best Global Universities in Europe

**Marquee Alumni**
- Csaba Zajdó, CEO & Founder at Innonic
- József Cseh, Chief Technology Officer at Platio
- László Bodrogkőzi, CEO at Neuron Software Ltd

**Total Enrolment:** 24K+

**Education:** Bachelor’s degree at University of Debrecen  
**Current works**: Create 3D models, 2D drawings according to customer requirements, creating technical drawings derived from the designed 3D data, tolerance analysis, 3D design, drawing, analytic calculation, programming in electric powered steering system

**Current works**: Interpret and offering opinions of specifications, testing time prediction, client-server based manual testing, supporting of internal developmental processes, writing and verifying change logs, making manual test on customers’ user acceptance test database and noticing defects

**Note**: DRAUP’s Talent Module analysed 40+ Hungary universities to identify top universities, key courses and partnerships in Information Technology.
Romania
Romania – Market Trends

1. Information Technology & Communication development, Business Process Outsourcing and Shared Service Centre continues to outperform over R&D in Romania.

2. Bucharest is the largest start-up hub in the country with over 150 startups and the home of many tech companies and VC firms as well as universities focused on technology, engineering and software development.

3. 70+ industrial parks spread across Romania. These companies focus on technological innovations.

4. Technology is the primary growth driver. IT services sector is forecasted to reach EUR 6.3 billion by 2020.

5. Venture Capital investments witnessed a massive increase trigger driven by tech start-ups and tech companies.

6. Romania continues to be the hotspot for Embedded Software & Hardware talent in the Eastern Europe region.

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
Ease of doing business in Romania

- Romania offers a 150% super deduction for eligible R&D expenditure
- In light of the corporate income tax rate of 16%, the R&D tax incentive provides tax savings of 8% of the qualifying costs.
- Expenses eligible for the R&D incentives are the following:
  - Depreciation and rental expenses of new tangible and intangible fixed assets that are used by taxpayers in R&D activities
  - Salaries of personnel directly involved in R&D activities and related expenses
  - Maintenance and repair costs for tangible and intangible assets used for the R&D activities
  - Operating expenses, including expenses for contractor fees, costs of consumables, expenses for materials that are included in inventory, raw materials expenses, expenses for animals used in experiments, and similar products used in R&D activities

Corporate Tax Rate: 16%

Romania Ease of doing Business

<table>
<thead>
<tr>
<th>Year</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>37</td>
</tr>
<tr>
<td>2015</td>
<td>35</td>
</tr>
<tr>
<td>2016</td>
<td>36</td>
</tr>
<tr>
<td>2017</td>
<td>45</td>
</tr>
</tbody>
</table>

Ranking on doing Business topics - Romania

- Starting a Business: 64
- Dealing with Construction Permits: 150
- Getting Electricity: 147
- Registering Property: 45
- Getting Credit: 20
- Protecting Minority Investors: 57
- Paying Taxes: 42
- Trading across Borders: 1
- Enforcing Contracts: 17
- Resolving Insolvency: 51

Note: DRAUP's proprietary talent module was used to analyse jobs by top companies and skill type.
### Economic Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth rate</td>
<td>7%</td>
</tr>
<tr>
<td>Political stability index</td>
<td>0.27</td>
</tr>
<tr>
<td>Cost of living index</td>
<td>40.4</td>
</tr>
<tr>
<td>Unemployment rate (2017)</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

### Talent & Ecosystem Overview

**4.9 Million**

Total Working Population

**10K+**

Installed Fresh Talent Pool (STEM)

**3.5K+**

Startup Talent Pool (Tech Startups)

### Top Universities

- University of Bucharest
- Babes-Bolyai University
- Alexandru Ioan Cuza University

### Notable Start-ups

- UiPath
- Zitec
- dcs plus

### Major Talent Hotspots

- Cluj
- Bucharest
- Timisoara
- Lasi

### Product Companies

- Continental
- Renault
- KELP
- Autoliv
- ORACLE

### Service Providers

- accenture
- SAP
- Capgemini
- IQUEST

---

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
Installed Talent Pool Analysis

**73K+**
Installed Technology Talent Pool

- **Mechanical Engineer**: 18K
- **Embedded Engineer**: 28.5K
- **Data Science/Al/ML**: 1.7K
- **BI/Analytics/Big Data**: 2.85K
- **Web/Mobile App Development**: 22K

**Most common technology roles in Romania**
- Design Engineer
- BigData Analyst
- Mechanical Engineer
- Java Developer
- Automation Engineer
- Application Developer
- Welding Engineer
- Software Testing
- Structural Engineer
- Machine Learning Engineer
- Software Developer
- Full Stack Developer
- Software Architect
- Front End Developer

### Engineering Talent Analysis Across Verticals

- **S/W & Internet**: 65%
- **Automotive**: 15%
- **Industrial**: 10%
- **Telecom**: 9%
- **Semiconductor**: 1%

### Median talent pool by experience levels (years)

<table>
<thead>
<tr>
<th>Roles</th>
<th>0-5</th>
<th>6-10</th>
<th>10+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineer</td>
<td>5600</td>
<td>5500</td>
<td>6900</td>
<td>18000</td>
</tr>
<tr>
<td>Embedded Engineer</td>
<td>11000</td>
<td>8000</td>
<td>9500</td>
<td>28500</td>
</tr>
<tr>
<td>Data Science / ML</td>
<td>850</td>
<td>525</td>
<td>325</td>
<td>1700</td>
</tr>
<tr>
<td>Analytics/ BI/ BigData</td>
<td>1300</td>
<td>900</td>
<td>650</td>
<td>2850</td>
</tr>
<tr>
<td>Web/Mobile App development</td>
<td>11000</td>
<td>6500</td>
<td>4500</td>
<td>22000</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>29750</td>
<td>21425</td>
<td>21875</td>
<td>73050</td>
</tr>
</tbody>
</table>

*Note: DRAUP’s proprietary talent module was used to analyse jobs by skill type*
### Romania: Top 5 employer analysis for Tech talent

<table>
<thead>
<tr>
<th>Top Employers</th>
<th>Total Talent Headcount (Top 5)</th>
<th>Mechanical Engineer</th>
<th>Embedded Engineer</th>
<th>Data Science/AI/ML</th>
<th>BI/Analytics/Big Data</th>
<th>Web/Mobile App Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental</td>
<td>~3300</td>
<td>17%</td>
<td>51%</td>
<td>2%</td>
<td>2%</td>
<td>29%</td>
</tr>
<tr>
<td>Endava</td>
<td>~1500</td>
<td>2%</td>
<td>28%</td>
<td>6%</td>
<td>8%</td>
<td>57%</td>
</tr>
<tr>
<td>Luxoft</td>
<td>~1000</td>
<td>1%</td>
<td>39%</td>
<td>5%</td>
<td>5%</td>
<td>50%</td>
</tr>
<tr>
<td>IBM</td>
<td>~1100</td>
<td>5%</td>
<td>30%</td>
<td>4%</td>
<td>8%</td>
<td>53%</td>
</tr>
<tr>
<td>Oracle</td>
<td>~800</td>
<td>5%</td>
<td>54%</td>
<td>4%</td>
<td>4%</td>
<td>33%</td>
</tr>
</tbody>
</table>

**Note:** DRAUP’s Talent Simulation Module
<table>
<thead>
<tr>
<th>Company</th>
<th>Key Titles</th>
<th>Headcount</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental</td>
<td>• Mechanical and Simulation Engineer</td>
<td>250-300</td>
<td>• Design of cluster instruments and central displays. Concept creation/definition (quotations) and Tolerance calculations&lt;br&gt;• Design of mechanical assemblies and components ensuring success of the organization&lt;br&gt;• Ensuring optimal robustness of designs meeting all customer product durability requirements</td>
<td>~24K</td>
</tr>
<tr>
<td></td>
<td>• Mechanical Design Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• CAD Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RENAULT</td>
<td>• Design/ R&amp;D Gearbox Engineer</td>
<td>125-150</td>
<td>• Assure the design of product/process and specification of parts/sub-assemblies or mechanical organs of kinematic perimeter chains/gearbox&lt;br&gt;• Design of BIW parts using Catia V6 for the safety regulations, QCD, standards, type sections, and Renault technical rules&lt;br&gt;• Making, checking and modifying the Sections-Type in different zones of the superstructure in CATIA V5 and Enovia V6</td>
<td>~33K</td>
</tr>
<tr>
<td></td>
<td>• CAD Design Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Body Design Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Autoliv</td>
<td>• Product Engineer</td>
<td>100-125</td>
<td>• Part development (roof component) 3D model and drawing and involvement in DFA (Design for Assembly) sessions&lt;br&gt;• Introduction of composite materials and technologies in the production process of steering wheels&lt;br&gt;• Calibrating and solving problems of Polyurethane RIM injection of steering wheels</td>
<td>~40K</td>
</tr>
<tr>
<td></td>
<td>• Innovation Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Process Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DELPHI</td>
<td>• Manufacturing Engineer</td>
<td>40-50</td>
<td>• Develop and improve machining strategies using CNC macro programming, tooling and fixtures&lt;br&gt;• Support manufacturing team and resolving technical problems that appears in the production process</td>
<td>~38K</td>
</tr>
<tr>
<td></td>
<td>• Mechanical Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>JAGUAR</td>
<td>• CAD Design Engineer</td>
<td>30-40</td>
<td>• Analyse and propose concepts/solutions using CATIA V5/V6 (Enovia)&lt;br&gt;• Manufacturing of Body Engineering - Exterior Systems - Active grille controller&lt;br&gt;• Design of Steering Systems and Chassis in the car</td>
<td>~41K</td>
</tr>
<tr>
<td></td>
<td>• Project Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lead Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
# Peer Employer Dashboard: Software

<table>
<thead>
<tr>
<th>Company</th>
<th>Key Titles</th>
<th>Headcount</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
</table>
| IBM         | • Java Application Developer  
             • Software Developer  
             • Web Developer                                           | 125-150   | • Design, development, testing of new functionalities and hot-fixes (unit testing)  
                                                                                     • Design and develop high-volume, low-latency applications, delivering high-availability and performance  
                                                                                     • Write maintainable, testable, efficient code                                                                 | ~27K                   |
| Luxoft      | • IT Developer  
             • Full Stack Developer  
             • Embedded Software Engineer                               | 125-150   | • Designing, developing, testing and documenting reporting systems for equity derivatives, both back-end and web-based applications  
                                                                                     • Porting the Cambium code to new hardware platforms, getting the cnSwitching feature set working on this new hardware  
                                                                                     • Redesigning/enhancing software modules within the ERS code                                                                 | ~22K                   |
| endava      | • Software Developer  
             • Full Stack Application Engineer  
             • Java Technical Lead                                     | 200-225   | • Develop and maintain software applications for not crashing, to design diagrams for projects, test the application  
                                                                                     • Implement new functionalities required by the business and fix the defects  
                                                                                     • Work closely with the development team to define and implement technical solutions                                                                 | ~28K                   |
| Softvision  | • Big Data Engineer  
             • Java Developer                                                | 300-325   | • Develop a solution that helps prevention and monitoring of biological threads  
                                                                                     • Design, build, and maintain efficient, reusable, and reliable Java code  
                                                                                     • Identify bottlenecks and bugs, and devise solutions to these problem                                                                 | ~33K                   |
| Pentalog    | • Application Engineer  
             • Full Stack Developer  
             • Front-end Developer                                       | 90-100    | • Automated application recovery, dynamic scaling, monitoring and anomaly detection  
                                                                                     • Developing enterprise grade software using: JavaScript, ES6, Webpack, React  
                                                                                     • Developed custom solutions for various clients using HTML, CSS, JavaScript                                                                 | ~24K                   |

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
## Romania: Peer Employer extended list for engineering talent pool

<table>
<thead>
<tr>
<th>Software/Internet</th>
<th>Automotive</th>
<th>Semiconductors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continental</td>
<td>Delphi</td>
<td>Emerson Automation Solutions</td>
</tr>
<tr>
<td>IBM</td>
<td>Groupe Renault</td>
<td>SEGULA Technologies</td>
</tr>
<tr>
<td>Endava</td>
<td>Autoliv</td>
<td>Schaeffler</td>
</tr>
<tr>
<td>Luxoft</td>
<td>Assystem</td>
<td>Emerson</td>
</tr>
<tr>
<td>Oracle</td>
<td>Jaguar Land Rover</td>
<td>Honeywell</td>
</tr>
<tr>
<td>Softvision</td>
<td>Magnetic Marelli</td>
<td></td>
</tr>
<tr>
<td>Pentalog</td>
<td>Bosch Group Romania</td>
<td></td>
</tr>
<tr>
<td>Evozon</td>
<td>Veoneer</td>
<td></td>
</tr>
<tr>
<td>EMAG</td>
<td>DRAAXLMAIER Group</td>
<td></td>
</tr>
<tr>
<td>ING</td>
<td>Porsche Engineering</td>
<td></td>
</tr>
<tr>
<td>Deutsche Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HELLA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bitdefender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accesa.eu</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Telecom</strong></td>
<td><strong>Semiconductors</strong></td>
<td></td>
</tr>
<tr>
<td>Ericsson</td>
<td>Emerson Automation Solutions</td>
<td></td>
</tr>
<tr>
<td>Nokia</td>
<td>SEGULA Technologies</td>
<td></td>
</tr>
<tr>
<td>Vodafone</td>
<td>Schaeffler</td>
<td></td>
</tr>
<tr>
<td>Huawei Technologies</td>
<td>Emerson</td>
<td></td>
</tr>
<tr>
<td>Telekom Romania</td>
<td>Honeywell</td>
<td></td>
</tr>
</tbody>
</table>

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
Average salary across engineering roles

Note: Salaries mentioned above are median salaries of roles clustered in particular domains
Note: DRAUP's Talent Simulation Module analysed cost across job profiles

Mechanical Engineer: $37,000
Embedded Engineer: $28,000
Data Science/ML: $45,000
Analytics/BI/BigData: $26,000
Web/Mobile App development: $25,000

Average Salary in Romania: $32,000
Start-ups - Romania: Top tech start-ups have high focus on building software, web development, cloud computing and Big Data.

### Total Start-Up Talent pool

- **Tech Startups**: ~700
- **Software**: ~120
- **Web Development**: ~60
- **Cloud Computing**: ~35
- **Big Data**: ~25
- **Hardware**: ~15
- **Semiconductor**: ~5

### Key Start-ups

<table>
<thead>
<tr>
<th>Software</th>
<th>Workload</th>
<th>Headcount</th>
<th>Key profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="#">hubgets</a></td>
<td>Team communication and collaboration app that helps people communicate and grow together</td>
<td>100+</td>
<td>Software Engineer, Account Specialist</td>
</tr>
<tr>
<td>Web Development</td>
<td>Glue Engine has the easiest editor layout designed especially for developers and regular users that really want to focus on the game mechanics and not dealing with complicated engine design</td>
<td>50+</td>
<td>Web Developer, 2D/3D Designer</td>
</tr>
<tr>
<td>Cloud Computing</td>
<td>Automated conversion rate optimization system, Automated e-mail integrations, KPI tracking system</td>
<td>50+</td>
<td>SaaS/PaaS Engineer</td>
</tr>
<tr>
<td>Big Data</td>
<td>Splinter.me allows professionals to showcase their profile (interests, skills, experience, personality) for work opportunities in an easy way</td>
<td>50+</td>
<td>Big Data Analyst</td>
</tr>
</tbody>
</table>

---

Note: DRAUP's Talent Simulation Module in Romania Based on Tech Startups
### Universities: 75+ universities have their footprint in and around Romania out of which ~50 universities were public institutions

<table>
<thead>
<tr>
<th>Romania Universities’ Landscape</th>
<th>Romania Courses Adoption (Top 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colleges and Universities in Romania</td>
<td>~75</td>
</tr>
<tr>
<td>Total Graduates (Across All Courses In Romania)</td>
<td>~152K</td>
</tr>
</tbody>
</table>

#### Largest Universities in Romania
- University Babes-Bolyai
- University of Bucharest
- Transilvania University of Brasov

#### Note:
DRAUP’s Talent module analysed 50+ in Romania to identify top universities and key courses

- ~408,000 students were enrolled in universities in Romania in the 2017–2018 academic year, according to data from the National Statistics Institute
- Among the universities in Romania, the top 3 universities collectively enrol ~15 - 20% of the total student population
- 24.8% of the graduates and enrolments were in STEM courses
- Bucharest is known as the home of some of the biggest universities in Romania which has most prominent universities like:
  - Babeș Bolyai
  - University of Cluj-Napoca
  - Alexandru Ioan Cuza
Transilvania University of Brasov: one of 44 universities included in U-Multirank for Romania comparing 95 countries worldwide

### Key Programs Offered

<table>
<thead>
<tr>
<th>BACHELOR’S DEGREE</th>
<th>Featured Research</th>
</tr>
</thead>
</table>
| • Mechanical Engineering  
• Product Design Engineering  
• Mechatronics  
• Robotics  
• Aerospace Engineering  
• Computers and Information Technology  
• Electrical Engineering and Computers  
• Traffic and Transport Engineering | Offers ~50 Engineering Bachelor’s full – time degree courses |

<table>
<thead>
<tr>
<th>MASTER’S DEGREE</th>
<th>Key Alumni Profiles</th>
</tr>
</thead>
</table>
| • Mechatronic Systems for Industry and Medicine  
• Computer Science for Virtual Environments  
• Innovative Manufacturing Engineering  
• Welding Engineering of Advanced Materials  
• Electronics and Communications Integrated Systems  
• Advanced Systems in Automation and Information Technologies  
• Sustainable Product Design and Environment | PROFILE 1  
**DESIGNATION:** Mechanical Design Engineer, Simultec  
**Education:** Design and Management of Manufacturing Technologies at Transilvania University Of Brasov, Doctor of Engineering Field Of Study Contributions to technology and equipment of abrasive water jet cutting at University POLITEHNICA of Bucharest  
**Current Works:** Design of product, follow-up manufacturing, assembly & testing |

PROFILE 2  
**DESIGNATION:** General Manager, Elcon Systems SRL  
**Education:** National College Andrei Saguna, Engineer’s Degree Field Of Study Electrical and Electronics Engineering at Transilvania University Of Brasov  
**Current works:** Managing Industrial Automation Control Solution and Control Equipment  
**Previous Works:** CEO at KT ELECTRONICS&AUTOMATICS SRL

### Top Rankings and Awards

- Ranked 7th by the UniRank among the universities in Romania

### Marquee Alumni

- ROXANA BLAGOI, Chief Executive Officer at Wind Technologies

### Total Enrolment

- ~19,000

### On Time Graduation rate

- ~78%

### Peer Companies

- Start-ups
- Universities

Note: DRAUP’s Talent Module analysed 20+ Romania based universities to identify top universities, key courses and partnerships in Information Technology.
University Babes-Bolyai: was ranked the best Romanian university in the national metaranking of the Ministry of Education and Research

<table>
<thead>
<tr>
<th>Key Programs Offered</th>
<th>Featured Research</th>
<th>Key Alumni Profiles</th>
</tr>
</thead>
</table>
| **BACHELOR’S DEGREE** • Chemistry and Chemical Engineering • Mathematics and Computer Science • Physics | Offers ~20 Bachelor’s full – time degree courses | **PROFILE 1**
**DESIGNATION:** President and JS Animator at SpringTech
Education: Computer Science at Babes-Bolyai University
Current Works: Responsible for web development, design, and animation
Previous Works: Senior JavaScript Developer at Wayfare, Senior Frontend Developer at Scout Idea Ranch |
| **MASTER’S DEGREE** • Chemistry and Chemical Engineering • Mathematics and Applied Mathematics • Computer Science • Physics | Undergraduate Enrolment ~11,000 | **PROFILE 2**
**DESIGNATION:** Chief Technical Officer at Around25
Education: BS Computer Science and MS Information Technology at Babes-Bolyai University
Current works: Responsible for providing engineering assistance and researching new frameworks and technologies
Previous Works: Co-Founder of CleverWash |
| **DOCTORATE DEGREE** • Cybernetics • Chemistry • Computer Science • Chemical Engineering | Graduate Enrolment ~4,000 | |

Note: DRAUP’s Talent Module analysed 20+ Romania based universities to identify top universities, key courses and partnerships in Information Technology.
Poland
Poland Business Market Overview

R&D and ITO installed talent is continuously growing in sectors such as automotive, telecom, healthcare, embedded software. Talent is spread across multiple cities.

The largest share of jobs in this sector is generated by BFSI shared services centers, followed by IT centers, outsourcing centers and R&D centers.

IT, finance and accounting roles created approximately 50% of the jobs.

Accelerating in EU backed projects will drive the growth of technology adoption across various industries in Poland. The country also has the highest technology and engineering talent in Eastern Europe.

Warsaw has the largest talent pool and is the biggest hub for global technology companies in Eastern Europe despite being the most expensive city in Poland.
Ease of doing Business in Poland

- Poland offers grants from both national and EU funds.
- The government grants up to 10% of the purchase price of fixed assets or up to EUR 3.9K per one newly created work place.
- R&D centres located in special economic zones (SEZ) may qualify for a tax exemption capped at 50% (10% to 30% for those located otherwise) of 2 years of labor costs or eligible capital expenditure.
- A company can deduct from its tax base up to 50% of expenditure incurred for the acquisition of new technology in the form of intangible assets, such as proprietary rights, licenses, rights under patents or utility models, know-how, that result in the improvement of existing products/services. If losses are incurred, tax deduction may be used during the subsequent three tax years.
- Poland is developing programs to finance R&D using EU funds during the period of 2014–2020. It will remain the largest beneficiary of EU funds with approximately €10B purely for R&D.

Corporate Tax Rate: 19%

Ease of doing Business Rankings

- 2014: 28
- 2015: 25
- 2016: 24
- 2017: 27

Rankings on doing Business topics - Poland

- Starting a Business: 110
- Dealing with Construction Permits: 41
- Getting Electricity: 54
- Registering Property: 38
- Getting Credit: 29
- Protecting Minority Investors: 51
- Getting Taxes: 51
- Trading across Borders: 1
- Enforcing Contracts: 55
- Resolving Insolvency: 22
Poland – Economic and Talent Indicator

Economic Indicators

- **GDP growth rate**: 4.55%
- **Political stability index**: 0.51
- **Cost of living index**: 40.09
- **Unemployment rate (2017)**: 4.4%

Talent & Ecosystem Overview

- **16.5 Million**
  Total Working Population

- **3K+**
  Installed Fresh Talent Pool (STEM)

- **5K+**
  Startup Talent Pool (Tech Startups)

Top Universities

- University of Warsaw
- Jagiellonian University
- AGH University of Science & Technology

Notable Start-ups

- UXPin
- MDB
- Ideone

Major Talent Hotspots

- Warsaw
- Krakow
- Lodz
- Wroclaw

Ease Of Doing Business

Global Ranking

- **27**

Product Companies

- ABB
- Samsung Electronics
- Motorola Solutions
- Nokia
- Credit Suisse

Service Providers

- Accenture
- Capgemini
- Infosys
- Atos
Installed Talent Pool Analysis

Most common technology roles in Poland

<table>
<thead>
<tr>
<th>Role</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design Engineer</td>
<td></td>
</tr>
<tr>
<td>BigData Analyst</td>
<td></td>
</tr>
<tr>
<td>Mechanical Engineer</td>
<td></td>
</tr>
<tr>
<td>Java Developer</td>
<td></td>
</tr>
<tr>
<td>Automation Engineer</td>
<td></td>
</tr>
<tr>
<td>Application Developer</td>
<td></td>
</tr>
<tr>
<td>Welding Engineer</td>
<td></td>
</tr>
<tr>
<td>Software Testing</td>
<td></td>
</tr>
<tr>
<td>Structural Engineer</td>
<td></td>
</tr>
<tr>
<td>Machine Learning Engineer</td>
<td></td>
</tr>
<tr>
<td>Software Developer</td>
<td></td>
</tr>
<tr>
<td>Full Stack Developer</td>
<td></td>
</tr>
<tr>
<td>Software Architect</td>
<td></td>
</tr>
<tr>
<td>Front End Developer</td>
<td></td>
</tr>
</tbody>
</table>

Note: DRAUP’s proprietary talent module was used to analyse jobs by skill type

### Engineering Talent Analysis Across Verticals

<table>
<thead>
<tr>
<th>Role</th>
<th>Median talent pool by experience levels (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-5</td>
</tr>
<tr>
<td>Mechanical Engineer</td>
<td>9600</td>
</tr>
<tr>
<td>Embedded Engineer</td>
<td>1800</td>
</tr>
<tr>
<td>Data Science/ML</td>
<td>1500</td>
</tr>
<tr>
<td>Analytics/BI/BigData</td>
<td>4200</td>
</tr>
<tr>
<td>Web/Mobile App development</td>
<td>3100</td>
</tr>
<tr>
<td>Overall</td>
<td>48,100</td>
</tr>
</tbody>
</table>

### Installed Talent Pool
- Mechanical Engineer: 23.5K
- Embedded Engineer: 6K
- Data Science/AI/ML: 2.75K
- BI/Analytics/Big Data: 9K
- Web/Mobile App Development: 57K

### Note:
DRAUP’s proprietary talent module was used to analyse jobs by skill type.
Poland: Top 5 employer analysis for Tech talent

<table>
<thead>
<tr>
<th>Top Employers</th>
<th>Mechanical Engineer (5%)</th>
<th>Embedded Engineer (4%)</th>
<th>Data Science/AI/ML (2%)</th>
<th>BI/Analytics/Big Data (8%)</th>
<th>Web/Mobile App Development (81%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMARCH</td>
<td>~1700</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>~1400</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBM</td>
<td>~1000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPAM</td>
<td>~900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LUXOFT</td>
<td>~900</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: DRAUP's Talent Simulation Module
# Peer Employer Dashboard: Automotive Industry

## Poland

<table>
<thead>
<tr>
<th>Company</th>
<th>Key Titles</th>
<th>Headcounts</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valeo</td>
<td>• FEA Simulation Engineer&lt;br&gt;• Process Development Engineer</td>
<td>80-100</td>
<td>• Coordinating, updating (FMEA, Flow Chart) and developing the design and construction of the machine&lt;br&gt;• Optimization of components based on calculation results and in cooperation with other departments</td>
<td>~30K</td>
</tr>
<tr>
<td>ZF</td>
<td>• Manufacturing Engineer&lt;br&gt;• Design Engineer&lt;br&gt;• Product Engineer</td>
<td>50-75</td>
<td>• Development, completion and archiving of technical and technological documentation aimed at ensuring product compliance with requirements&lt;br&gt;• Designing plastic elements of seatbelt retractors (mechanical sensors) and Stack up dimension tolerances analysis&lt;br&gt;• organize prototypes and tests, analyse product, fulfil customer (Daimler, Audi, Ford, Fiat) requirements and prepare reports after tests</td>
<td>~35K</td>
</tr>
<tr>
<td>BWI</td>
<td>• CAE Engineer&lt;br&gt;• Product Engineer&lt;br&gt;• Manufacturing Engineer</td>
<td>50-75</td>
<td>• Check the strength and fatigue analyses of welded joints and bolted joints&lt;br&gt;• Supporting prototype phase and implementation new valves settings into serial production for various plants&lt;br&gt;• Create process documentation: PFD, PFMEA, Standard Cell, Control Plan, Work Instruction</td>
<td>~43K</td>
</tr>
<tr>
<td>WABCO</td>
<td>• Mechanical Design Engineer&lt;br&gt;• Vehicle Systems Test Engineer</td>
<td>50-75</td>
<td>• Calculations of structure using finite element method&lt;br&gt;• Creation and maintenance of technical documentation&lt;br&gt;• Creation of test cases and test specifications for public road test&lt;br&gt;• Conducting road tests on public roads and on special proving grounds</td>
<td>~35K</td>
</tr>
<tr>
<td>Faurecia</td>
<td>• Tool Engineer&lt;br&gt;• Design Engineer&lt;br&gt;• Engineer Chassis Suspension</td>
<td>50-75</td>
<td>• Thermoforming, cutting, welding, foaming of the tools and injection of the moulding tools&lt;br&gt;• Creating ideas for new designs and for cost reduction project&lt;br&gt;• Creating and maintaining documentation, taking on technical and design responsibility</td>
<td>~32K</td>
</tr>
</tbody>
</table>

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
<table>
<thead>
<tr>
<th>Company</th>
<th>Key Titles</th>
<th>Headcounts</th>
<th>Job Overview</th>
<th>Average Salary (in USD)</th>
</tr>
</thead>
</table>
| **COMARCH** | • Android Developer  
• Java Developer  
• Scala/ Big Data Developer | 700-750    | • Developing native Android applications with Oracle Apex as webservices  
• Implementing the parts of large application in TELCO area  
• Optimization of fast processing big amount of data using the Technologies: Cloudera, Hadoop, Apache Flume, Java, Bash-Scripting | ~15K                   |
| **bluesoft**  | • Software Developer  
• Full Stack Developer  
• Java Developer | 100-125    | • Designing and developing REST APIs Documenting software specifications and requirements  
• Creation and development of four mobile applications (Java Android)  
• Gain proficiency with current Self-service, Automation and Master Data Applications | ~23K                   |
| **Sabre**    | • Software Engineer  
• Java Web Developer  
• Senior Scrum Master | 150-175    | • Develop scalable, fast, robust, and simple web-based solutions to tackle complex business problems  
• Developing high quality code to achieve sprint goals and implementing test cases  
• Design, development, debugging and maintenance of software components using the Java/JEE, | 24K                    |
| **epam**     | • Big Data Developer  
• Software Test Automation Engineer | 100-125    | • Migration of old java application to new Scala, Spark application  
• Investigation of old and new models implementation, implementation and deploying of new models using Scala, Spark. Introducing of code review process | ~26K                   |
| **LUXOFT**   | • Software Engineer  
• IOS Developer | 125-150    | • Design, code and debug Java code, write developer tests and use continuous integration practices to productize business needs  
• Full development of app: general API architecture, iOS architecture, iOS coding in swift | ~25K                   |

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type.
Poland: Peer Employer extended list for engineering talent pool

<table>
<thead>
<tr>
<th>Software and Internet</th>
<th>Semiconductors</th>
<th>Automotive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comarch</td>
<td>Intel</td>
<td>Valeo</td>
</tr>
<tr>
<td>Ericsson</td>
<td>Synopsys</td>
<td>ZF Group</td>
</tr>
<tr>
<td>Sabre Corporation</td>
<td>Cadence Design Systems</td>
<td>Faurecia</td>
</tr>
<tr>
<td>EPAM Systems</td>
<td>DisplayLink</td>
<td>Autoliv</td>
</tr>
<tr>
<td>Luxoft</td>
<td>Silicon Creations</td>
<td>WABCO</td>
</tr>
<tr>
<td>BlueSoft</td>
<td>Imagination Technologies</td>
<td>BWI Group</td>
</tr>
<tr>
<td><strong>Telecom</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nokia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motorola Solutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orange Polska</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADVA Optical Networking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Samsung Electronics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: DRAUP’s proprietary talent module was used to analyse jobs by top companies and skill type
Note: Salaries mentioned above are median salaries of roles clustered in particular domains
Note: DRAUP’s Talent Simulation Module analysed cost across job profiles
**Start-ups- Poland**: Top tech start-ups have high focus on IoT, Analytics, Robotics and 3D Printing

<table>
<thead>
<tr>
<th>Key Start-ups</th>
<th>Workload</th>
<th>Headcount</th>
<th>Key Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analytics</strong></td>
<td>PipesLab is a multi-purpose flow-base online platform including ETL, Big Data, financial analysis and statistics</td>
<td>~50</td>
<td>Data Analyst</td>
</tr>
<tr>
<td><strong>IoT</strong></td>
<td>Multi-level protection, authentication and verification of access to data and services, Data security and facilities (including access control, encryption, and geolocation)</td>
<td>~50</td>
<td>Software Tester Cybersecurity Specialist</td>
</tr>
<tr>
<td><strong>Cyberuslabs</strong></td>
<td>Research &amp; Development outsourcing, Software development for robotics, Unmanned Aerial Vehicles and the Internet of Things, Cloud integration</td>
<td>~50</td>
<td>UI/UX Designer Python Developer</td>
</tr>
<tr>
<td><strong>Robotics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Internet of Things</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3D Printing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3DKreator LTD</strong></td>
<td>3DKreator LTD is a 3D printer manufacturer having workloads under Automatics, CAD, robotics and program engineering</td>
<td>~50</td>
<td>Mechanical Engineer</td>
</tr>
</tbody>
</table>

**Tech Startups**:
- **~600**
  - Analytics: ~145
  - Internet of Things: ~80
  - Robotics: ~30
  - 3D Printing: ~20

Note: DRAUP's Talent Simulation Module in Poland Based on Tech Startups
There are over 5000 courses available in Poland and each of them has had to gain the Polish Accreditation Committee’s approval.

Poland holds fourth place in Europe (after the United Kingdom, Germany and France) in terms of the number of people enrolled in higher education.

~11K international students study in Poland according to the latest CSO data.

Poland's strong educational system stresses science, math, and engineering gives rise to a new generation of talented software developers.

Note: DRAUP’s Talent module analysed 100+ universities in Poland to identify top universities and key courses.
## Wroclaw University of Technology:

### Key Programs Offered

<table>
<thead>
<tr>
<th>Level</th>
<th>Programs Offered</th>
</tr>
</thead>
</table>
| Entry Level  | - Mechanical Engineering  
- Electronics  
- Geoengineering Mining and Geology  
- Mechanical and Power Engineering  
- Microsystems Electronics and Photonics  
- Chemistry  
- Architecture |

<table>
<thead>
<tr>
<th>Intermediate</th>
<th>Programs Offered</th>
</tr>
</thead>
</table>
|              | - Bioinformatics  
- Internet Engineering  
- Business Information Systems  
- Nanoeengineering  
- Automotive Engineering  
- Production Management  
- Medicinal Chemistry  
- Environmental Quality Management  
- Computer Engineering |

### Featured Research

- ~2% International Students
- 33:67 Student Ratio of Females to Males
- 85% Employed in Companies

### Key Alumni Profiles

#### PROFILE 1
**DESIGNATION:** Senior Support Engineer at CADSOL Design Polska Sp. Z o. o  

**Education:** M.Sc. Mechanics and Machine Design at Wroclaw University of Technology  

**Current works:** Training in CATIA V5, CATIA V6, 3D VIA (CATIA Composer) software at all level, support for the software sales process and implement the projects in CATIA V5 and 3D VIA

#### PROFILE 2
**DESIGNATION:** Design Engineer at Kammerer Group  

**Education:** M.S. Mechanical Engineer Management and Manufacturing Engineering at Wroclaw University of Technology  

**Current works:** Development and design of plastic parts according to strake requirements in different phases of the project - from concept to production and creating PPT presentations with results

---

**Note:** DRAUP’s Talent Module analysed 50+ Poland based universities to identify top universities, key courses and partnerships in Information Technology.
Warsaw University of Technology:  

<table>
<thead>
<tr>
<th>Key Programs Offered</th>
<th>Featured Research</th>
<th>Key Alumni Profiles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entry Level</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| • Mechanical Engineering | ~12% Under graduation Rate | **PROFILE 1**  
DESIGNATION: Site Manager, Wartsila Baltic Design Centre LTD  
Education: Post Graduate Gas Engineering at Warsaw University of Technology, Mechanics at Mining and Metallurgy University in Cracow  
Current works: Managing the site, supervising of site progress and resources, acting as the main technical adviser on construction site for clients and subcontractors, supervising the installations of all equipment |
| • Civil Engineering |                   |                     |
| • Electrical Engineering |                   |                     |
| • Electric Hybrid Vehicle Engineering |                   |                     |
| • Power Engineering |                   |                     |
| • Mechatronics – Photonics Engineering |                   |                     |
| • Aerospace Engineering |                   |                     |
| **Intermediate**     |                   | **PROFILE 2**  
DESIGNATION: Mateusz Wnuk-Lipinski, GE Oil & Gas Engineer Design Center  
Education: International Welding Engineer Course at Warsaw University of Technology, Master’s degree Materials Science at Technical University of Gdansk  
Current works: Selection of material used in Subsea Equipment- Subsea Wellheads and X-mass Trees in terms of material grade, corrosion, ND testing, welding, coating and support of design engineers in terms of materials |
| • Architecture and Urban Planning | ~12% Under graduation Rate |                     |
| • Computer Science – Artificial Intelligence |                   |                     |
| • Environment Protection Engineering |                   |                     |
| • Global Enterprise Management |                   |                     |
| • Nuclear Power Engineering |                   |                     |
| • Robotics |                   |                     |
| • Transport Systems Engineering and Management |                   |                     |
| **~1,300 Number of International Students** | | |