DevSkiller Future
Skills Report 2025:
Essential Insights for IT and Tech Professionals

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Foreword

The world of work is evolving faster than ever, and 2024 has been a pivotal year in redefining the skills landscape. With rapid advancements in technologies like Generative AI, organizations are facing a transformative moment where the skills that were once essential are now being reimagined to meet the needs of tomorrow.

I am honored to introduce **The DevSkiller Future Skills Report 2025**, our 7th edition, produced in collaboration with Statista, a global leader in data and market research. Partnering with **Statista** has allowed us to elevate the depth and accuracy of our insights, combining DevSkiller's skills expertise with Statista's renowned data analytics. This partnership reflects our dedication to delivering the most in-depth and meaningful analysis of the skills that will shape the future of work.

By examining data from hundreds of companies and thousands of daily users, we offer a comprehensive analysis of the digital and technical skills that will define 2025. Our aim is not only to highlight emerging trends but also to equip you with actionable knowledge to future-proof your teams.

We aim to challenge your perspective and to consider how these insights can guide your workforce strategy in the year ahead.

Sincerely,
Jakub Kubrynski
DevSkiller CEO & Cofounder

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The evolving tech market landscape: Challenges and opportunities

Executive summary

The tech and IT industry is undergoing a rapid transformation, driven by digitalization, advancements in artificial intelligence (AI), and cloud technologies, among other factors. While global IT spending is projected to reach record highs in 2024, global economic uncertainties have led to high numbers of tech job layoffs and has created a complex landscape.

Companies are prioritizing skills-based hiring due to the increasing demand for technical knowledge in future-facing technologies and soft skills that are vital in the workplace. Proficiency in programming languages remains crucial, with JavaScript, HTML/CSS, Python, C/C++, and SQL being some of the most widely used and most popular among developers today. For IT professionals, selecting the appropriate tech stack for their specific sector is crucial to stay competitive and make informed decisions. Research reveals high levels of proficiency across IT roles, with specific skills varying based on job function, which highlights the importance of continuous learning.

Meanwhile, AI continues to transform industries, automate tasks, and increase efficiency, but it is also raising concerns about job displacement, especially in tech professions. Despite this, AI also presents opportunities for streamlining processes and freeing up professionals to focus on more complex tasks.

Indeed, the fastest-growing job roles in the coming years are expected to be in AI, machine learning (ML), and sustainability, while clerical and secretarial positions are facing a decline due to automation. Moreover, the IT services market is experiencing significant growth, particularly in IT outsourcing and business process outsourcing, which will lead to rising demand for skilled professionals in emerging technologies in the years to come.

This DevSkiller report, in partnership with Statista, provides insights into the current tech landscape in order to inform and guide IT professionals, job seekers, recruiters, HR professionals, business leaders, decision-makers, investors, and industry analysts. Covering six chapters, the report aims to help industry stakeholders navigate the complexities of the rapidly changing tech world, enabling them to make informed decisions about their careers, businesses, and investments.

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The Tech Market Landscape
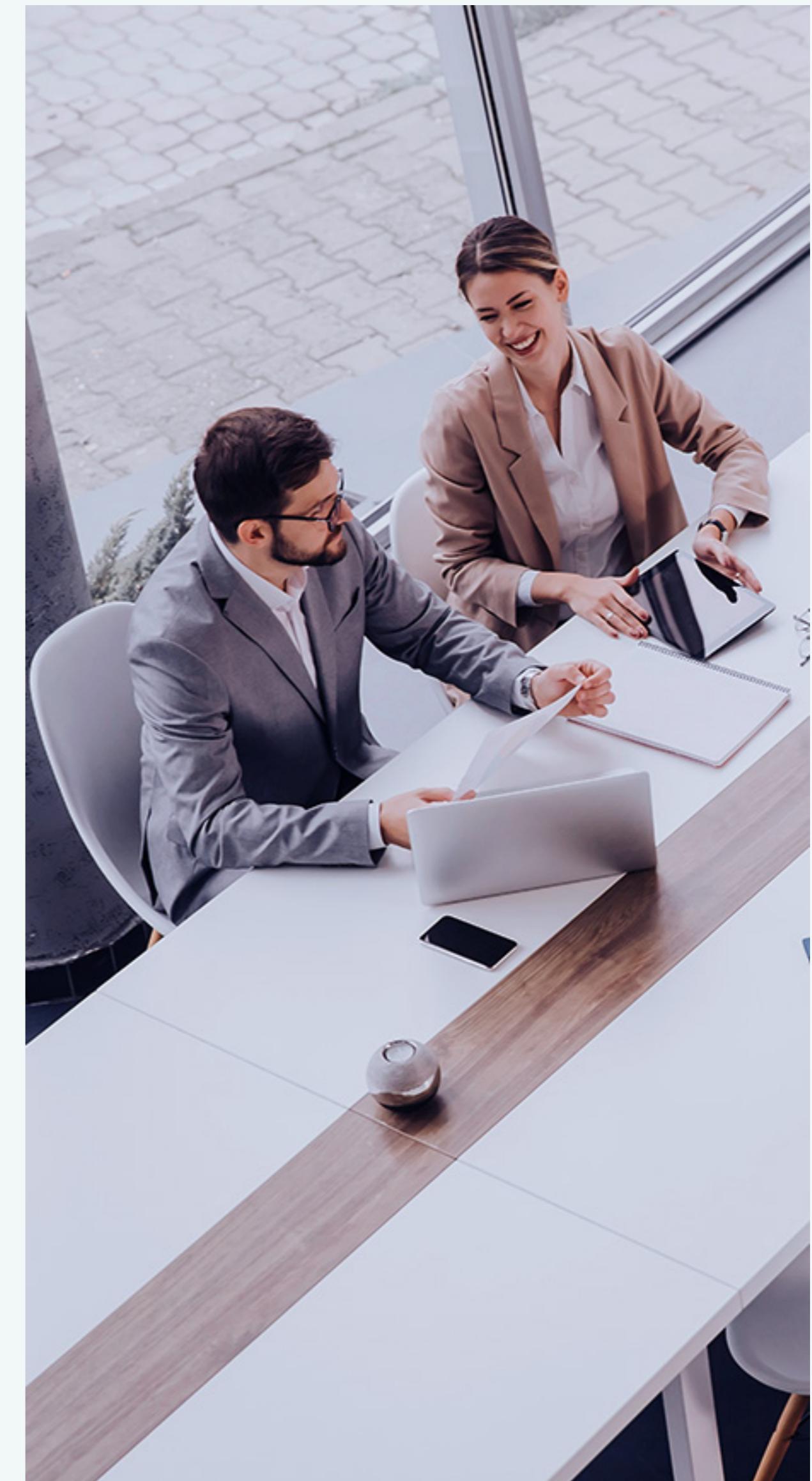
Digital transformation continues to drive the IT market

In 2024, businesses globally are projected to spend a record-high 5.3 trillion U.S. dollars on IT, with the largest growth seen in software and cloud technologies, indicating a strong push toward digital transformation **(see page 8)**. This rise in IT spending, mainly in IT services and software, points to a bright employment outlook in these fields. Companies undergoing digital transformations will require additional IT experts, software developers, cloud engineers, and data analysts.

In 2024, cloud technologies took the lead in technical staffing allocations worldwide, closely followed by DevOps (referring to development and operations), CI/CD (which stands for continuous integration and continuous delivery/deployment), site reliability, and lastly, cybersecurity roles, highlighting a global organizational focus on cloud-centric and secure technologies **(see page 9)**.

In terms of salaries, in 2024, senior executives in the IT sector commanded the highest total annual compensation, with a median exceeding 127,000 U.S. dollars **(see page 10)**. Developer advocates, managers, and developer experience engineers also earned well above 100,000 U.S. dollars annually. Site reliability engineers and cloud infrastructure engineers reported median earnings of almost 100,000 U.S. dollars and 97,000 U.S. dollars, respectively. At the lower end of the spectrum, academic researchers, front-end developers, and students earned less than 50,000 U.S. dollars in total annual compensation.

Sources: Gartner; Linux Foundation; Stack Overflow; Layoff.fyi
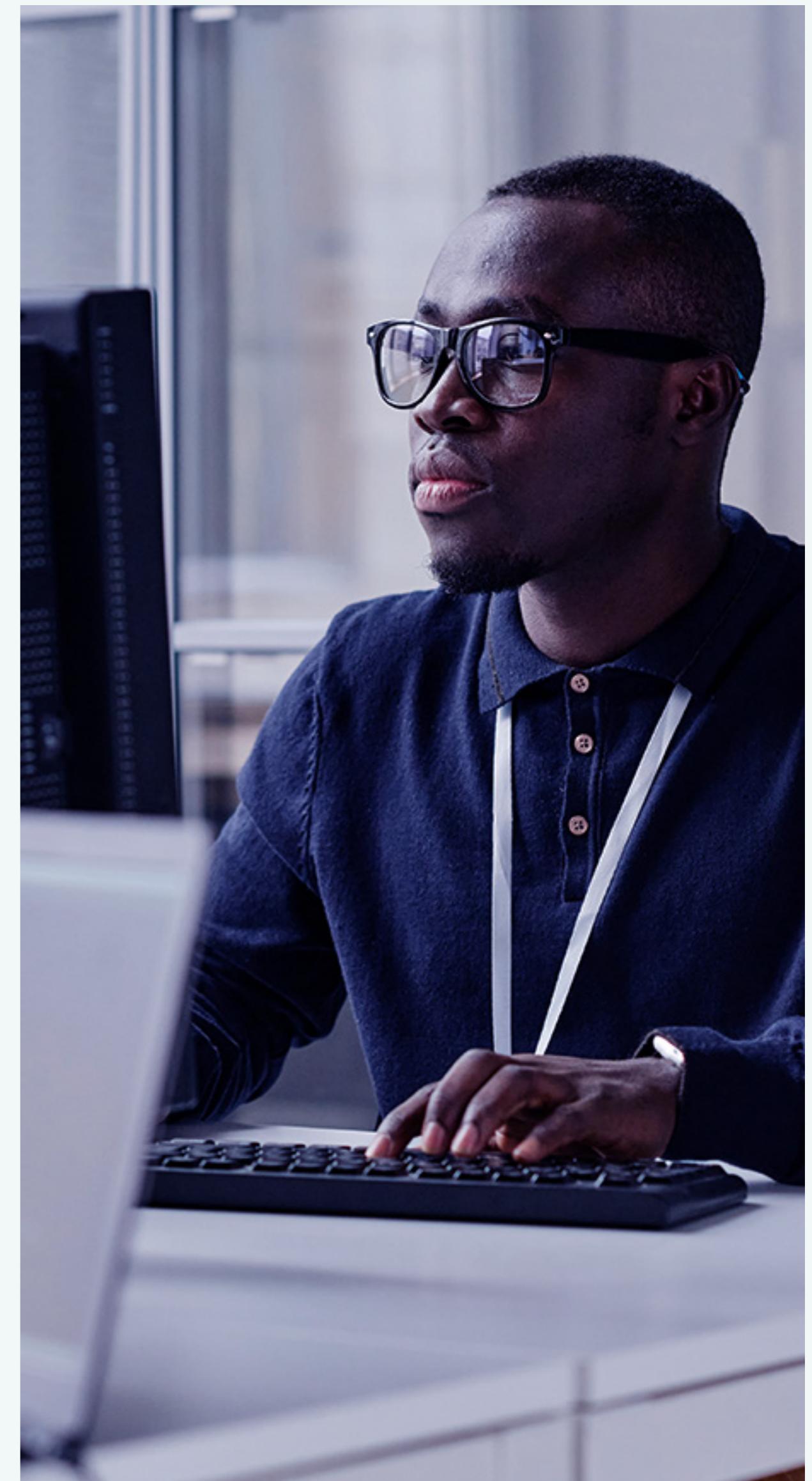
Digital transformation continues to drive the IT market

Meanwhile, in terms of programming language technologies, in 2024, the median annual compensation for Erlang developers surpassed 100,000 U.S. dollars, placing them among the highest-paid developers globally based on technology. Other high-paying programming languages included Elixir, Clojure, Nim, RB, Perl, and Scala.

However, while the future looks promising for IT professionals, the tech sector has had quite a tumultuous period in recent years and has witnessed layoffs of over 100,000 workers in the first half of 2024 alone **(see page 11)**. This has been driven by factors like inflation, sluggish global economic growth, AI advancements, over-hiring during the pandemic, and outsourcing, impacting multiple industries **(see page 12)**.
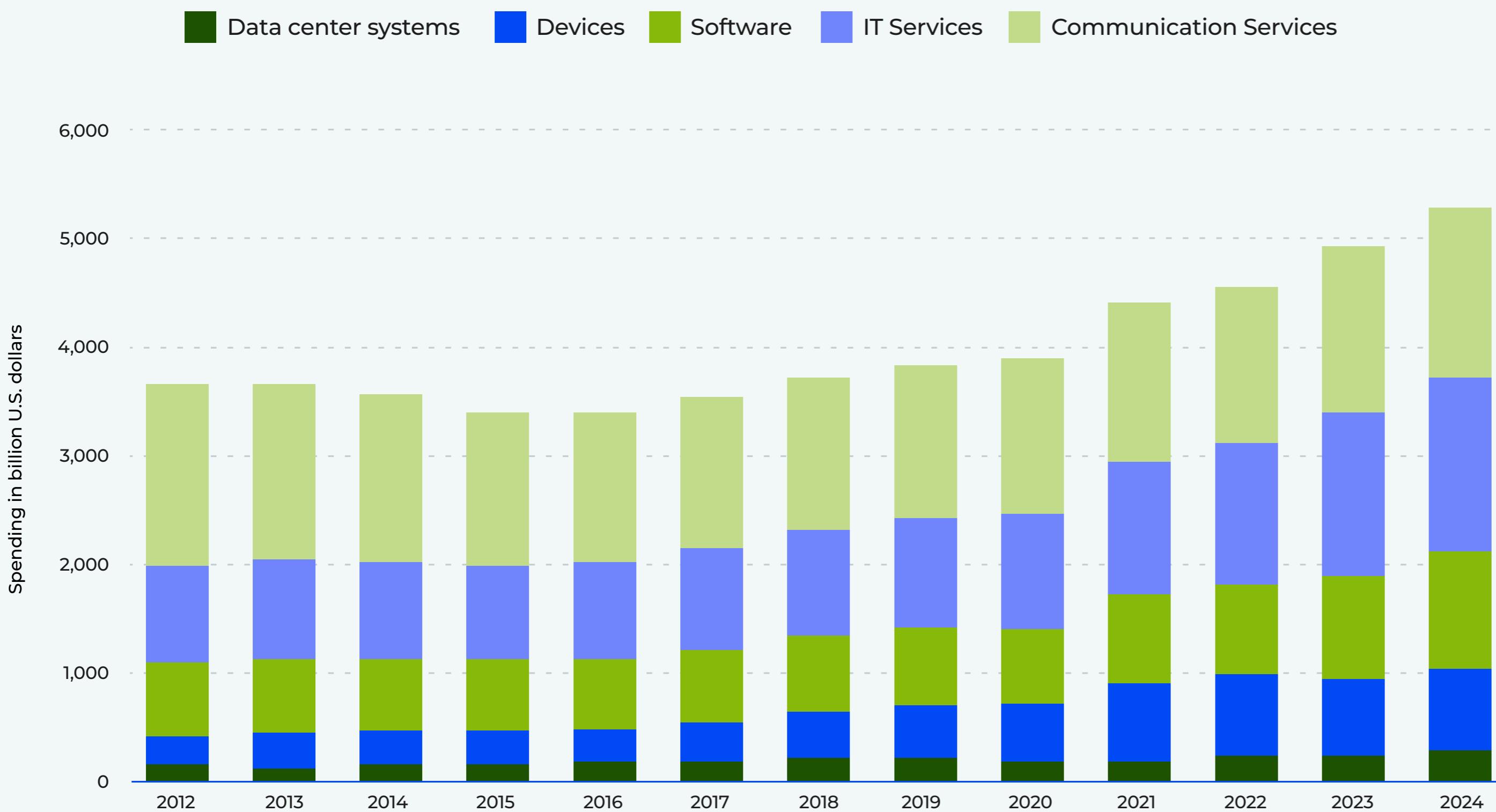
The tech industry's layoffs have had a profound human impact, and many companies are facing criticism for their handling of the process. Indeed, the tech industry is at a crossroads. While its future is generally bright, it depends on how the sector adapts to economic and technological challenges and how it values its workforce.

Global IT spending surge signals promising career outlook

Software and IT services lead the charge, indicating robust job growth in those tech segments

Global IT spending forecast 2012-2024, by segment

Legend: Data center systems · Devices · Software · IT Services · Communication Services

Spending in billion U.S. dollars

Global IT spending is projected to rise 7.5 percent to 5.3 trillion U.S. dollars over 2024. IT services dominate at 31, followed by communication services and software. Software spending, which includes the cloud, will register the highest year-on-year growth in 2024, at 12.6 percent, followed by IT services, at almost five percent. This suggests that businesses will spend more than ever on newer technologies that are driving business and digital transformation.

Source: Gartner

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Technical staffing in 2024

Distribution of technical staff in organizations worldwide 2024

Cloud, containers, and virtualization
0.55

DevOps, CI/CD, and site reliability
0.51

Cybersecurity
0.49

AI, ML, data, and analytics
0.43

Networking, and edge
0.3

System administration
0.27

Cross-technology
0.25

Web and application development
0.24

System engineering
0.23

Linux kernel
0.22

Blockchain
0.21

Privacy and security
0.18

IoT and embedded
0.17

Open source and compliance best practices
0.16

Open hardware
0.12

Supply chain
0.11

Safety-critical systems
0.11

Open-source program offices (OSPO)
0.11

Visual effects
0.06

In 2024, cloud technologies emerged as the dominant technology area staffed by technical personnel in organizations worldwide, with 55 percent of surveyed companies allocating resources to this domain. DevOps, CI/CD, and site reliability followed closely at 51 percent, while cybersecurity ranked third at 49 percent. AI, machine learning, and data analytics also saw significant adoption, with 43 percent of organizations reporting technical staff dedicated to these areas. This underscores a clear emphasis on cloud-based and security-focused technologies among organizations globally in 2024.

Source:

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FOUNDATION
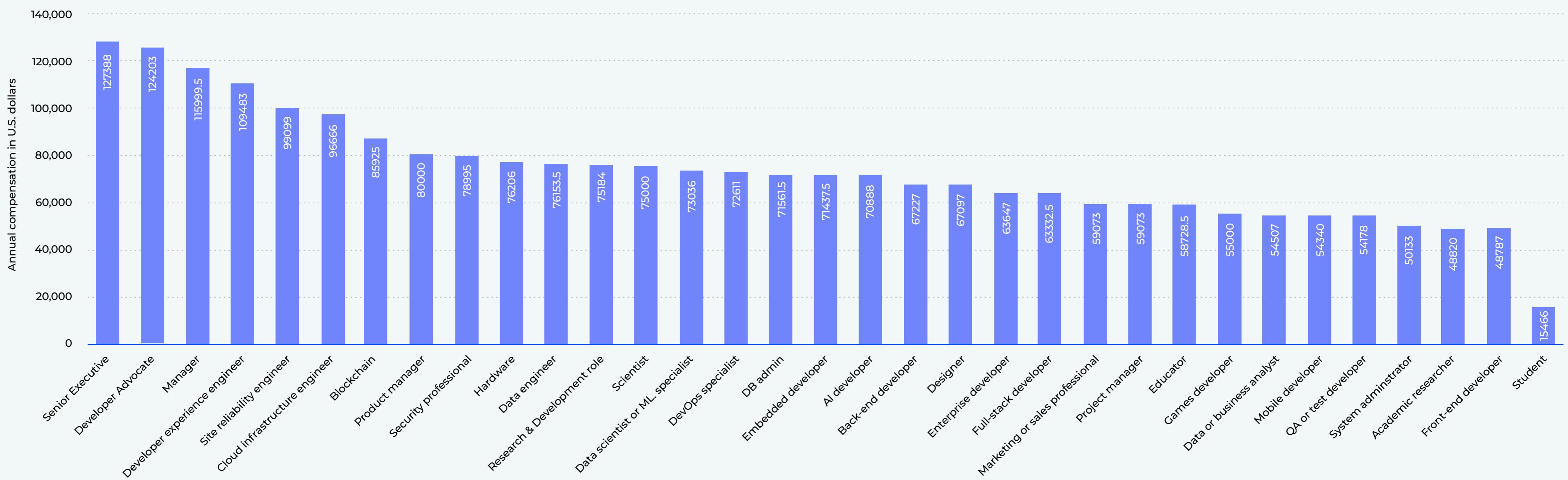
The top-paying IT roles in 2024

Senior executives in the IT market reported the highest total annual compensation

Annual salaries of IT professionals worldwide 2024

Role	Annual compensation in U.S. dollars
Senior Executive	127388
Developer Advocate	124203
Manager	115999.5
Developer experience engineer	109483
Site reliability engineer	99099
Cloud infrastructure engineer	96666
Blockchain	85925
Product manager	80000
Security professional	78995
Hardware	76206
Data engineer	76153.5
Research & Development role	75184
Scientist	75000
Data scientist or ML specialist	73036
DevOps specialist	72611
DB admin	71561.5
Embedded developer	71437.5
AI developer	70888
Back-end developer	67227
Designer	67097
Enterprise developer	63647
Full-stack developer	63332.5
Marketing or sales professional	59073
Project manager	59073
Educator	58728.5
Games developer	55000
Data or business analyst	54507
Mobile developer	54340
QA or test developer	54178
System administrator	50133
Academic researcher	48820
Front-end developer	48787
Student	15466

Tech layoffs, while still high, show signs of slowing down

There were fewer tech sector layoffs in the first half of 2024 compared to the same period in 2023

Tech layoffs worldwide 2020-2024, by quarter

Number of employees

Q1'20	9628
Q2'20	60141
Q3'20	9690
Q4'20	1509
Q1'21	6928
Q2'21	2695
Q3'21	2108
Q4'21	3292
Q1'22	9829
Q2'22	34183
Q3'22	35174
Q4'22	84929
Q1'23	167574
Q2'23	46433
Q3'23	25535
Q4'23	23628
Q1'24	57149
Q2'24	41685

The first half of 2023 saw 214,007 tech layoffs, compared to 100,666 in the same period of 2024. This indicates a significant slowdown in layoffs within the tech sector, following a challenging 2022 and 2023.
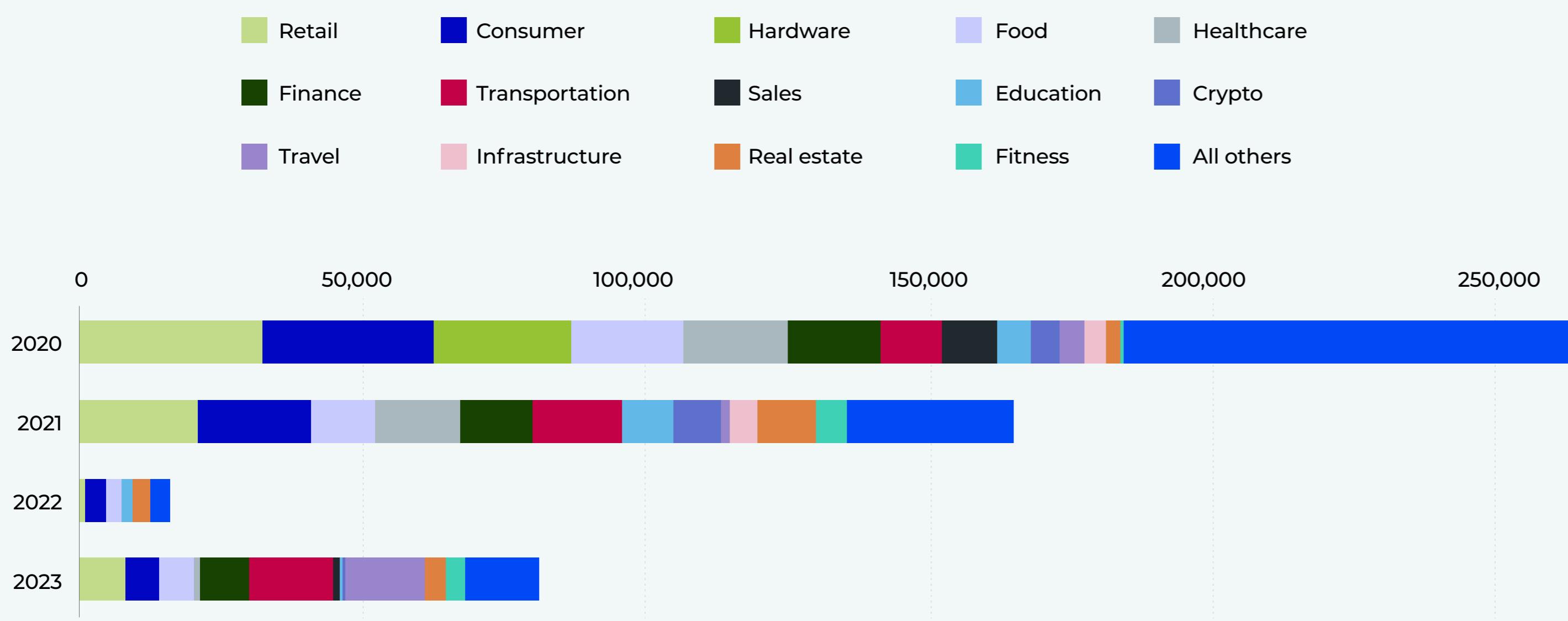
Major tech companies, including Google, Microsoft, Meta, and IBM, as well as companies like Tesla, Amazon, TikTok, and Snap, conducted significant layoffs in the first few months of 2024. Moreover, smaller startups also experienced a considerable number of cuts, and in some instances, have ceased operations entirely due to factors such as inflation, economic downturn, AI advancements, over-hiring during the pandemic, and outsourcing.

Source: Layoffs.fyi

The retail industry had the highest number of tech layoffs

The retail sector was hardest hit due to inflationary pressures

Tech layoffs worldwide 2020-2023, by industry

- Retail
- Consumer
- Hardware
- Food
- Healthcare
- Finance
- Transportation
- Sales
- Education
- Crypto
- Travel
- Infrastructure
- Real estate
- Fitness
- All others

The year 2023 marked the highest number of layoffs in the global tech industry since the onset of the COVID-19 pandemic. Tech-related jobs experienced a significant wave of layoffs, with the retail industry being the most severely impacted for the second consecutive year, recording over 32,000 job losses. This is due to consumers cutting back on non-essential spending in an era of higher inflation. Amazon accounted for the bulk of these retail sector layoffs, with approximately 27,000 job cuts in 2022 and 2023 combined, followed by Groupon and Shopify. The consumer and hardware sectors were also significantly affected, experiencing over 30,000 and 24,000 layoffs, respectively.

Source: Layoffs.fyi

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Most Popular Tech Skills

The most in-demand tech skills

Businesses are shifting to skills-based recruitment and workforce development, driven by the need to harness new technologies. The most in-demand skills for 2024 fall into two categories: technical skills that enable organizations to leverage frontier technology, such as proficient knowledge of programming languages, and soft skills that machines can't replicate, such as team building and teamwork skills **(see page 19)**.

Programming languages are the fundamental instructions that drive computer behavior and enable various tasks. The increasing reliance on technology has amplified the importance of programming across industries, with professionals seeking to enhance their skills in high-demand languages like Python, R, and SQL for career advancement.

In 2024, JavaScript and HTML/CSS were the most popular programming languages among software developers worldwide, with over 62 percent of respondents using JavaScript and approximately 53 percent using HTML/CSS **(see page 15)**. Additionally, Python, SQL, and TypeScript completed the top five most widely used programming languages globally.

Programming knowledge is becoming an important skill to possess within various industries throughout the business world. For example, in 2023, the SQL programming language led the financial services, healthcare, hospitality, non-profit, and marketing & advertising industries **(see page 16)**. Meanwhile, JavaScript, Java, and SQL were the most popular technologies in the computer software sector. Python, due to its automation capabilities, was the top technology for manufacturing.

On the DevSkiller platform, in the first half of 2024, Java, SQL, and JavaScript remain the top tested programming languages, with a notable rise in SQL usage **(see page 17)**. Moreover, the rising importance of precise coding for sophisticated digital products has driven a surge in demand for testing for C/C++, data science, and SQL skills **(see page 18)**.
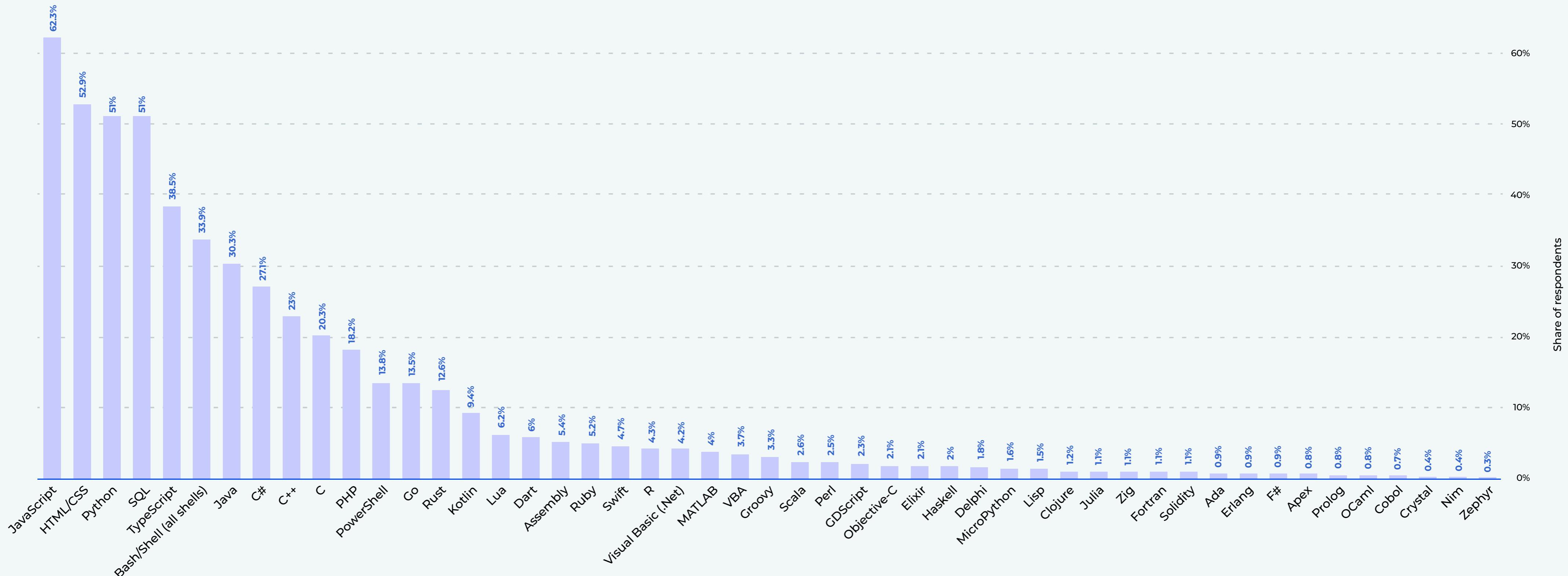
The programming languages reigning supreme

JavaScript, HTML/CSS, and Python are the most used programming languages among software developers

Most widely utilized programming languages among developers worldwide, 2024

Share of respondents

Language	Share
JavaScript	62.3%
HTML/CSS	52.9%
Python	51%
SQL	51%
TypeScript	38.5%
Bash/Shell (all shells)	33.9%
Java	30.3%
C#	27.1%
C++	23%
C	20.3%
PHP	18.2%
PowerShell	13.8%
Go	13.5%
Rust	12.6%
Kotlin	9.4%
Lua	6.2%
Dart	6%
Assembly	5.4%
Ruby	5.2%
Swift	4.7%
R	4.3%
Visual Basic (.Net)	4.2%
MATLAB	4%
VBA	3.7%
Groovy	3.3%
Scala	2.6%
Perl	2.5%
GDScript	2.3%
Objective-C	2.1%
Elixir	2.1%
Haskell	2%
Delphi	1.8%
MicroPython	1.6%
Lisp	1.5%
Clojure	1.2%
Julia	1.1%
Zig	1.1%
Fortran	1.1%
Solidity	1.1%
Ada	0.9%
Erlang	0.9%
F#	0.9%
Apex	0.8%
Prolog	0.8%
OCaml	0.8%
Cobol	0.7%
Crystal	0.4%
Nim	0.4%
Zephyr	0.3%

Programming languages across industries

Most popular technologies worldwide 2023, by industry

Share of respondents

Legend: JavaScript, Python, React Native, Java, HTML/CSS, .NET/C#, Salesforce, SQL, PHP, QA, DevOps, Data Science, NoSQL
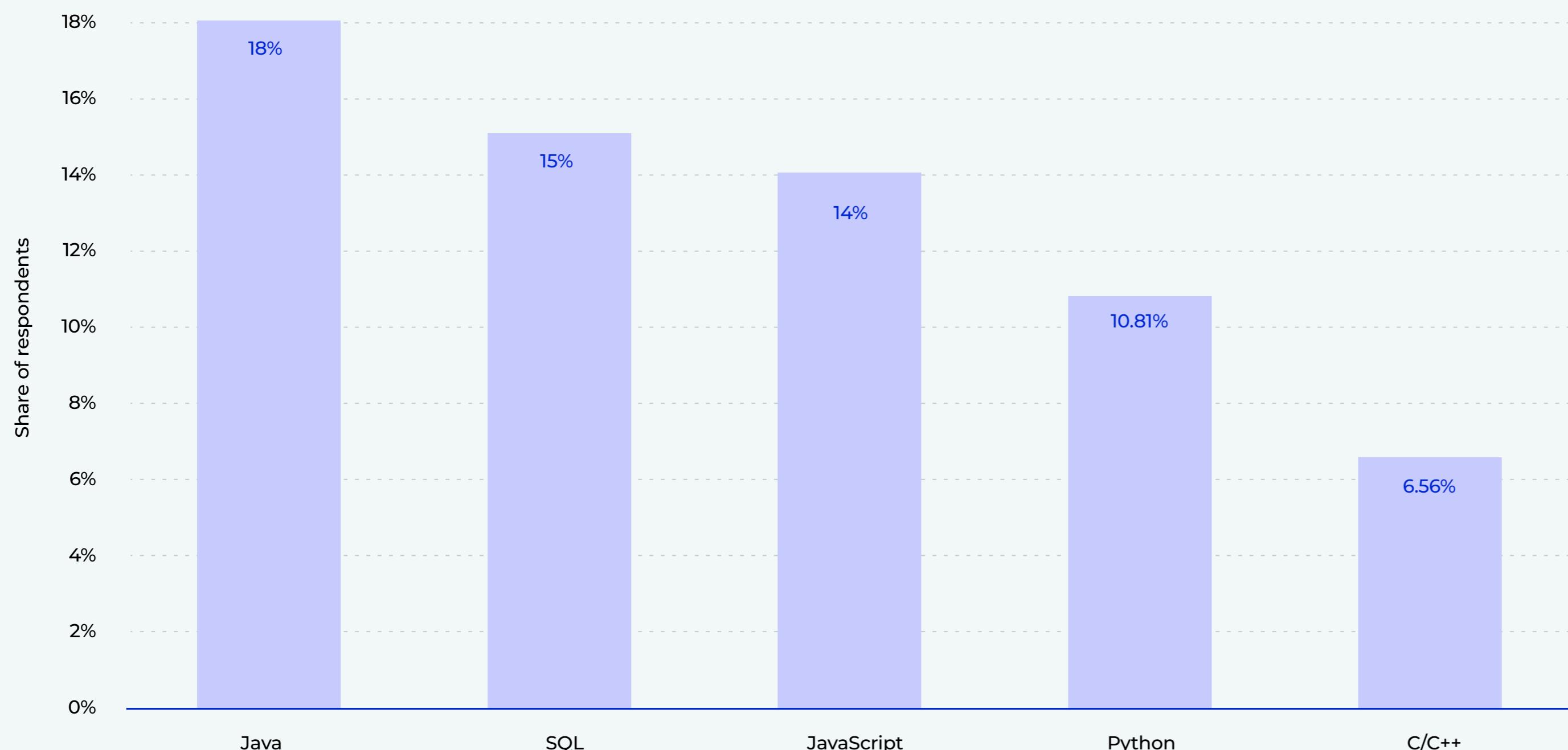
Source: **Dev**Skiller

The leading programming languages

Java and JavaScript remain strong

Most popular programming languages worldwide 2024

In the first half of 2024, the most popular programming languages tested on the DevSkiller platform were Java (18 percent), SQL (15.5 percent), and JavaScript (14.2 percent). This is a shift from the end of 2023, where Java and JavaScript held larger shares at 27.2 percent and 19.2 percent, respectively, while SQL was significantly lower at 8.6 percent.
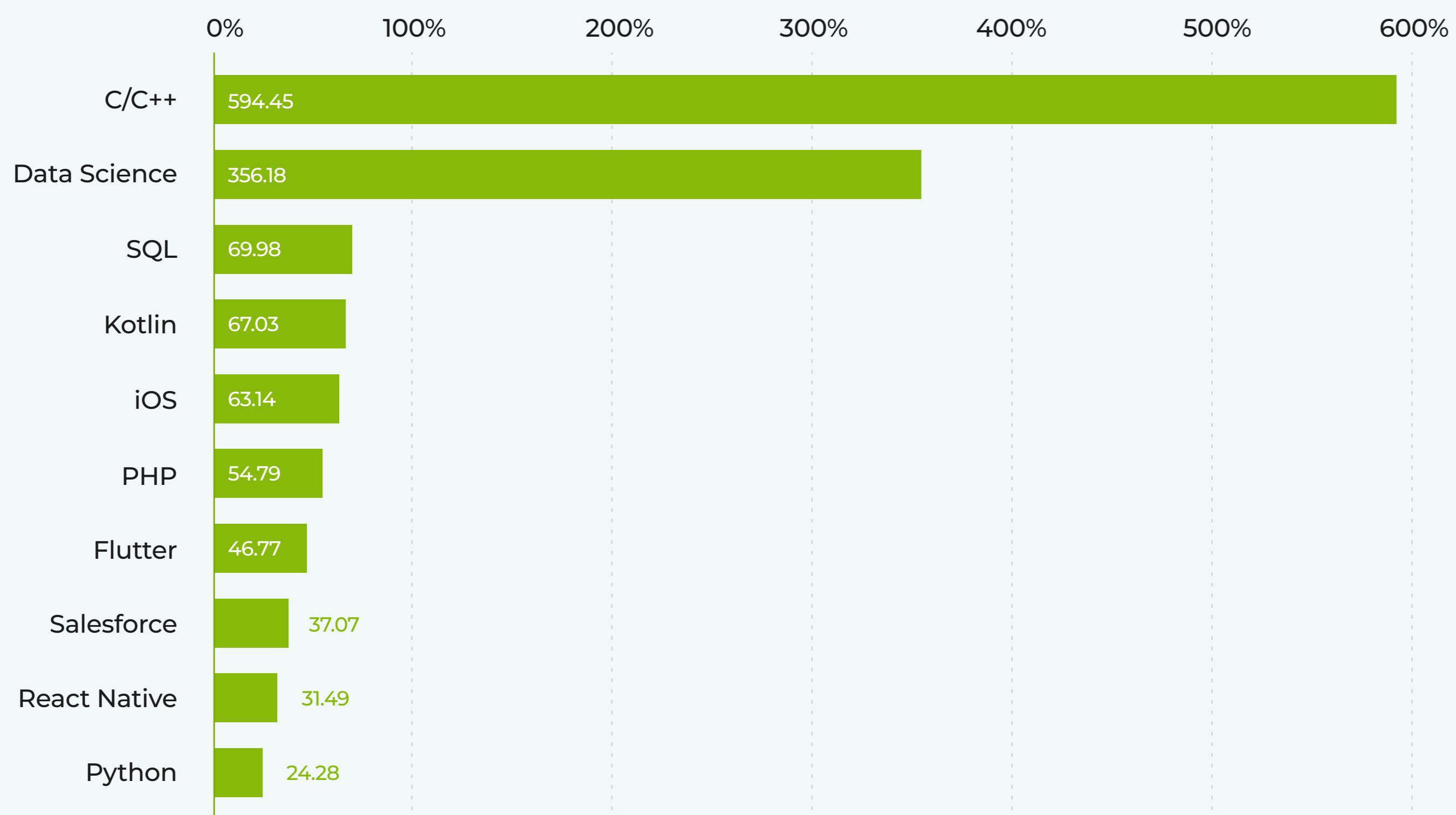
The evolving tech landscape emphasizes the continued prominence of Java and JavaScript, along with the increasing prominence of SQL in the first half of 2024.

Source: **Dev**Skiller

C/C++ takes the lead in the tech skills race

Versatility and efficiency drive demand for programming languages

Fastest-growing technology skills worldwide 2024

Skill	Growth
C/C++	594.45
Data Science	356.18
SQL	69.98
Kotlin	67.03
iOS	63.14
PHP	54.79
Flutter	46.77
Salesforce	37.07
React Native	31.49
Python	24.28
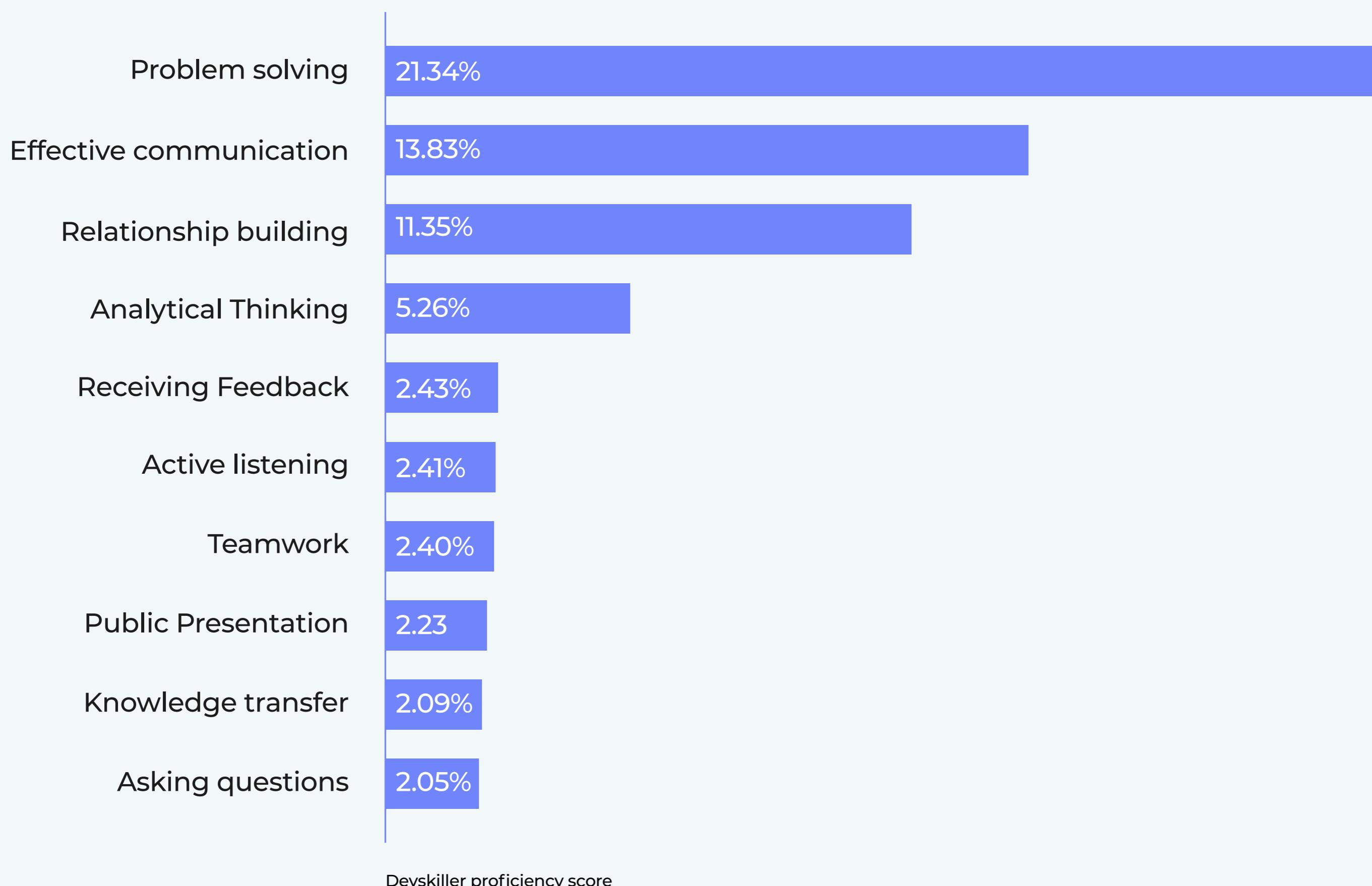
In the first half of 2024, the technology that saw the most significant increase in testing on the DevSkiller platform compared to 2023 was C/C++, experiencing growth of almost 600%. C++ is a versatile and efficient programming language widely used in various industries, leading to numerous career opportunities and high salary packages. Data science and SQL followed as the second and third fastest-growing technology skills, with growth rates of 356.2% and 70%, respectively. These surges are due to the increasing complexity of digital products, necessitating a greater focus on meticulous coding practices.

Source: **DevSkiller**

Problem solving tops the list of soft skills in IT

Professionals are prioritizing critical thinking

Most common soft skills among IT professionals worldwide 2024

Skill	Score
Problem solving	21.34%
Effective communication	13.83%
Relationship building	11.35%
Analytical Thinking	5.26%
Receiving Feedback	2.43%
Active listening	2.41%
Teamwork	2.40%
Public Presentation	2.23
Knowledge transfer	2.09%
Asking questions	2.05%

Devskiller proficiency score

In 2024, problem-solving emerged as the most sought-after soft skill among IT professionals globally, with 21 percent actively developing this ability. Effective communication followed closely at 14 percent, while relationship building ranked third, with 11 percent of IT professionals focusing on its development. Interestingly, analytical thinking, often associated with technical roles, was only being pursued by five percent of professionals. Skills such as active listening, teamwork, and public presentation each accounted for approximately five percent of learning focus, suggesting a diverse range of interpersonal abilities being cultivated and required within the IT sector.

Source: **DevSkiller**

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Most Used Technologies

Choosing the right tech stack for success

A tech stack represents the combination of technologies a company uses in order to build and run an application or project. Tech stacks include everything from programming languages to frameworks and databases. Choosing the right tech stack for an organization's software product is crucial for its success, impacting factors like design, functionality, and scalability.
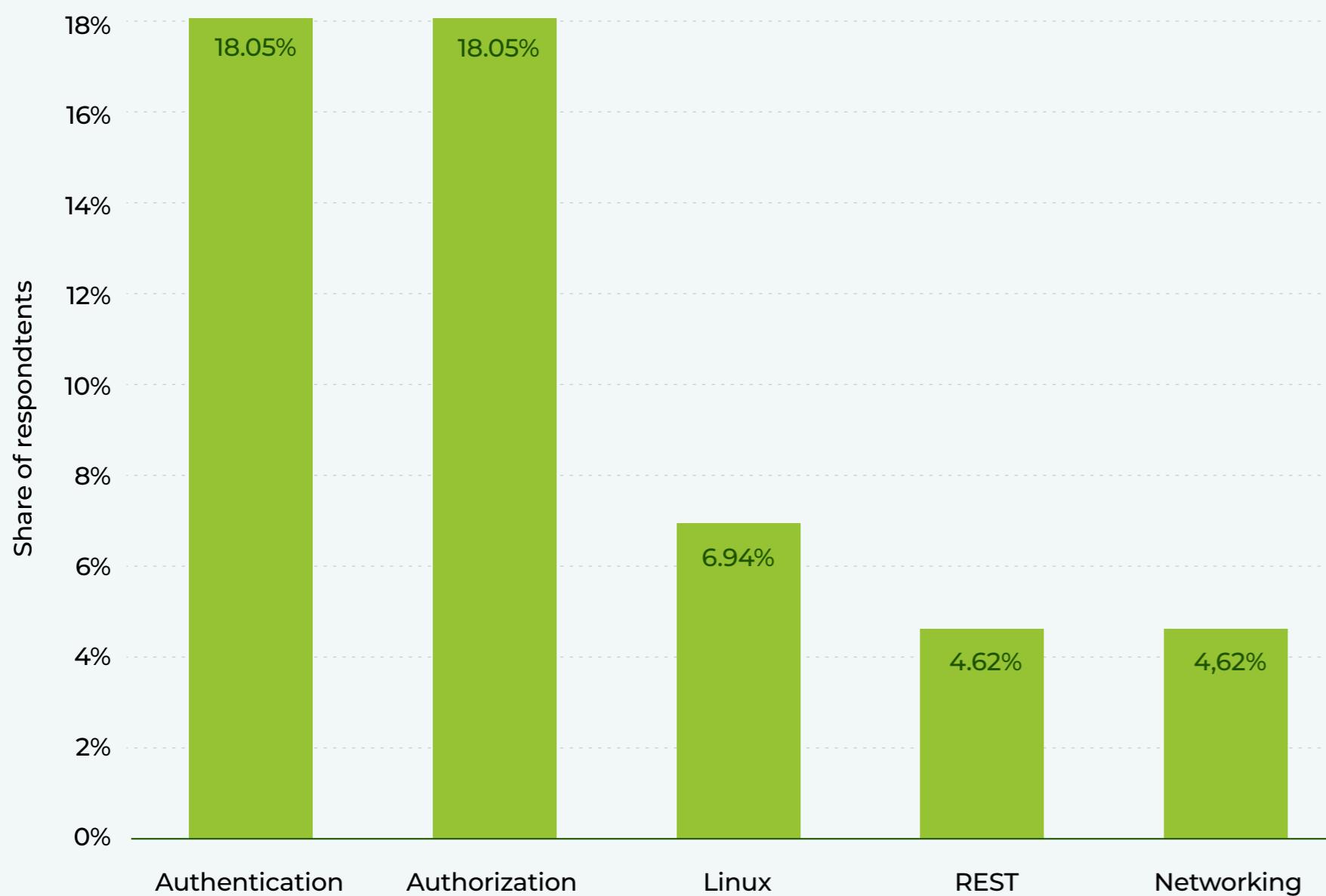
Understanding the composition and trends within tech stacks across various segments is essential for both individuals and organizations to stay competitive and make informed decisions in today's technology-driven landscape. Data collected across the DevSkiller platform indicates the most popular technologies in their regarding tech stacks were as follows:

- **Cybersecurity tech stack:** **(see page 22)** Authentication and authorization were each chosen by 18 percent of respondents. Linux ranked third, preferred by over seven percent of respondents.
- **Data science tech stack:** **(see page 22)** Python 3.x was the top choice, selected by 15.7 percent of respondents. ETL (extract, transform, load) came in second at 9.8 percent. This is unsurprising given Python's importance in developing AI and machine learning solutions.
- **DevOps tech stack:** **(see page 23)** Kubernetes led the way, followed closely by Docker, each chosen by over 13 percent of respondents. Amazon Web Services ranked third at 6.5 percent.
- **PHP tech stack:** **(see page 23)** CodeIgniter was the most popular choice, selected by over 29 percent of respondents. WordPress came in second at over 26 percent.
- **Python tech stack:** **(see page 24)** Data engineering was the top choice at 18.4 percent, followed by PySpark at nearly 11 percent.
- **.NET C# tech stack:** **(see page 24)** Database connectivity was chosen by over 15 percent of respondents, followed by MVC (model-view-controller) at almost five percent.
- **Java tech stack:** **(see page 25)** Spring led the way at nearly 10 percent, followed by Spring Boot and Exceptions.
- **JavaScript tech stack:** **(see page 25)** React was the top choice, selected by nearly 15 percent of respondents. React Hooks ranked second at over nine percent.

Cybersecurity and Data Science
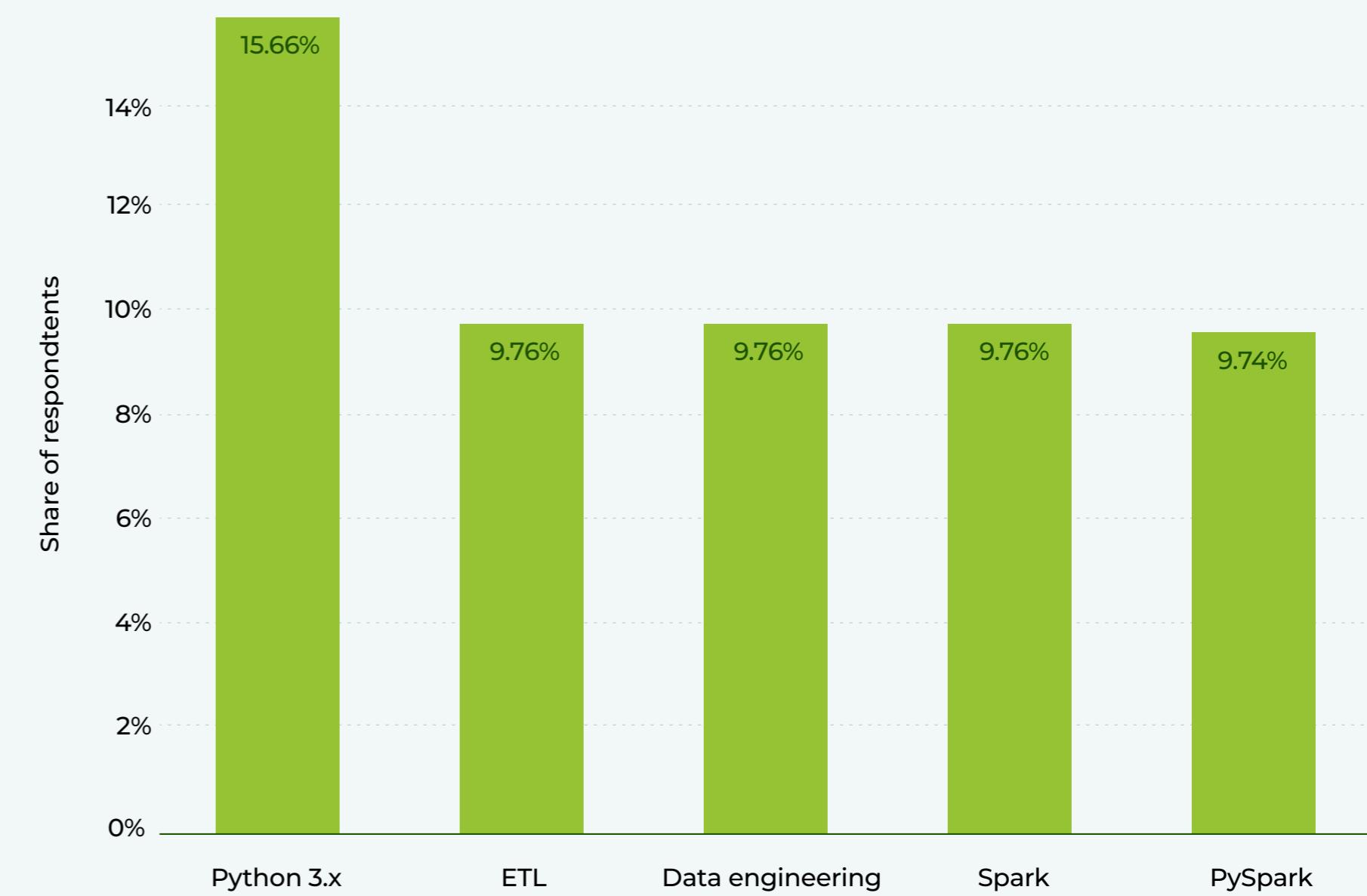
Most used technologies in the Cybersecurity tech stack worldwide 2024

Share of respondtents

- Authentication: 18.05%
- Authorization: 18.05%
- Linux: 6.94%
- REST: 4.62%
- Networking: 4,62%
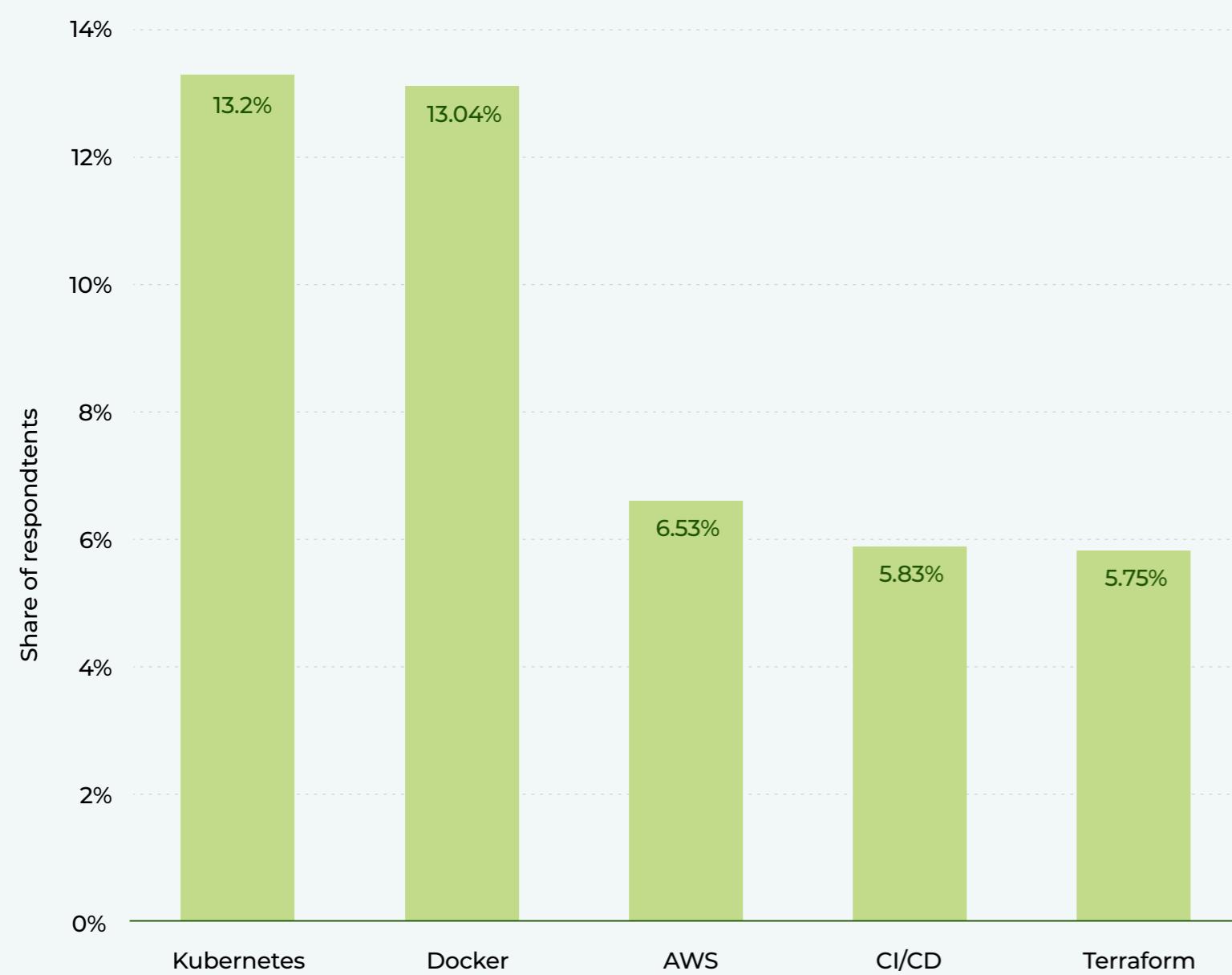
Most used technologies in the Data Science tech stack worldwide 2024

Share of respondtents

- Python 3.x: 15.66%
- ETL: 9.76%
- Data engineering: 9.76%
- Spark: 9.76%
- PySpark: 9.74%

Source: **DevSkiller**

DevOps and PHP
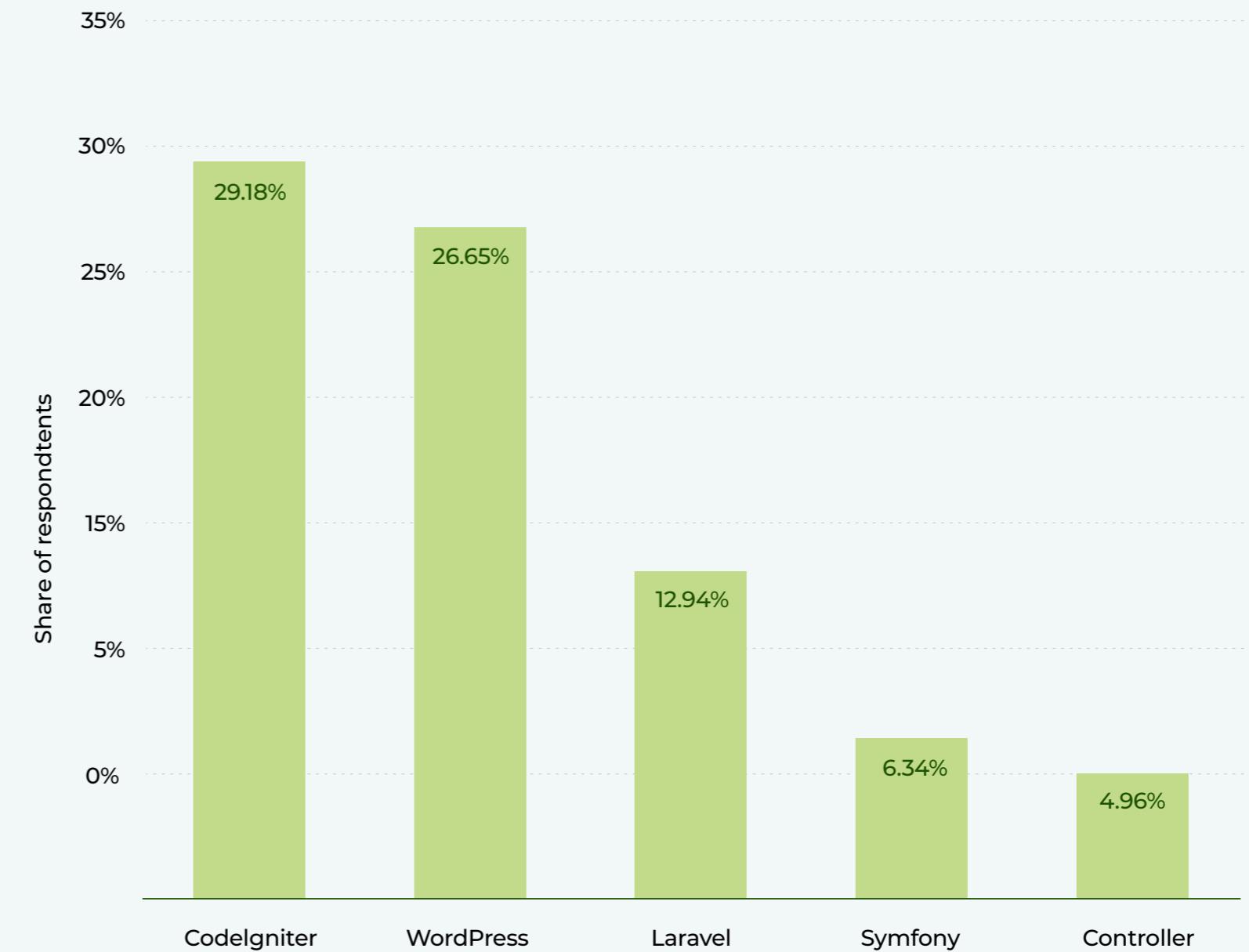
Most used technologies in the DevOps tech stack worldwide 2024

Share of respondtents

Kubernetes	Docker	AWS	CI/CD	Terraform
13.2%	13.04%	6.53%	5.83%	5.75%
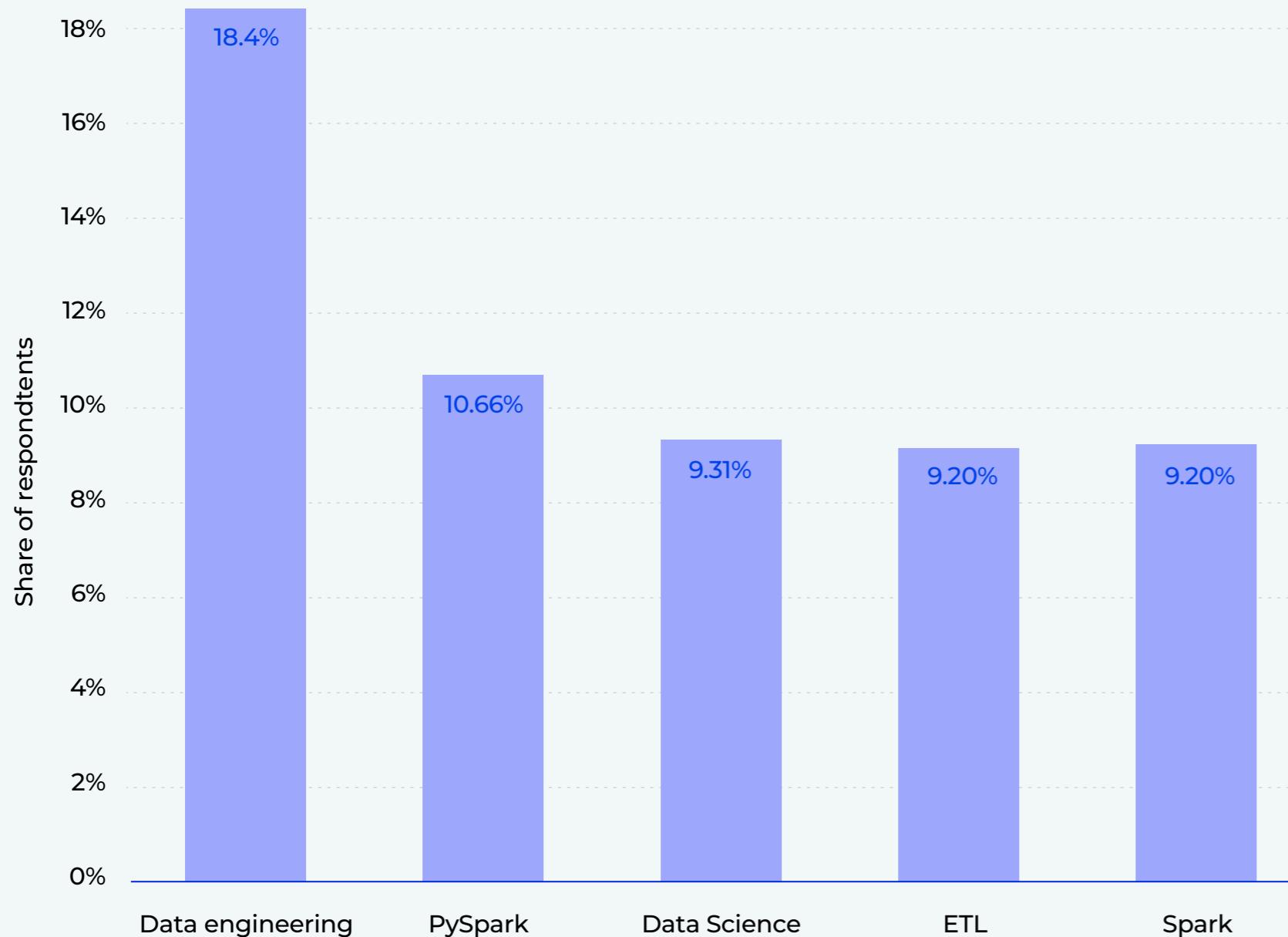
Most used technologies in the PHP tech stack worldwide 2024

Share of respondents

CodeIgniter	WordPress	Laravel	Symfony	Controller
29.18%	26.65%	12.94%	6.34%	4.96%

Source: **Dev**Skiller

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Python and .NET C#
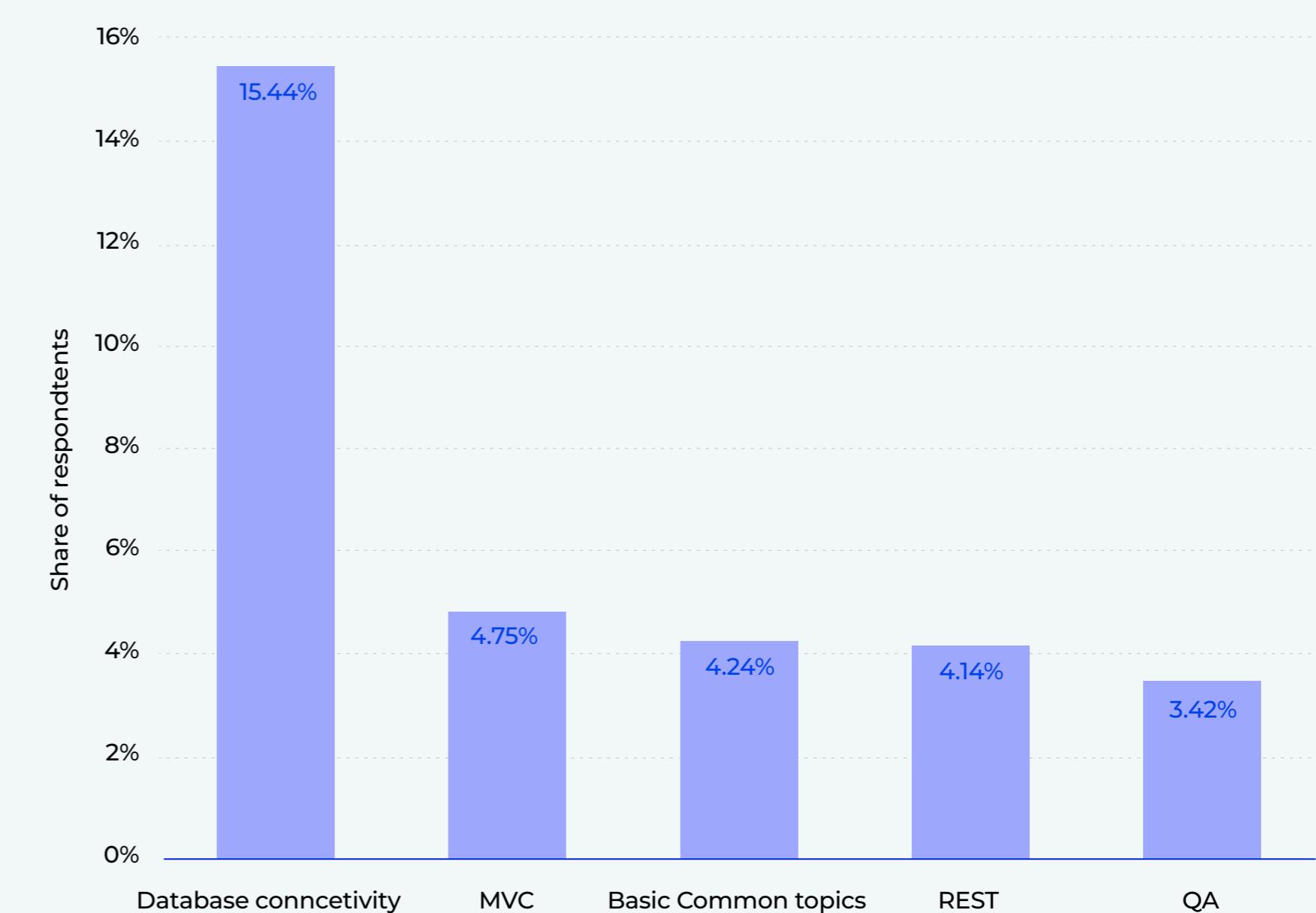
.NET | C#

Most used technologies in the Python tech stack worldwide 2024

Share of respondtents

- Data engineering: 18.4%
- PySpark: 10.66%
- Data Science: 9.31%
- ETL: 9.20%
- Spark: 9.20%
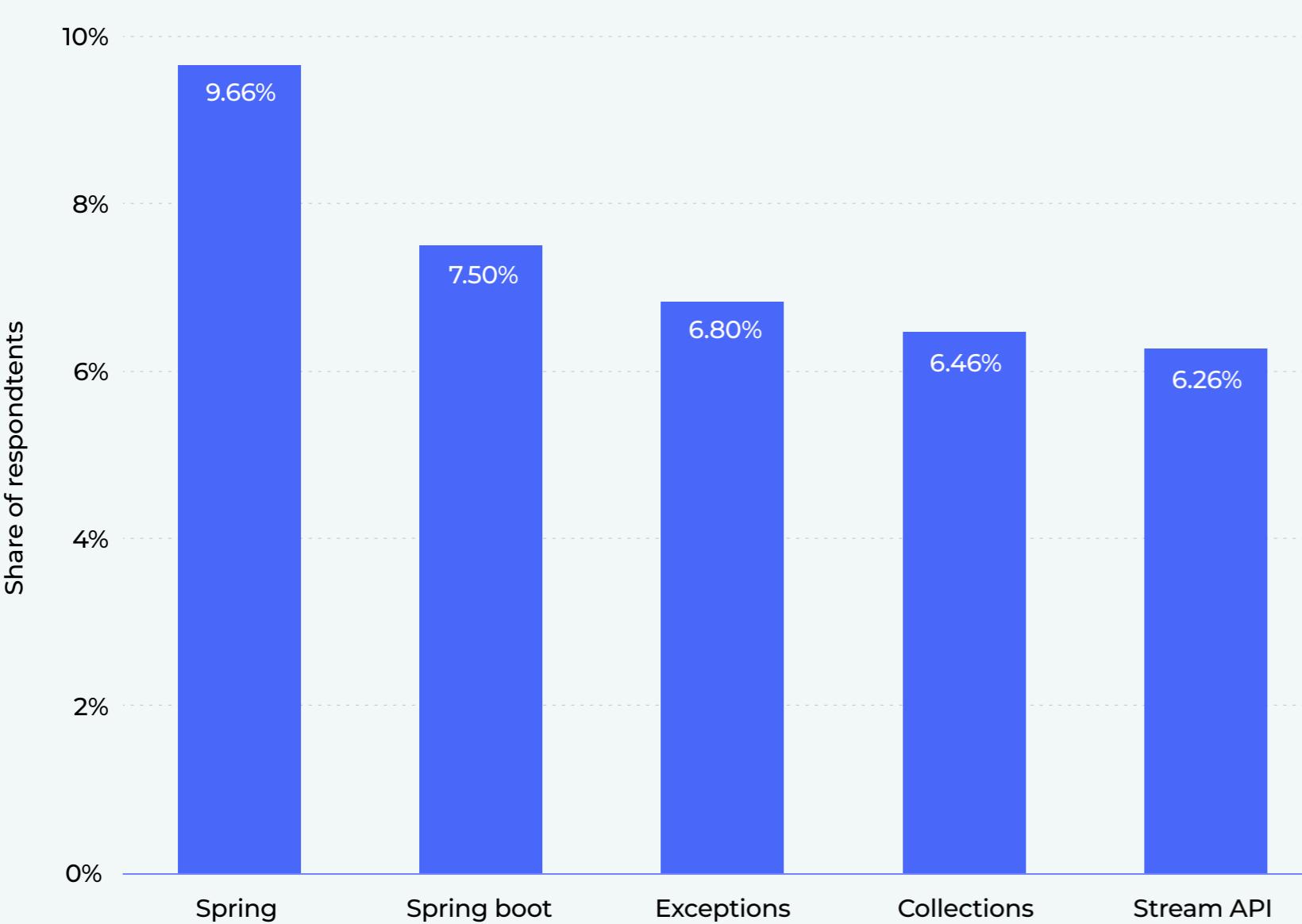
Most used technologies in the .NET C# tech stack worldwide 2024

Share of respondtents

- Database conncetivity: 15.44%
- MVC: 4.75%
- Basic Common topics: 4.24%
- REST: 4.14%
- QA: 3.42%

Source: **DevSkiller**

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Java and JavaScript
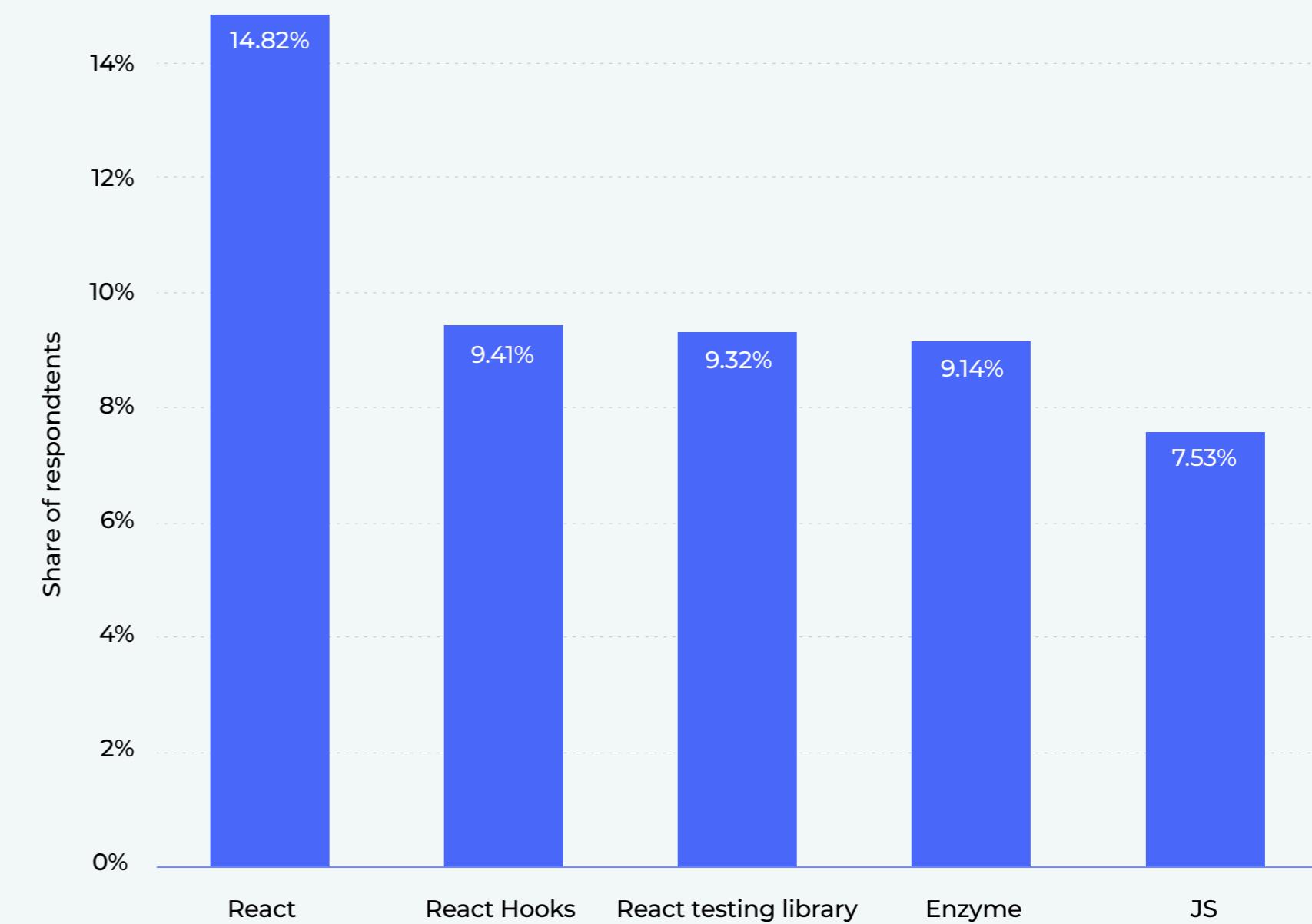
Most used technologies in the Java tech stack worldwide 2024

Share of respondtents

- Spring: 9.66%
- Spring boot: 7.50%
- Exceptions: 6.80%
- Collections: 6.46%
- Stream API: 6.26%

Most used technologies in the JavaScript tech stack worldwide 2024

Share of respondtents

- React: 14.82%
- React Hooks: 9.41%
- React testing library: 9.32%
- Enzyme: 9.14%
- JS: 7.53%

Source: **Dev Skiller**
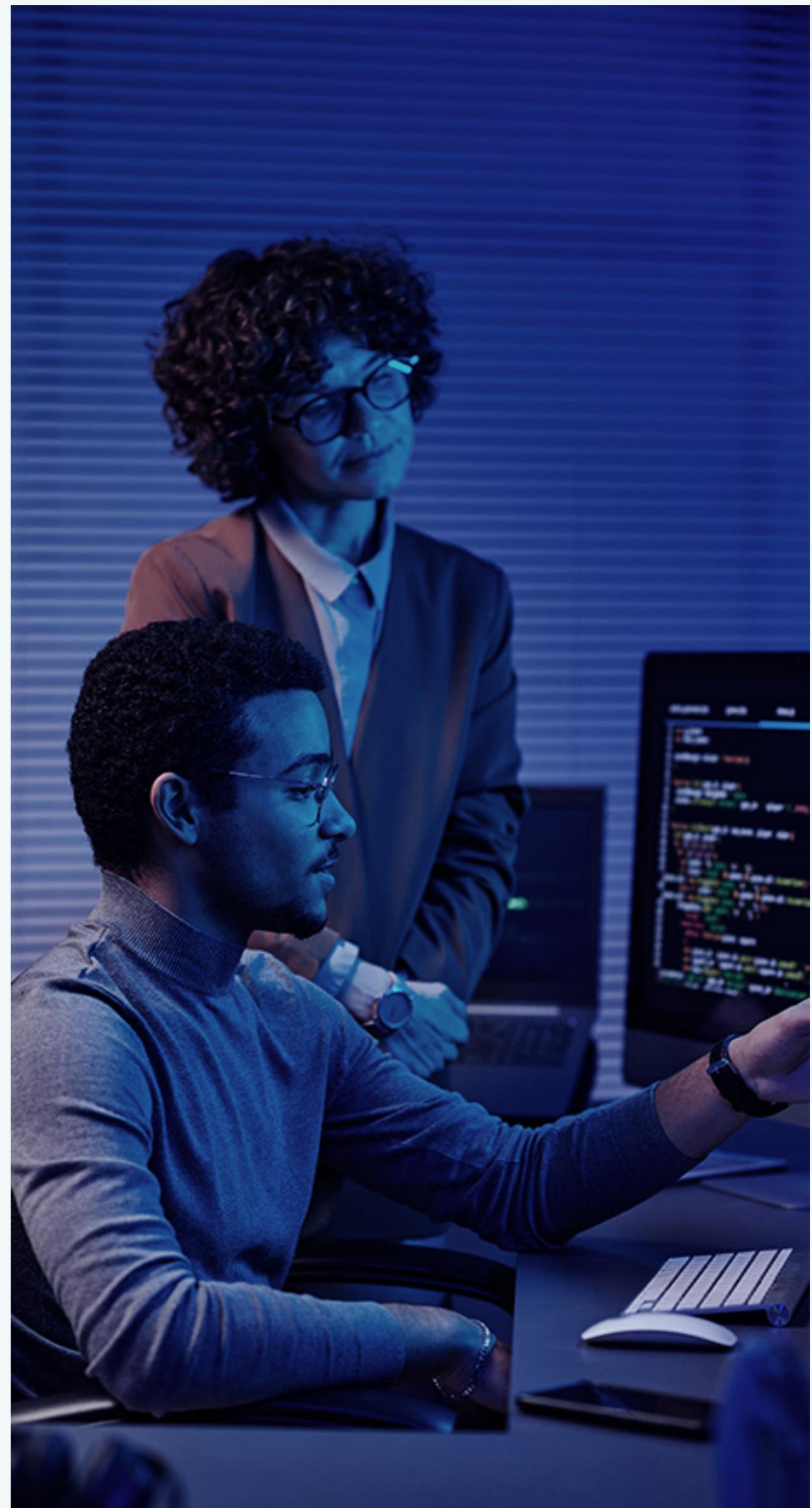
Continuous learning is the key to thriving in the tech market

In the digital age, proficiency in specific skills in IT roles is more crucial than ever. Customer skills data collected on our platform over the course of 2024 highlights the diverse skillsets required across IT positions, with scores reflecting a generally high level of competency among IT professionals. This underpins the importance of continuous learning and upskilling to stay competitive in the tech industry.

Our rating system uses five proficiency levels ranging from 0 percent (clean slate where the skill has not been assessed) to 100 percent (expert) to evaluate skills based on job positions, with each level indicating increasing levels of competence and decreasing need for supervision. The average skill proficiencies for top skills based on job positions were as follows:

- **IT professionals:** (see page 31) An assessment of IT job proficiency across various positions revealed that all roles scored above 61, indicating a solid intermediate level of competency. Quality assurance engineers led the pack, closely followed by support and software design roles.

- **Software design engineers:** (see page 31) Wireframing stands out as the top skill among software design engineers globally, achieving an impressive advanced-level score of 75 in DevSkiller assessments. User-centric design, interactive prototypes, and UX audits also demonstrate high proficiency, underscoring the critical role of user experience in software design.
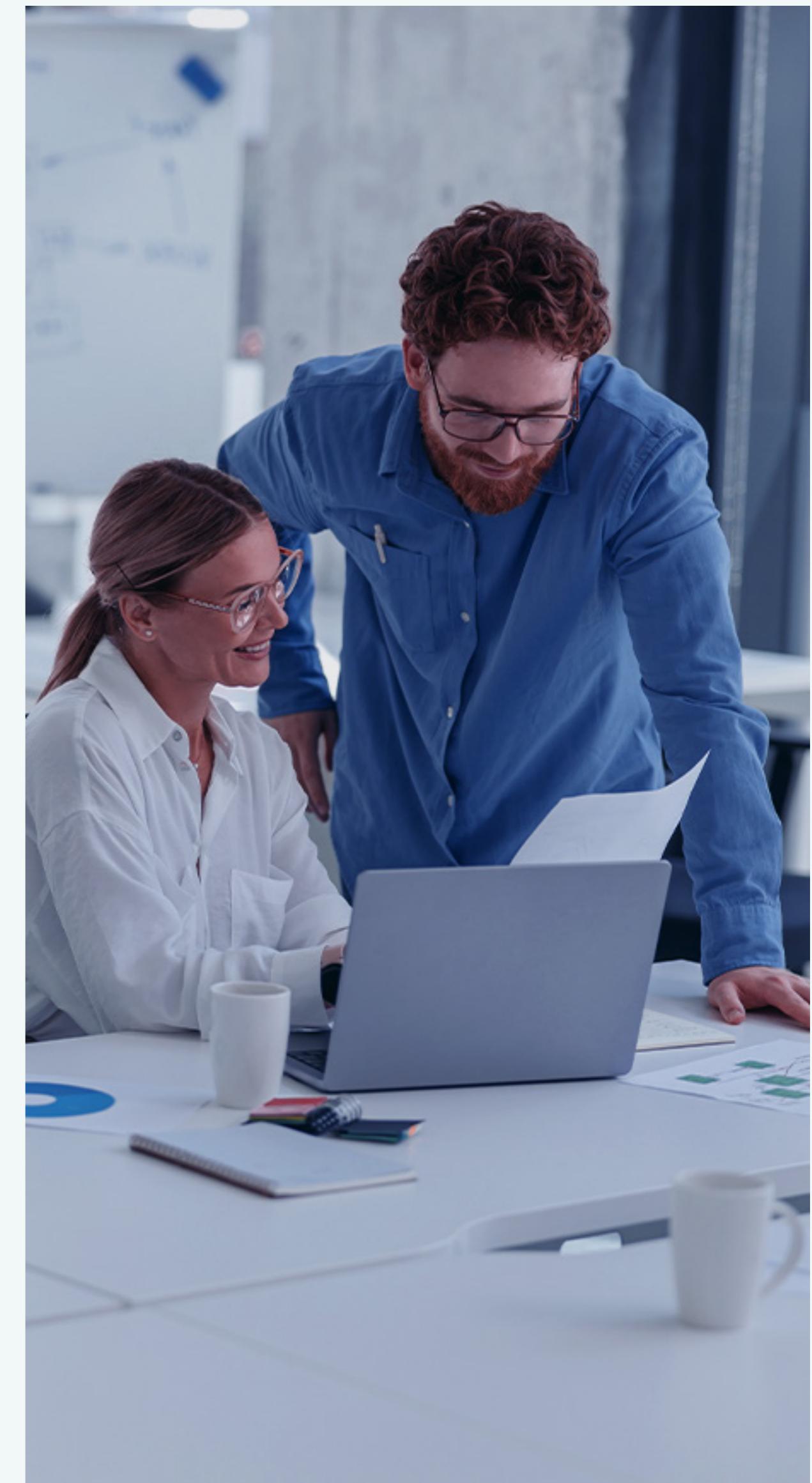
Continuous learning is the key to thriving in the tech market

- **Cybersecurity engineers:** (see page 32) Identity and access management emerged as the most proficient skill, with an intermediate-level score of 61. Networking fundamentals, security by design, and network protocols all demonstrated competency with scores slightly exceeding 50.

- **Cloud engineers:** (see page 32) Cloud Director has emerged as the top skill among cloud engineers globally, boasting an advanced-level proficiency score of 80. Command Line tools also demonstrated a high level of proficiency, achieving an advanced-level score of 73.

- **Data scientists:** (see page 33) CSV handling emerged as the most proficient skill, achieving an advanced-level score of 73. This high proficiency in CSV manipulation underscores the ongoing importance of working with structured data in diverse formats. Data analysis and data structures followed closely, with scores of 69 and 68, respectively, demonstrating strong foundational skills.

- **DevOps engineers:** (see page 33) OMNI emerged as the most proficient skill, achieving an advanced-level score of approximately 76, highlighting its significance within the DevOps toolkit. HTTPS and CI/CD Fundamentals followed closely, with scores of 65 and 61 respectively, indicating a strong grasp of secure communication protocols and continuous integration and delivery processes.
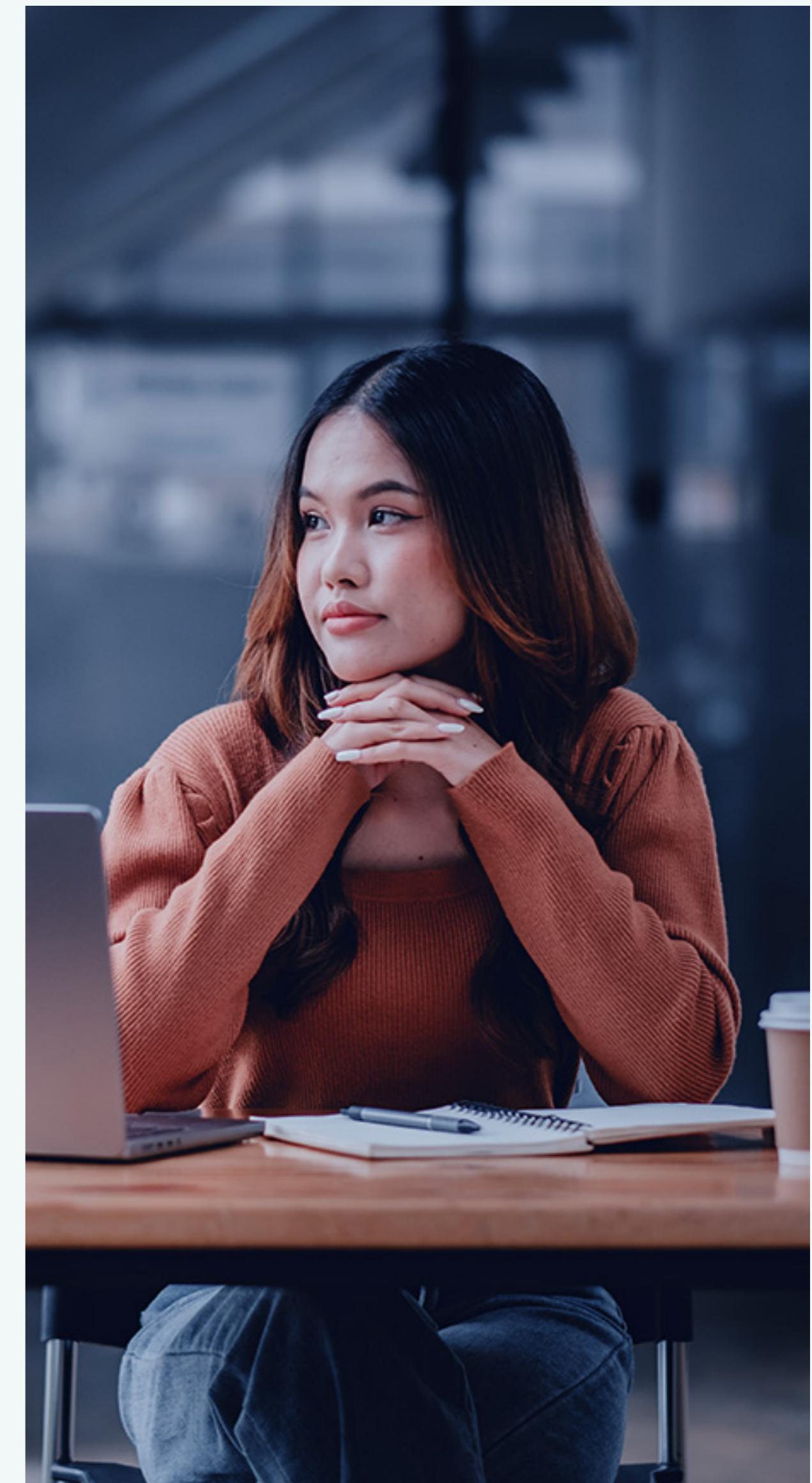
Continuous learning is the key to thriving in the tech market

• **Backend developers:** (see page 34) API specification creation emerged as the most proficient skill, achieving an advanced-level score of 70. Other notable skills, including ATG Fundamentals and .NET Framework fundamentals, closely followed, each scoring just below the advanced threshold.

• **Frontend developers:** (see page 34) ES6+ emerged as the most proficient skill, achieving a high advanced-level score of 78. ES6+ encompasses versions of ECMAScript that introduce modern JavaScript features, thereby enhancing the language's functionality and readability. Loops and CSS Typography followed closely. Other tools demonstrating advanced-level proficiency included Angular built-in directives, Tableau, and HTML Semantic Tags.

• **Mobile app developers:** (see page 35) Android Activities emerged as the most mastered skill, achieving a high advanced-level score of 80. Other fundamental concepts in Android development, such as Android XML Layout, Android Context, and Android Lifecycle, demonstrated high proficiency among mobile app developers globally. The programming SOLID principles followed closely behind, indicating a strong emphasis on clean code architecture.
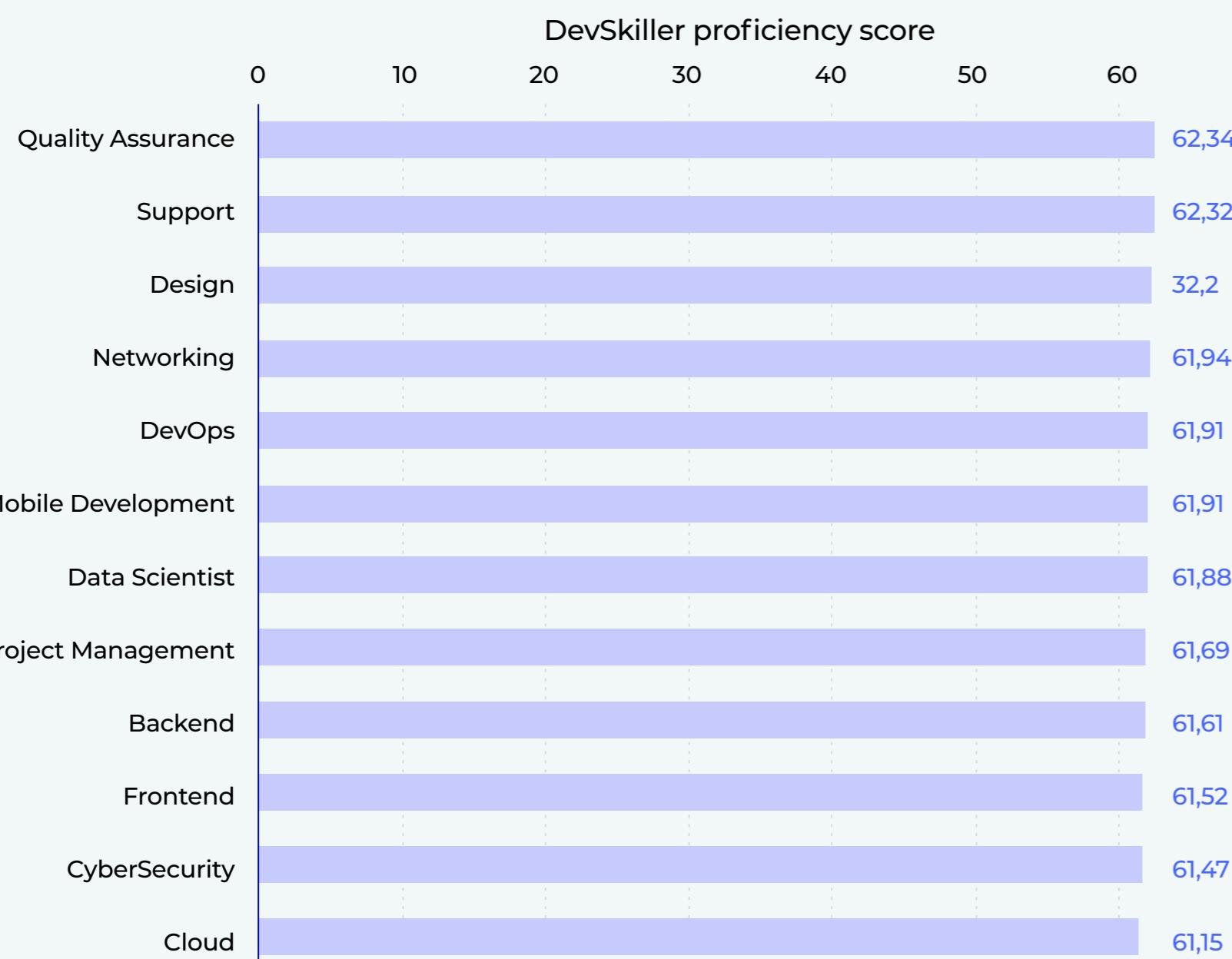
Continuous learning is the key to thriving in the tech market

- **Project managers in IT:** (see page 35) Open communication was identified as the most proficient skill among IT project managers worldwide. Remote team management, capacity planning, and backlog management were also highly developed skills, highlighting the importance of resource management and Agile methodologies in the field of IT project management.

- **Quality Assurance engineers:** (see page 36) Manual tests fundamentals emerged as the most mastered skill, followed closely by test execution and regression testing. Web testing, UI testing, and smoke testing all received advanced-level scores of around 77, respectively, emphasizing the critical role of these techniques in ensuring software quality.

- **AI engineers:** (see page 36) ChatGPT Assistants API has emerged as the most proficient skill among AI engineers globally, securing an average score of 61. This intermediate-level proficiency suggests that while AI development is rapidly progressing, the overall skill level, even for top skills, might be influenced by the recent surge in interest in AI. Azure Databricks and AI-code assistant Tabnine followed closely with scores of 60. Significantly, ethical AI usage scored around 52, indicating a growing awareness and focus on responsible AI practices within the AI development community.
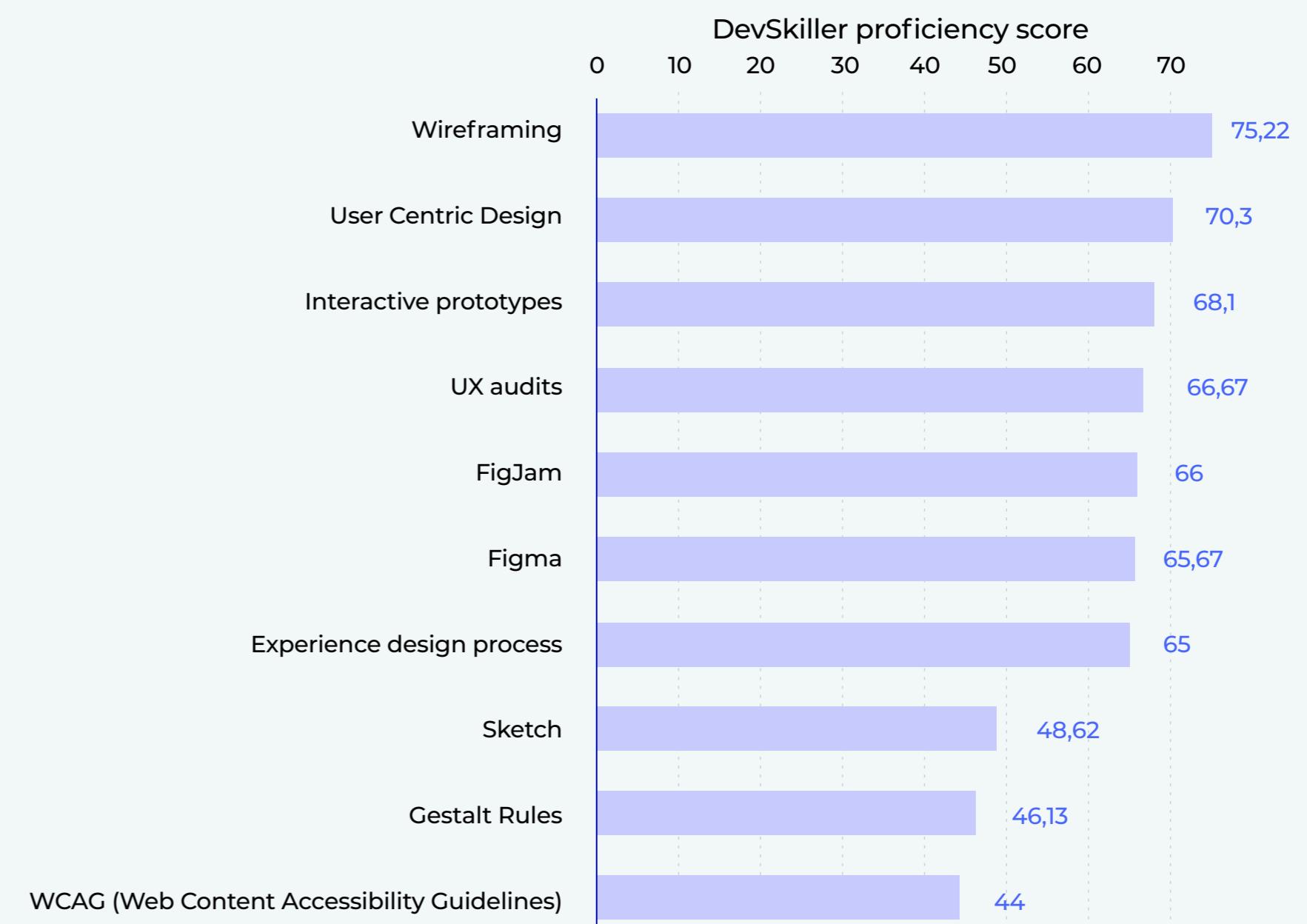
IT professionals and Software Design Engineers

Average skill proficiency of IT professionals by job position worldwide in 2024

DevSkiller proficiency score

Job position	Score
Quality Assurance	62,34
Support	62,32
Design	32,2
Networking	61,94
DevOps	61,91
Mobile Development	61,91
Data Scientist	61,88
Project Management	61,69
Backend	61,61
Frontend	61,52
CyberSecurity	61,47
Cloud	61,15
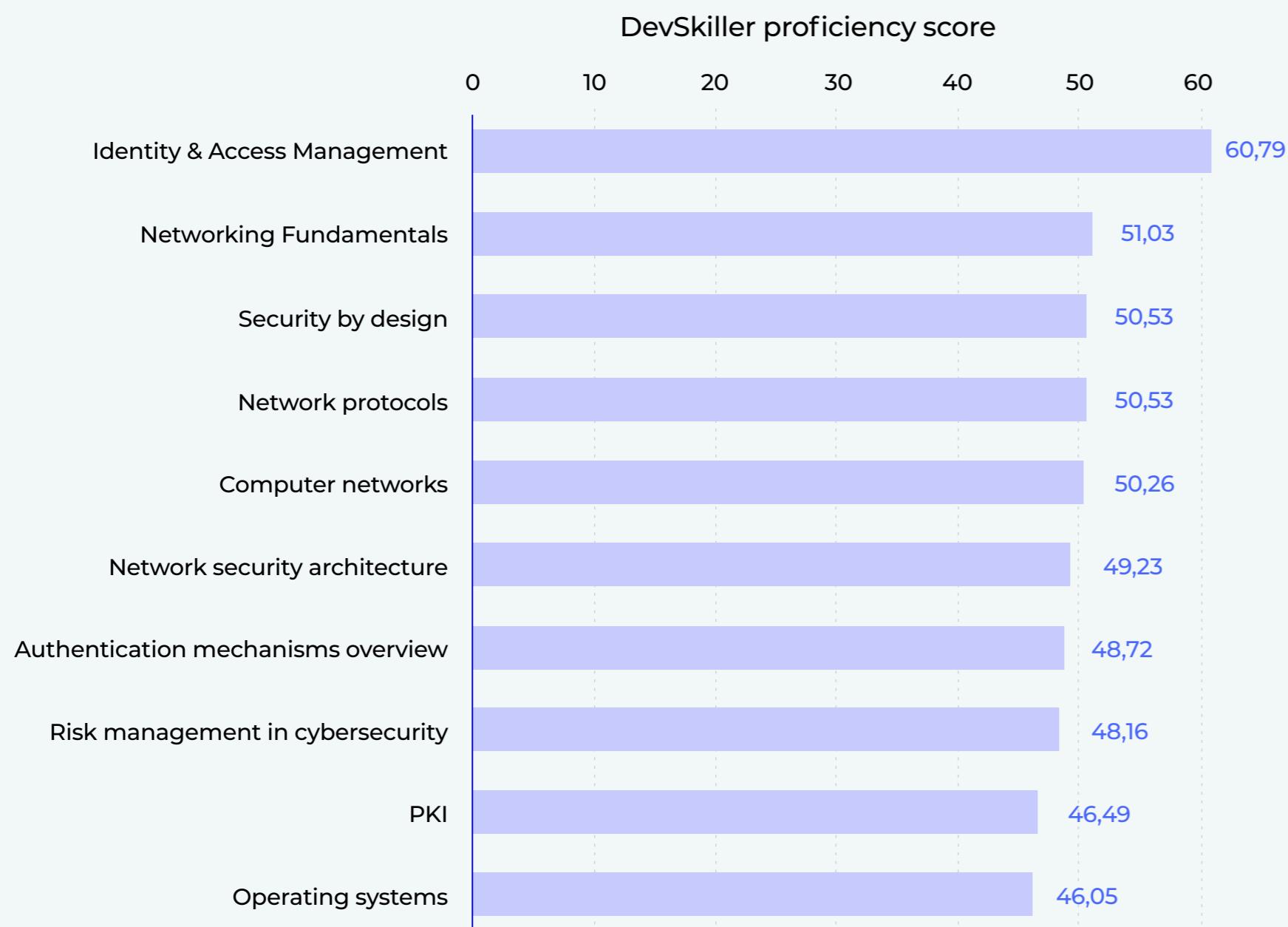
Average skill proficiency of Software Design Engineers worldwide 2024

DevSkiller proficiency score

Skill	Score
Wireframing	75,22
User Centric Design	70,3
Interactive prototypes	68,1
UX audits	66,67
FigJam	66
Figma	65,67
Experience design process	65
Sketch	48,62
Gestalt Rules	46,13
WCAG (Web Content Accessibility Guidelines)	44
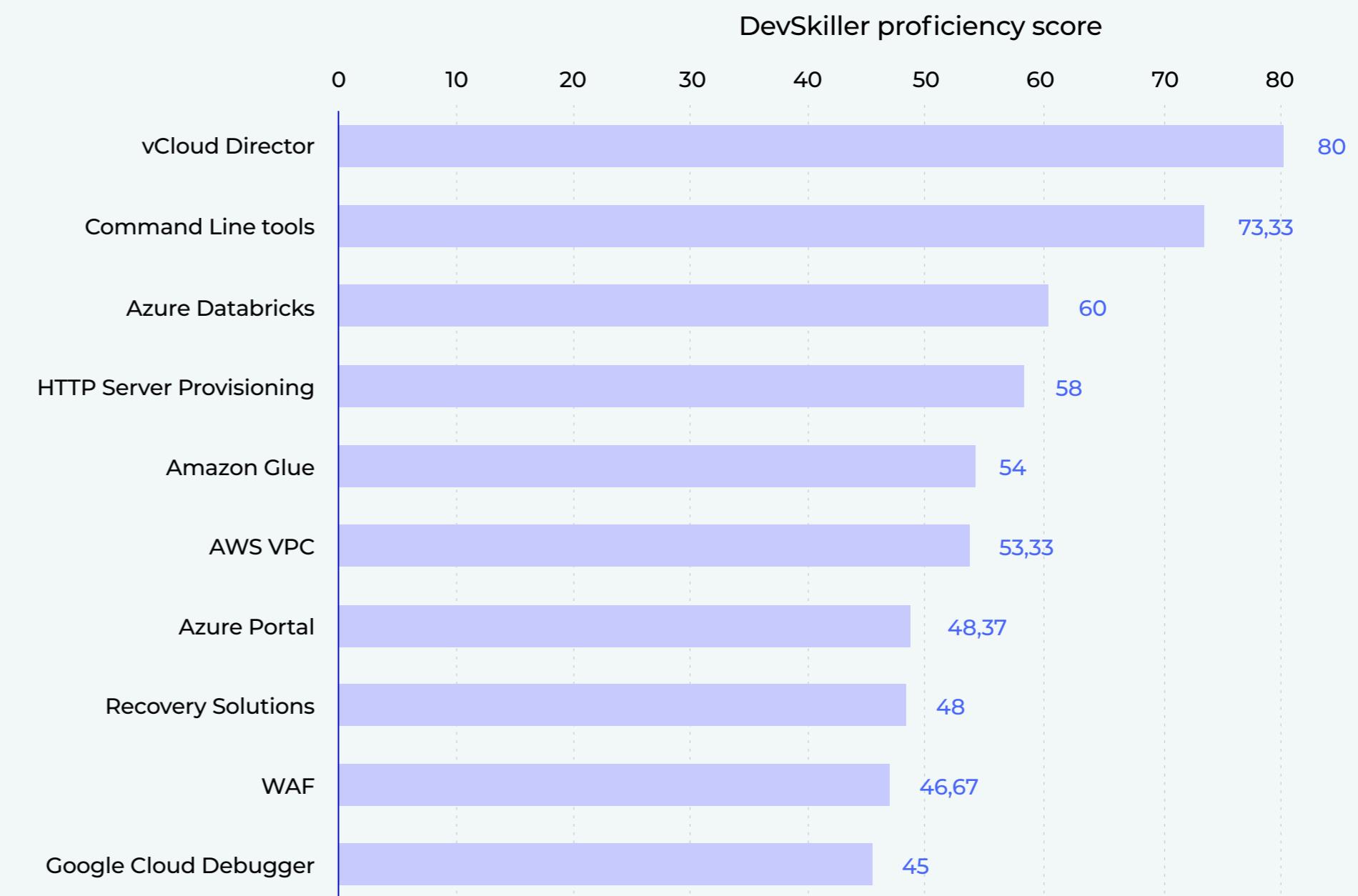
Source: **Dev**Skiller

Cybersecurity Engineers and Cloud Engineers

Average skill proficiency of Cybersecurity Engineers worldwide 2024

DevSkiller proficiency score

Skill	Score
Identity & Access Management	60,79
Networking Fundamentals	51,03
Security by design	50,53
Network protocols	50,53
Computer networks	50,26
Network security architecture	49,23
Authentication mechanisms overview	48,72
Risk management in cybersecurity	48,16
PKI	46,49
Operating systems	46,05
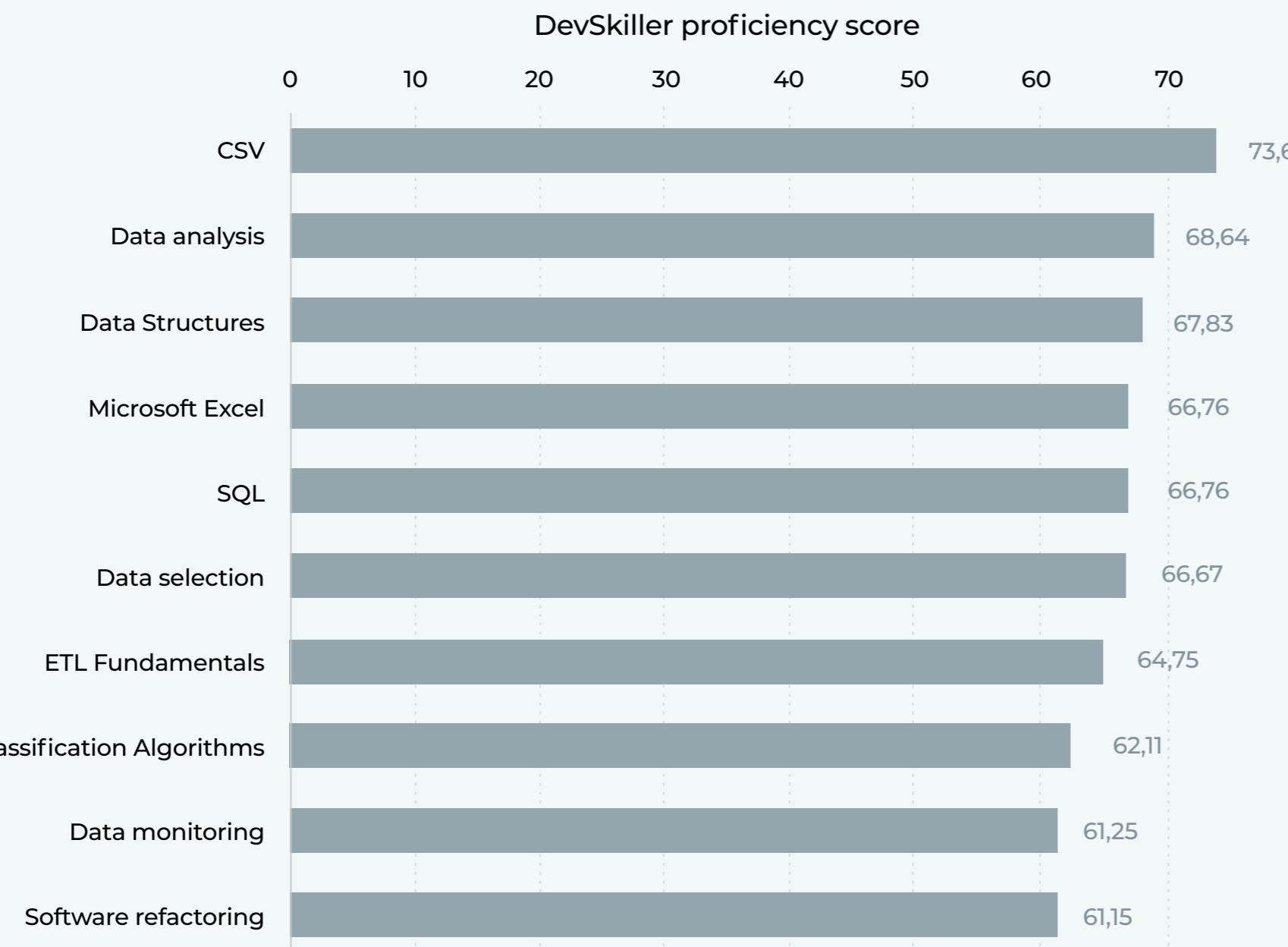
Average skill proficiency of Cloud Engineers worldwide 2024

DevSkiller proficiency score

Skill	Score
vCloud Director	80
Command Line tools	73,33
Azure Databricks	60
HTTP Server Provisioning	58
Amazon Glue	54
AWS VPC	53,33
Azure Portal	48,37
Recovery Solutions	48
WAF	46,67
Google Cloud Debugger	45
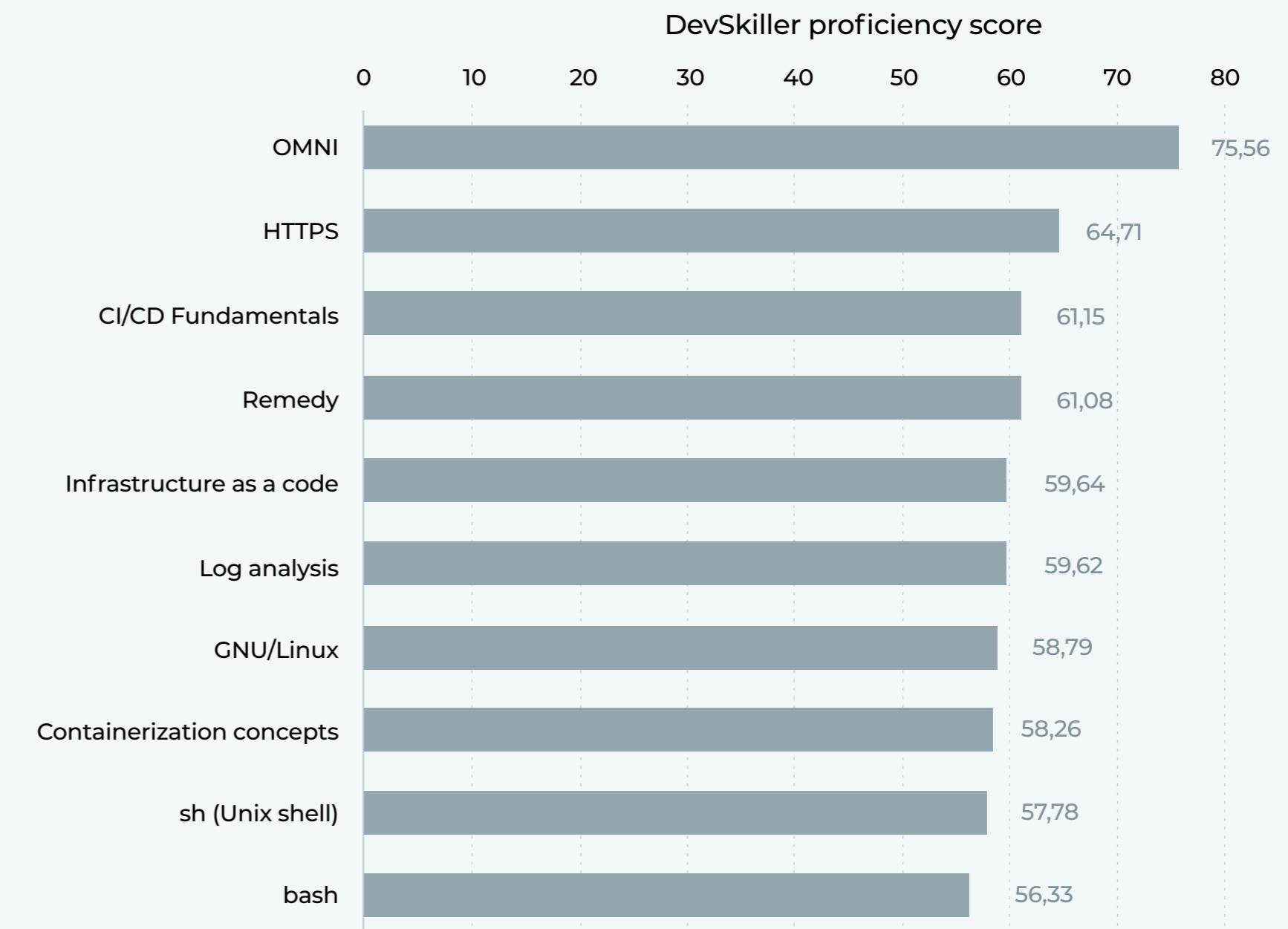
Source: **Dev Skiller**

Data Scientists and DevOps Engineers

Average skill proficiency of Data Scientists worldwide 2024

DevSkiller proficiency score

Skill	Score
CSV	73,6
Data analysis	68,64
Data Structures	67,83
Microsoft Excel	66,76
SQL	66,76
Data selection	66,67
ETL Fundamentals	64,75
Classification Algorithms	62,11
Data monitoring	61,25
Software refactoring	61,15
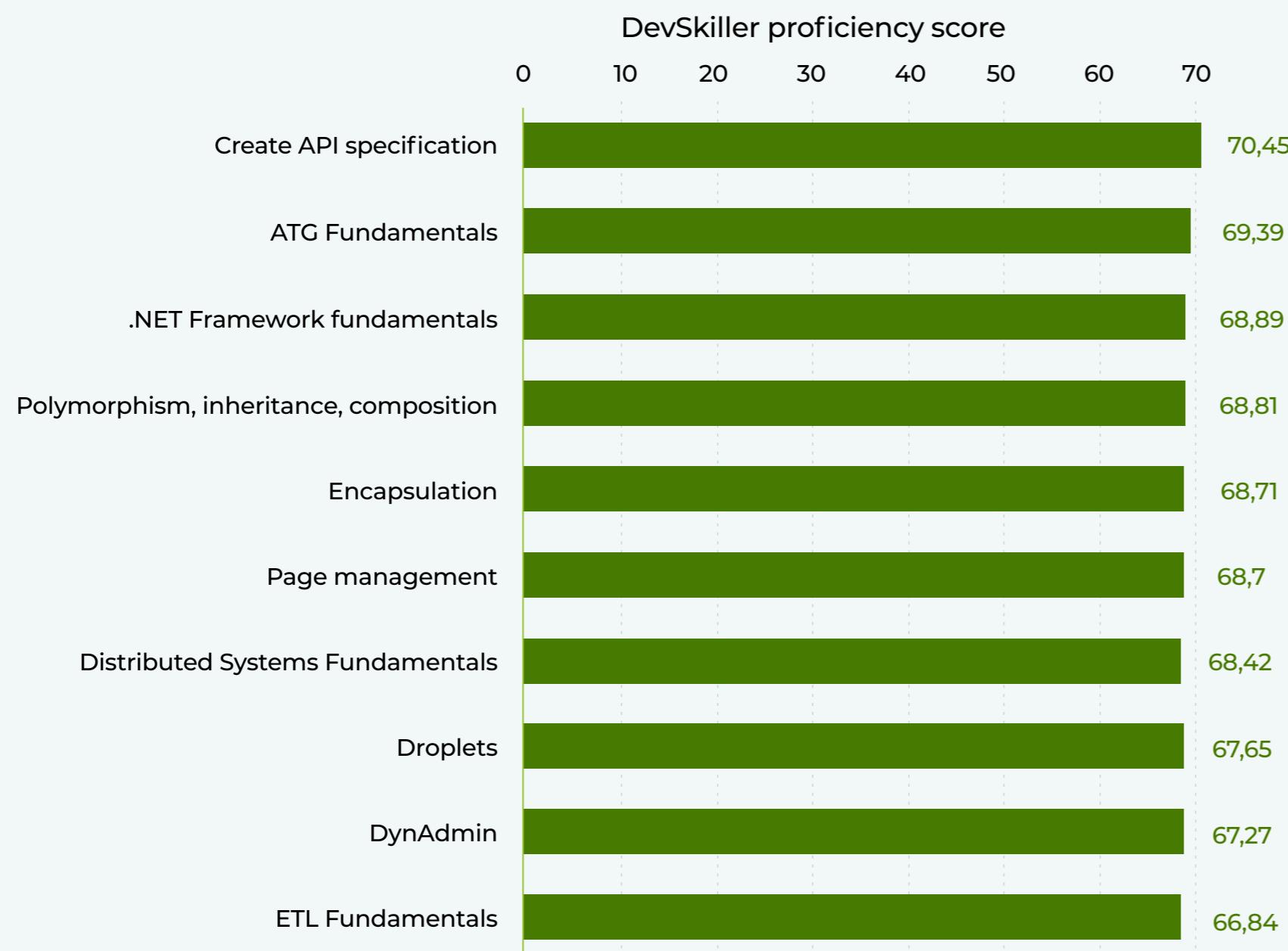
Average skill proficiency of DevOps Engineers worldwide 2024

DevSkiller proficiency score

Skill	Score
OMNI	75,56
HTTPS	64,71
CI/CD Fundamentals	61,15
Remedy	61,08
Infrastructure as a code	59,64
Log analysis	59,62
GNU/Linux	58,79
Containerization concepts	58,26
sh (Unix shell)	57,78
bash	56,33
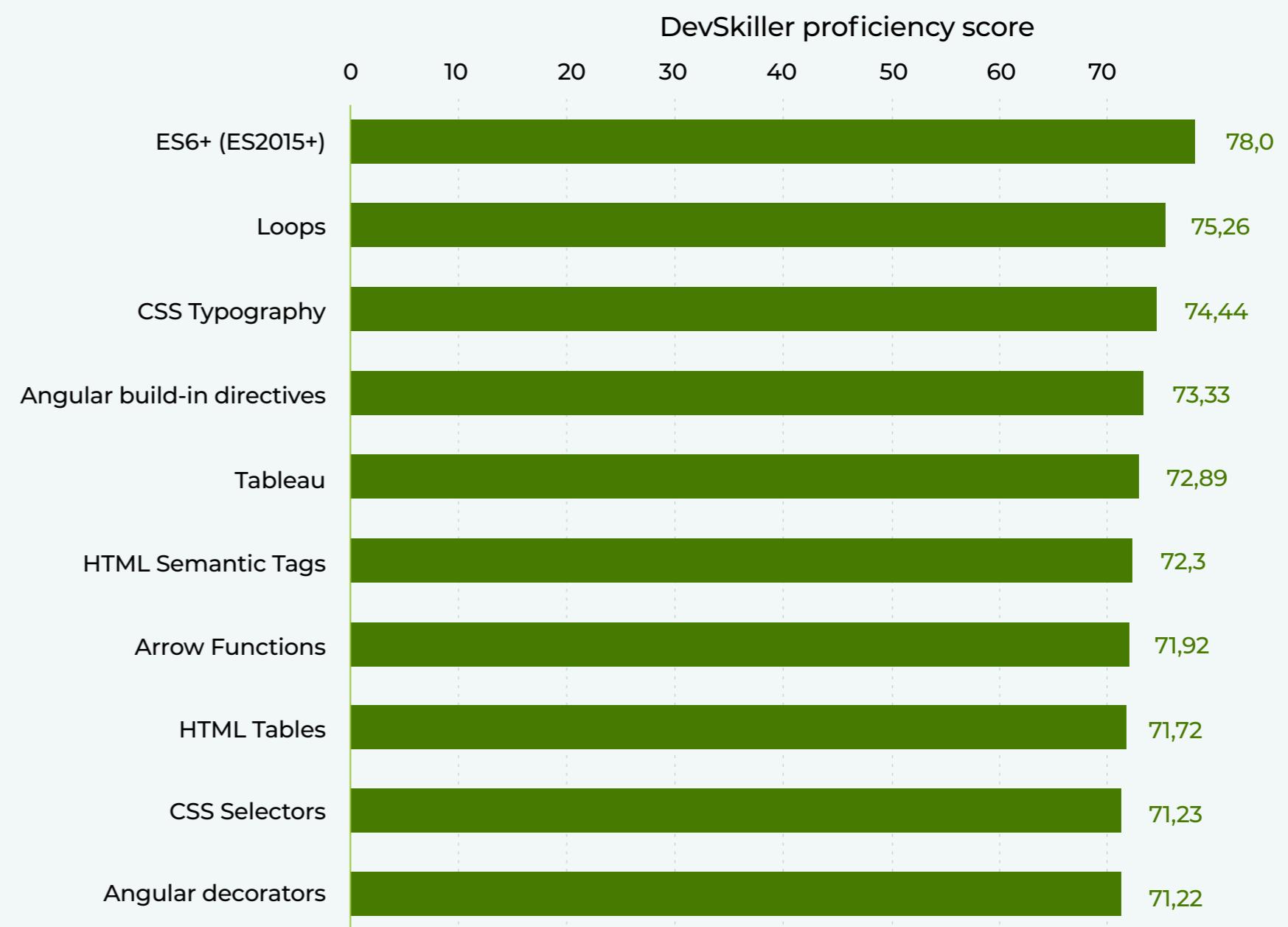
Source: **Dev Skiller**

Backend and Frontend Developers

Average skill proficiency of Backend Developers worldwide 2024

DevSkiller proficiency score

Skill	Score
Create API specification	70,45
ATG Fundamentals	69,39
.NET Framework fundamentals	68,89
Polymorphism, inheritance, composition	68,81
Encapsulation	68,71
Page management	68,7
Distributed Systems Fundamentals	68,42
Droplets	67,65
DynAdmin	67,27
ETL Fundamentals	66,84
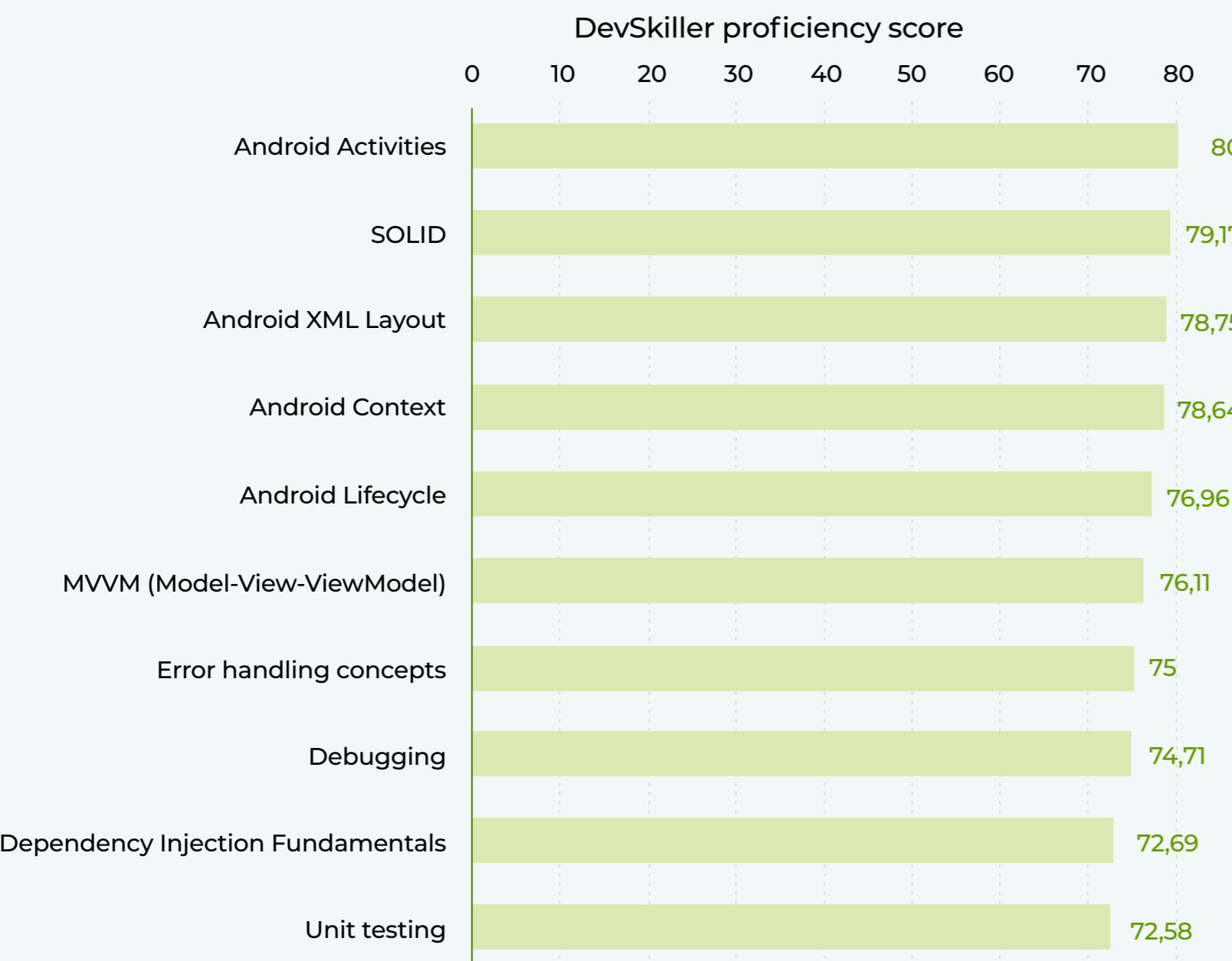
Average skill proficiency of Frontend Developers worldwide 2024

DevSkiller proficiency score

Skill	Score
ES6+ (ES2015+)	78,0
Loops	75,26
CSS Typography	74,44
Angular build-in directives	73,33
Tableau	72,89
HTML Semantic Tags	72,3
Arrow Functions	71,92
HTML Tables	71,72
CSS Selectors	71,23
Angular decorators	71,22

Source: **Dev**Skiller
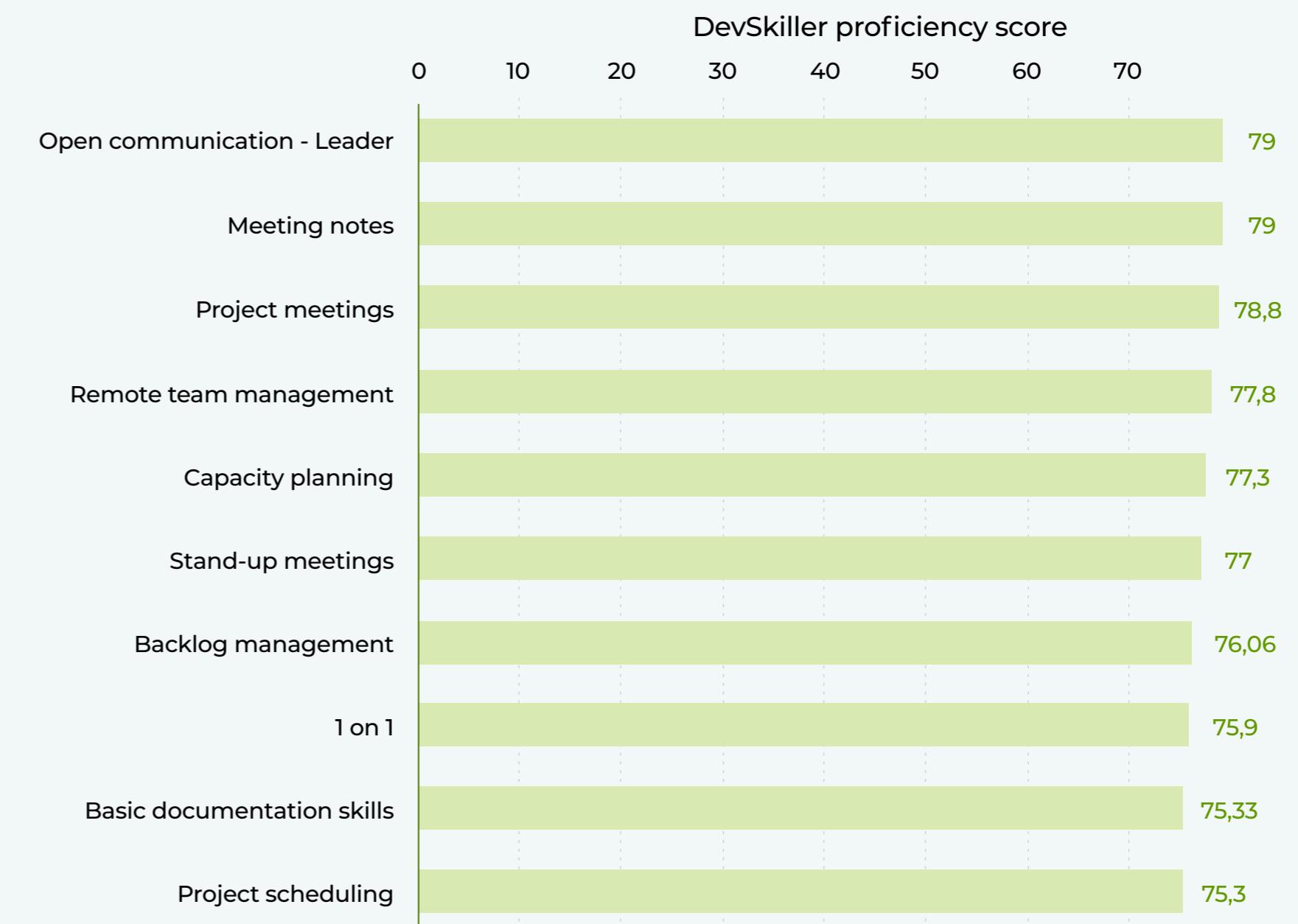
statista **Dev**Skiller

Mobile App Developers and Project Managers in IT

Average skill proficiency of Mobile App Developers worldwide 2024

DevSkiller proficiency score

Skill	Score
Android Activities	80
SOLID	79,17
Android XML Layout	78,75
Android Context	78,64
Android Lifecycle	76,96
MVVM (Model-View-ViewModel)	76,11
Error handling concepts	75
Debugging	74,71
Dependency Injection Fundamentals	72,69
Unit testing	72,58
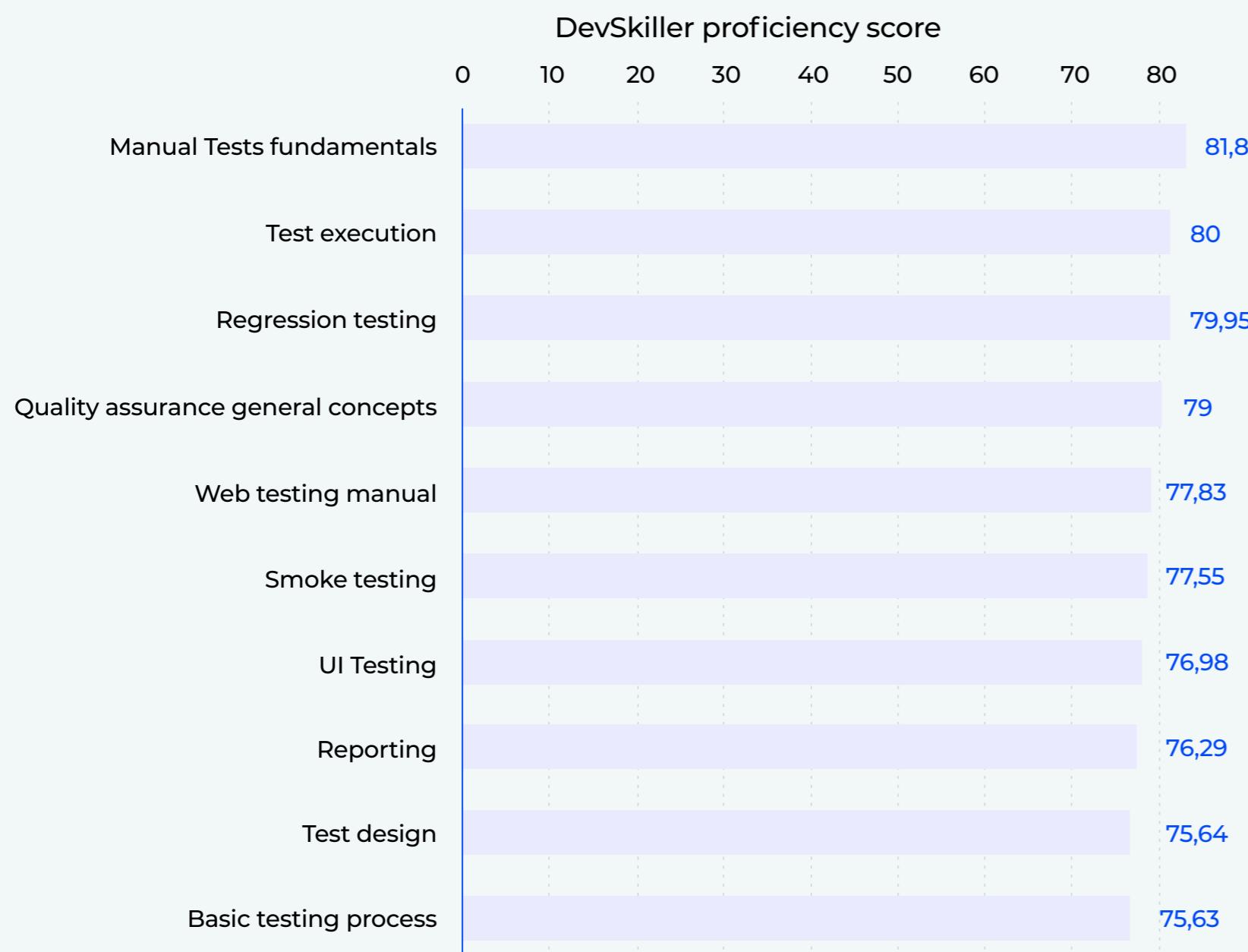
Average skill proficiency of Project Managers in IT worldwide 2024

DevSkiller proficiency score

Skill	Score
Open communication - Leader	79
Meeting notes	79
Project meetings	78,8
Remote team management	77,8
Capacity planning	77,3
Stand-up meetings	77
Backlog management	76,06
1 on 1	75,9
Basic documentation skills	75,33
Project scheduling	75,3
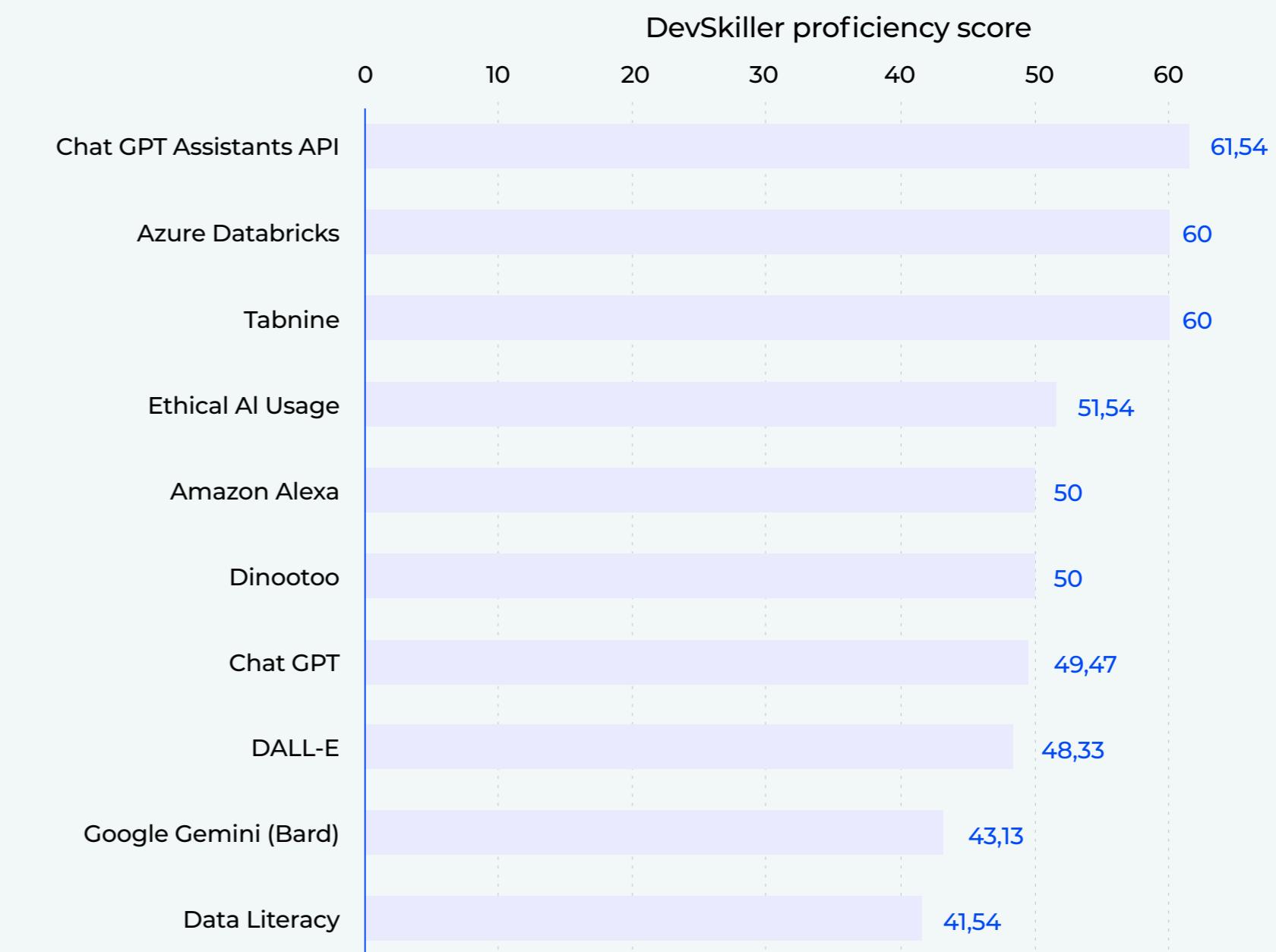
Source: **Dev**Skiller

QA Engineers and AI Engineers

Average skill proficiency of QA Engineers worldwide 2024

DevSkiller proficiency score

Skill	Score
Manual Tests fundamentals	81,81
Test execution	80
Regression testing	79,95
Quality assurance general concepts	79
Web testing manual	77,83
Smoke testing	77,55
UI Testing	76,98
Reporting	76,29
Test design	75,64
Basic testing process	75,63

Average skill proficiency of AI Engineers worldwide 2024

DevSkiller proficiency score

Skill	Score
Chat GPT Assistants API	61,54
Azure Databricks	60
Tabnine	60
Ethical AI Usage	51,54
Amazon Alexa	50
Dinootoo	50
Chat GPT	49,47
DALL-E	48,33
Google Gemini (Bard)	43,13
Data Literacy	41,54

Source: **Dev Skiller**

The Intersection of IT Skills and Artificial Intelligence

Navigating the AI era

In recent years, AI has caused significant disruption across industries, transforming how people work, navigate their careers, and even perceive reality. While AI's potential to automate repetitive tasks and increase efficiency is clear, its impact on the workforce, particularly in white-collar professions like IT, is a growing concern. As AI-assisted tools become more prevalent, companies may increasingly rely on them to automate tasks that were typically handled by junior developers, leading to a reduction in entry-level roles and potential skill degradation.

For instance, tools like GitHub Copilot can generate code snippets or entire functions based on natural language descriptions – enabling developers to write code faster – in addition to fixing bugs and suggesting code optimizations. OpenAI's ChatGPT stood out as the most popular AI-powered tool among developers over the past year, with 82 percent reporting regular usage **(see page 40)**. GitHub Copilot secured the second position at 44 percent, followed by Google Gemini at 22 percent. Other notable tools included Microsoft-owned Bing AI and Visual Studio Intellicode.

Despite the concerns around AI job disruption, there are also significant benefits and opportunities associated with AI. When leveraged effectively, AI can streamline processes, eliminate inefficiencies, and drive profits, and businesses are actively seeking to automate low-risk, high-value tasks, freeing their workforce to focus on more complex, human-centric work.

While generative AI can automate certain tasks, human expertise remains essential for optimizing its use. The ability to apply critical thinking, creativity, and empathy is what distinguishes humans from machines. The emergence of new technology-driven professions like prompt engineering, which focuses on crafting instructions for AI tools, further highlights the ongoing transformation.

As the world of work navigates this AI-driven era, it is vital to recognize the potential for both job displacement and the creation of new opportunities. Adaptability, continuous learning, and a focus on developing uniquely human skills will be the key to thriving in this evolving landscape.

AI adoption is prominent in tech, media, and telecoms

AI adoption in organizations worldwide in 2023, by industry and application

Share of responders

Industry	Human resources	Manufac-turing	Marketing and sales	Produkt and/or service development	Risk assessment	Service operations	Strategy and corporate finance	Supply chain management
All industries	9%	6%	25%	26%	12%	24%	8%	9%
Business, legal, and professional services	9%	5%	28%	24%	10%	19%	13%	6%
Consumer goods/retail	7%	9%	31%	15%	6%	22%	2%	14%
Financial services	9%	1%	22%	20%	28%	31%	14%	4%
Healthcare systems/pharma and medical products	5%	7%	8%	26%	7%	15%	6%	11%
Tech/media/telecoms	14%	6%	36%	44%	7%	36%	6%	9%

Application

AI is rapidly providing organizations worldwide with enhanced benefits and increased productivity due to its expanded automation capabilities, improved accessibility, and a broader range of proven use cases. A research survey by McKinsey & Company published in Stanford University's AI Index Report 2024 looked at AI adoption by industry and AI function. In 2023, the highest AI adoption rates were in the tech, media, and telecommunications industry, particularly the functions of product and/or service development (44 percent), marketing and sales (36 percent), and service operations (36 percent).
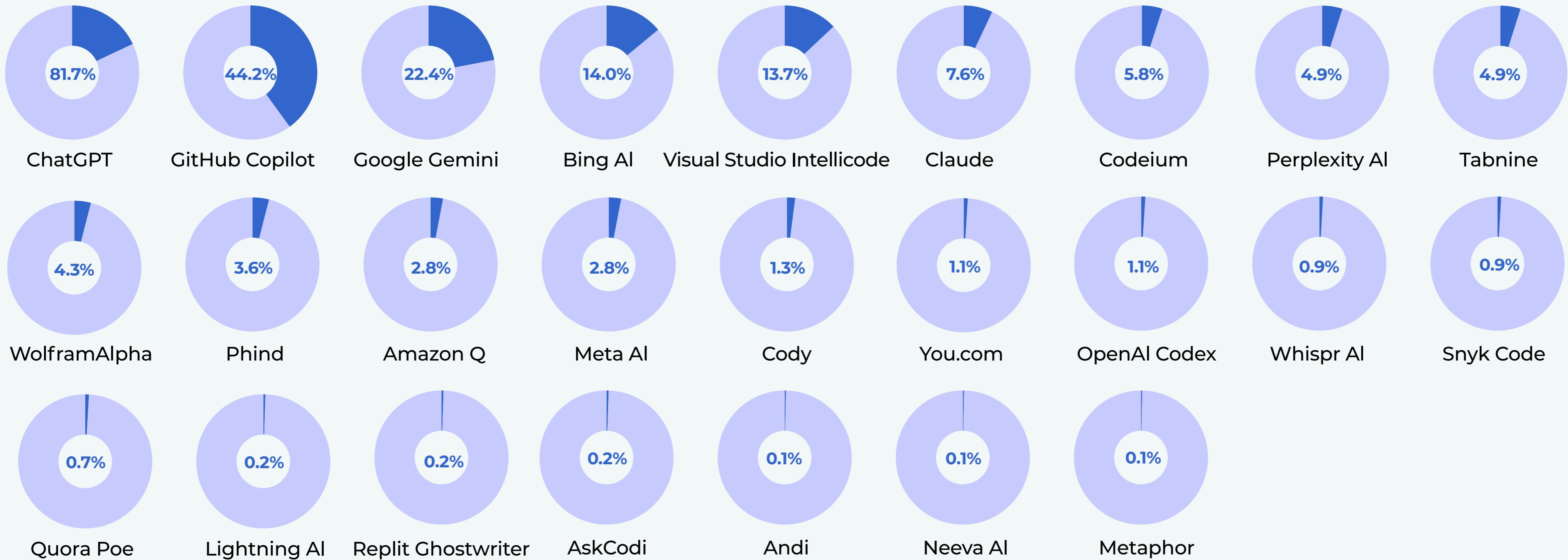
Source: McKinsey & Company

AI tools in 2024

OpenAI's ChatGPT leads the pack in AI tool adoption

Most used AI search and developer tools among developers worldwide 2024

Source: stackoverflow

|								
81.7%	44.2%	22.4%	14.0%	13.7%	7.6%	5.8%	4.9%	4.9%
ChatGPT	GitHub Copilot	Google Gemini	Bing AI	Visual Studio Intellicode	Claude	Codeium	Perplexity AI	Tabnine
4.3%	3.6%	2.8%	2.8%	1.3%	1.1%	1.1%	0.9%	0.9%
WolframAlpha	Phind	Amazon Q	Meta AI	Cody	You.com	OpenAI Codex	Whispr AI	Snyk Code
0.7%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%		
Quora Poe	Lightning AI	Replit Ghostwriter	AskCodi	Andi	Neeva AI	Metaphor		
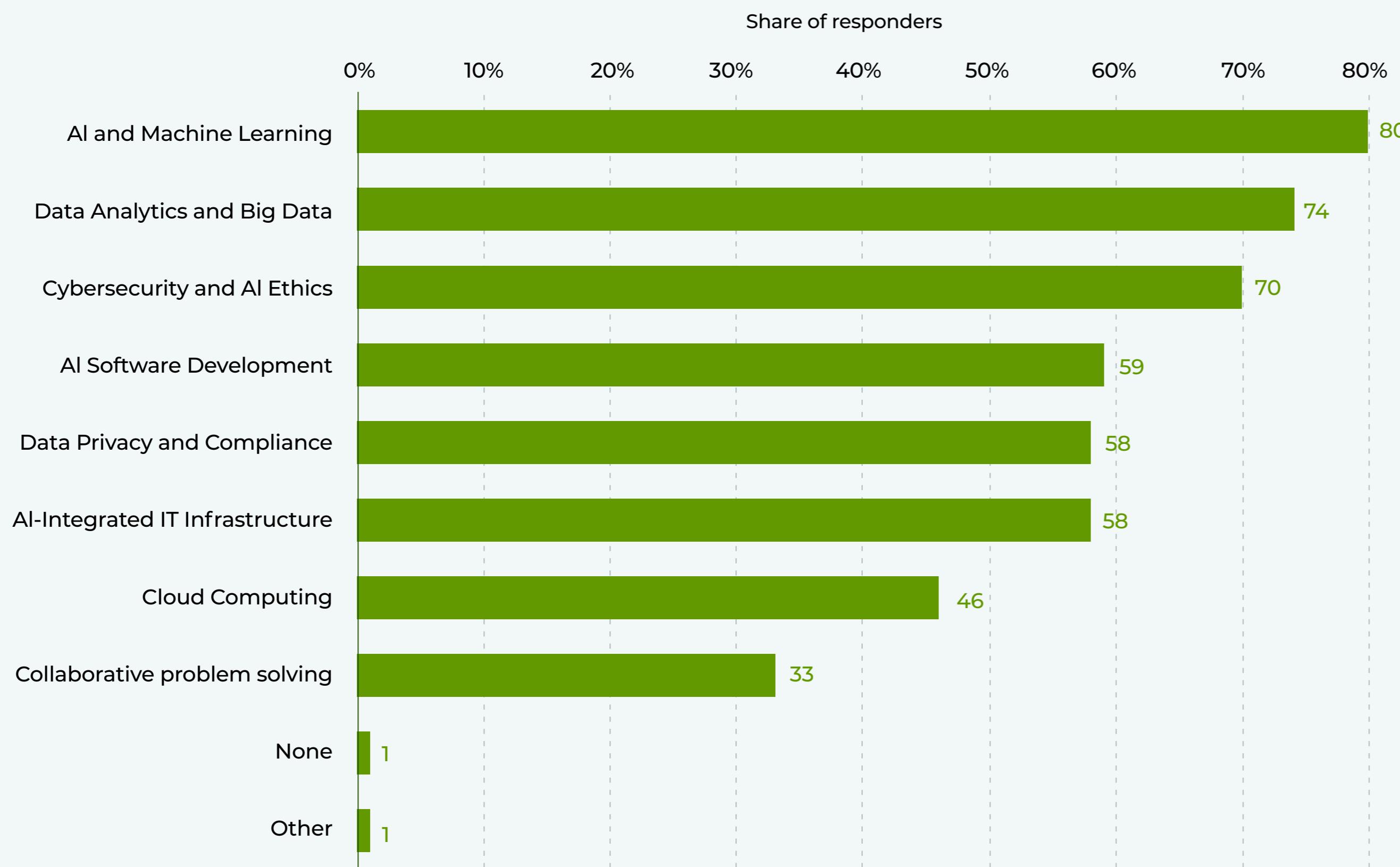
Generative AI is reshaping the IT skills landscape

Specialist with AI skills are being sought after to drive innovation

IT skills with expected increase in demand due to generative AI worldwide 2023

Share of responders

| Skill	Value
AI and Machine Learning	80
Data Analytics and Big Data	74
Cybersecurity and AI Ethics	70
AI Software Development	59
Data Privacy and Compliance	58
AI-Integrated IT Infrastructure	58
Cloud Computing	46
Collaborative problem solving	33
None	1
Other	1
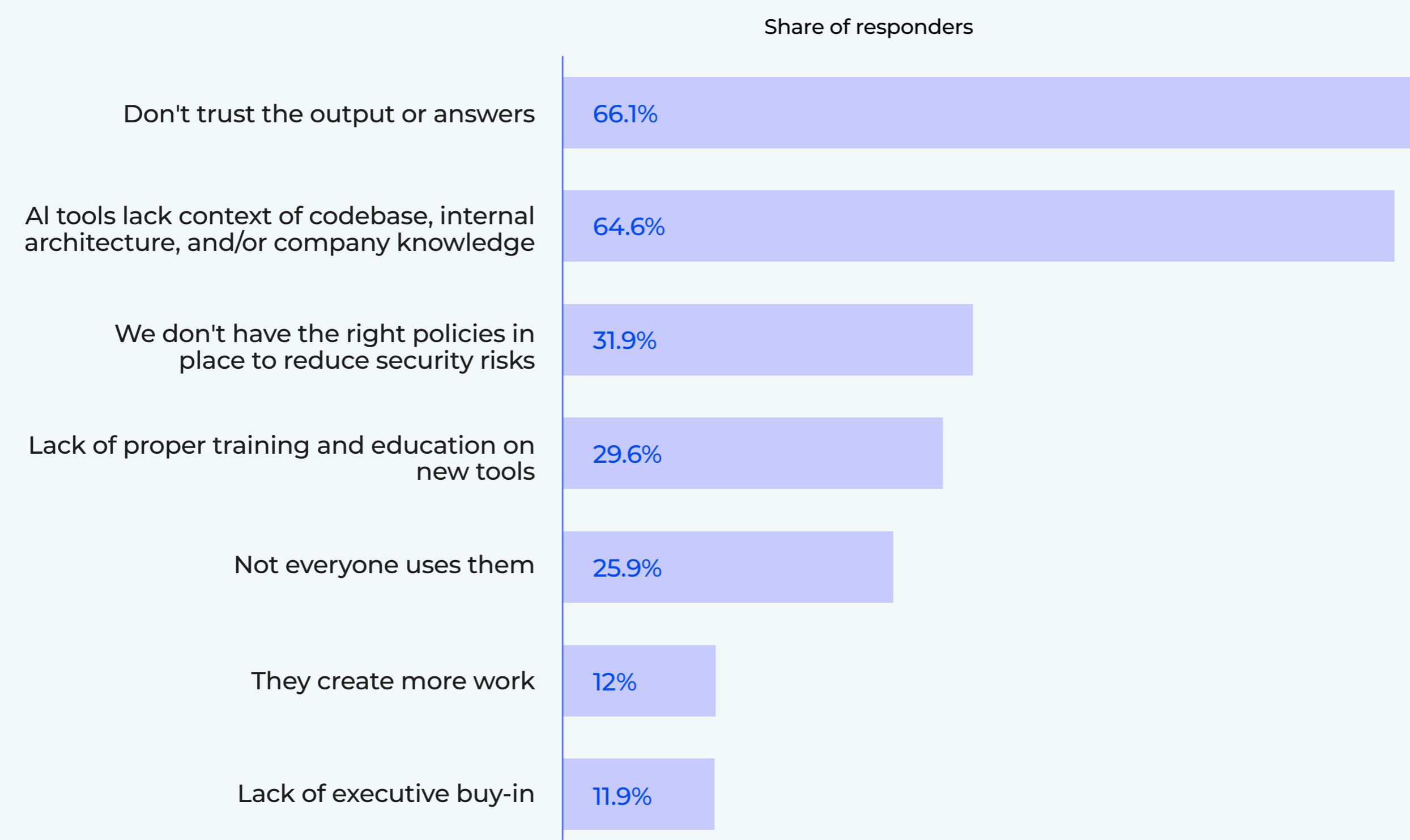
A 2023 survey shows a shift in the IT skills landscape driven by the rise of generative AI. Globally, 80 percent foresee a surge in demand for AI and machine learning expertise, while 74 percent of IT leaders anticipate increased demand for data analytics and big data skills. Additionally, 70 percent of respondents predict a heightened need for cybersecurity and AI ethics professionals. The focus on data analytics, big data, and AI/ML skills highlights the need to manage and leverage AI-generated data. Moreover, the emphasis on cybersecurity and AI ethics reflects the importance of responsible AI development and deployment in an increasingly AI-driven world.

Source: INFO~TECH RESEARCH GROUP

A trust deficit hampers AI integration among developers

Transparency and context-awareness are essential for building confidence

Challenges to working with AI tools among developers worldwide 2024

Share of responders

Challenge	Share
Don't trust the output or answers	66.1%
AI tools lack context of codebase, internal architecture, and/or company knowledge	64.6%
We don't have the right policies in place to reduce security risks	31.9%
Lack of proper training and education on new tools	29.6%
Not everyone uses them	25.9%
They create more work	12%
Lack of executive buy-in	11.9%

In 2024, distrust in the output of AI code assistants and generative AI tools lacking context presented the most significant challenge to integrating AI into the development workflow, affecting around two-thirds of developers globally. Additionally, nearly 30 percent of developers identified inadequate policies, and a lack of training and education on new AI tools as key challenges. Notably, a lack of executive buy-in posed a barrier for approximately 12 percent of developers seeking to implement AI solutions. This underscores a clear need for increased trust-building measures, comprehensive training programs, and stronger advocacy for AI within organizations.

Source: stack**overflow**

Tech Market Outlook & Key Takeaways

The fastest-growing jobs are driven by technology and digitalization

Demand is growing for skilled workers who can develop, implement, and maintain new tech

Fastest-growing vs fastest-declining jobs between 2023 and 2027

Top 10 fastest growing jobs

1. AI and ML specialists
2. Sustainability specialists
3. Business intelligence analysts
4. Information security analysts
5. Fintech engineers
6. Data analysts and scientists
7. Robotics engineers
8. Big data specialists
9. Agricultural equipment operators
10. Digital transformation specialists

Top 10 fastest declining jobs

1. Bank tellers and related clerks
2. Postal service clerks
3. Cashiers and ticket clerks
4. Data entry clerks
5. Administrative executive secretaries
6. Material recording and stock-keeping clerks
7. Accounting, book-keeping, and payroll clerks
8. Home appliance installers and repairers
9. Legislators and officials
10. Statistical, finance, and insurance clerks

Source: WORLD ECONOMIC FORUM

Ongoing digital transformation necessitates skilled professionals who can navigate and leverage emerging tech. This trend is creating new industries and transforming existing ones. As a result, there is a growing demand for skilled workers who can develop, implement, and maintain new technologies, such as AI/ML, cloud computing, and renewable energy. According to the World Economic Forum, surveyed businesses expect AI and ML specialists to be the fastest-growing job between 2023 and 2027.

Meanwhile, the fastest-declining positions, due to the repetitive nature of the tasks involved, are primarily clerical or secretarial roles. Bank tellers and related clerks, postal service clerks, cashiers and ticket clerks, and data entry clerks are expected to experience the most rapid decline due to the influence of technology and digitalization.

IT outsourcing dominates the IT services market

There will be rising demand for skilled IT profressionals

Revenue in the IT Services market Worldwide 2017-2029 (in billion U.S. dollars)

Legend:
- IT outsourcing
- Business Process Aoutsourcing
- Other IT Services
- IT Consulting & Implementation

In billion U.S. dollars
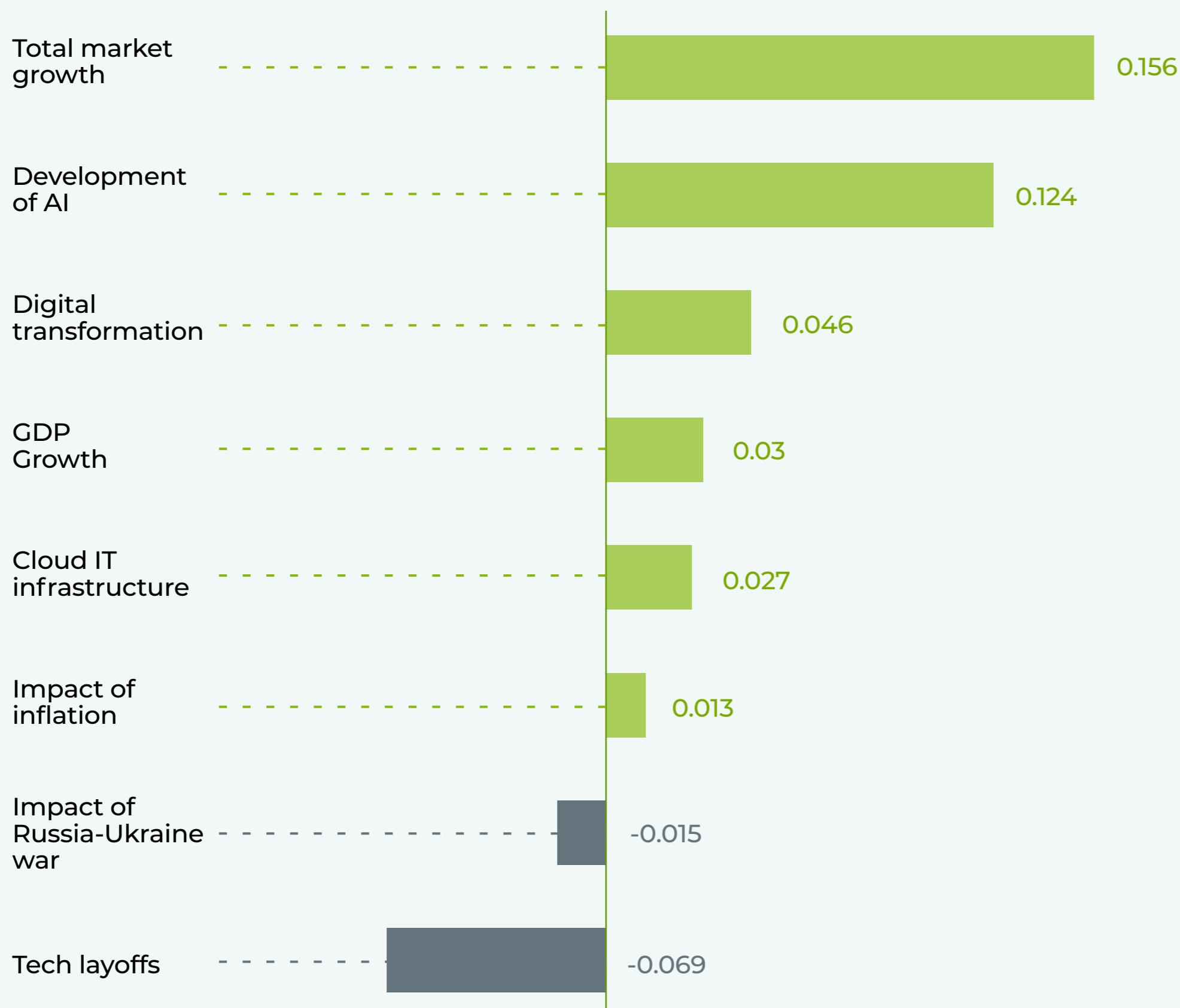
The IT services market is poised for significant growth, with revenue projected to reach 1.4 trillion U.S. dollars in 2024. IT outsourcing leads the market at 541.1 billion U.S. dollars, followed by business process outsourcing at nearly 40 billion U.S. dollars, IT consulting and implementation at approximately 75 billion U.S. dollars, and other IT services at over 411 billion U.S. dollars. This growth trajectory is expected to continue, with a projected compound annual growth rate of 5.8 percent between 2024 and 2029, reaching 1.9 U.S. dollars trillion by 2029. The increasing demand for IT services translates to a need for skilled professionals in these areas.

Source: statista

AI is fueling the IT services boom

While tech layoffs and war in Europe dampened growth

Global market drivers for value change in IT services in 2023, by growth rate

Driver	Growth rate
Total market growth	0.156
Development of AI	0.124
Digital transformation	0.046
GDP Growth	0.03
Cloud IT infrastructure	0.027
Impact of inflation	0.013
Impact of Russia-Ukraine war	-0.015
Tech layoffs	-0.069

In 2023, the IT services market experienced a substantial overall growth of nearly 16 percent. The emergence of AI development proved to be one of the strongest drivers of value change within the sector, boasting an impressive estimated growth rate of 12.4 percent. This highlights AI's crucial role in shaping future market dynamics, along with digital transformation, which also holds considerable growth potential. Conversely, tech layoffs acted as a significant obstacle, causing a seven percent decline in the IT services market, and the ongoing Russia-Ukraine conflict further hampered sector growth by 1.5 percent.

Source: statista

Key takeaways

1 **Digital transformation is driving IT spending and job growth:** Record-high global IT spending, especially in software and cloud technologies, highlights the increasing need for IT experts, software developers, cloud engineers, and data analysts. Upskilling in these areas can lead to promising career opportunities.

2 **Continuous learning and upskilling is key:** The tech industry's fast-paced nature necessitates constant learning and development. Professionals should stay updated on the latest trends, tools, and technologies in order to remain competitive.

3 **Cloud computing and cybersecurity are top priorities:** The global emphasis on cloud-centric and secure technologies underlines the importance of acquiring skills in these domains. Professionals who are proficient in cloud technologies and cybersecurity will be highly sought after in the IT job market.

4 **AI is transforming the IT landscape:** The widespread adoption of AI-powered tools underscores the importance of acquiring AI and ML expertise. Moreover, the ethical implications of the AI revolution call for professionals to develop skills in responsible AI development and deployment.

5 **Soft skills complement technical expertise:** The growing demand for soft skills like problem-solving, effective communication, and relationship-building shows that technical proficiency alone is not enough. IT and tech professionals should strive to develop a well-rounded skillset that combines technical and interpersonal abilities.

6 **Emerging technologies are creating new opportunities:** The rise of new technologies such as AI/ML, cloud computing, and robotics is creating new industries and career paths. Professionals need to consider exploring these emerging fields to stay ahead of the curve.

7 **Tech stack mastery is vital for success:** Familiarity with the most popular technology stacks in a particular tech segment, such as cybersecurity, data science, DevOps, and various programming languages, is essential for navigating complex technological landscapes.

8 **IT services market is booming:** Significant growth is projected for the IT services market, especially in areas like IT outsourcing and consulting. This growth presents numerous career opportunities. Individuals with the right skills can leverage this growth to their advantage.

Glossary

Artificial intelligence (AI)
Artificial intelligence is the ability of a computer or robot to perform tasks that are commonly associated with intelligent beings, such as reasoning, learning, and problem-solving.

CI/CD
Standing for continuous integration/continuous delivery or deployment, CI/CD is a practice in software development that automates the process of integrating, testing, and deploying code changes, which allows for faster and frequent releases.

DevOps
DevOps is a collaborative approach that brings together software development (dev) and operations (ops) to streamline the entire software delivery process, from coding to deployment, enabling faster and more reliable releases.

Generative AI
Generative AI is a type of AI that can create new and original content, including text, images, audio, and videos, based on prompts from a user. It has the potential to revolutionize many industries, from art and entertainment to healthcare and finance.

Machine learning (ML)
ML is a branch of AI that enables computers to learn and improve without explicit programming. It accomplishes this by analyzing data and identifying patterns that can be used to make predictions or decisions.

Tech stack
A tech stack is the combination of technologies, tools, and frameworks that are used to build and run software applications in a particular sector.

Authors

Justin Lestal

Marketing Director
at DevSkiller

jls@devskiller.com

Justin Lestal is the Marketing Director at DevSkiller and a key contributor to the DevSkiller Future Skills Report 2025. With a deep understanding of data-driven insights, Justin played a crucial role in collecting and analyzing data from the DevSkiller platform, highlighting the emerging skills shaping the future of work. His expertise lies in leveraging platform data to uncover trends and inform strategic decision-making in the tech talent landscape.

Ahmed Sherif

Research Expert –
Technology
& Telecommunications
at Statista

ahmed.sherif@statista.com

Ahmed Sherif, a researcher in the technology and telecoms team, specializes in global IT market trends such as IT services and gaming hardware. He also contributes to Statista's coverage of mobile operating systems, telecoms operators, and the tech industry in Africa.

Timothy Owens

Senior Research
Lead – Technology
& Telecommunications
at Statista

timothy.owens@statista.com

Timothy Owens is a leading expert on the AI at Statista and a thought leader in the field of emerging technologies. As Statista's senior research lead for technology and telecommunications, Tim is passionate about demystifying complex topics and helping businesses understand the trends driving growth and innovation within the tech sector. His diverse background – encompassing digital strategy, emerging markets analysis, editorial project management, and data storytelling – allows him to bring a well-rounded perspective to his work.

Lionel Sujay Vailshery

Senior Research Expert –
Technology
& Telecommunications
at Statista

lionel.vailshery@statista.com

Lionel Sujay Vailshery is a senior research expert in the cloud computing and emerging tech industries, with a strong background in informatics and extensive knowledge of the tech sector.

Equip your team with the essential IT and digital skills of 2025 with DevSkiller.
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