



# COE HOTSPOTS OF THE WORLD 2024

MAY



Where are the top COE hotspots of the world?

# OBJECTIVE

TO IDENTIFY CENTERS OF EXCELLENCE HOTSPOTS  
IN THE WORLD WHERE COMPANIES CAN:

**BUILD SCALABLE  
AND FULL  
SOFTWARE  
PRODUCT  
ENGINEERING  
TEAMS**

**LEVERAGE A  
MATURE  
ECOSYSTEM**

**HAVE HIGH  
EASE OF DOING  
BUSINESS**

**BUILD TEAMS  
AT AFFORDABLE  
COSTS**

**TALENT**

**ECOSYSTEM**

**EASE OF BUSINESS**

**COST**



# ABOUT THE REPORT

## TARGET AUDIENCE

CXOs; Strategy, Operations and HR Leadership from Global MNCs, Private Equity Firms

## IMPORTANT NOTE

Selection of the countries to be studied was made based on the fact that these countries show high potential for software engineering as observed over 22 years of Zinnov's experience working with global organizations, which have shown interest in these countries.

## DISCLAIMER

By no means is this an exhaustive list of countries where companies can set up software engineering teams. The study is a Zinnov's point of view on potential locations for building Centers of Excellence with analysis based on Zinnov's database, primary and secondary research. These COE hotspots are benchmarked against developed countries like the USA, the UK, and Japan.

## DEEP DIVES

The report contains a deep dive on software engineering capability of the countries below:

- Central and Eastern Europe - Poland, Czechia, Bulgaria, Romania, Lithuania, Estonia, Belarus, Serbia, and Latvia
- North America - Canada
- APAC - India, China, The Philippines, Indonesia, Taiwan, Malaysia, and Vietnam
- LATAM - Mexico, Brazil, Colombia, Chile, Argentina, and Costa Rica



# TAXONOMY

- **GCCs:** Global Capability Centers are the offshore delivery centers of global companies, that are owned, operated, and managed as subsidiaries – often in affordable, talent-rich locations
- **Z1000 Database:** Database of the top 1000 Global ER&D spenders across 20+ verticals. The cumulative list has a coverage of 80% of all the global companies investing in Engineering R&D across industry verticals
- **Zinnov Service Provider Database:** Database of 600+ ER&D Service Providers tracked across the globe
- **Start-ups:** Companies established in the last 5 years with core tech offerings and must be at a prototype stage or have an MVP
- **Unicorns:** Privately held start-ups with over USD 1Bn in valuation (as of March 2023)
- **Software Engineering Talent:** The talent pool employed in global product companies primarily responsible for building computer system software and application software
- **Time to Hire:** The total time spent (in weeks) from the time of posting the job description regarding a role till the time of extension of the first offer
- **Attrition rate:** Rate of employee turnover in a year across software engineering companies
- **Salary growth:** Year-on-year growth rate in average salaries (across roles and years of experience) for software engineering companies
- **Higher educational institutions:** Top-tier engineering schools based out of that location

# AI & ML JOB ROLES

The AI & ML engineering roles considered in this report encompass the essential positions needed to assemble a team that is capable of demonstrating complete ownership of the product lifecycle, from inception to deployment:

- **AI&ML Engineer:** AI Research Engineer, Deep Learning Engineer, Computer Vision Engineer
- **Data Scientist:** Software Engineer - Machine Learning
- **Data Engineer:** Data Architect, Data Modeler, Big Data Engineer, Big Data Developer, Scala Developer, Data Platform Engineer
- **Data Analyst:** Business Data Analyst, Quantitative Analyst, Data Quality Analyst
- **Business Analyst:** Business Intelligence Analyst, IT Business Analyst, Technical Business Analyst

# SOFTWARE ENGINEERING JOB ROLES

The software engineering roles considered in this report reflect the necessary roles required to build a team that can showcase end-to-end product ownership. In no manner does it reflect the complete list of software engineering roles that exist in the market. (For example, we have not considered roles like Performance Test Engineer, Embedded Developer, Security Engineer, etc.)

- **Software Development Engineer:** Software Developer, Front-End Developer, Application Developer, Software Engineer, Web Developer, Mobile Application Developer, IT Developer
- **QA Engineer:** Quality Assurance Engineer, QA Manual Engineer, QA Automation Engineer, Test Automation Engineer
- **Database Administrator:** Database Engineer, Database Specialist, Database Developer, SQL Server Database Administrator
- **DevOps Engineer:** DevOps Developer, DevOps Specialist, Platform Engineer, Reliability Engineer
- **Architect:** Software Architect, Application Architect, Enterprise Architect, Infrastructure Architect
- **Technical Writer:** Technical Content Writer, Proposal Writer, Technical Editor Writer
- **UI/UX Designer:** User Interface Designer, User Experience Designer, User Experience Product Designer, Graphic Designer, UI/UX Web Designer



# Foreword



**NILESH THAKKER**  
PRESIDENT

In today's highly competitive business environment, the pursuit of global talent is not just a strategy—it's a critical offensive move that ensures companies maintain a competitive edge. Regardless of economic conditions, the demand for skilled engineering talent remains robust globally, underscoring the necessity for businesses to expand their reach beyond traditional borders.

Companies are increasingly recognizing the immense value in tapping into diverse global talent pools. This approach is not merely about filling gaps—it's about strategically positioning businesses to leverage unique skills and perspectives that drive innovation and growth. With regions like Europe, Asia, Latin America, and North America all competing for top talent, the global talent landscape is vibrant and dynamic. Companies are increasingly realizing that the key to success lies in looking beyond their traditional borders for talent. The Asia Pacific region, for instance, has seen a 13% increase in its talent pool over the last year, as several global companies from Europe, North America, and the Middle East established centers in countries like India, the Philippines, Vietnam, and Malaysia, translating to installed workforce growth.

The adoption of Artificial Intelligence and Machine Learning has seen a significant uptake across various industries, particularly in Fintech, Healthcare, and e-Commerce. The global market opportunity for AI & ML use cases stands at an impressive USD 14 Bn. This surge in demand, coupled with the influx of companies seeking specialized talent, has led to a concentration of AI & ML expertise in regions like North America (35%) and Asia-Pacific (38%), where businesses are tapping into these highly sought-after talent pools to drive innovation and growth.



**AMITA GOYAL**  
PARTNER AND  
HEAD OF GCC BUSINESS

It is evident that most businesses are going global, and it is now more crucial than ever to adopt a multi-hub strategy to de-risk and ensure business continuity. The demand for skill-based hiring at an affordable cost will be a driving factor in exploring newer Center of Excellence (COE) hotspots. Moreover, strong ecosystem collaborations between COEs, local start-ups, Service Providers, and academia further strengthen the case for global companies to leverage these hotspots.

In the fourth edition of the 'COE Hotspots of the World' report, we have identified 23 countries across North America, Latin America, Central and Eastern Europe, and Asia Pacific, where we have evaluated them across the following parameters: Talent Availability, Software Engineering Ecosystem Maturity, Ease of Doing Business, Living Condition Analysis, Culture Analysis, Diversity & Inclusion Maturity, and Cost Analysis. By leveraging these global talent hotspots, companies can not only build full, scalable software product engineering and IT teams at affordable costs but also drive high business growth at an accelerated pace.

We hope that the insights from this report will help you make data-driven decisions in your globalization strategy, enabling you to navigate the challenges of the current landscape and position your organization for success in the years to come.



## MAJOR TRENDS



### YEAR OF NORMALIZATION

Over-hiring during COVID followed by a global economic slowdown triggered a strong recessionary environment during 2022, which persisted into 2023

Attrition rates in Centers of Excellence (COE) hotspots remained steady at ~17% throughout 2022 and 2023

This has shifted market supply over demand for Software Engineering roles. On average, salary growth has normalized from 20% in 2021 to 10% in 2022 to 8.5% in 2023.



### AI & ML WORKFORCE

Post-COVID, industries like Fintech, Healthcare, and e-Commerce, have increasingly integrated Artificial Intelligence (AI) & Machine Learning (ML) into their operations, with applications in Speech Recognition, Fraud Detection, Pattern Recognition, etc.

There are over 450,000 job opportunities in fields like Generative AI, Virtual Assets, Cybersecurity, Xops, and Exascale Computing, indicating a strong market demand

The global market potential for AI & ML use cases in these fields is over USD 14 Bn. With a talent pool of 3 Mn, the average cost to set up a team of 100 members is USD 5.3 Mn



### GEOPOLITICS AND THE RISE OF NEW EMERGING MARKETS

Ongoing geopolitical tensions between Russia and Ukraine, as well as Israel and Palestine, have prompted talent migration to European countries like Poland and Germany

Due to escalating tensions, global companies are hesitant to establish new centers in Europe and are instead looking at emerging markets such as Argentina, Chile, Costa Rica, Colombia, Latvia, Indonesia, Taiwan, and Vietnam. For companies in the US, Mexico has become a popular nearshore hub

## RAMIFICATIONS



### COE HOTSPOTS FOR BUSINESS CONTINUITY

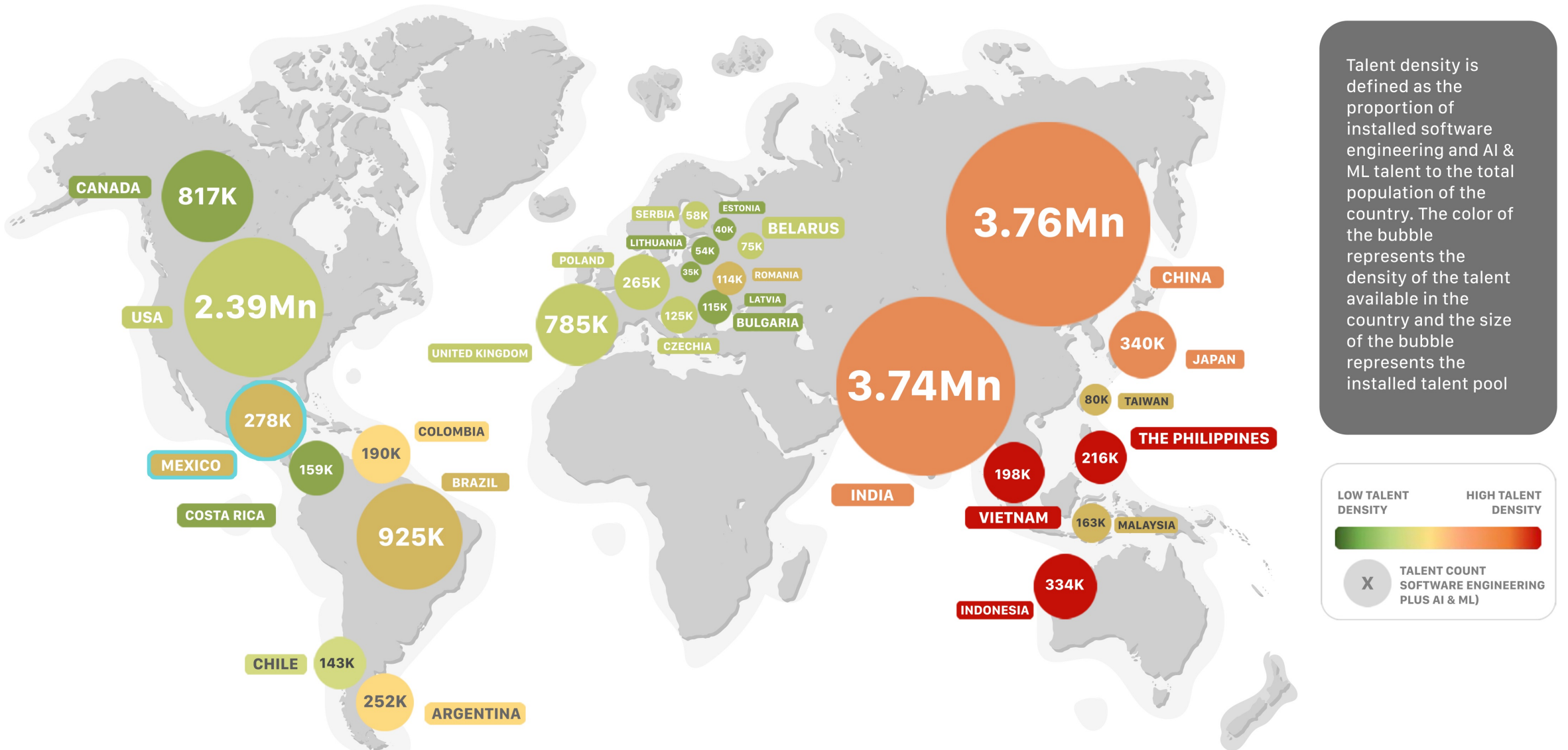
Companies worldwide should adopt a multi-hub strategy to minimize risks and ensure business continuity. There is a bigger demand for skill-based hiring at an affordable cost. This will be a driving factor to explore newer global COE hotspots

Strong ecosystem collaborations between Global Capability Centers (GCCs), local start-ups, Service Providers, and Academia strengthens the case for global companies to continue leveraging these. For example, Zinnov analysis reveals that India is expected to add 500 more GCCs by 2025





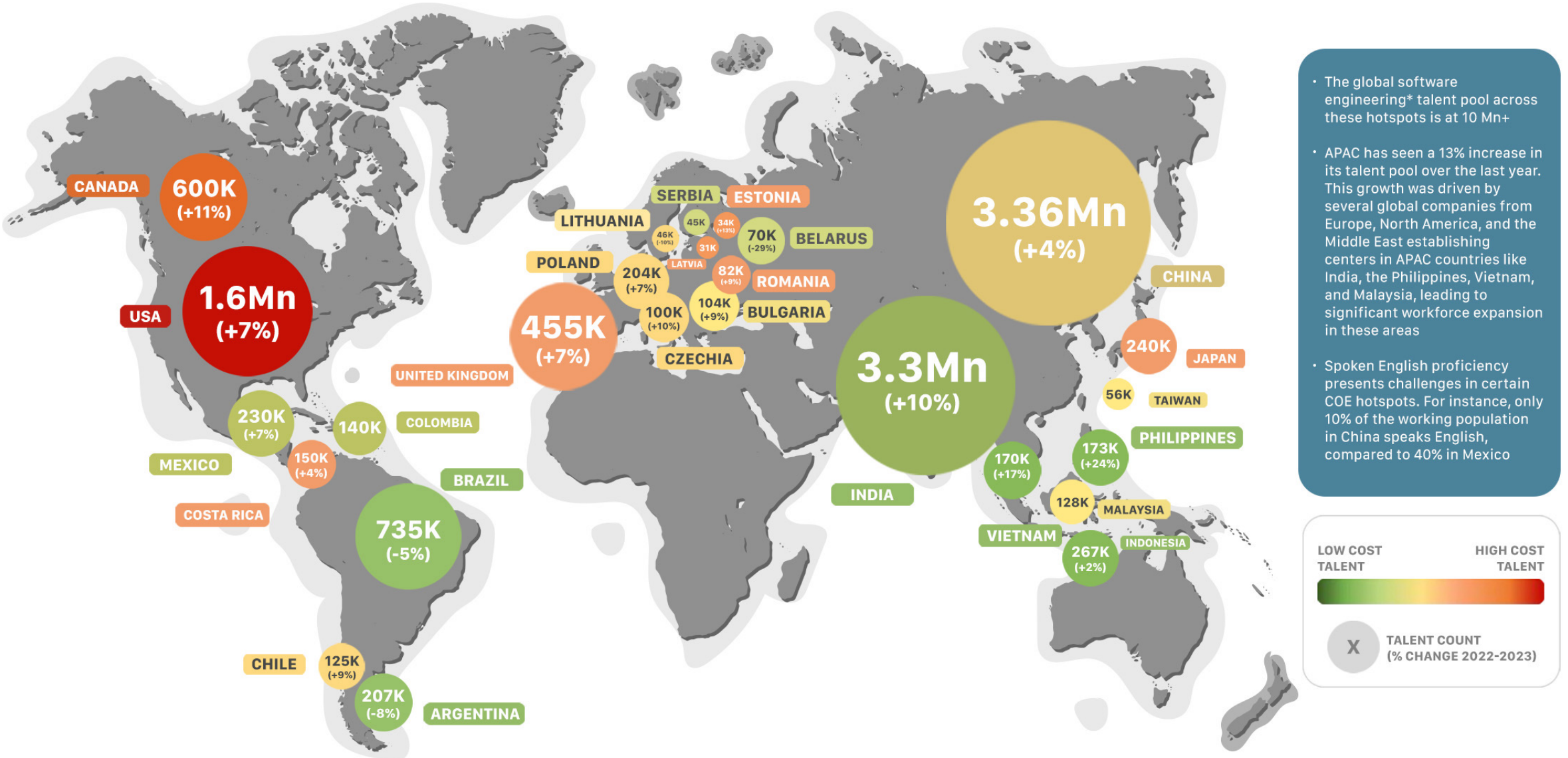
# Availability of Talent across Key Hotspots



Source: Secondary research, Github, StackOverflow



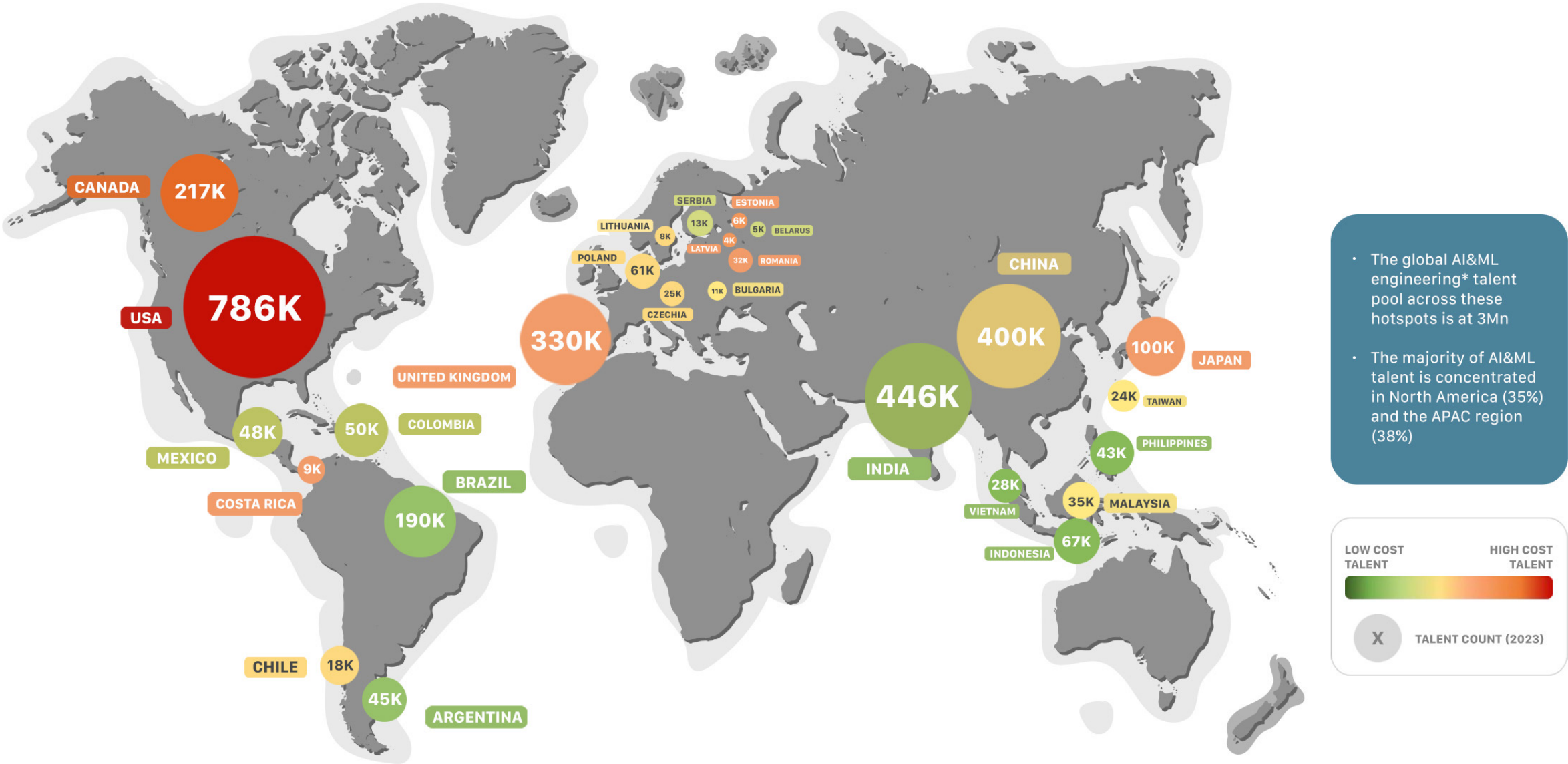
# Global Software Engineering Talent Availability and Cost



\*Software Engineering roles considered are Software Developer, QA Engineer, DevOps Engineer, Database Administrator, Engineering Manager, Product Manager, Solution Architect, UX/UI Designer and Technical Writer



# Global AI & ML Engineering Talent Availability and Cost



\*AI&ML roles considered are AI&ML Engineer, Data Scientist, Data Engineer, Data Analyst, Business Analyst, AI Researcher

Source: DRAUP, Zinnov Primary Research

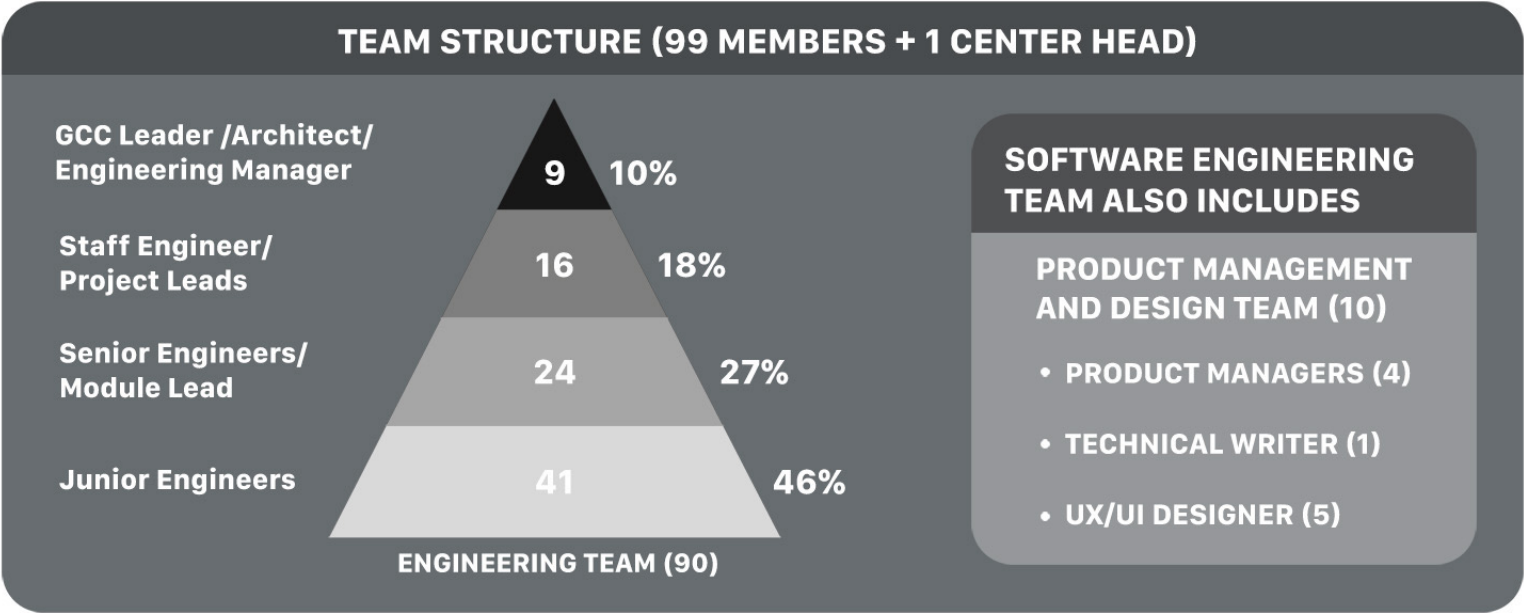


# Talent Pyramid for a 100-member Software Engineering team to build a COE



As part of this analysis, we have assumed a Software Engineering team size of 100.

We have divided the Software Engineering team into two different functions as depicted in the pyramid on the right: Engineering team and the Product Management & Design team.



ENGINEERING TEAM	HEADCOUNT	1-4 YoE	3-6 YoE	5-8 YoE	8+ YoE
Software Development Engineer	57	33	16	8	
Quality Engineer	14	8	4	2	
DevOps Engineer	8		3	5	
Database Administrator	2		1	1	
Engineering Manager/Architect	8				8
Center Head	1				1
<b>TOTAL</b>	<b>90</b>	<b>41</b>	<b>24</b>	<b>16</b>	<b>9</b>

PRODUCT MANAGEMENT AND DESIGN TEAM	HEADCOUNT	1-4 YoE	3-6 YoE	5-8 YoE	8+ YoE
Product Manager	4				4
Technical Writer	1		1		
UX/UI Designer	5		2	3	
<b>TOTAL</b>	<b>10</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>4</b>





# Team Scalability Analysis - 100-member Team: Software Engineering Talent availability as a function of 'Number to Hire' in comparison with the US, UK, and Japan



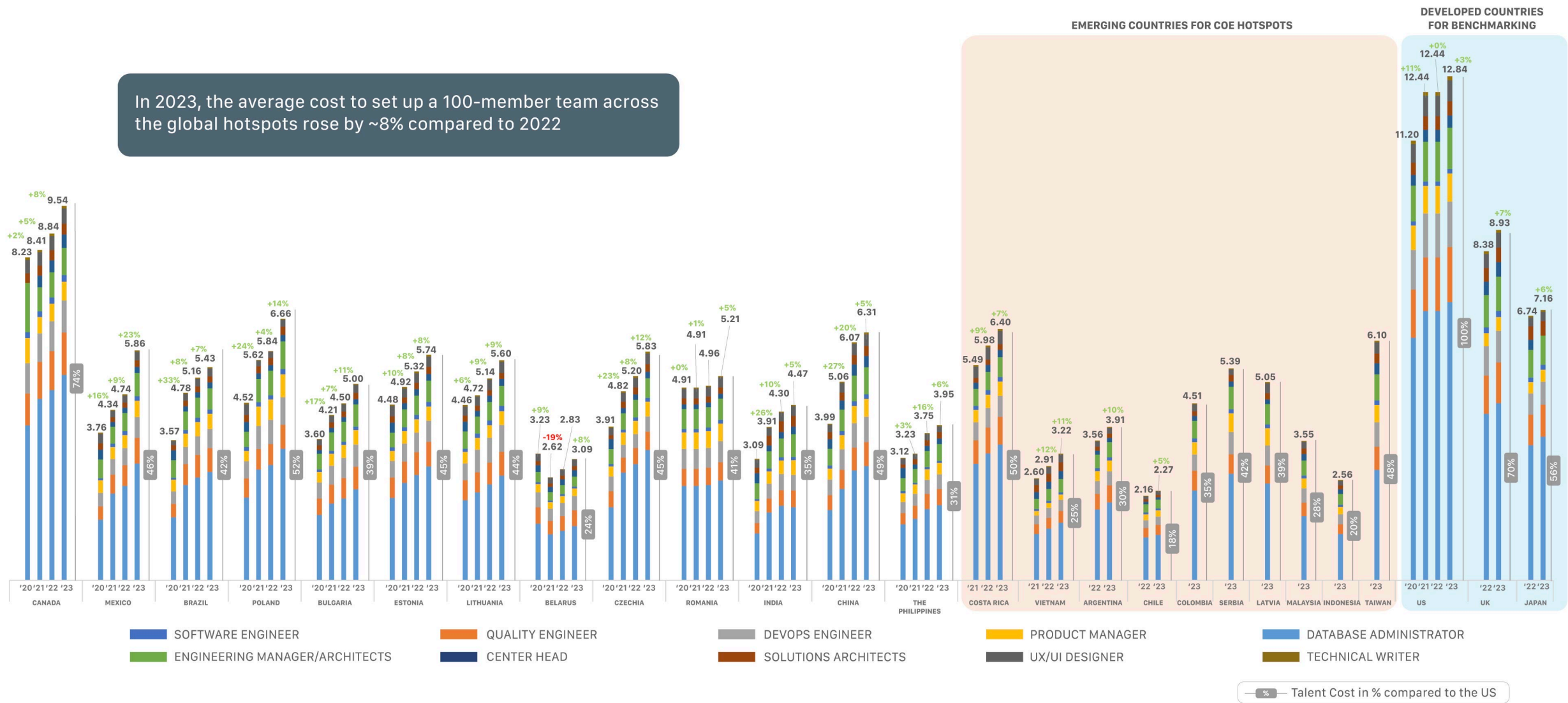
\*Availability is for all level of experiences – not restricted to 3-6 years



# 100-member Software Engineering team Cost Analysis (in USD Mn)



In 2023, the average cost to set up a 100-member team across the global hotspots rose by ~8% compared to 2022

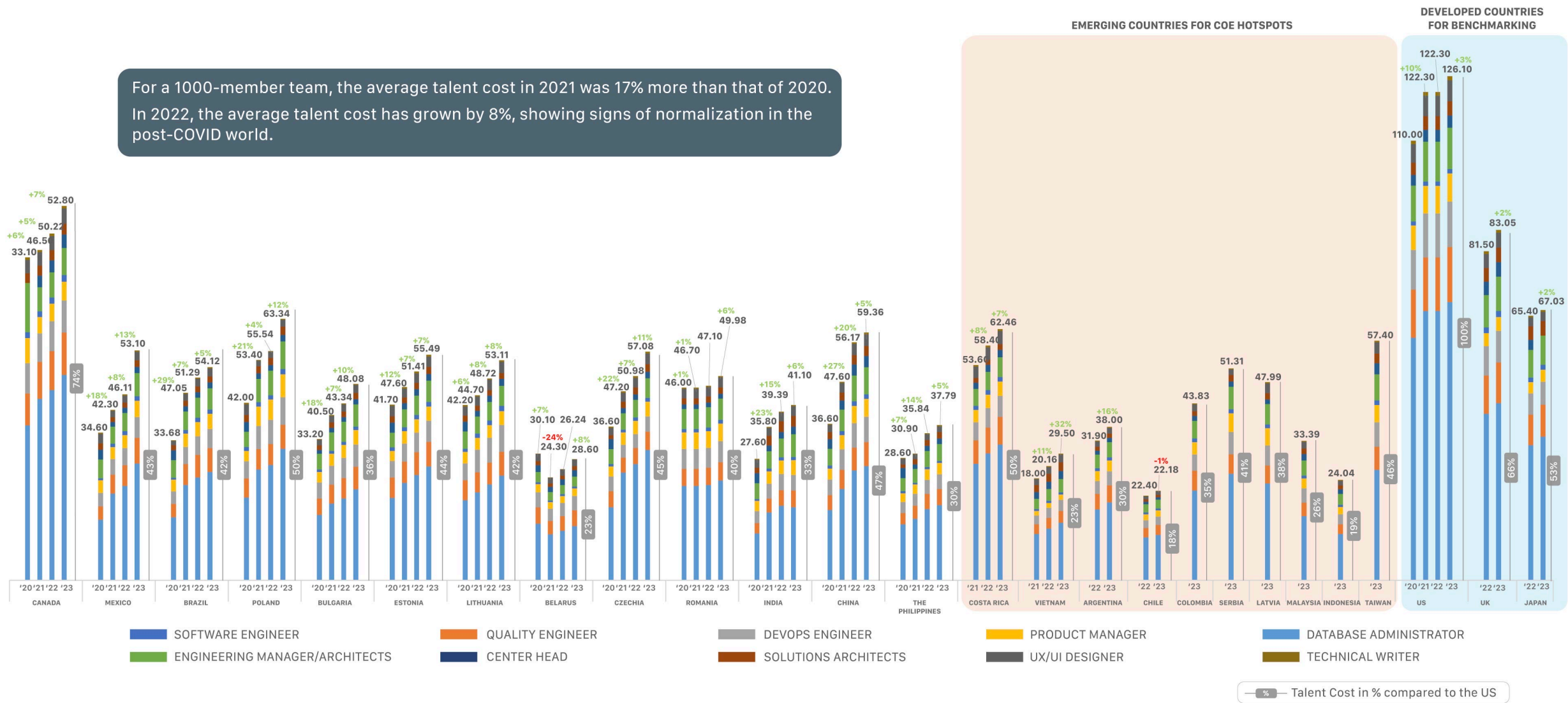




# 1000-member Team Cost Analysis (in USD Mn)



For a 1000-member team, the average talent cost in 2021 was 17% more than that of 2020. In 2022, the average talent cost has grown by 8%, showing signs of normalization in the post-COVID world.



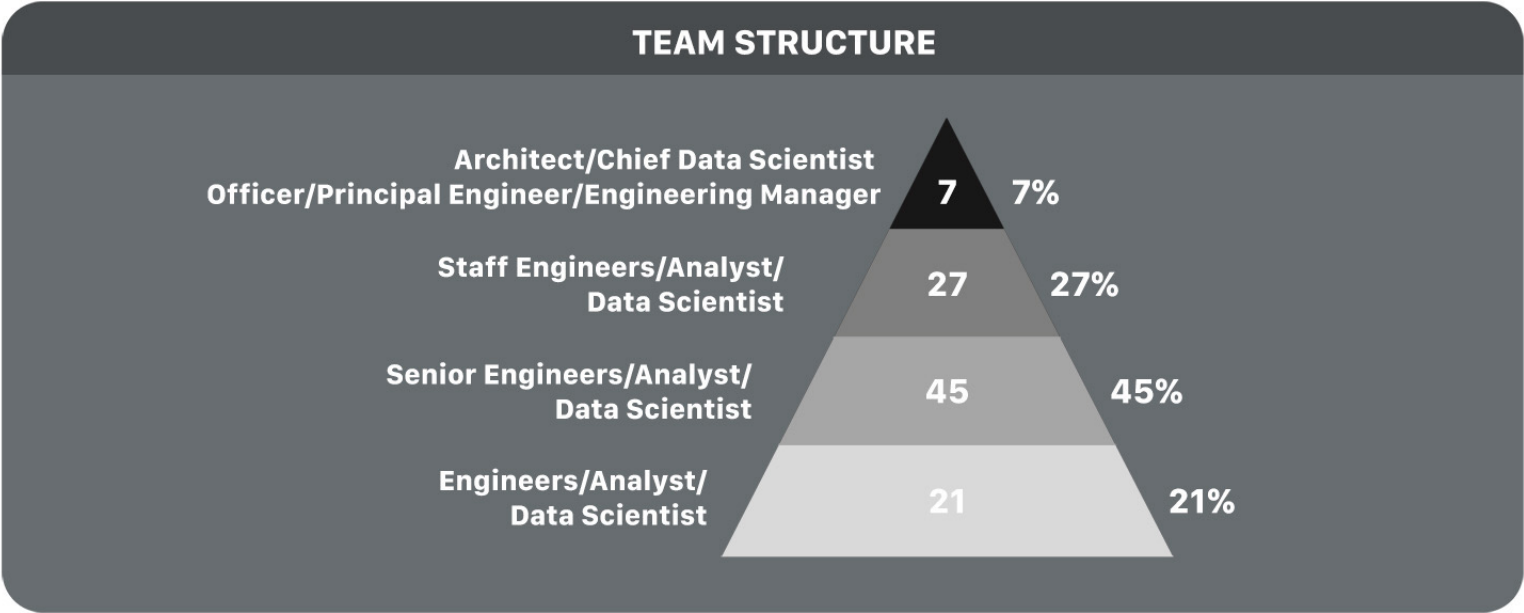


# Talent Pyramid of a 100-member AI & ML team

As part of this analysis, we have assumed an AI & ML Engineering team size of 100

We have divided the AI & ML Engineering team into two different functions: the Engineering & Analysis team, and the Data Science team

The structure of the 100-member team is relatively flatter at mid-level, with functional roles such as Data Engineer and Data Scientist comprising of 52% of the AI & ML team



ENGINEERING & ANALYSIS TEAM	HEADCOUNT	3-5 YoE	5-8 YoE	8-12 YoE	12+ YoE
Data Engineer	26	6	14	6	
Data Analyst	16	4	8	4	
Business Analyst	4			4	
Software Engineer	15	5	5	3	
Architect	3				2
					3
TOTAL	64	15	27	17	5

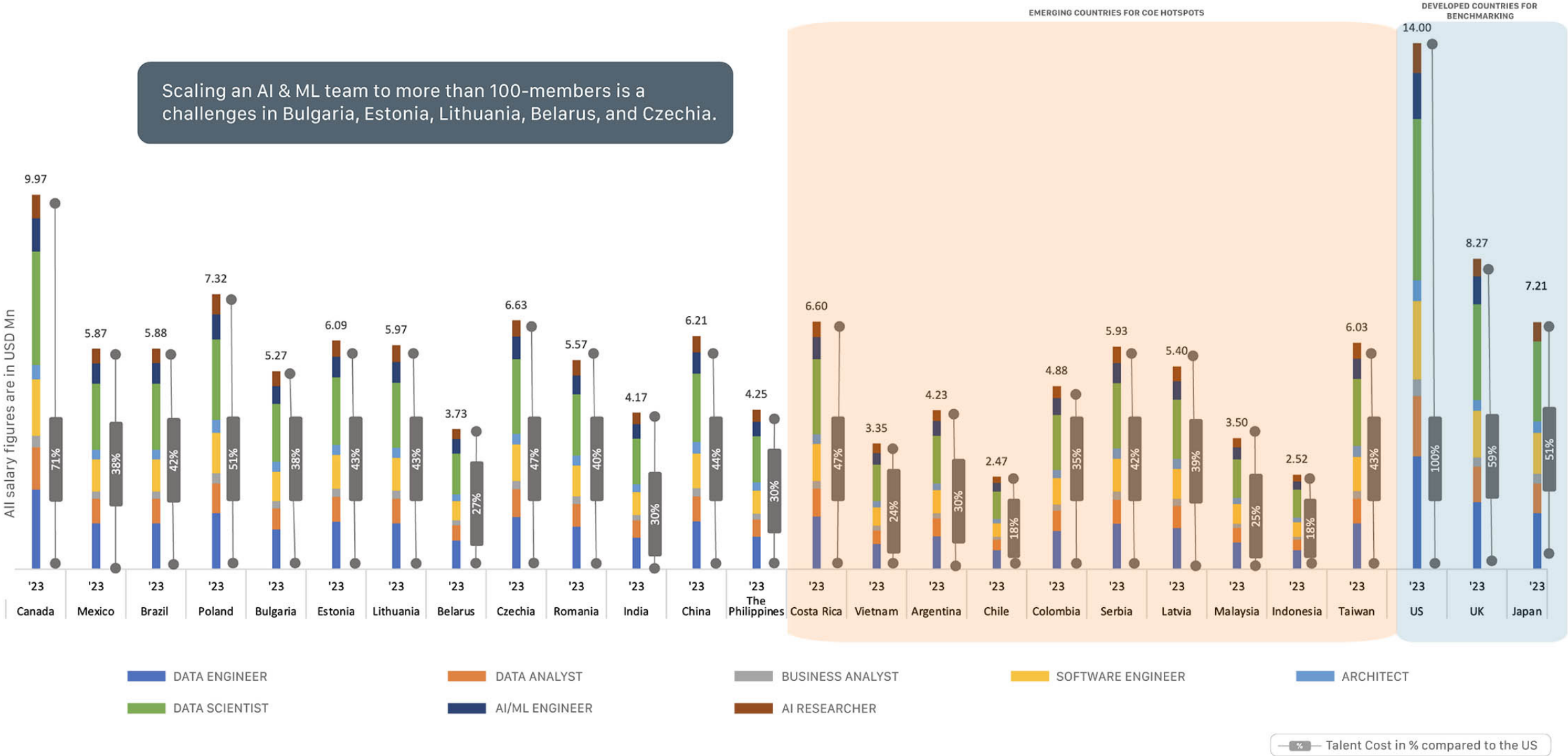
DATA SCIENCE TEAM	HEADCOUNT	3-5 YoE	5-8 YoE	8-12 YoE	12+ YoE
Data Scientist	26	6	14	5	1
AI & ML Engineer	6		4	2	
AI Researcher	4			3	
TOTAL	36	6	18	10	1





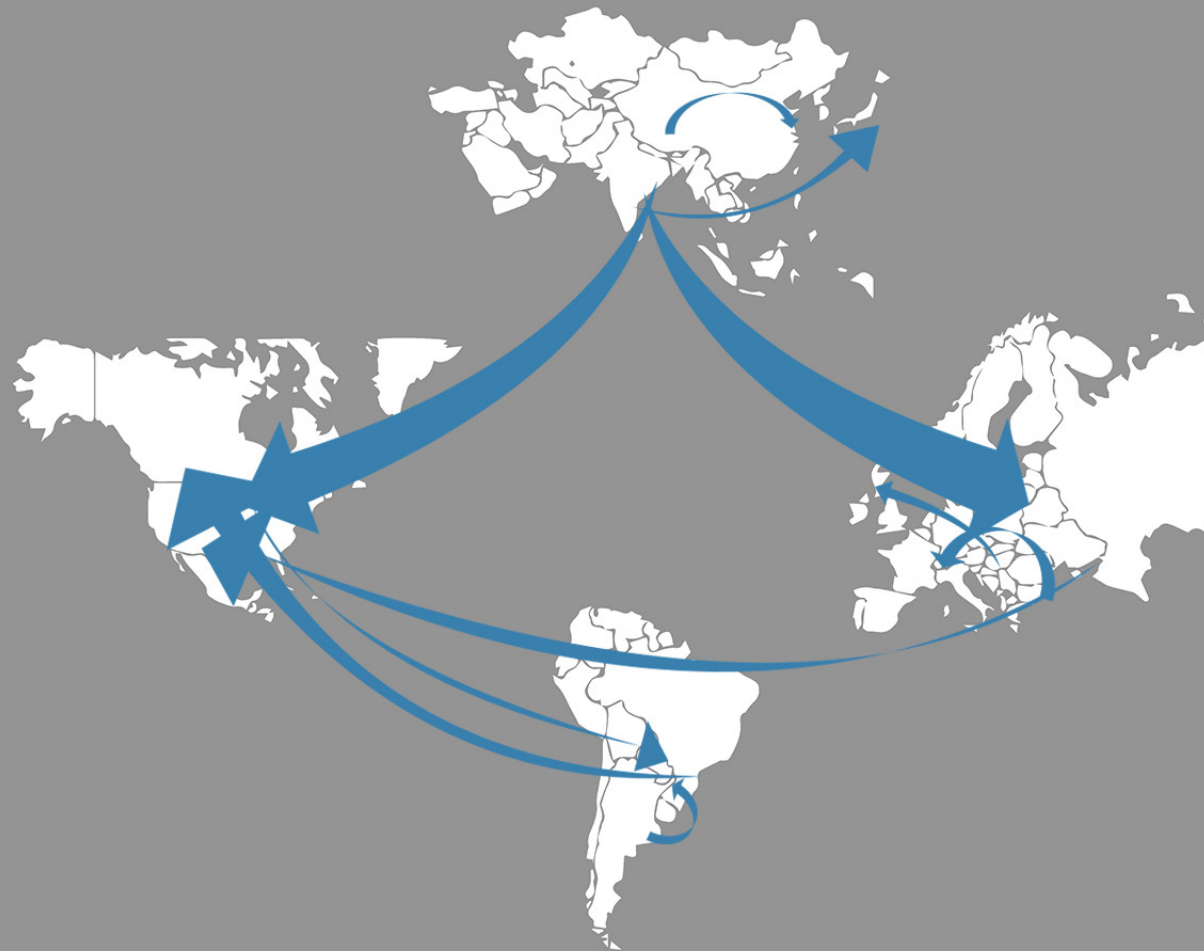
# 100-member AI & ML Team Cost Analysis (in USD Mn)

Scaling an AI & ML team to more than 100-members is a challenges in Bulgaria, Estonia, Lithuania, Belarus, and Czechia.





# Global Talent Immigration Footprint (1/2)



## EUROPE

Countries like Germany, the UK, and Ireland, known for their attractive salaries, good work-life balance, and strong tech ecosystems, continue to draw IT professionals both from within Europe and internationally.

The Russia-Ukraine conflict has led to IT talent migration, with professionals moving from Ukraine to Poland and from Russia to Armenia.

The conflict involving Israel and Palestine in the Middle East has prompted MNCs and talent to migrate to alternative offshore locations like Germany and the UK in Europe, as well as to the US.

## ASIA

The offshoring of work from regions like Europe, North America, and the Middle East to APAC countries, such as India, The Philippines, Singapore, and Malaysia, has increased. This has led to workforce growth in these countries. Additionally, the last 5-7 years have seen a reverse migration of Indians from the US back to India for job opportunities.

In 2023, the number of foreign companies hiring talent in Singapore increased by 35%.

Over the past 2-3 decades, the Indian and Chinese governments have implemented policies such as loans for start-ups, reduced thresholds for IP financing, and incentives for Foreign Direct Investment (FDI), which have contributed to the growth of GCCs and attracted a larger local talent pool.

## LATIN AMERICA (LATAM)

Mexico, along with Brazil, is a top destination for talent immigration in Latin America. Many companies establish their regional headquarters in Mexico and set up satellite offices in emerging countries like Costa Rica and Chile.

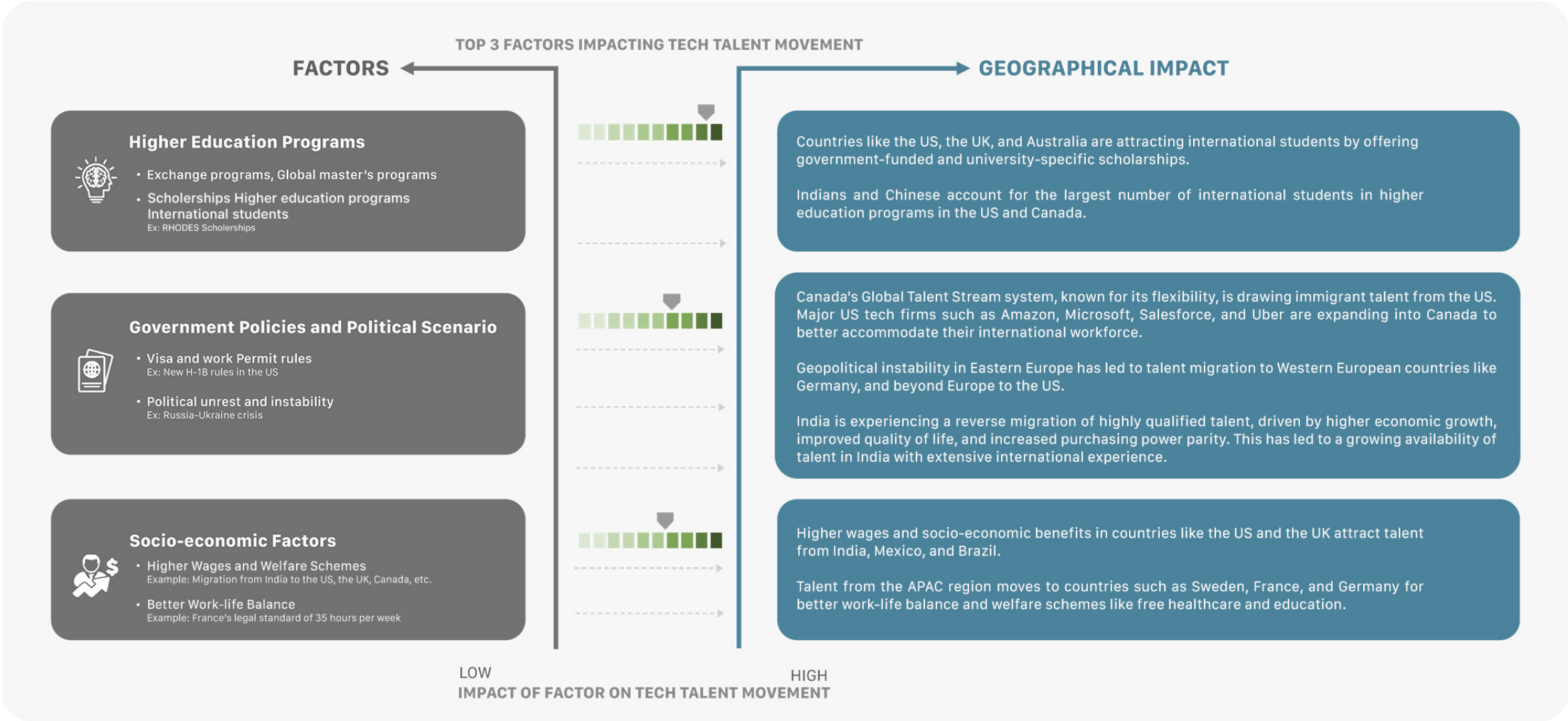
## NORTH AMERICA

The US is a prime destination for software engineering immigrants, with the top source countries being India and China. Canada is also a popular choice, especially for French-speaking IT professionals.

Canada has launched a Tech Talent Strategy to support its high-growth industries and attract international talent. Cities like Vancouver, Calgary, and Waterloo have seen the most significant influx of tech workers over the past five years, with 32,115 new workers arriving between April 2022 and March 2023, primarily from India and Nigeria.

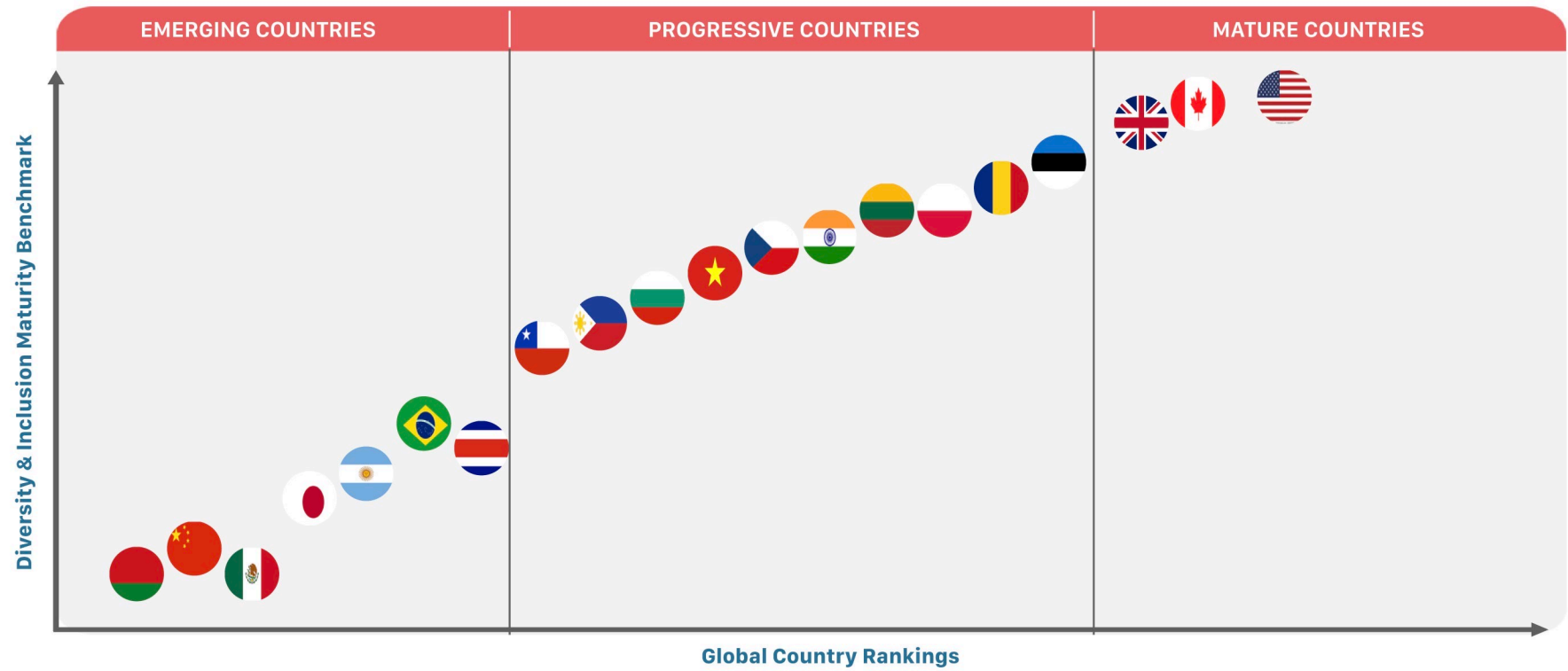


# Global Talent Immigration: Factors impacting talent migration (2/2)





# Global Diversity & Inclusion Maturity Framework – Includes Women, LGBTQ+, and PwD



Canada and the US have relatively higher acceptance of people with disabilities (PwD) in the tech sector compared to the other shortlisted countries because tech companies have adopted accessibility practices in the workplace backed by strong federal laws and policies to encourage PwD hiring and retention.

Women's participation in the workforce is particularly low in China and Belarus compared to the other shortlisted countries owing to factors like gender bias, stereotypes, cultural norms, and lack of supportive policies toward women's career development.

Except for Belarus, CEE countries have higher societal acceptance and awareness of the LGBTQ+ community, leading to higher representation in the corporate workforce.

Major global tech organizations like Salesforce, Google, and Microsoft have embraced roles like Chief Equality Officer and Chief Diversity Officer to foster more inclusive workplace cultures, which in turn encourages people to be more efficient and productive at their jobs.

**Top 5 highest rated global tech organizations for LGBTQ+ employees**

**Top 5 global tech organizations empowering employees with disabilities**

FRAMEWORK: The cumulative score is generated by scoring the countries on the following parameters				
Levers	Community	Women	PwD	LGBTQ+
Representation in corporate organization (45%)				
Number of corporate-driven community initiatives to hire (35%)				
D&I-focused talent marketing (20%)				

Community	Women	PwD	LGBTQ+
	45%	35%	20%



# Living Conditions



Living conditions are based on the overall quality of life in a country and consider the following –

➤ Purchasing power

➤ Healthcare Index

➤ Cost of Living Index

➤ Safety Index

➤ Pollution Index

➤ Traffic Commute Time Index

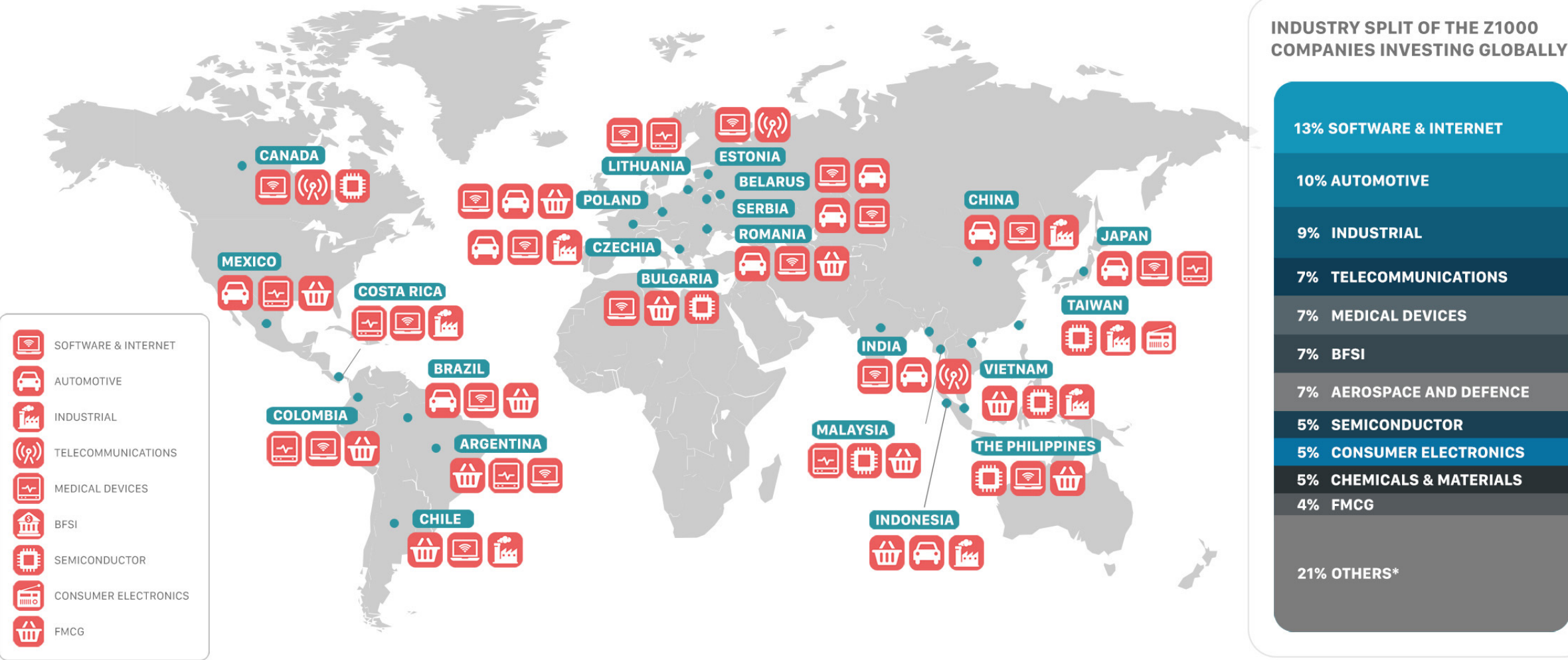
Region	Country	Purchasing Power	Cost of living	Safety	Healthcare	Pollution	Traffic	Overall Quality Score
Americas	Canada							
	Mexico							
	Costa Rica							
	Colombia							
	Brazil							
	Chile							
	Argentina							
Europe	UK							
	Poland							
	Lithuania							
	Serbia							
	Estonia							
	Latvia							
	Belarus							
	Romania							
	Bulgaria							
	Czechia							
APAC	India							
	China							
	Japan							
	Taiwan							
	Malaysia							
	Indonesia							
	Vietnam							
	The Philippines							

The cumulative score is generated by rating the countries on the following parameters					
Purchasing Power	Cost of Living	Safety	Healthcare	Pollution	Traffic
30%	15%	15%	15%	15%	10%

Legend	
	Low
	Moderate
	High



# Major industries in which Z1000 companies are investing across shortlisted countries



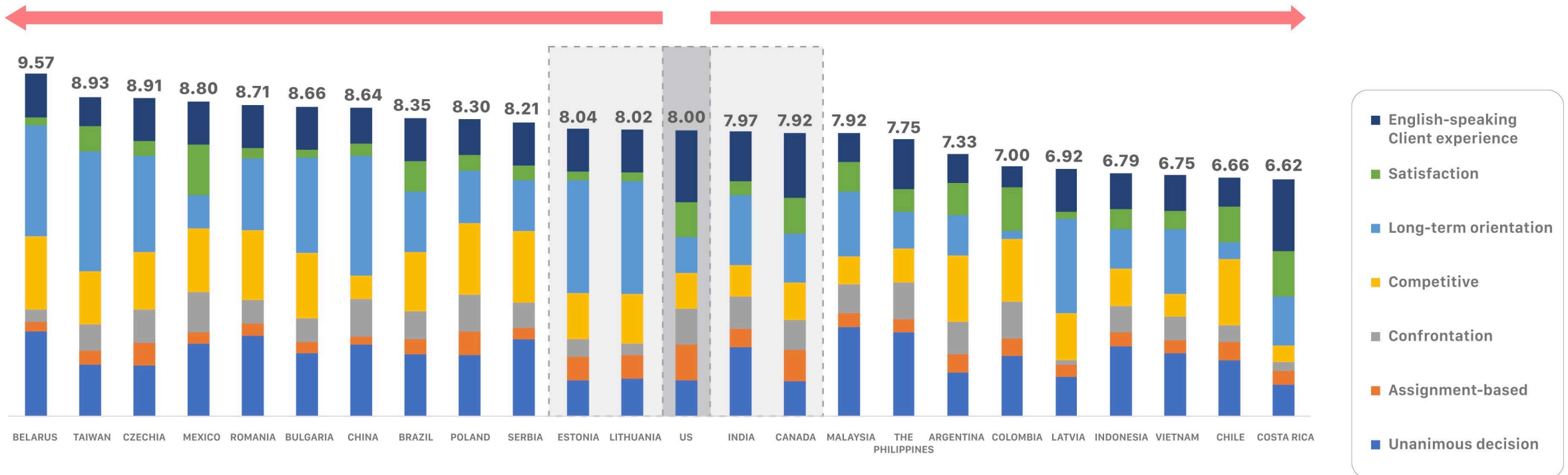
\*Other Industries include Energy, Pharmaceuticals, Biotechnology, Healthcare, Retail, Transportation, Mining  
Source: DRAUP



# Cultural Analysis

A country's cultural score is based on multiple parameters like English-speaking client experience, satisfaction, confrontation, etc.

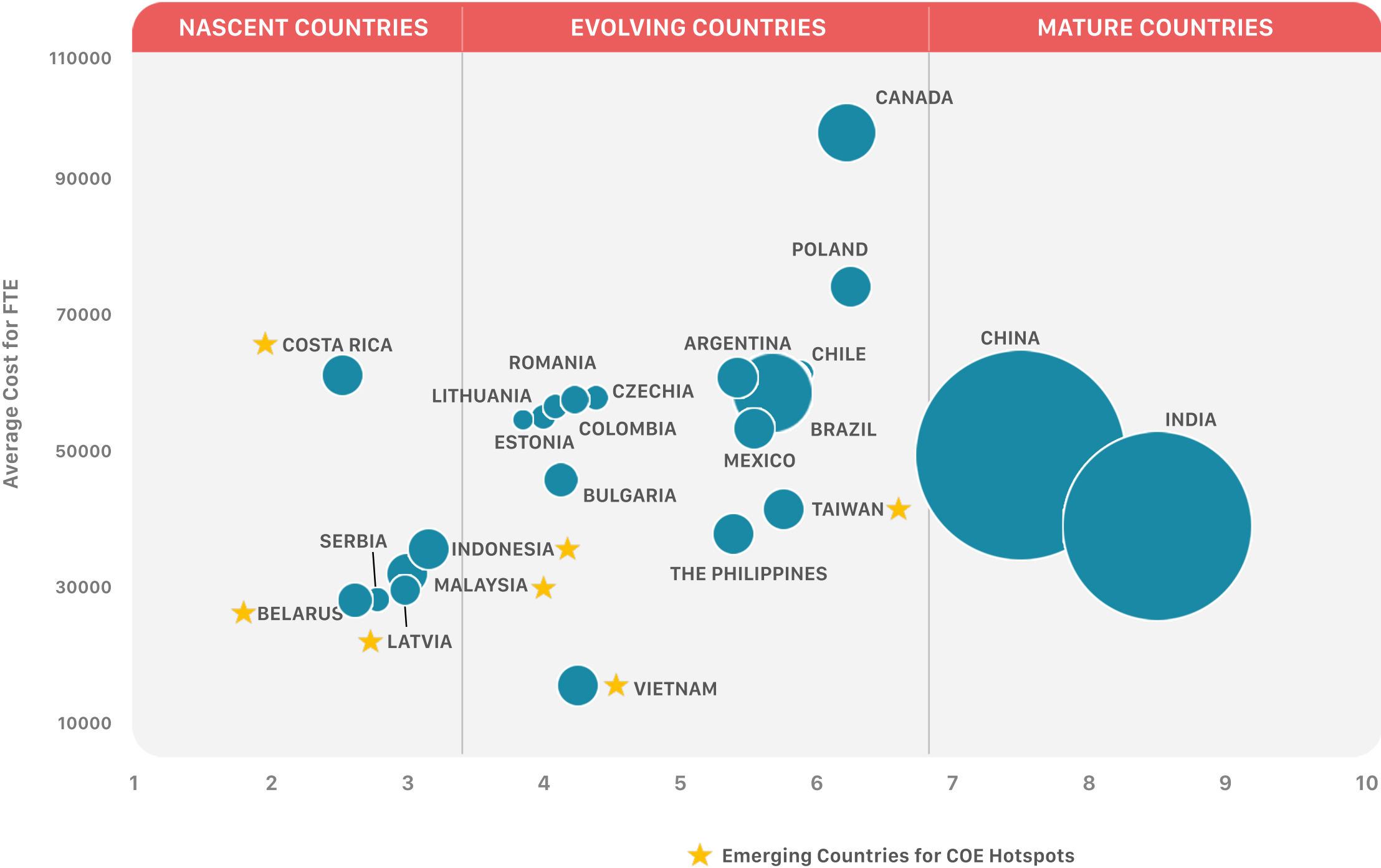
A country's score close to that of the US indicates similar cultural attributes. Examples include Lithuania, Estonia, Poland, Canada, and India.



- **Unanimous decision:** Perceive and handle inequalities among individuals' decisions
- **Assignment-based:** Autonomy and personal achievement valued against those where group harmony and loyalty take precedence
- **Confrontation:** Assess how people regulate desires and reactions
- **Competitive:** Assess culture driven by success
- **Long-term orientation:** Balance current preservation with adaptation to future challenges
- **Satisfaction:** Valuing competition and success fulfillment
- **English-speaking client experience:** Assess familiarity working with English native speakers



# Software Engineering Ecosystem Maturity Analysis



The ecosystem maturity in countries like Estonia and Lithuania has improved significantly due to more than a 2.5X increase in the number of technology start-ups in recent years.

- In APAC, Vietnam has demonstrated high maturity due to its large number of tech start-ups and Service Providers employing a substantial talent pool. However, its industry is not as developed as some smaller Eastern European countries, and there is a shortage of senior talent.

## LEGEND

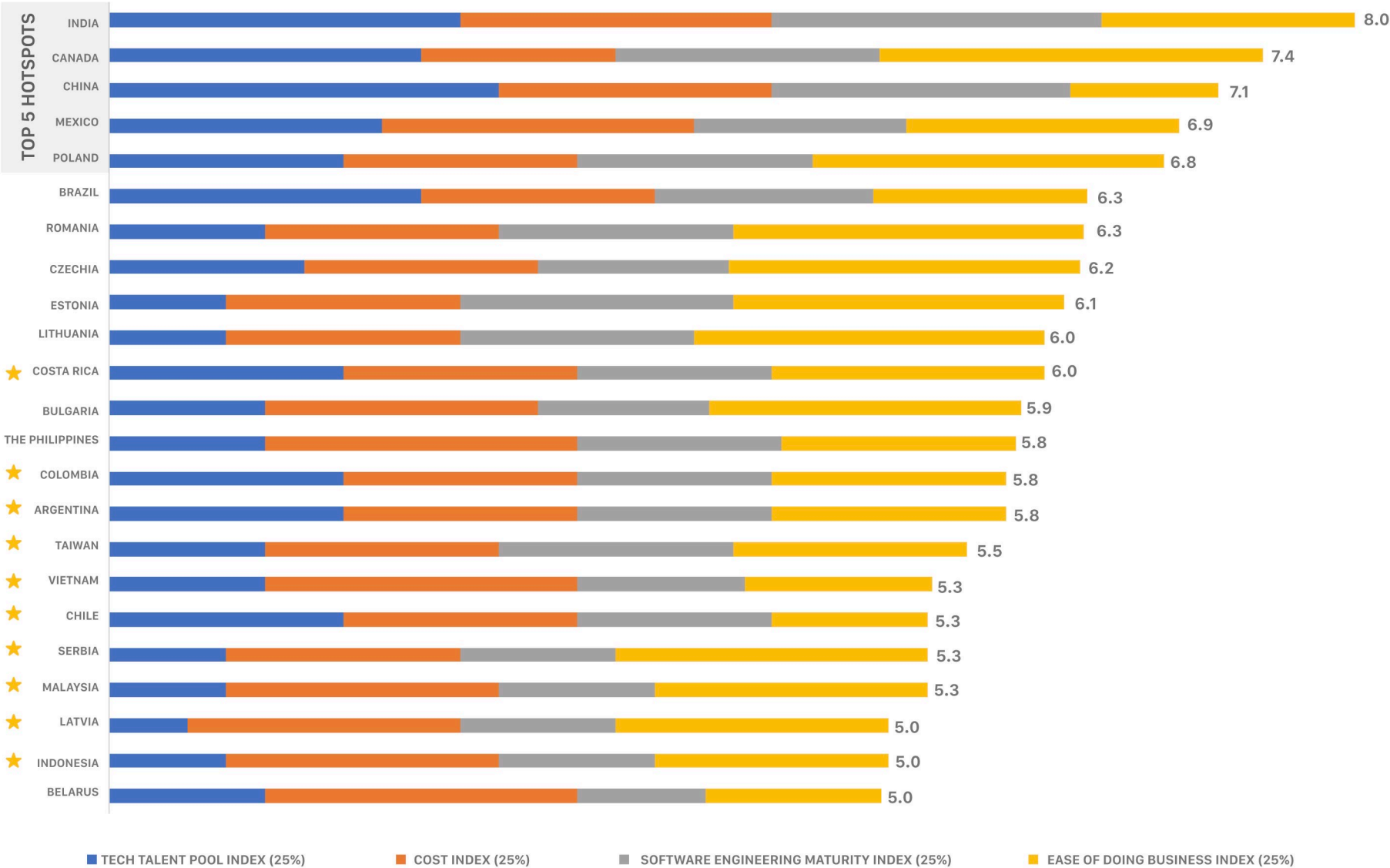
The maturity analysis is generated by scoring the countries on the following parameters

- Number of Z1000 companies (on a scale of 1-10)(Weightage: 45%)
- Number of Tech Start-ups (on a scale of 1-10)(Weightage: 25%)
- Service Provider Industry Revenue (on a scale of 1-10)(Weightage: 20%)
- Number of Engineering Schools (on a scale of 1-10)(weightage: 10%)

Size of the bubble indicates the talent pool size



# Overall Ranking of COE Hotspots



The top 5 COE hotspots continue to remain the same as 2022.

In 2023, Mexico ranks above Poland, compared to 2022. This rise is due to increased demand for nearshoring by US companies, which has boosted Mexico's popularity. In contrast, Poland's ranking has been affected by ongoing geopolitical tensions in the region.

**Software Engineering Maturity:** A higher maturity accounts for a higher score

**Cost Index:** A lower cost accounts for a higher score

**Tech Talent Pool:** A higher pool size accounts for a higher score

**Ease of Doing Business:** A greater ease of doing business accounts for a higher score

★ Emerging Countries for COE Hotspots



Founded in 2002, Zinnov is a global management and strategy consulting firm, with presence in New York, Santa Clara, Houston, Seattle, Bangalore, Gurgaon, Pune, Hyderabad, and Paris. Over the past 22 years, Zinnov has successfully consulted with over 250+ Fortune 500 enterprises to develop actionable insights to help them accelerate their technology journeys to create value – across dimensions of revenue, transformation, and optimization. With core expertise in Digital Engineering Talent, Digital Transformation, Innovation, and Outsourcing Advisory, Zinnov assists clients by:

- Enabling global companies to develop and optimize a global engineering talent footprint through center setups and accelerators - in an as-a-service model, as well as optimizing their global portfolios, to achieve higher R&D efficiencies, innovation, and productivity;
- Advising global PE firms in asset shortlisting and target evaluation, commercial due diligence, and value creation;
- Growing revenue for companies' products and services in newer markets through account intelligence, market entry, and market expansion advisory;
- Helping global companies outline and drive their open innovation programs, design and operate accelerator programs, and enable collaboration with start-ups across specific use cases and predefined outcomes;
- Structuring and implementing Digital Transformation levers enabled by technologies like AI/ML, Intelligent Automation, Cloud, IOT, etc.

With their team of experienced consultants, subject matter experts, and research professionals, Zinnov serves clients from across multiple industry verticals including Enterprise Software, BFSI, Healthcare, Automotive, Retail, and Telecom in the US, Europe, Japan, and India.

For more information, visit <http://www.zinnov.com>





# CONNECT WITH US



**NILESH THAKKER**  
PRESIDENT



**AMITA GOYAL**  
PARTNER AND HEAD OF GCC BUSINESS



---

## AUTHORS



**PRAJWAL SHANKAR**  
CONSULTANT



**ADITYA RAJ**  
PROJECT LEAD



**ANKIT MISHRA**  
ENGAGEMENT MANAGER



# SPECIAL MENTION TO ORGANISATIONS WE INTERVIEWED FOR THIS REPORT



大连智博人才顾问有限公司  
Dalian Wide-wise HR Consulting Co., Ltd



PROCOLOMBIA  
EXPORTS TOURISM INVESTMENT COUNTRY BRAND



**vstorm**



TALENT  
ADVISORS



antal

THE VALUE OF  
SPECIALIZED TALENTS





SANTA CLARA | NEW YORK | SEATTLE | HOUSTON | PARIS | BANGALORE | NCR | PUNE | HYDERABAD

© 2024 Zinnov. All Rights Reserved