📊 Global Employment Trends in Data and Engineering Roles, Insights on Salaries, Skills, and Recruitment Platforms

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🗓️ Time Period: January to December 2023

📌 Dataset Size: 32,628 job records

"…Information is the oil of the 21st Century, and Analytics is the combustion engine…."

- *PETER SONDERGAARD,*
- *Senior Vice President And Global Head Of Research At Gartner, Inc*

🔍 Overview

This report presents an in-depth analysis of the 2023 U.S. job market in the data and technology sector. The dataset includes various job roles, salary types (hourly and annual), employment formats (full-time, contract, internship, part-time), and associated technologies or tools.

Key objectives of this analysis include:

- Identifying job demand trends over time
- Analysing salary variations across roles and work types
- Evaluating which skills or technologies correlate with higher pay
- Providing actionable insights for job seekers, recruiters, and students

📈 Monthly Job Posting Trends (Jan–Dec 2023)

MONTH	JOB COUNT
January	3,113
February	2,523
March	2,926
April	2,565
May	2,672
June	3,228
July	2,859
August	3,563 🔼 Highest
September	2,606
October	2,533
November	1,972 🔽 Lowest
December	2,068
Total	32,628

✅ Key Insights:

- The highest volume of job postings occurred in August, likely aligned with mid-year hiring cycles and project initiations.
- November and December appear to have the sharpest drop. This may be possibly due to:
  - Budget exhaustion at year-end
  - Holiday hiring freezes
- The job posting trend suggests peak hiring seasons in Q2 and Q3, with Q4 being relatively quiet.

📊 Quarterly Breakdown:

QUARTER	JOB COUNT	% OF TOTAL
Q1 (Jan–Mar)	8,562	26.2%
Q2 (Apr–Jun)	8,465	25.9%
Q3 (Jul–Sep)	9,028	27.7%
Q4 (Oct–Dec)	6,573	20.1%

🔎 **Key Insight:**

Q3 had the highest share of job activity — an ideal time for job seekers to apply.

💼 Salary Trends by Role

Job Title	Avg. Salary ($)
Senior Data Scientist	$154,160.78
Senior Data Engineer	$145,982.29
Data Scientist	$135,872.46
Data Engineer	$130,214.29
Machine Learning Engineer	$126,719.69
Senior Data Analyst	$113,927.57
Software Engineer	$113,308.09
Cloud Engineer	$111,268.45
Data Analyst	$93,796.22
Business Analyst	$91,159.96
Overall Avg.	**$123,250.76**

🔹 **Average Annual Salary by Role across all countries**

🧠 **Insight**:

- Leadership roles (e.g., Senior Data Scientist/Engineer) command the highest salaries, reflecting seniority, strategic responsibility, and specialized knowledge.
- Analytical support roles such as Data Analyst and Business Analyst offer entry-level to mid-tier salaries.
- Software and Cloud Engineers earn slightly below Data Scientists, possibly due to the domain-specific premium data science currently commands.

💼 Hourly Salary Analysis

JOB TITLE	HOURLY RATE ($)	# OF POSTINGS
Senior Data Engineer	$62.97	2,010
Data Engineer	$57.20	6,779
Senior Data Scientist	$54.01	2,013
Data Scientist	$49.40	8,486
ML Engineer	$48.48	621
Senior Data Analyst	$47.26	1,484
Software Engineer	$45.99	572
Cloud Engineer	$45.59	86
Business Analyst	$42.86	1,000
Data Analyst	$38.19	9,577
Overall Avg.	$47.05	32,628

🔹 AVERAGE HOURLY PAY BY ROLE

💡 Key Insight:

Hourly rates are directly proportional to seniority and technical skill — with Senior Engineers and Scientists paid the highest average hourly pay.

Data Analysts are the most frequently listed role but earn the lowest average rate, reinforcing their role as entry points into the data field.

👔 Salary by Work Type

Job Type	Avg. Annual ($)	Avg. Hourly ($)
Full-time	$127,961.41	$44.56
Contractor	$109,535.50	$59.47
Internship	$84,084.60	$28.72
Part-time	$152,137.96	$41.20
Temp Work	$112,363.85	$53.08
Per Diem	$82,010.50	$19.58
Overall	$128,085.01	$49.13

🔹 **Average Salary & Hourly Rate**

🧠 **Key Observations:**

- Contractors earn more per hour than full-time employees, reflecting the flexibility and specialized nature of contract work.
- Part-time jobs show high annual averages — likely skewed by high-salary senior or consulting roles working part-time hours.
- Internships and per diem roles are entry-level or temporary, hence significantly lower in compensation.

🧪 Top-Paying Technologies & Skills

SKILL / TOOL	AVG. SALARY ($)	JOB COUNT
Debian	$196,500.00	1
RingCentral	$182,500.00	4
Lua	$170,500.00	2
MongoDB	$170,257.98	360
Dplyr	$160,667.21	25
Watson	$157,102.29	46
Node.js	$156,697.30	80
Haskell	$155,757.67	7
Solidity	$153,639.95	12
Average	$165,993.13	538

📌 **Key Insight:**

- Specialized or niche technologies (Debian, Lua, Haskell) correlate with higher salaries, despite low job counts — these are rare skills in high demand.
- Tools like MongoDB, Node.js, and Watson are more common, yet still yield above-average salaries, suggesting high enterprise adoption.

Summary of Key Insights

CATEGORY	INSIGHT
Job Trends	Hiring peaks mid-year (Q2–Q3), drops sharply in November–December.
Salary by Role	Senior roles dominate earnings; Data Engineers & Scientists are top-paid.
Salary by Work Type	Contractors earn more per hour; full-time roles offer higher job stability.
High-paying Skills	MongoDB, Node.js, Watson, Haskell, Solidity — valuable for high pay roles.
Entry-Level Dynamics	Data Analyst roles are most common, with lowest average pay — ideal for starting careers.

📌 Recommendations

For Job Seekers:

- Focus applications during May–August, the most active hiring period.
- Upskill in in-demand technologies like MongoDB, Node.js, or emerging ones like Solidity.
- Consider contractor roles for higher pay flexibility if you have niche technical expertise.

For Students:

- Target roles like Data Engineer or ML Engineer after graduation — they offer strong long-term growth and pay.
- Build portfolios using tools like Python, SQL, and cloud platforms, which are common across the top ten (10) paying roles.

For Recruiters:

- Allocate hiring budgets around Q2 and Q3 when job postings and candidate interest are at their peak.
- Offer competitive hourly rates for part-time and contract roles to attract skilled professionals.

✅ Conclusion

This report demonstrates how data analytics can uncover valuable trends in the job market. By combining time-based trends, role-specific salary benchmarks, and skill-based pay insights using Microsoft Excel