



# IT Job Opportunities

during the period of 2019–2023

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From 2019 to 2023, the IT sector saw significant growth and change, driven by digital transformation, cloud computing, AI, and cybersecurity needs. The COVID-19 pandemic accelerated remote work, increasing demand for IT support, cybersecurity, and cloud services. Emerging technologies like blockchain, 5G, and IoT also opened new job opportunities. The period marked a shift towards specialized skills, online learning, and hybrid work models, making the IT job market dynamic and expansive across various roles and industries.



# BUSINESS PROBLEM

## **"Analyzing Salary Discrepancies and Skill Demand Across IT Job Roles to Optimize Recruitment Strategies."**

This problem involves investigating how different factors like job title, location, required skills, and experience level influence salary ranges. By understanding these discrepancies, businesses can better align their recruitment strategies, ensuring competitive compensation packages and attracting top talent in a highly competitive IT job market. Additionally, insights into skill demand can guide training and development efforts to bridge any talent gaps.

# DATA COLLECTION

Data was extracted from the Kaggle via Web Scrapping. The data was collected on September, 2019 and may not reflect the most recent updates. The dataset contains genuine data.

Please note that this dataset is entirely fictional and created for academic and research purposes, with no correlation to real job postings or market conditions.

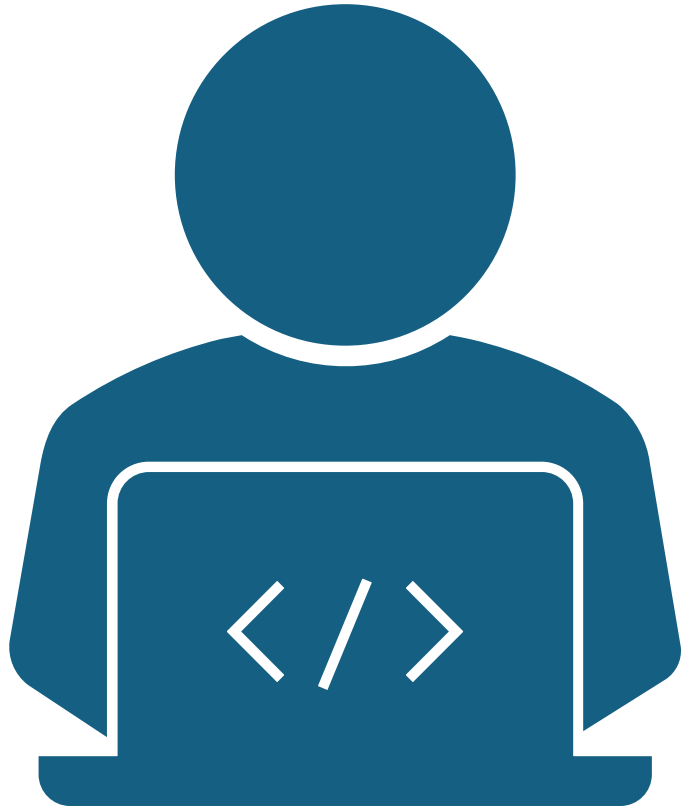
# ABOUT DATASET:

The "IT Job Opportunities Dataset (2019-2023)" is a comprehensive collection of hypothetical IT job postings spanning five years, from 2019 to 2023. This dataset is designed to simulate the dynamic nature of the IT job market, reflecting the ever-changing demands for skills and expertise in the Information Technology sector.

Each entry in this dataset includes essential details such as job titles, job descriptions, required skills, salary ranges, job locations, company names, experience levels, industry sectors, job types (e.g., full-time, part-time), and the date the job was posted. The dataset provides a valuable resource for researchers, educators, and analysts interested in understanding the trends and evolution of IT job opportunities over time.

Whether you are studying the impact of technological advancements, changes in industry demand, or the effects of external events on the IT job market, this dataset offers a hypothetical yet realistic representation of job listings that can be used for analysis, trend prediction, or educational purposes.

# Description of Attributes



- **Job Title** : The name or title of the job position (e.g., Software Engineer, Data Analyst, Network Engineer).
- **Job Description** : A brief overview of the primary responsibilities and tasks associated with the job title.
- **Required Skills** : The specific technical skills or proficiencies needed for the job (e.g., Java, Python, SQL, Excel, Cisco, WAN).
- **Location** : The geographical location where the job is based (e.g., London, Manchester, Birmingham).
- **Company** : The name of the company offering the job position (e.g., ABC Tech, XYZ Analytics, Network Solutions).
- **Experience Level** : The level of professional experience required for the job (e.g., Entry-Level, Junior, Mid-Level).
- **Industry** : The sector or industry in which the job role is categorized (e.g., Technology, Analytics, Networking).
- **Job Type** : The nature of the employment contract (e.g., Full-Time).
- **Date Posted** : The date on which the job posting was made public.
- **Min Salary** : The minimum salary offered for the job position.
- **Max Salary** : The maximum salary offered for the job position.

# Instance of the Dataset (Before data cleaning)

	Job Title	Job Description	Required Skills	Salary Range	Location	Company	Experience Level	Industry	Job Type	Date Posted
0	Software Engineer	Develop software	Java, Python	£40,000 - £60,000	London	ABC Tech	Entry-Level	Technology	Full-Time	01/05/2023
1	Data Analyst	Analyze data	SQL, Excel	£35,000 - £50,000	Manchester	XYZ Analytics	Junior	Analytics	Full-Time	02/10/2023
2	Network Engineer	Maintain networks	Cisco, WAN	£45,000 - £70,000	Birmingham	Network Solutions	Mid-Level	Networking	Full-Time	03/15/2023
3	Cloud Architect	Design cloud	AWS, Azure	£60,000 - £90,000	Edinburgh	Cloud Innovators	Senior	Cloud Computing	Full-Time	04/20/2023
4	Cybersecurity Analyst	Protect data	Cybersecurity	£50,000 - £80,000	Glasgow	SecureGuard	Mid-Level	Security	Full-Time	05/25/2023
...	...	...	...	...	...	...	...	...	...	...
359	AI Ethics Consultant	Ensure AI ethics	Ethics, AI Governance	£75,000 - £120,000	Leeds	AI Ethics	Senior	Ethics	Full-Time	05/26/2019
360	IT Support Specialist	Provide IT support	Windows, Troubleshooting	£45,000 - £75,000	Sheffield	IT Support Specialists	Mid-Level	Support	Full-Time	06/21/2019
361	Data Analytics Manager	Manage data analytics	Data Analytics, Team Management	£80,000 - £130,000	Nottingham	Data Managers	Senior	Analytics	Full-Time	07/16/2019
362	IT Project Coordinator	Coordinate IT projects	Project Coordination	£50,000 - £85,000	Liverpool	Project Coordinators	Mid-Level	Project Management	Full-Time	08/11/2019
363	Cloud Solutions Analyst	Analyze cloud solutions	AWS, Azure, Cloud Analysis	£70,000 - £110,000	Birmingham	Cloud Analysts	Mid-Level	Cloud Computing	Full-Time	09/06/2019


In this Dataset, the no of rows is 364 and no. of columns is 10




# Instance of the Dataset (After data cleaning)

	Job Title	Job Description	Required Skills	Location	Company	Experience Level	Industry	Job Type	Date Posted	Min Salary	Max Salary	Average Salary
0	Software Engineer	Develop software	Java	London	ABC Tech	Entry-Level	Technology	Full-Time	2023-01-05	40000	60000	50000.0
0	Software Engineer	Develop software	Python	London	ABC Tech	Entry-Level	Technology	Full-Time	2023-01-05	40000	60000	50000.0
1	Data Analyst	Analyze data	SQL	Manchester	XYZ Analytics	Junior	Analytics	Full-Time	2023-02-10	35000	50000	42500.0
1	Data Analyst	Analyze data	Excel	Manchester	XYZ Analytics	Junior	Analytics	Full-Time	2023-02-10	35000	50000	42500.0
2	Network Engineer	Maintain networks	Cisco	Birmingham	Network Solutions	Mid-Level	Networking	Full-Time	2023-03-15	45000	70000	57500.0
...	...	...	...	...	...	...	...	...	...	...	...	...
361	Data Analytics Manager	Manage data analytics	Team Management	Nottingham	Data Managers	Senior	Analytics	Full-Time	2019-07-16	80000	130000	105000.0
362	IT Project Coordinator	Coordinate IT projects	Project Coordination	Liverpool	Project Coordinators	Mid-Level	Project Management	Full-Time	2019-08-11	50000	85000	67500.0
363	Cloud Solutions Analyst	Analyze cloud solutions	AWS	Birmingham	Cloud Analysts	Mid-Level	Cloud Computing	Full-Time	2019-09-06	70000	110000	90000.0
363	Cloud Solutions Analyst	Analyze cloud solutions	Azure	Birmingham	Cloud Analysts	Mid-Level	Cloud Computing	Full-Time	2019-09-06	70000	110000	90000.0
363	Cloud Solutions Analyst	Analyze cloud solutions	Cloud Analysis	Birmingham	Cloud Analysts	Mid-Level	Cloud Computing	Full-Time	2019-09-06	70000	110000	90000.0

In this Dataset, the no of rows is 813 and no. of columns is 12



	count	unique	top	freq
Job Title	364	74	IT Support Specialist	16
Job Description	364	74	Provide IT support	22
Required Skills	364	91	Windows, Troubleshooting	16
Salary Range	364	32	£55,000 - £90,000	46
Location	364	12	Birmingham	48
Company	364	83	Data Insights	16
Experience Level	364	5	Mid-Level	216
Industry	364	40	Support	30
Job Type	364	1	Full-Time	364
Date Posted	364	201	12/10/2023	8



## DESCRIPTIVE STATISTICS (NON-GRAPHICAL) :

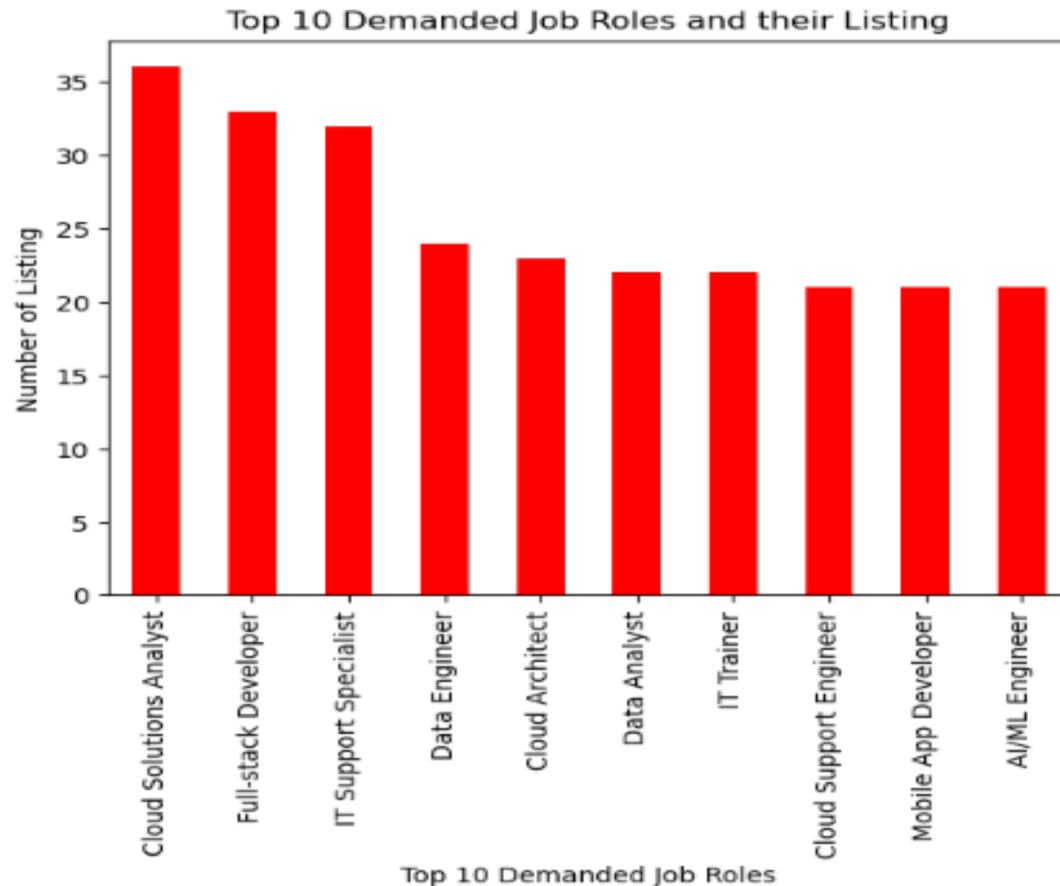
In this section, we will look at the Measures of Central Tendency (Mean, Median, Mode) and Measures of Dispersion (Standard Deviation, Range and Quartiles)





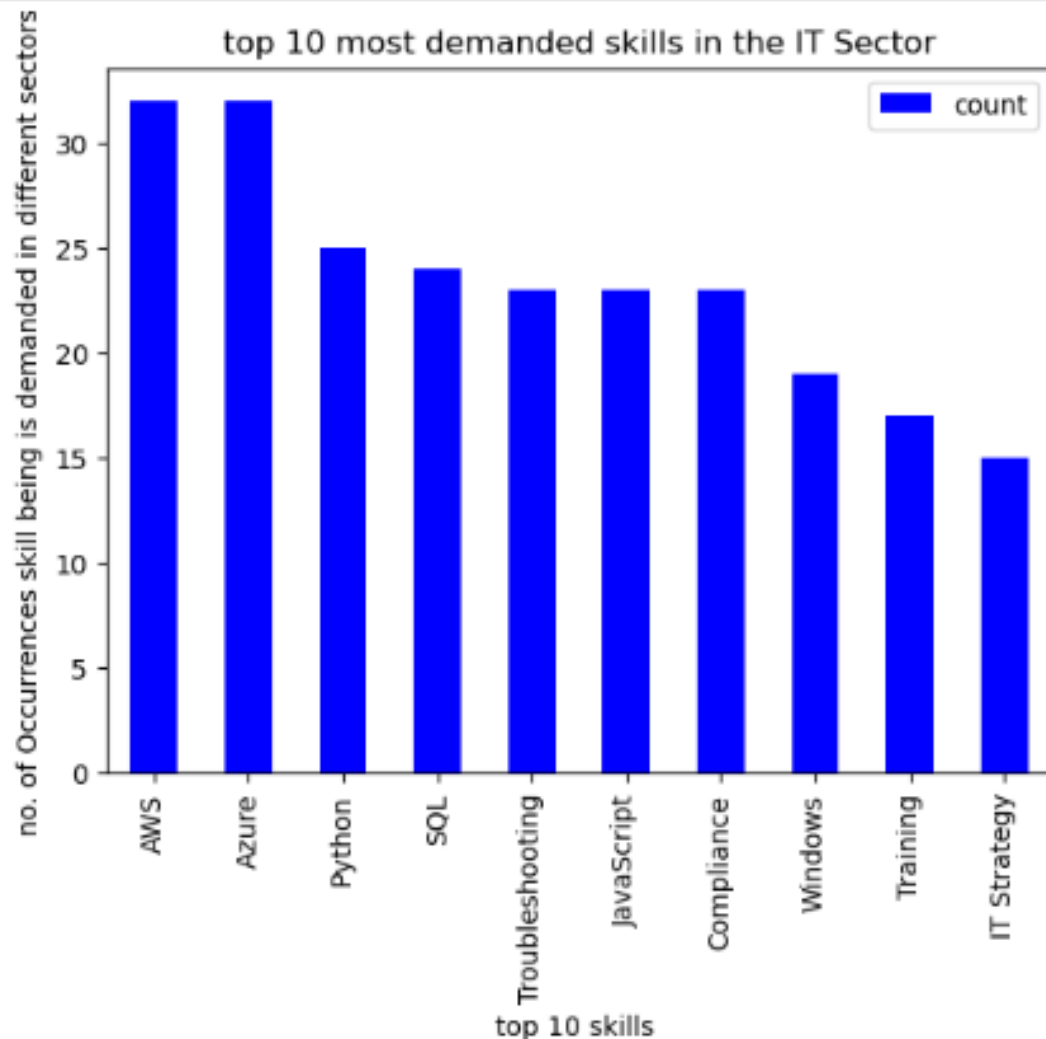
# Data Insights

# Demanded Job roles in IT sector 2019-2023



- The bar chart indicates that the most demanded job roles are **Cloud Solutions Analyst**, **Full-Stack Developer**, and **IT Support Specialist**. These roles have the highest number of listings, suggesting a strong market demand in these areas. The other roles, such as **AI/ML Engineer** and **Mobile App Developer**, also have significant demand but comparatively fewer listings. This highlights a focus on cloud computing, full-stack development, and IT support in the current job market.

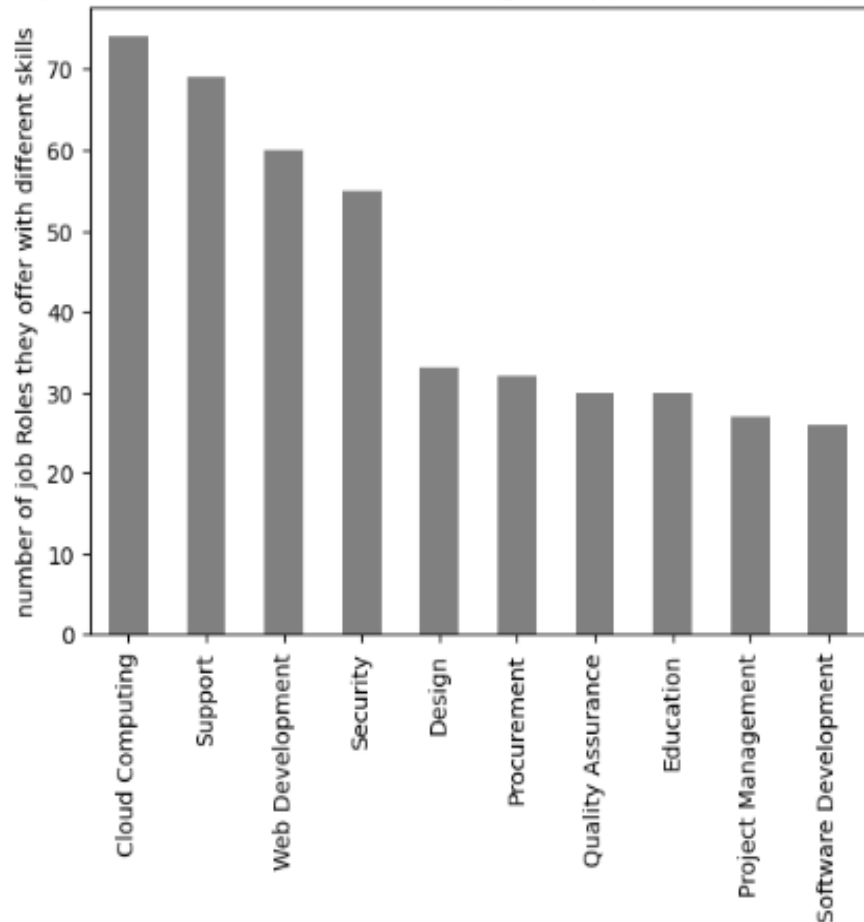
# Most Demanded Skills in IT Sector during the period 2019-2023



From this Analysis we can say that AWS and Azure skills are more demanded by many IT companies due to the before analysis that cloud Solution analyst are in demanded Job Roles in this period. And the next demanded skill is Python and SQL due to their vast usage in many fields, mainly as a Data Analyst Role. Here JavaScript Language is also most considerable demanded skill in this period.

# Industries with Wide range of Opportunities

Top 10 industries that offers wide range of opportunities(Roles) to work



Top 10 industry that offers various job Roles

From this analysis, we can see cloud computing offers many opportunities by Different roles such as : '*Cloud Architect*', '*Cloud Solutions Architect*', '*Cloud Solutions Analyst*', '*Cloud Migration Specialist*'.

So with right skills with respect to cloud technologies, Many can get into IT Sector.

We can also see that, Web Development also provide significantly many opportunities to people. So learning the languages such as *CSS*, *JavaScript*, *HTML*, *php*, etc., many can enter into IT Sector during that Period.

# No. Of Opportunities in Different Locations



The line chart shows that **Birmingham** and **Manchester** have the highest number of job opportunities, followed by **Glasgow** and **Edinburgh**. On the other end, **Newcastle** and **Liverpool** have the fewest job opportunities. This suggests that job availability is concentrated in larger cities, with Birmingham and Manchester being the top locations for job seekers.

Top 10 average salary of each job feilds

index		Job Title	Average Salary
0	0	AI Ethics Consultant	90000.000000
1	7	Cloud Security Engineer	86785.714286
2	4	Cloud Architect	85108.695652
3	1	AI/ML Engineer	81428.571429
4	2	Blockchain Developer	78214.285714
5	9	Cloud Solutions Architect	76875.000000
6	8	Cloud Solutions Analyst	75208.333333
7	5	Cloud Migration Specialist	72500.000000
8	3	Business Analyst	62500.000000
9	6	Cloud Security Analyst	60000.000000

Average salary variation with respect to experience level

Average Salary	
Experience Level	
Entry-Level	37500.000000
Internship	25000.000000
Junior	54793.893130
Mid-Level	71247.433265
Senior	92777.777778



# Salary Trends with respect to Industries

Top 10:

Least 10:

Average Salary		Average Salary	
Industry		Industry	
Software Design	107500.000000	Quality Assurance	58833.333333
Governance	93333.333333	Data Analysis	58500.000000
Sales	93125.000000	IT Services	57500.000000
Ethics	90000.000000	IT Analysis	52500.000000
Business Continuity	90000.000000	Support	51391.304348
Consulting	87857.142857	Technology	50000.000000
Analytics	84166.666667	Education	48500.000000
Project Management	84074.074074	Research	37500.000000
Mobile Development	81428.571429	Training	30000.000000
Artificial Intelligence	81428.571429	Cloud	25000.000000

# Salary Trends with respect to Required Skill

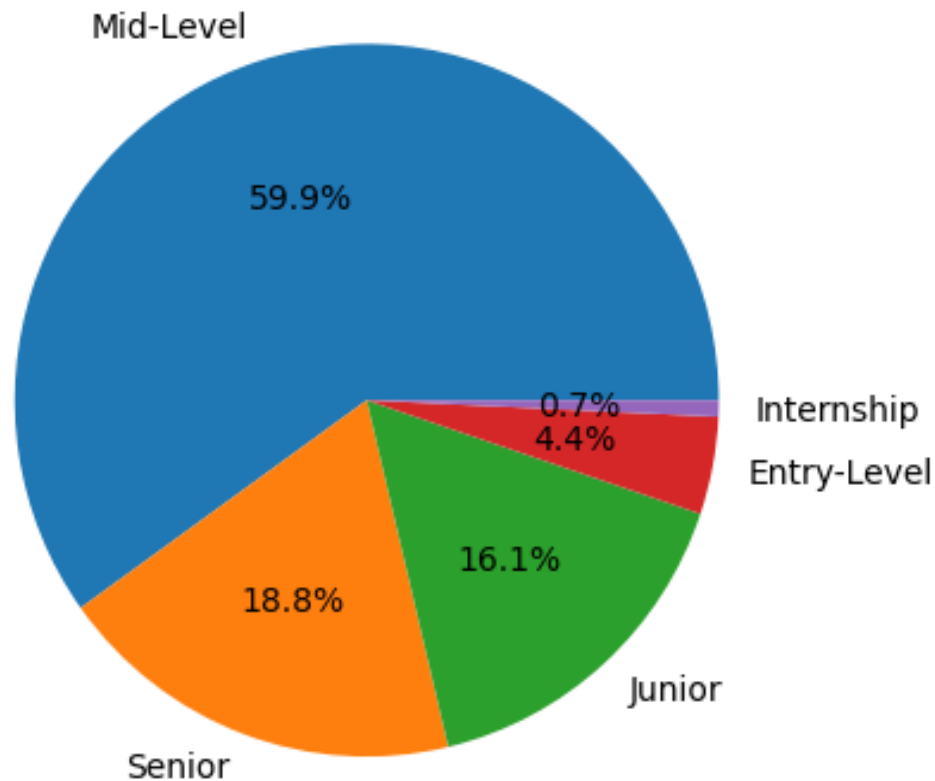
Top 10:

Least 10:

Average Salary		Average Salary	
Required Skills		Required Skills	
Architecture	104375.000000	Architecture	104375.000000
Agile	92500.000000	Agile	92500.000000
AI Governance	90000.000000	AI Governance	90000.000000
AI/ML	81428.571429	AI/ML	81428.571429
Android	81428.571429	Android	81428.571429
AWS	73906.250000	AWS	73906.250000
Azure	73906.250000	Azure	73906.250000
Big Data	72812.500000	Big Data	72812.500000
Audit	69285.714286	Audit	69285.714286
Active Directory	57500.000000	Active Directory	57500.000000

# Job Opportunities with respect to Experience Level during the period 2019-23

Job opportunities with respect to Experience Level



The pie chart indicates that **Mid-Level** positions dominate job opportunities (59.9%) because employers often seek experienced professionals who can contribute immediately. **Senior** roles (18.8%) also have significant demand due to the need for leadership and expertise. **Junior** (16.1%) and **Entry-Level** (4.4%) positions are less common, reflecting the limited roles available for less experienced candidates. **Internships** (0.7%) are the rarest, typically offering fewer opportunities as they are temporary and often limited to students or recent graduates.

# Company-Wise Distribution of Job Opportunities by Experience Level

## Entry-Level:

Company	
IT Services	8
QA Solutions	6
IT Helpdesk	6
IT Training Assist	6
ABC Tech	2
Service Desk	2
IT Analyst Trainees	2
UX Research Assistants	2
Network Admin Trainees	2

## Junior\_Level:

Company	
IT Training	22
Cloud Support	21
Data Insights	20
IT Support Experts	10
Web Creations	9
IT Solutions	8
UX Innovations	8
QA Solutions	8
UX Labs	8
IT Support Specialists	6
Design Studios	5
XYZ Analytics	2
Sales Reps	2
IT Insights	2

## Mid\_Level:

Company	
Cloud Analysts	36
Web Creations	27
AI Innovations	21
Mobile Devs	21
Data Engineers	21
Data Insights	20
DevOps Solutions	20
Tech Solutions	18
Web Studios	18
SecureGuard	17

## Senior\_Level:

Company	
Project Leaders	20
IT Governance Mgmt	16
Cloud Innovations	15
Sales Leaders	14
Software Architects	14
Procurement Mgmt	14
Data Managers	14
Cloud Innovators	11
Cloud Architects	9
IT Consultancy	8
AI Ethics	8
IT Consultants	6
Change Managers	2
Continuity Managers	2

## Intern :

Company	
Data Interns	2
Dev Interns	2
Cloud Interns	2

# Conclusion

The IT job market from 2019 to 2023 experienced significant growth, largely driven by advancements in digital transformation, cloud computing, AI, and cybersecurity. The COVID-19 pandemic accelerated the demand for remote work support, boosting job opportunities in cloud services and cybersecurity.

The IT job market expanded significantly, driven by advancements in cloud computing, AI, and cybersecurity. Key roles like Cloud Solutions Analyst, Full-Stack Developer, and IT Support Specialist were in high demand, with AWS, Python, and Azure emerging as the most sought-after skills. Major cities like Birmingham and Manchester led in job opportunities, particularly for Mid-Level professionals, reflecting a strong demand for experienced talent. The industry also saw a shift towards remote and hybrid work models, underscoring the importance of specialized skills and adaptability in the evolving IT landscape.

## Key insights :

**High Demand Roles:** Positions like Cloud Solutions Analyst, Full-Stack Developer, and IT Support Specialist were the most in-demand.

**Top Skills:** AWS, Azure, Python, SQL, and JavaScript emerged as the most sought-after skills, reflecting the industry's focus on cloud computing, data analysis, and web development.

**Industry Opportunities:** Cloud computing and web development were identified as industries with the widest range of job opportunities.

**Geographic Concentration:** Birmingham and Manchester were highlighted as top locations for job opportunities, with fewer openings in smaller cities like Newcastle and Liverpool.

**Experience Levels:** Mid-Level positions accounted for the majority of job opportunities, indicating a strong preference for experienced professionals. Senior roles also had significant demand, while entry-level positions were relatively scarce.