



deti

universidade de aveiro
departamento de eletrónica,
telecomunicações e informática

24TH NOVEMBER 2025/26

Information Visualization

GLOBAL SALARY TRENDS IN AI & DATA

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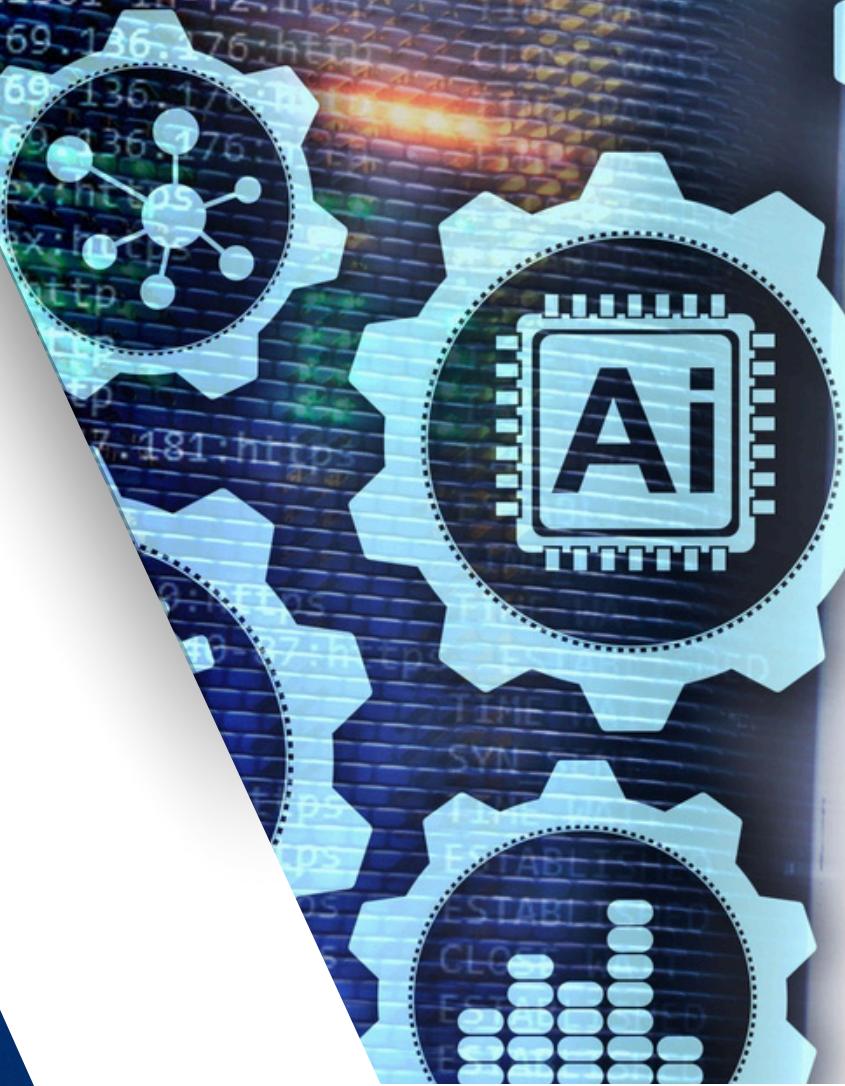


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DataSet Overview**

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1

Phenomenon

Phenomenon

Objective

To understand **how salaries in Data Science, AI, and ML careers vary over time** and across different factors, including:

Experience level

Type of employment contract

Company size

....

FOCUS AREAS

DATA SCIENCE

ARTIFICIAL INTELLIGENCE

MACHINE LEARNING

ANALYTICS

DATA ENGINEERING





2

Data Overview DataSet Overview

Data Overview



Data Sources

- 365DataScience
- Payscale
- KDnuggets
- ZipRecruiter
- AIJobs.net (CCO Salary Survey)
- Wellfound (formerly AngelList)

Variables

- Work_year
- Experience_Level
- Employment_Type
- Job_Title
- Company_Size
- Company_Location
- Remote_ratio
- Employee_Residence
- Annual_Salary
- Jobs_Category
- Salary_Currency
- Salary_in_EU

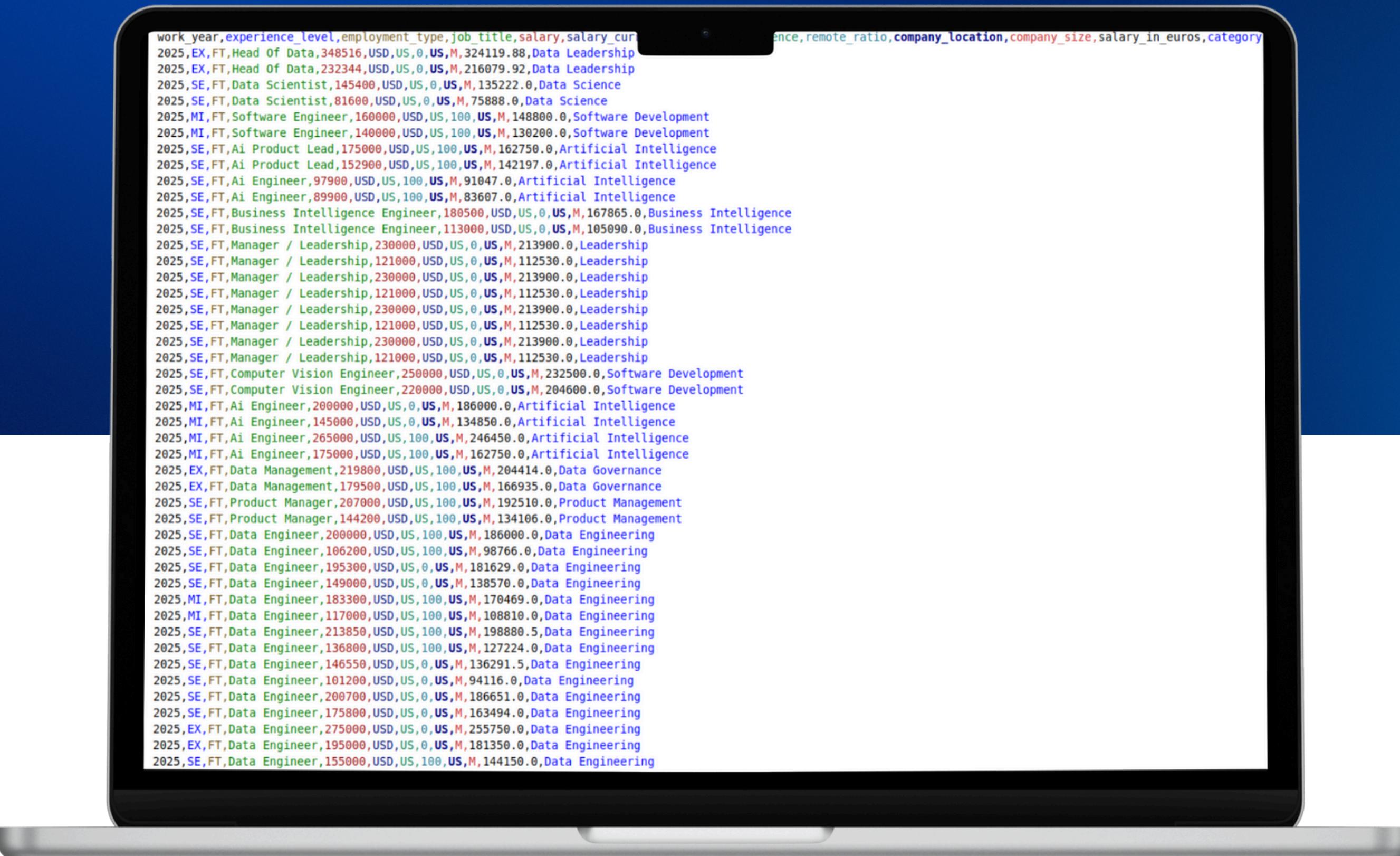
DataSet Overview

Before

work_year	experience_level	employment_type	job_title	salary	salary_curr	employee_residence	remote_ratio	company_location	company_size	category
2025	EX,FT	Head of Data	348516,USD	348516,US	0,US,M	Data Leadership				
2025	EX,FT	Head of Data	232344,USD	232344,US	0,US,M	Data Leadership				
2025	SE,FT	Data Scientist	145400,USD	145400,US	0,US,M	Data Science				
2025	SE,FT	Data Scientist	81600,USD	81600,US	0,US,M	Data Science				
2025	MI,FT	Engineer	160000,USD	160000,US	100,US,M	Other				
2025	MI,FT	Engineer	140000,USD	140000,US	100,US,M	Other				
2025	SE,FT	AI Product Lead	175000,USD	175000,US	100,US,M	Leadership				
2025	SE,FT	AI Product Lead	152900,USD	152900,US	100,US,M	Leadership				
2025	SE,FT	AI Engineer	97900,USD	97900,US	100,US,M	Artificial Intelligence				
2025	SE,FT	AI Engineer	89900,USD	89900,US	100,US,M	Artificial Intelligence				
2025	SE,FT	Business Intelligence Engineer	180500,USD	180500,US	0,US,M	Business Intelligence				
2025	SE,FT	Business Intelligence Engineer	113000,USD	113000,US	0,US,M	Business Intelligence				
2025	SE,FT	Manager	230000,USD	230000,US	0,US,M	Leadership				
2025	SE,FT	Manager	121000,USD	121000,US	0,US,M	Leadership				
2025	SE,FT	Manager	230000,USD	230000,US	0,US,M	Leadership				
2025	SE,FT	Manager	121000,USD	121000,US	0,US,M	Leadership				
2025	SE,FT	Manager	230000,USD	230000,US	0,US,M	Leadership				
2025	SE,FT	Manager	121000,USD	121000,US	0,US,M	Leadership				
2025	SE,FT	Manager	230000,USD	230000,US	0,US,M	Leadership				
2025	SE,FT	Manager	121000,USD	121000,US	0,US,M	Leadership				
2025	SE,FT	Computer Vision Engineer	250000,USD	250000,US	0,US,M	AI Specializations				
2025	SE,FT	Computer Vision Engineer	220000,USD	220000,US	0,US,M	AI Specializations				
2025	MI,FT	AI Engineer	200000,USD	200000,US	0,US,M	Artificial Intelligence				
2025	MI,FT	AI Engineer	145000,USD	145000,US	0,US,M	Artificial Intelligence				
2025	MI,FT	AI Engineer	265000,USD	265000,US	100,US,M	Artificial Intelligence				
2025	MI,FT	AI Engineer	175000,USD	175000,US	100,US,M	Artificial Intelligence				
2025	EX,FT	Data Management	219800,USD	219800,US	100,US,M	Data Governance				
2025	EX,FT	Data Management	179500,USD	179500,US	100,US,M	Data Governance				
2025	SE,FT	Product Manager	207000,USD	207000,US	100,US,M	Leadership				
2025	SE,FT	Product Manager	144200,USD	144200,US	100,US,M	Leadership				
2025	SE,FT	Data Engineer	200000,USD	200000,US	100,US,M	Data Engineering				
2025	SE,FT	Data Engineer	106200,USD	106200,US	100,US,M	Data Engineering				
2025	SE,FT	Data Engineer	195300,USD	195300,US	0,US,M	Data Engineering				
2025	SE,FT	Data Engineer	149000,USD	149000,US	0,US,M	Data Engineering				
2025	MI,FT	Data Engineer	183300,USD	183300,US	100,US,M	Data Engineering				
2025	MI,FT	Data Engineer	117000,USD	117000,US	100,US,M	Data Engineering				
2025	SE,FT	Data Engineer	213850,USD	213850,US	100,US,M	Data Engineering				
2025	SE,FT	Data Engineer	136800,USD	136800,US	100,US,M	Data Engineering				
2025	SE,FT	Data Engineer	146550,USD	146550,US	0,US,M	Data Engineering				
2025	SE,FT	Data Engineer	101200,USD	101200,US	0,US,M	Data Engineering				
2025	SE,FT	Data Engineer	200700,USD	200700,US	0,US,M	Data Engineering				
2025	SE,FT	Data Engineer	175800,USD	175800,US	0,US,M	Data Engineering				
2025	EX,FT	Data Engineer	275000,USD	275000,US	0,US,M	Data Engineering				
2025	EX,FT	Data Engineer	195000,USD	195000,US	0,US,M	Data Engineering				
2025	SE,FT	Data Engineer	155000,USD	155000,US	100,US,M	Data Engineering				

DataSet Overview

After (Final Format)

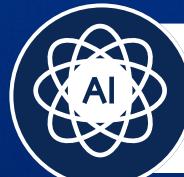




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Context Target Users and Needs

Context



Detailed overview of salary variations in Data Science, AI, and Machine Learning



Analysis of how factors such as experience, location, and contract type influence salaries



Comparison between roles, company sizes, and work settings (remote, hybrid, on-site)



Emphasis on global patterns and insights that reflect the evolution of the data-driven job market



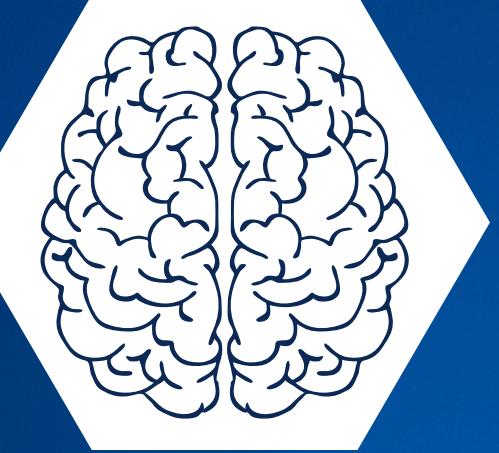
Highlight of global salary trends and market evolution in 2025



Target Users And Needs

Tech Talent & Career Seekers

Includes data scientists, AI professionals, students, and job seekers.



Need: Understand salary trends, compare roles/locations, and plan career progression.

Employers & HR Teams

Includes HR managers, recruiters, companies, and startups.



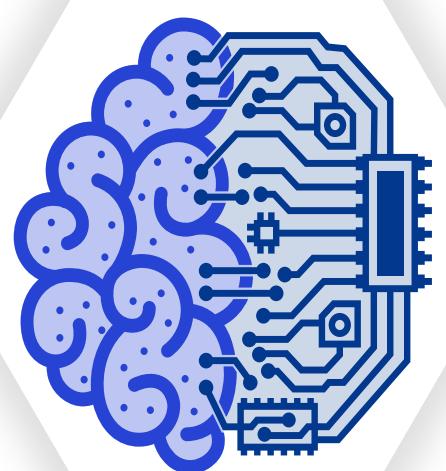
Need: Benchmark salaries, design competitive compensation, and attract top talent.



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Goals

Goals



ARTIFICIAL INTELLIGENCE

- Explore how salaries vary across job categories, years, and experience levels through visual comparisons.
- Detect trends and differences between AI, Data Science, and Leadership roles from 2020 to 2025.

EVALUATE INFLUENCING FACTORS



- Assess how experience, company size, employment type, and remote work impact salary levels.
- Identify which factors most strongly affect compensation growth across roles.

Goals



MAP GEOGRAPHIC AND WORK PATTERNS

- Visualize global salary distribution and the connection between company and employee locations.
- Track how regional AI job markets have evolved over time with the rise of remote work.

SUPPORT PROFESSIONAL AND BUSINESS DECISIONS



- Help professionals benchmark salaries and career expectations based on data-driven insights.
- Assist organizations in defining fair and competitive compensation strategies worldwide.

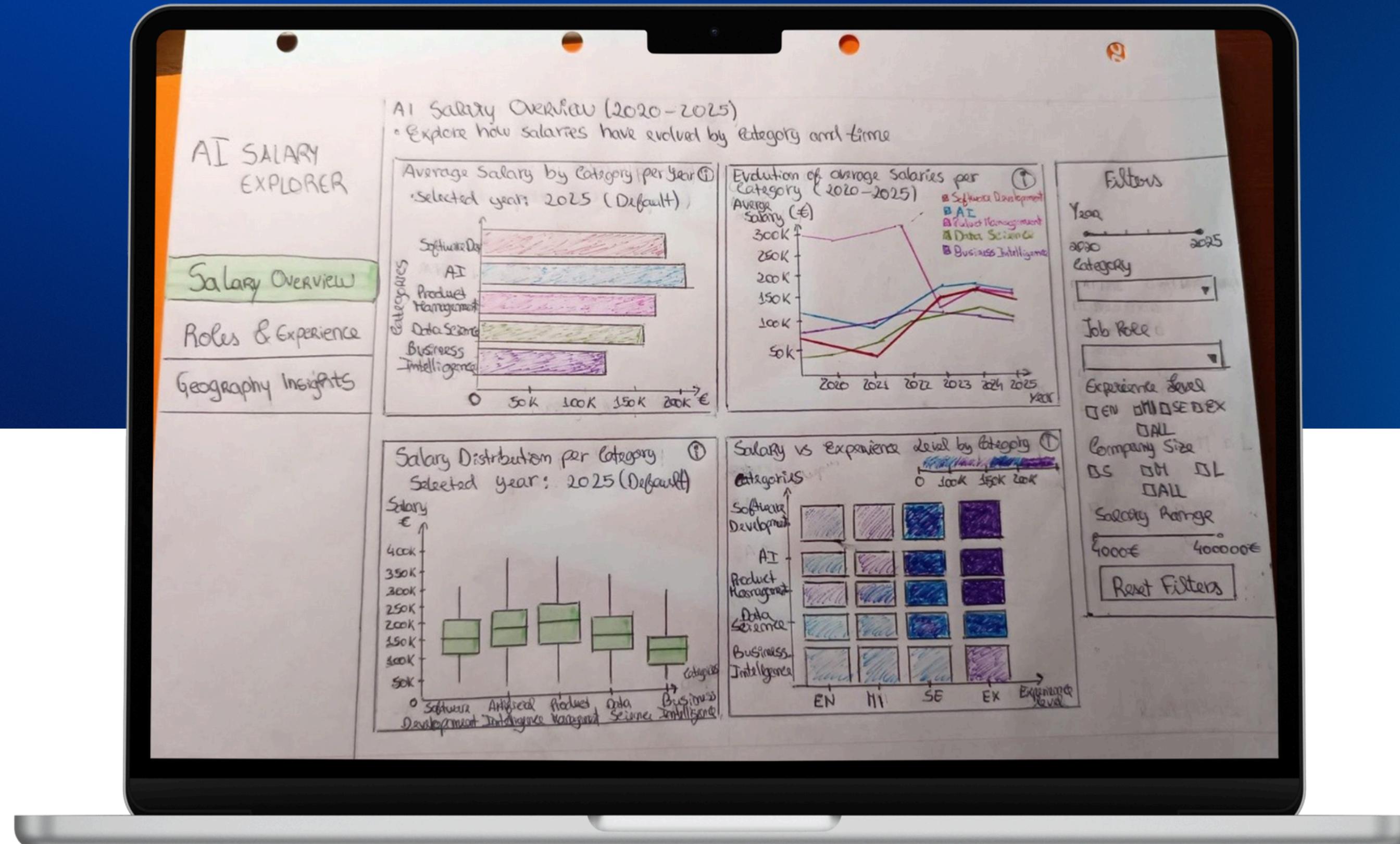


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Low Fidelity Prototype

Low Fidelity Prototype

AI SALARY OVERVIEW PAGE



Low Fidelity Prototype

ROLES & EXPERIENCE OVERVIEW PAGE

AI Salary Explorer

Salary Overview

Roles & Experience

Geography Insights

Roles & Experience Overview (2020-2025)

* How experience, company size and work style shape AI jobs salaries

Average Salary by Job Role and Experience Level
Selected year: 2025 (default)

EN HI SE EX

Average Salary by Company Size and Job Role
Selected year → 2025 (default)

Small Medium Large

Evolution of AI Job Roles (2020-2025)

Head of Machine Learning, AIE, Product Manager, Data Scientist, Software Development Engineer

Salary by Employment type and Remote ratio, per job role
Selected year: 2025 (default), Hybrid (50%), On-site (0%), Fully Remote (50%)

Filters

Year: 2020 to 2025

Category: EXP

Experience Level: EN HI SE EX

Job Role: AI Product Manager

Company Size: S M L ALL

Employment type: OFT DPT DCT DFL

Remote: 0%, 50%, 100%

Salary Range: 40000€ to 400000€

Reset Filters

Low Fidelity Prototype

GEOGRAPHY & WORK PATTERNS PAGE

AI SALARY EXPLORER

Salary Overview

Roles & Experience

Geography Insights

Geography & work Patterns (2020-2025)

- How location, company region and remote work shape salaries in the AI job market

Global AI Job Distribution and remote connectivity (2020-2025)

England - 2025

Average Salary by Remote Ratio and Country

Country	On-Site (%)	Hybrid (50%)	Remote (100%)
US	~18%	~15%	~67%
CA	~15%	~10%	~75%
IE	~12%	~18%	~70%
FI	~8%	~12%	~80%
SG	~10%	~15%	~75%

Average Salary by Employee Residence

Residence	Average Salary (€)
CD	~220K
US	~180K
HK	~160K
BG	~140K
CH	~120K
IE	~100K

Filters

Country

Year: 2020 → 2025

Category

Experience Level: SEN MGR SDE DEX All

Job Role

Company Size: SM ML All

Employment type: FTF DPT OCT DFL

Remote Ratio: 0% 50% 100%

Salary Range: 40000€ → 400000€

Employee Residence

Reset Filters

Prototype Evaluation

Tarefa 1

Diz qual é a categoria com o salário médio mais alto e qual tem o mais baixo.

Tarefa 2

Indica quais as categorias que, no nível de experiência EX (Executive), apresentaram a melhor média salarial em 2025.

Tarefa 3

Identifica qual o papel (job role) que apresenta o salário médio mais elevado no nível EX (Executive) em 2025.

Tarefa 4

Indica qual é o salário médio para o cargo “Data Scientist” no ano de 2021. Observa se o salário médio aumenta ou diminui quando o trabalho é presencial.

Tarefa 5

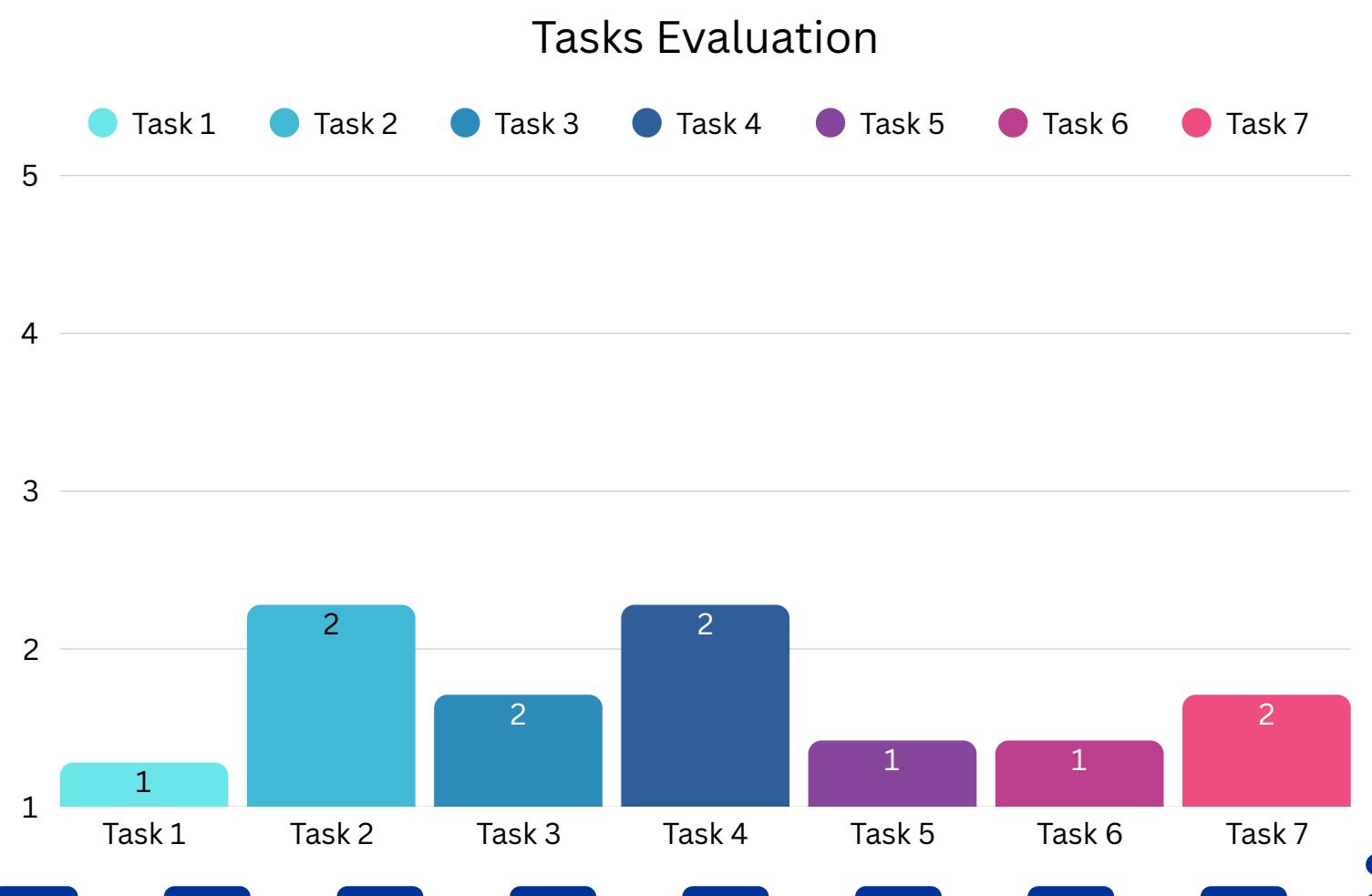
Qual é o salário médio de um Manager / Leadership que trabalha numa grande empresa?

Tarefa 6

Em 2025, qual parece ser a categoria de trabalho mais comum em Inglaterra (IE)? E consegues perceber qual tem o salário médio mais alto?

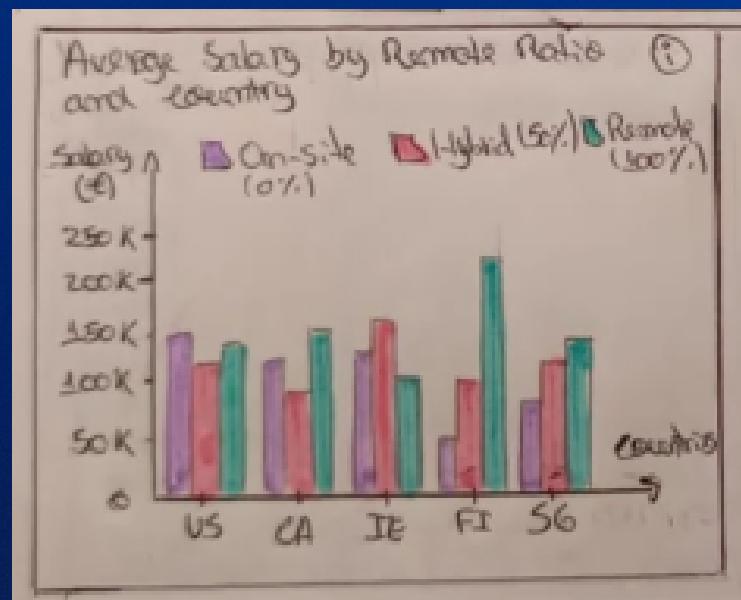
Tarefa 7

Quais são os países em que o salário médio está entre 170 000 € e 400 000 €?

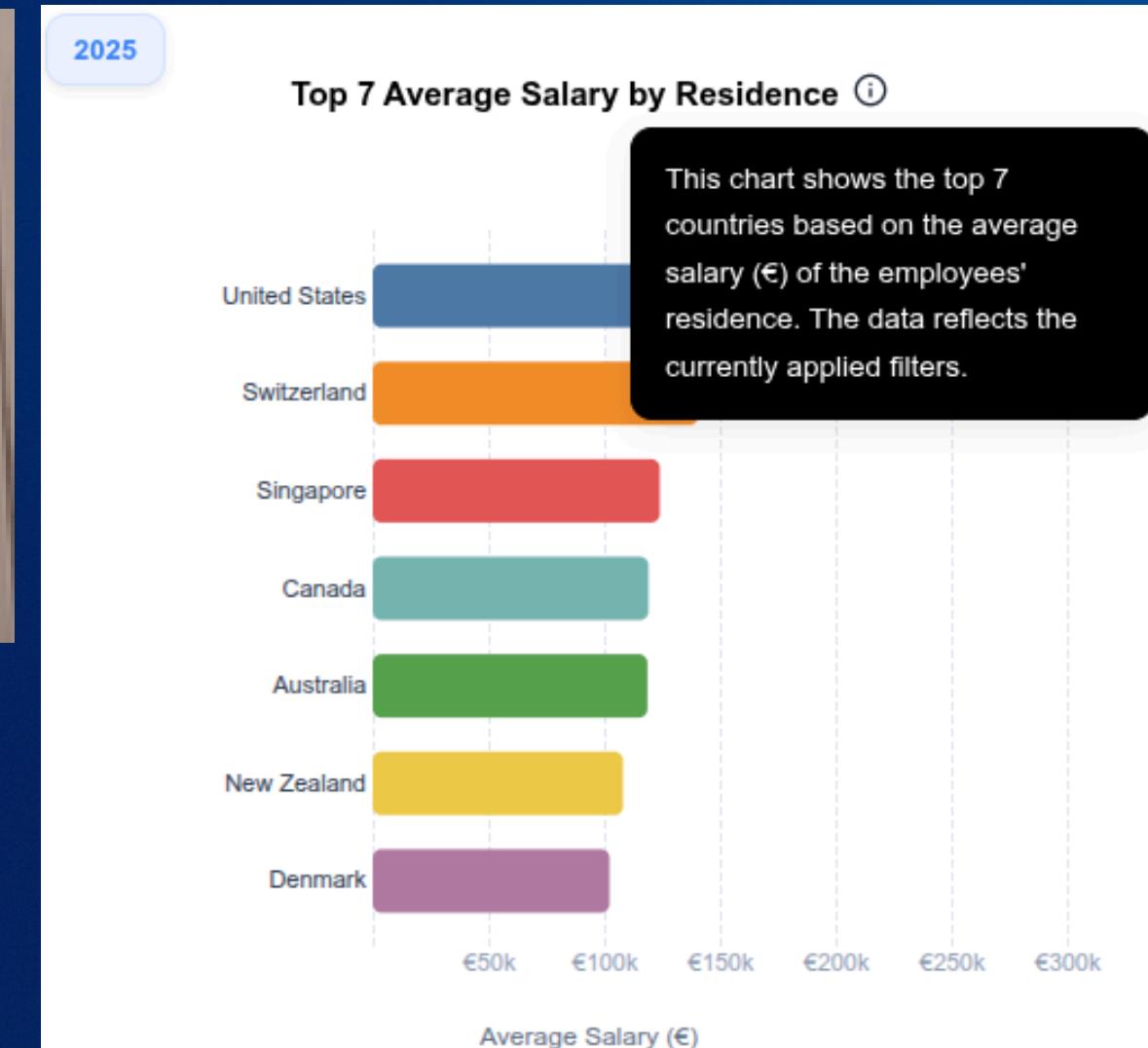
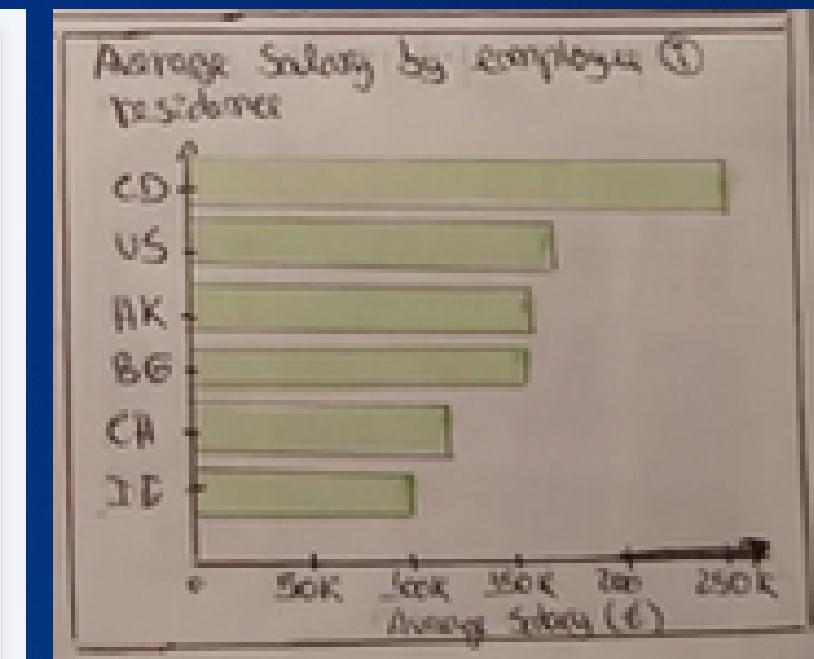


Feedback received

Improved Year Visibility



Fix: Added Explicit Country Labels

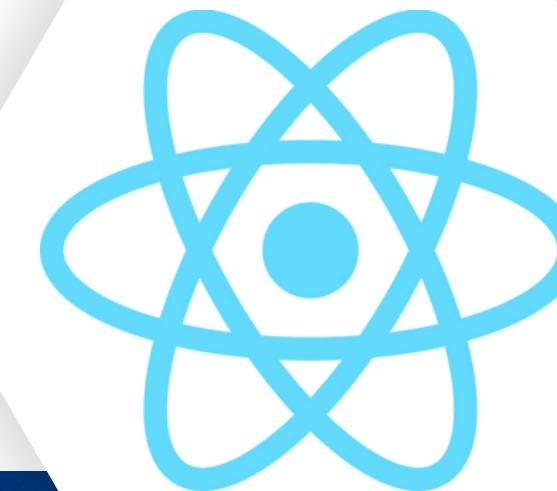




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Functional Prototype

Technological Stack Overview



REACT JS



D3

Heuristic Evaluation

Nielsen's 10 Usability Heuristics

1. Visibility of system status
2. Match between the system and the real world
3. User control and freedom
4. Consistency and standards
5. Error prevention
6. Recognition rather than recall
7. Flexibility and efficiency of use
8. Aesthetic and minimalist design
9. Help users recognize, diagnose, and recover from errors
10. Help and documentation



Heuristic Evaluation

Nielsen's 10 Usability Heuristics – Low Fidelity Prototype

1. Visibility of system status

Problem: The prototypes do not show feedback after applying filters

Severity: 2

2. Match between the system and the real world

Problem: Some abbreviated labels (e.g., EN) may not be clear without an explicit legend.

Severity: 3

3. User control and freedom

Problem: No issues identified

4. Consistency and standards

Problem: No issues identified

5. Error prevention

Problem: Missing feedback when filters return no data

Severity: 3

6. Recognition rather than recall

Problem: The use of abbreviations in the charts forces users to memorize codes, increasing cognitive load.

Severity: 3

7. Flexibility and efficiency of use

Problem: No issues identified

8. Aesthetic and minimalist design

Problem: No issues identified

9. Help users recognize, diagnose, and recover from errors

Problem: Insufficient information about filters and error handling

Severity: 2

10. Help and documentation

Problem: There is no form of help, tutorial, general legend, or tooltips available.

Severity: 3

Heuristic Evaluation

Nielsen's 10 Usability Heuristics – Functional Prototype

1. Visibility of system status

Problem: Filters don't scroll with the page, hindering interaction

Severity: 2

2. Match between the system and the real world

Problem: No issues identified

3. User control and freedom

Problem: No issues identified

4. Consistency and standards

Problem: No issues identified

5. Error prevention

Problem: Missing feedback when filters return no data

Severity: 3

6. Recognition rather than recall

Problem: No issues identified

7. Flexibility and efficiency of use

Problem: No issues identified

8. Aesthetic and minimalist design

Problem: No issues identified

9. Help users recognize, diagnose, and recover from errors

Problem: Insufficient information about filters and error handling

Severity: 2

10. Help and documentation

Problem: Lack of an 'About' page

Severity: 1

System Usability Scale (sus)

Low Fidelity Prototype

1. I think that I would like to use this system frequently.

Strongly
disagree

Strongly
agree

2. I found the system unnecessarily complex.



3. I thought the system was easy to use.

1 2 3 4 5

4. I think that I would need the support of a technical person to be able to use this system.

5. I found the various functions in this system were well integrated.

7 responses

6. I thought there was too much inconsistency in this system.

7. I would imagine that most people would learn to use this system very quickly.

8. I found the system very cumbersome to use.

9. I felt very confident using the system.

SUS SCORE: 87

10. I needed to learn a lot of things before I could get going with this system.

System Usability Scale (sus)

Functional Prototype

1. I think that I would like to use this system frequently.

Strongly
disagree

Strongly
agree

2. I found the system unnecessarily complex.



3. I thought the system was easy to use.

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3 responses

6. I thought there was too much inconsistency in this system.

7. I would imagine that most people would learn to use this system very quickly.

8. I found the system very cumbersome to use.

9. I felt very confident using the system.

SUS SCORE: 91

10. I needed to learn a lot of things before I could get going with this system.

Functional Prototype - DEMO

AI SALARY EXPLORER

MENU

- Home
- Salary Overview
- Roles & Experience
- Geography Insights

Salary Overview (2020–2025)

Overview of salary evolution, experience levels, categories, and company sizes.

Annual Salary Distribution

Selected Year: 2025

Category	Salary (€)
Business Int.	100k
Artificial	120k
Data Engine.	110k
Cloud Engin.	105k

Compare All Years

Historical Salary Trends

Year	Business Intelligence (€)	Artificial Intelligence (€)	Data Engineering (€)
2020	50k	70k	60k
2021	60k	80k	70k
2022	70k	90k	80k
2023	80k	100k	90k
2024	90k	110k	100k
2025	95k	120k	110k

Enable Year Filter

Company Size Impact

2025

Company Size	Impact
Small (<50)	150k
Medium (50-250)	180k
Large (>250)	200k

M L L M

Salary vs Experience Level

2025

Experience Level	Salary Range (€)
EN	100k
MI	150k

EN MI

Filters

Reset

YEAR

JOB CATEGORY

4 selected

JOB ROLE

Select roles

EXPERIENCE LEVEL

Entry-level

Mid-level

Senior

Executive / Expert

COMPANY SIZE

Small (<50)

Medium (50-250)

Large (>250)

SALARY RANGE (€)

28



7

Future Work



Future Work

- **Better navigation:** seamless links between charts and clickable headings.
- **Dedicated views:** full-size charts with explanations and insights.
- **Enhanced interactivity:** multi-highlight, range selection, richer tooltips.
- **Unified visuals:** consistent styles, animations, and UX.
- **New features:** export options, saved filters, updated data integration.
- **Improved Error Handling and Data Validation:** Validation implements mechanisms for handle invalid or missing information.

Conclusion



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THANK YOU

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