

AI for Diversity and Inclusion: raising awareness in the workplace



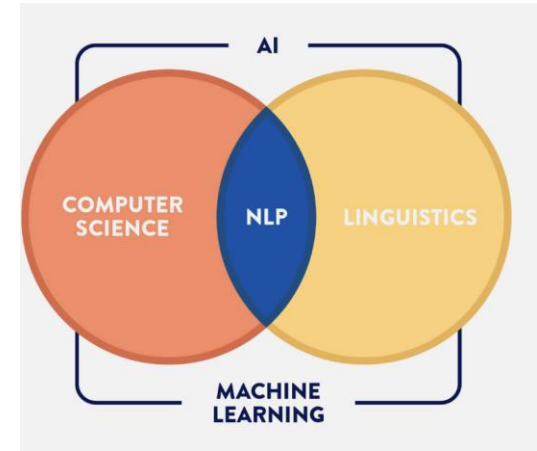
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Tecnologia

Natural Language Processing (NLP) is a subfield of linguistics, computer science, and artificial intelligence that deals with the interactions between computers and human language, particularly how to program computers to process and analyze large amounts of natural language data.

Deep Learning is part of a broader family of machine learning methods based on artificial neural networks with representation learning. The learning can be supervised, semi-supervised, or unsupervised.



TechStack

Linguaggio di programmazione: Python

Librerie di data science: NLTK, Pandas, Numpy, Matplotlib, Seaborn

Data base: Postgres/Mongo

API REST: API veloce

Librerie di deep learning: Pytorch

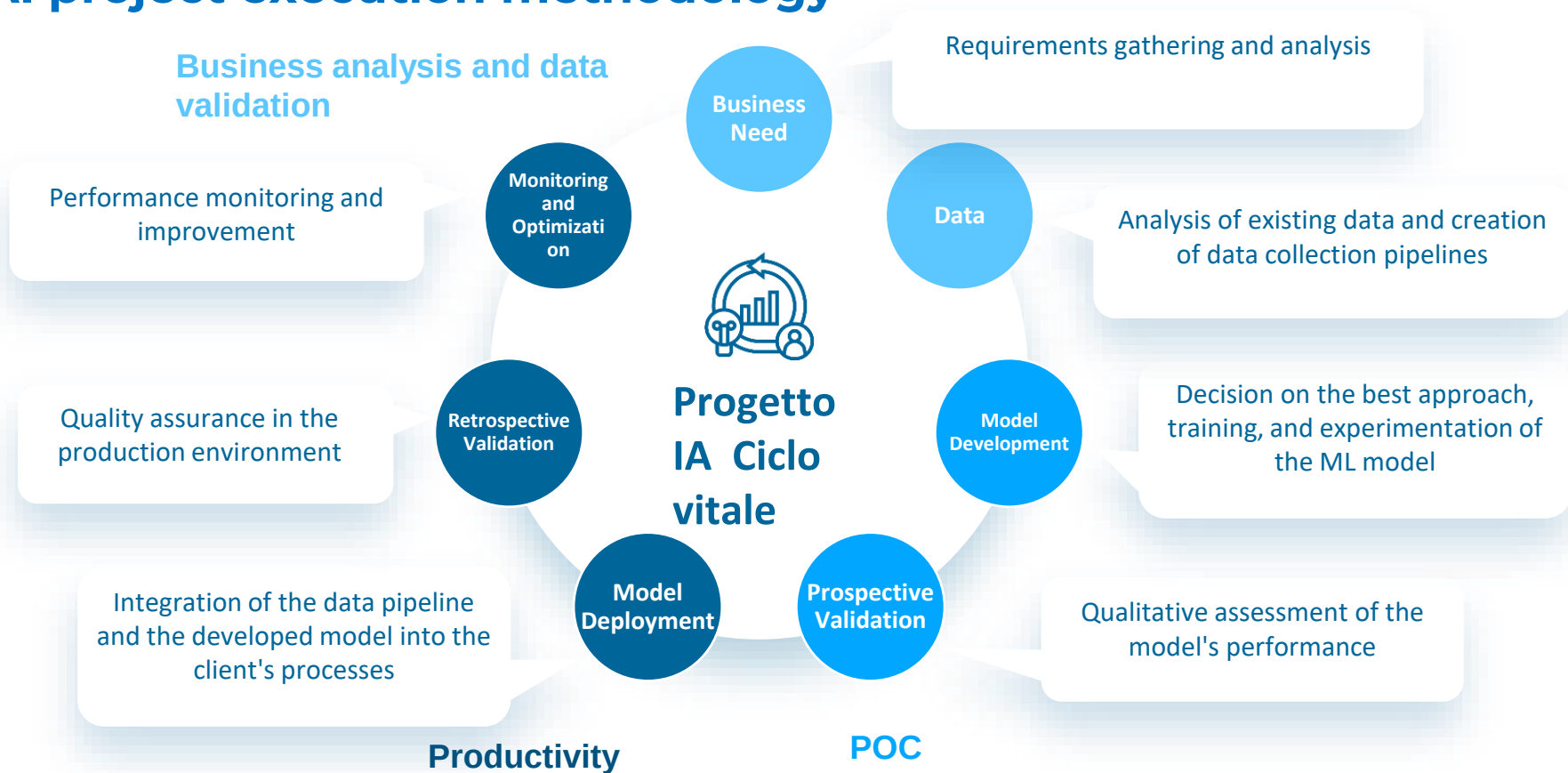
Reti pre-addestrate/Codificatori: Bert, RoBerta, Multilingue

Containerizzazione: Docker, Kubernetes

Cloud: servizi Web di Amazon



AI project execution methodology



Survey

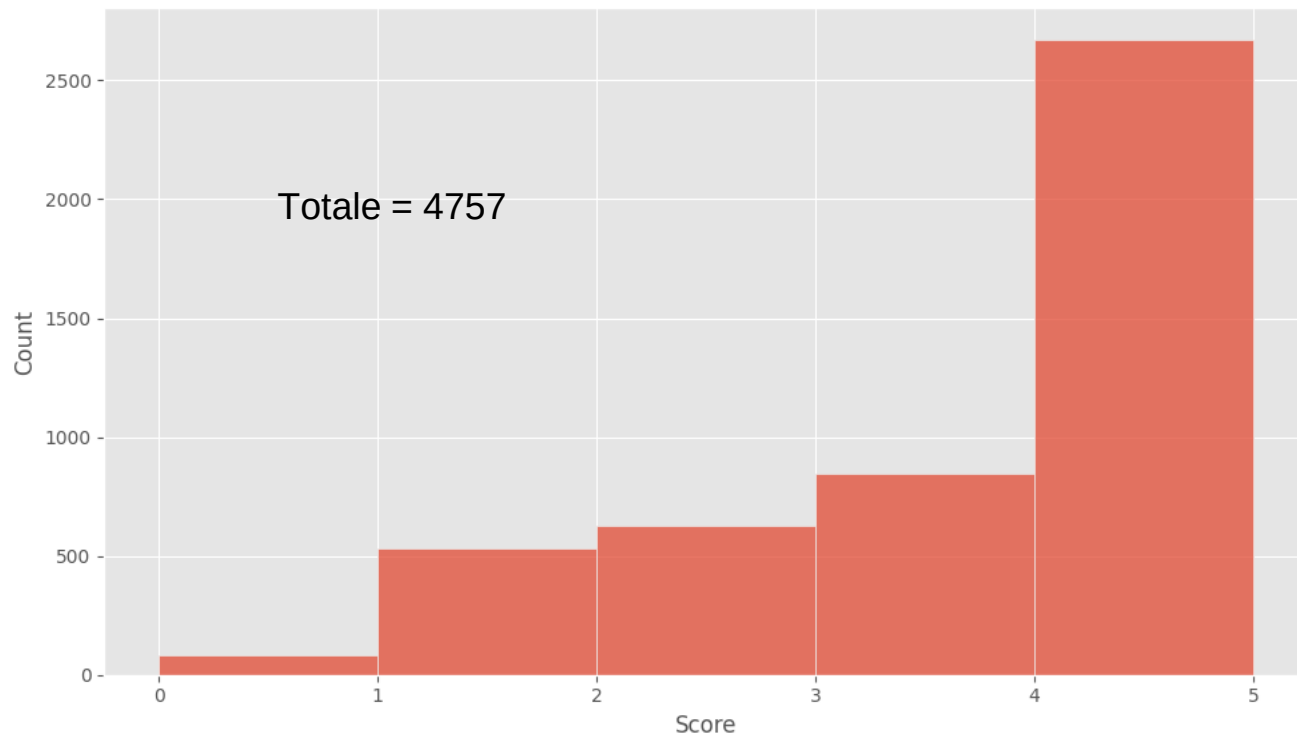
- 1) What do your colleagues and supervisors do when you express your opinion?
- 2) What differences do you notice in the reactions of colleagues and supervisors to ideas expressed by men compared to those expressed by women or non-binary individuals?
- 3) In which situations are you asked for help?
- 4) What do your colleagues and supervisors do when you ask them to change their behavior?
- 5) How do colleagues and supervisors react when you offer them your help?
- 6) How do colleagues and supervisors react when someone expresses preferences, ideas, or ways of being that are different from those commonly expressed in the company?
- 7) How is your experience used and valued?
- 8) What do your colleagues and supervisors do if someone (you) needs help?
- 9) When you make a request, how available are they, and how do they respond to it?
- 10) In situations are your opinion and/or advice requested?

Survey

- 11) How are people of different ethnicities and religions welcomed in your workplace?
- 12) If you have difficulties with procedures or work activities, how can you get help?
- 13) What do you have in common with your colleagues and supervisors?
- 14) What happens when someone at work makes a mistake?
- 15) How would you like the procedure for speaking with managers and colleagues to be?
- 16) What opportunities do you have to communicate with managers and colleagues when necessary?
- 17) What opportunities do you have for privacy and confidentiality, if needed?
- 18) How does the company facilitate the balance between work and personal life, especially if the employee has family responsibilities?
- 19) How does the company communicate decisions to employees?
- 20) What kind of decisions would you like to make in your work environment?

Data analysis

Distribution of inclusion

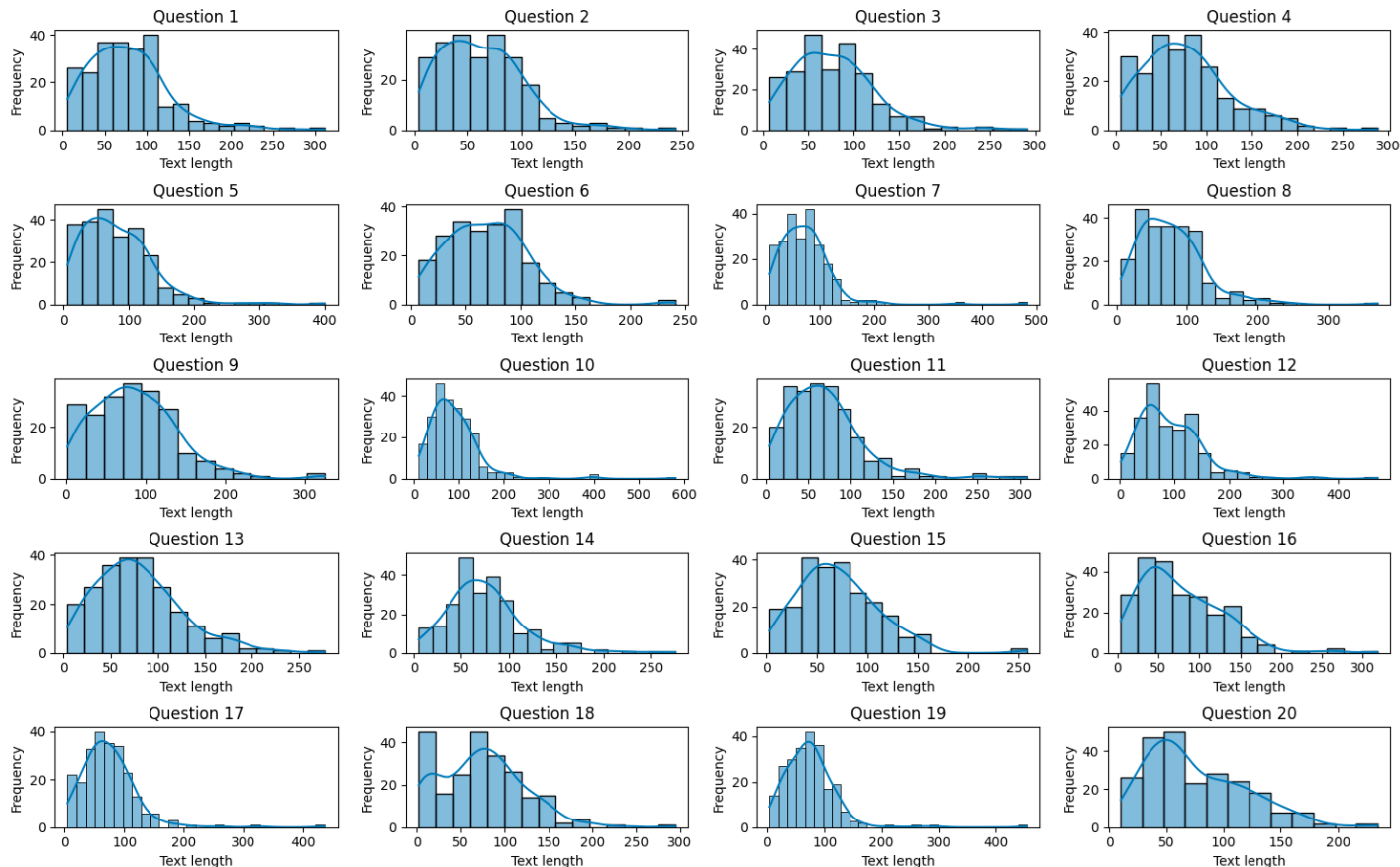


The distribution shows a pronounced rightward skew.

Not all classes are equally represented in the dataset.

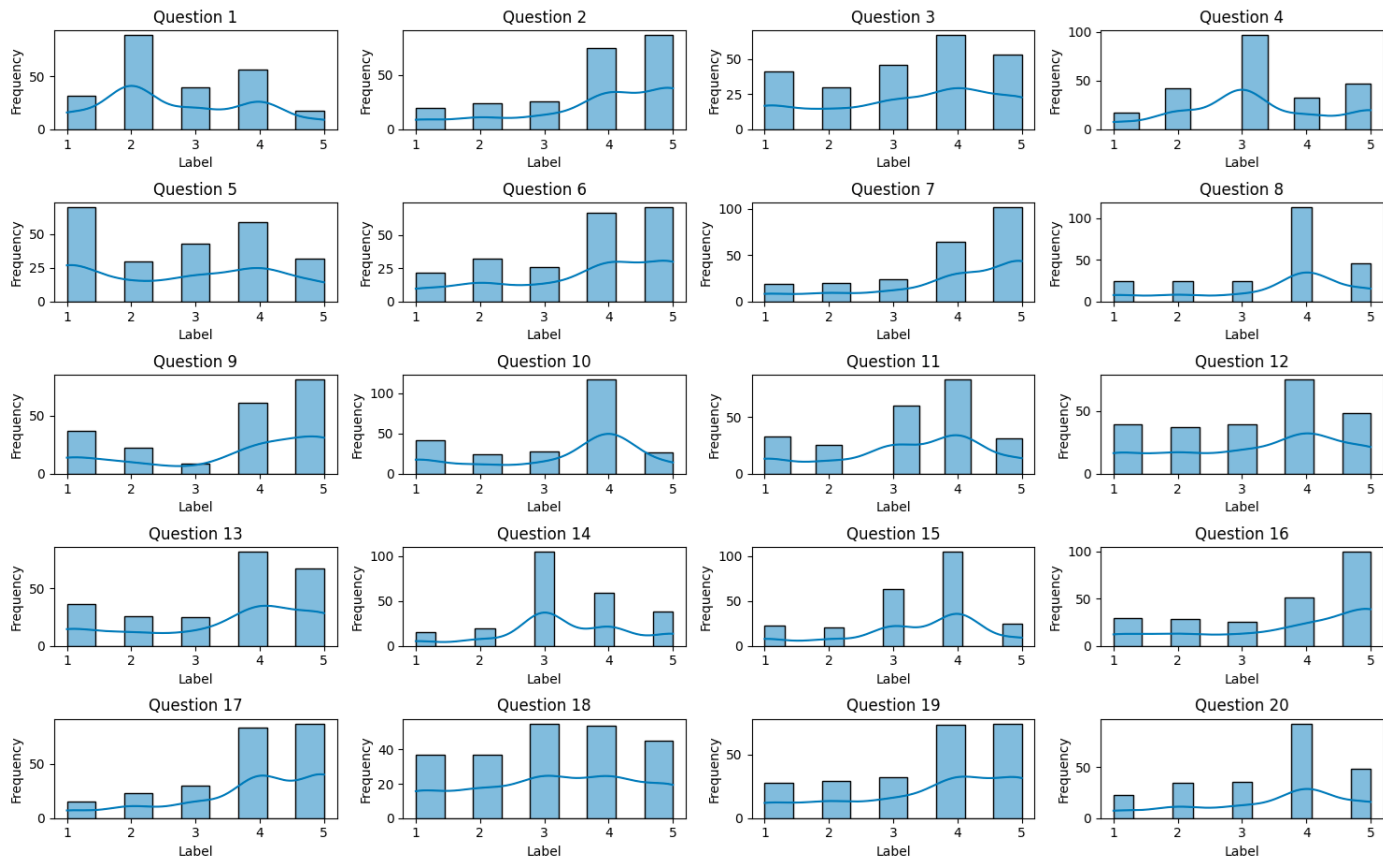
Length of the response text

Distribution of Text Length for Each Question

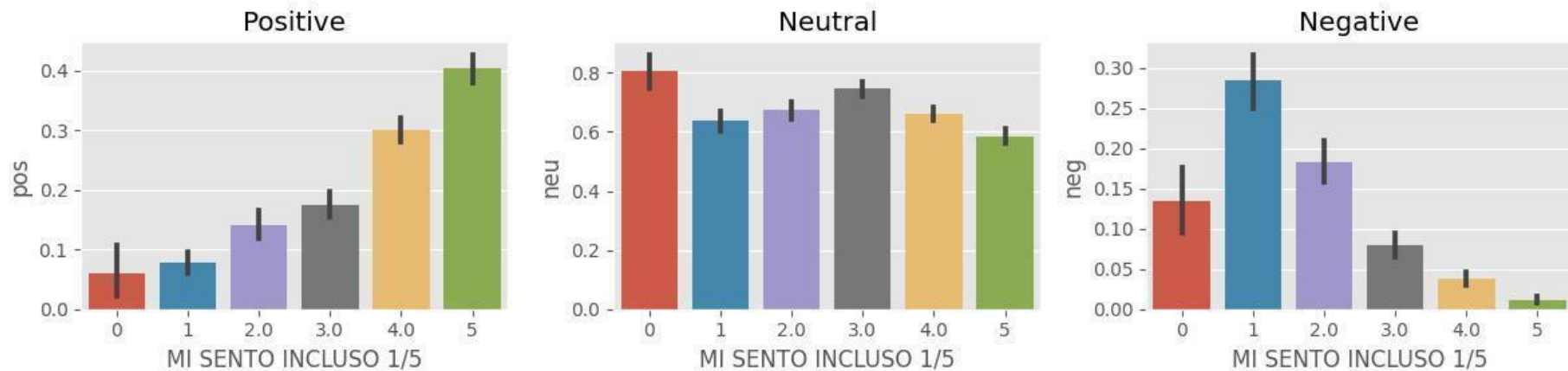


Response scores

Distribution of Label for Each Question



Naive sentiment analysis

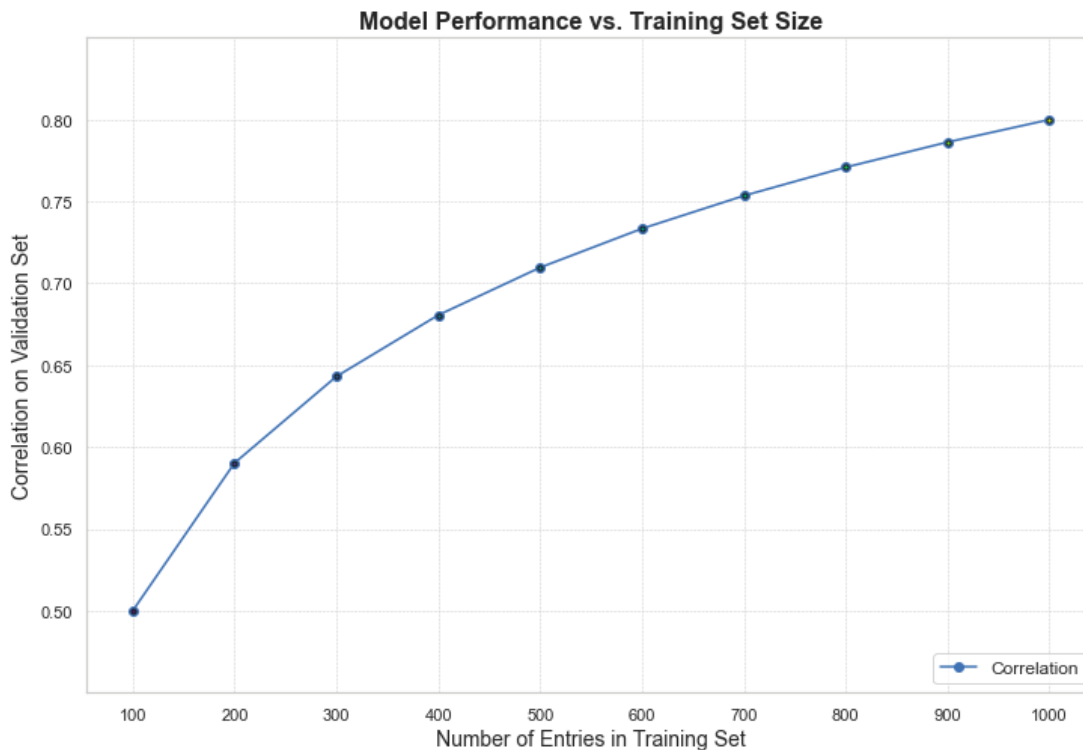


With a pre-trained BERT model, we can easily identify sentiment trends through simple sentiment analysis

Performance increases with a larger training set

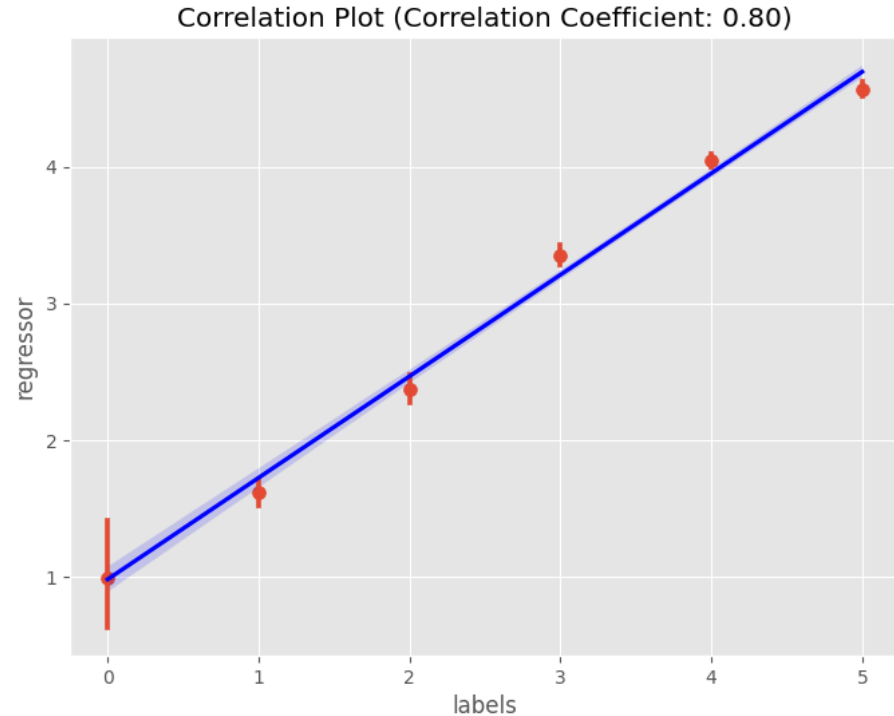
The graph illustrates how the model performance improves in correlation on a validation set.

This demonstrates the effectiveness of augmenting training data in improving predictive accuracy.



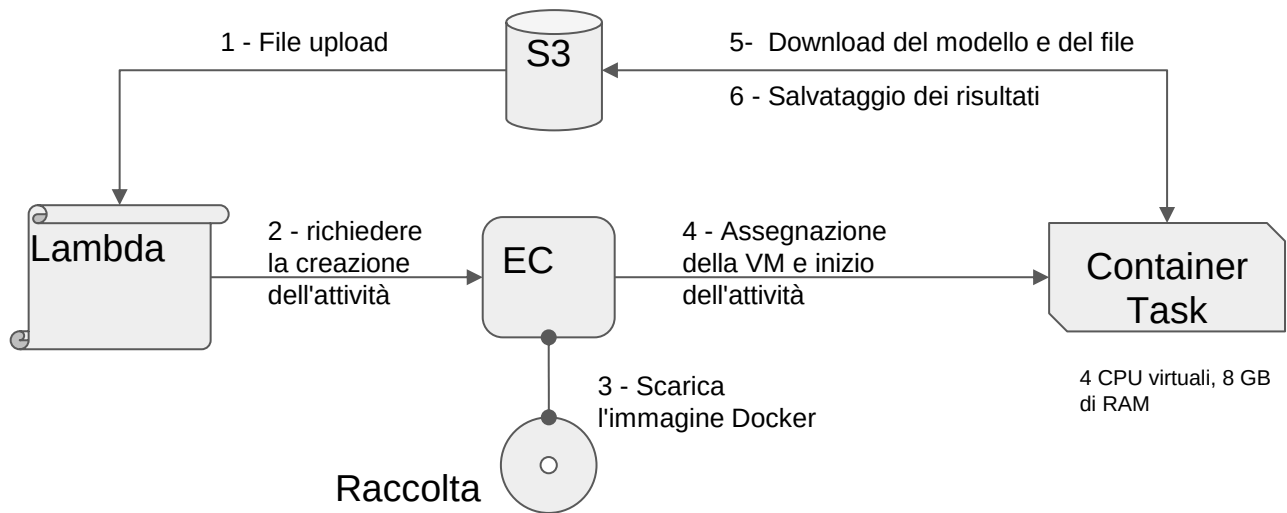
Performance evaluation

Even in the presence of a highly imbalanced dataset, the model capably captures the underlying business logic when evaluated on the test set.



Cloud architecture

- S3: model storage, input files, and results.
- ECR: docker image registry.
- ECS: execution of analysis tasks, support for multiple analyses.
- Lambda: request/trigger management, ECS task initiation.





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