



L I S B O N

Predicting medical specialties

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FINAL PROJECT

Data Analytics Full-Time Bootcamp, June 2020

- **Machine Learning in Healthcare**
- **Vision**
- **Workflow**
- **Model Implementation**
- **Main Challenges**
- **Future Perspectives**

SUMMARY

Machine Learning for Healthcare

Machine learning in healthcare is one such area which is seeing gradual acceptance in the healthcare industry.



Machine Learning for Healthcare

Top three applications

Diagnosis and Diseases

diseases and ailments
considered hard-to-
diagnose

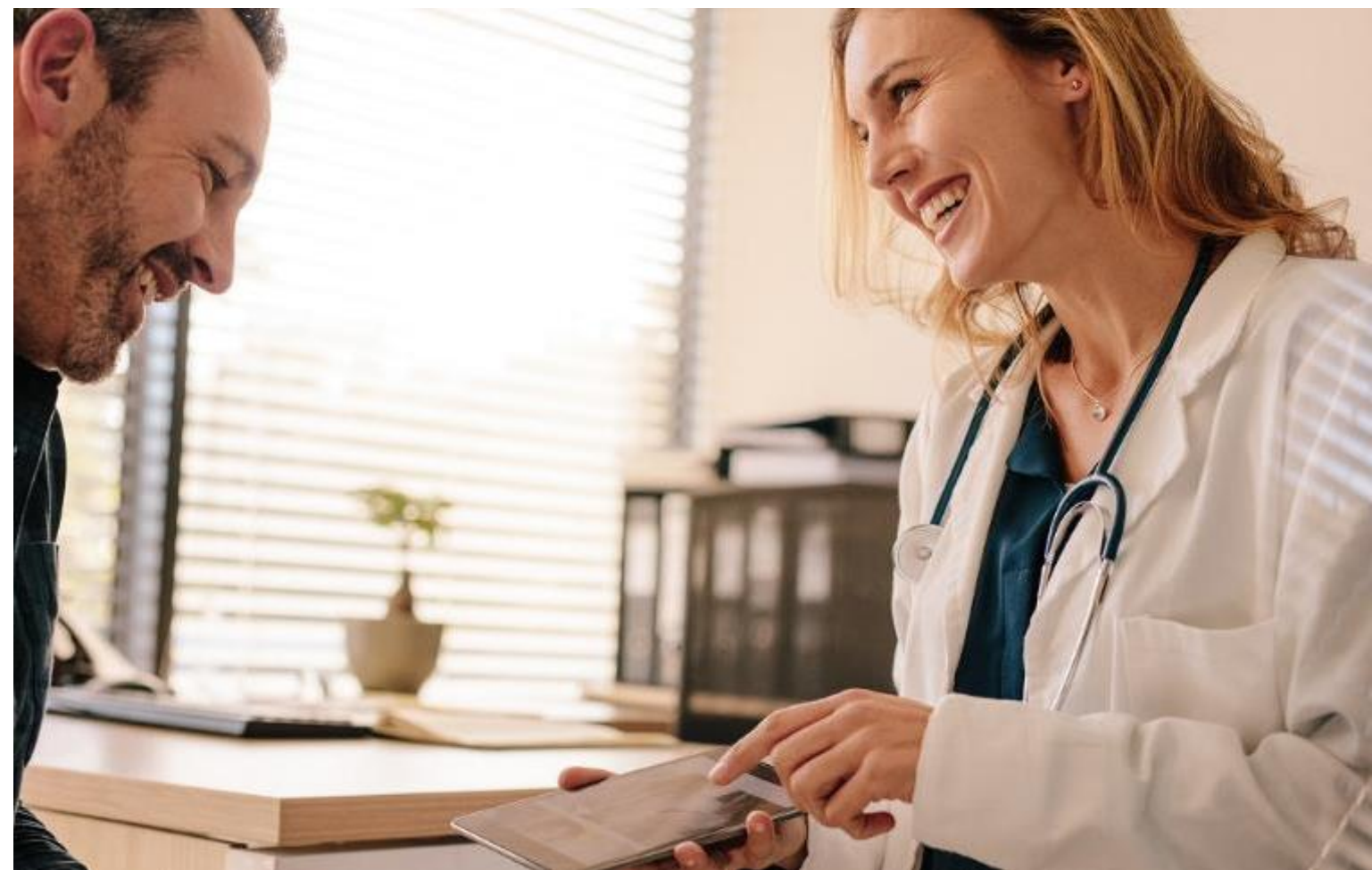
Drug Discovery and Manufacturing

early-stage drug
discovery process

Medical Imaging Diagnosis

image diagnostic tools
for image analysis

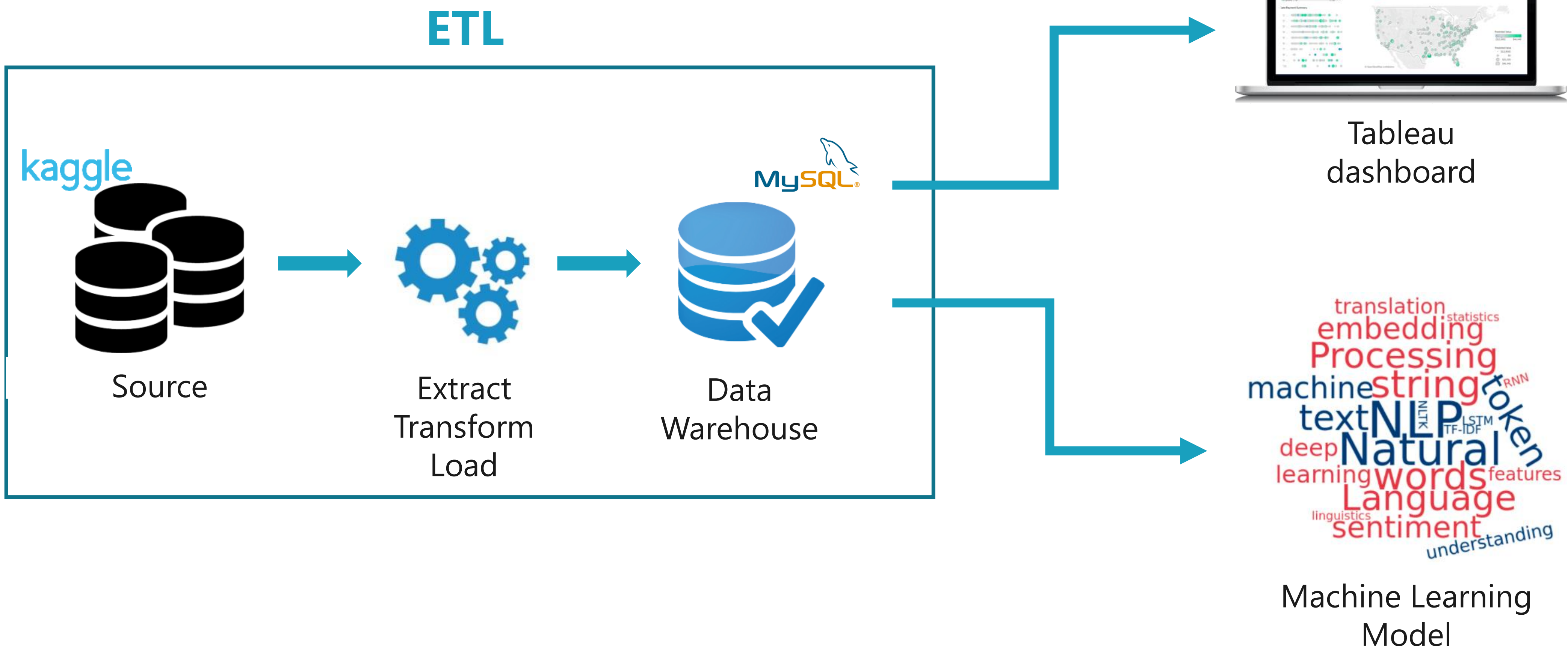
<https://www.flatworldsolutions.com/healthcare/articles>



VISION

Aid healthcare workers identify the right medical specialty based on the patient diagnosis transcriptions.





40 Medical Specialties

4966 Medical Transcriptions



Data cleaning

- Class Imbalance
- Null rows
- Necessary transformations (blank spaces)



Cleaned dataset insights-> https://public.tableau.com/profile/joan.concha#!/vizhome/final_project_dashboard/Firstdashboard

Model Implementation

TF-IDF

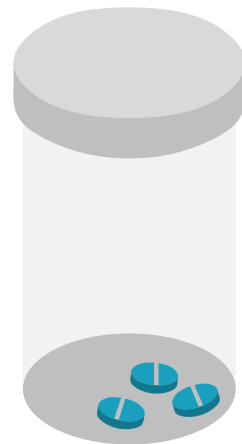
- N-grams (1, 3)
- Max features: 2000
- Stop words

Splitting data



80%

Training set



20%

Testing set

Model Selection



- Supervised ML model
- Multinomial Naive Bayes / Random Forest
- Grid search parameter optimization

Best accuracy: 45%

Predictions



- Flask App
- Bootstrap

Tableau Dashboard

- **Choosing dataset.**
- **Too many medical specialties / poor information in some medical specialties.**
- **Low accuracy.**
- **Productivity.**

MAIN CHALLENGES

Future Perspectives

More Data

Glintt software used in many hospitals (Portugal).

NLP vs Neural Network

Improving the accuracy and the predictive power of the final model.


Predicting Keywords

Identify diseases, diagnosis, pharmaceutical drugs, and more.

Improve the Flask app

Import lots of transcriptions at a time into a database.





“The best way
to predict the future
is to create it”

Abraham Lincoln

**ANY
QUESTIONS?**

