WHAT MAKES NEWS SUCCESSFUL?

CHARACTERISING AND PREDICTING USER ENGAGEMENT OF NEWS POSTINGS

Engagement

DIGITAL NEWS ORGANISATIONS → ENGAGEMENT ← SOCIAL MEDIA PLATFORMS

Predicting Engagement

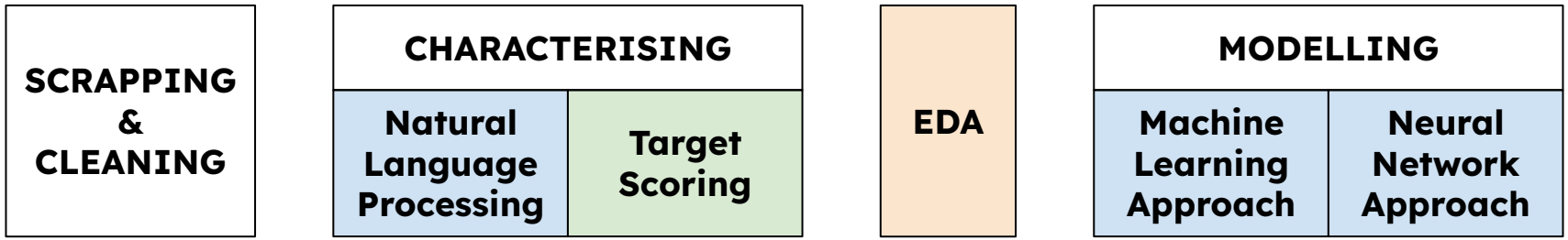
DIGITAL NEWS ORGANISATIONS

PREDICTING ENGAGEMENT

SOCIAL MEDIA PLATFORMS:

- find trends earlier.
- focus on what matters
- content tailoring
- news clustering...

Workflow


SCRAPPING & CLEANING
CHARACTERISING
Natural Language Processing
Target Scoring
EDA
MODELLING
Machine Learning Approach
Neural Network Approach

SCRAPPING & CLEANING

125k news postings

Data:

Title

Body

Views

Likes

Comments

CHARACTERISING

- Natural Language Processing
- Target Scoring

EDA

MODELLING

- Machine Learning Approach
- Neural Network Approach

Scrapping & Cleaning

125k news postings

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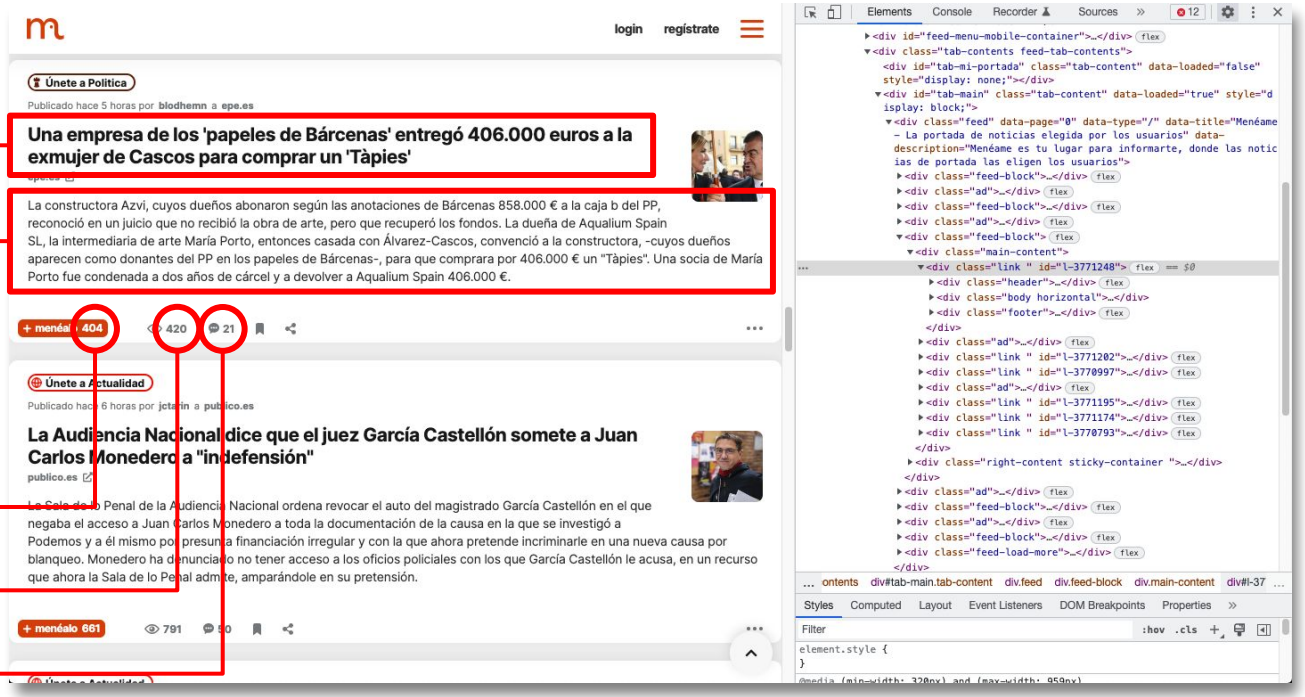
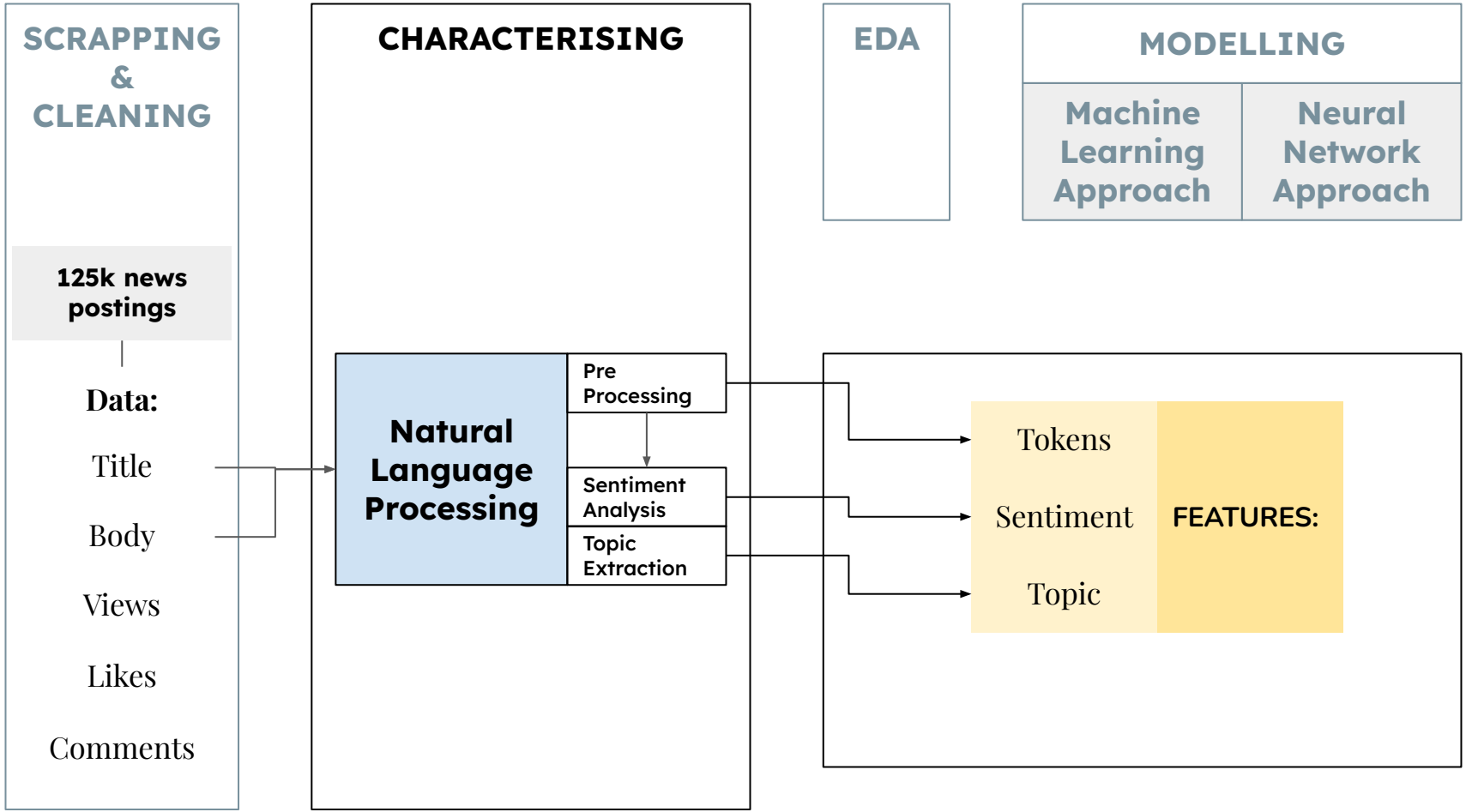


- BeautifulSoup


SCRAPPING & CLEANING
125k news postings
Data:
Title
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Views
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Comments
CHARACTERISING
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Neural Network Approach
Tokens
Sentiment
Topic
FEATURES:

Characterising - Topic + Sentiment

IN: RAW TEXT

PREPROCESSING

TOKEN / LEMMA

N-GRAMS

RELLEVANT

- sciPy
- NLTK

OUT: LIST

TOKENS

- transformers pipeline
- bert-base-multilingual-uncased-sentiment

PRE-TRAINED MODEL

SENTIMENT SCORE

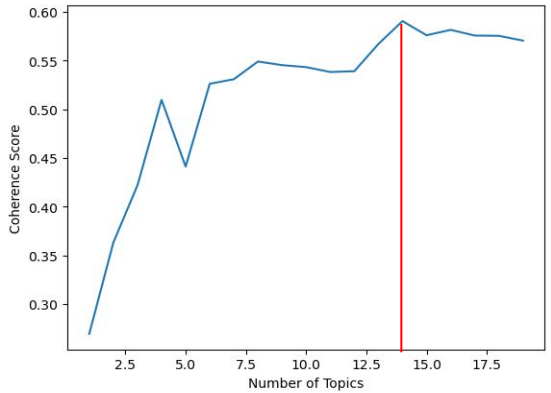
- doc2bow

CREATE DICTIONARY

CREATE CORPUS

LATENT DIRICHLET ALLOCATION

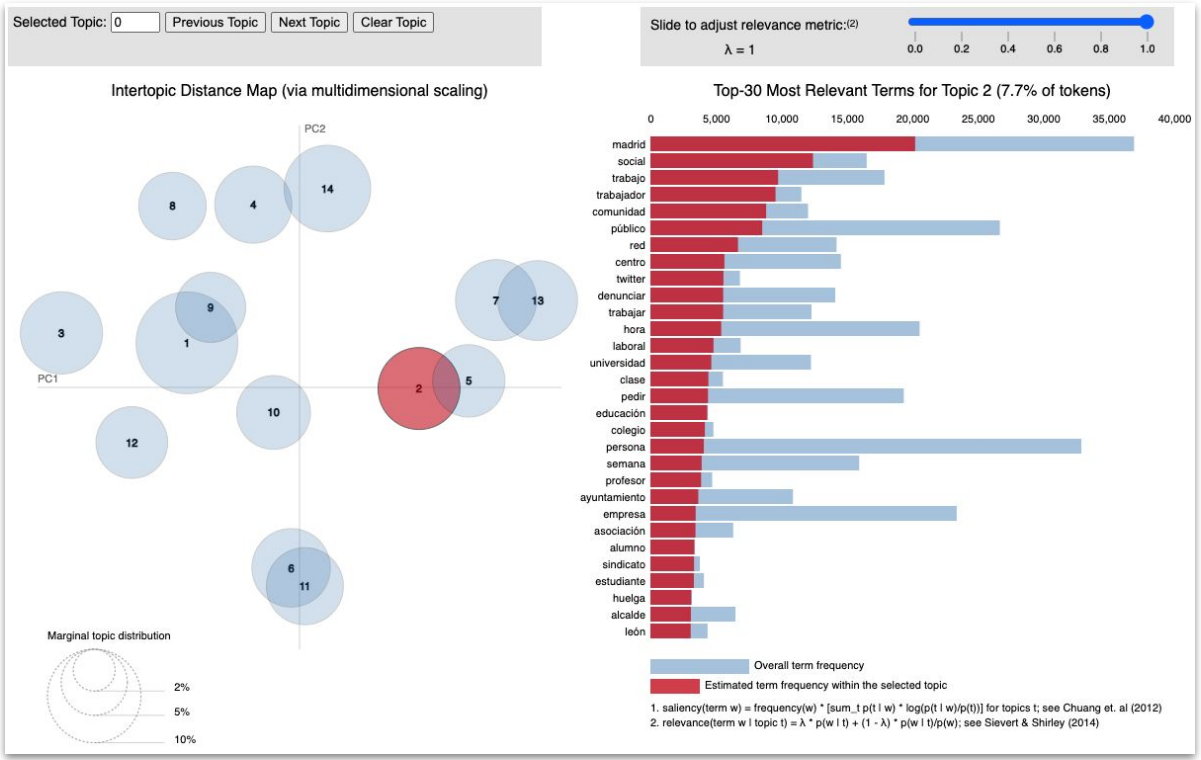
14 TOPICS



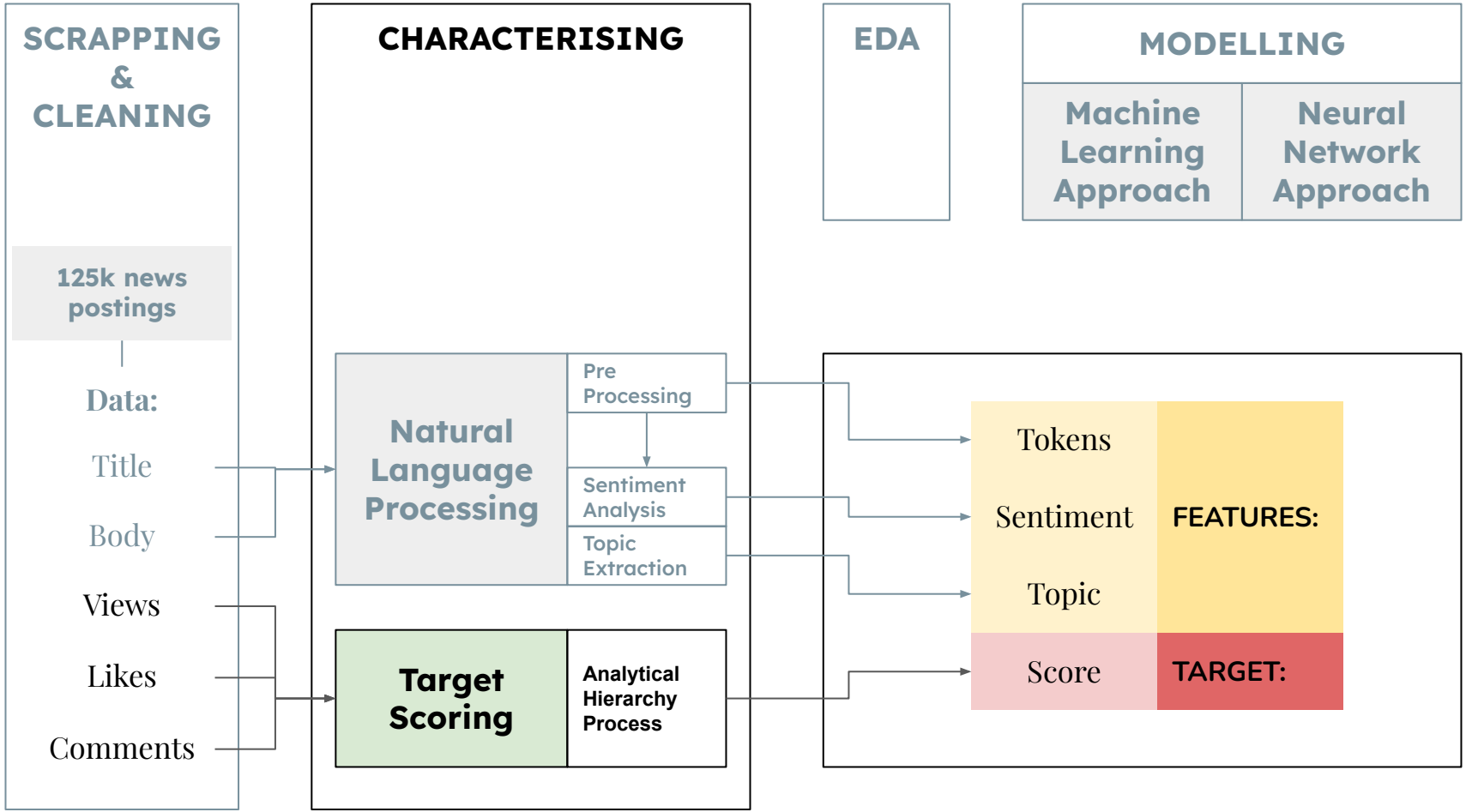
C_V COHERENCE TEST

- gensim

Characterising - Topic + Sentiment



- pyLDAvis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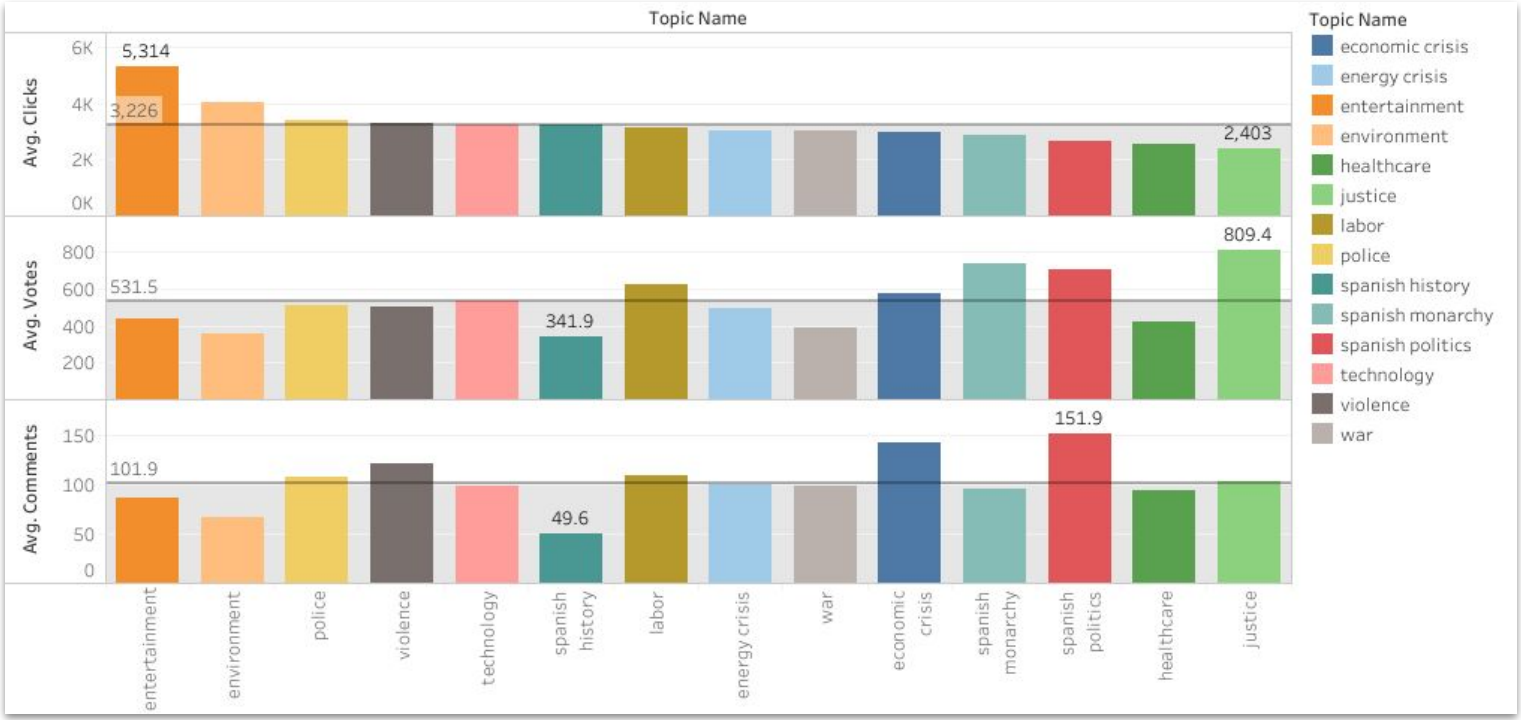
FEATURES:
Score
TARGET:

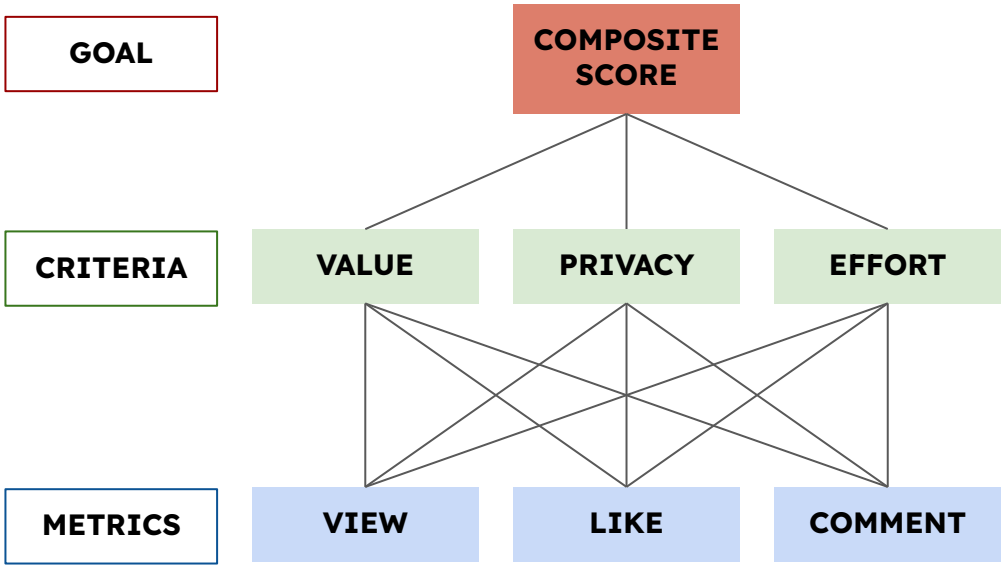
Score targeting: Evaluating scales



Score targeting: A. Hierarchy Process

METRICS:			CRITERIA:	WEIGHTS:
level 4	POSTING	Spreading content by sharing		
level 3	COMMENT	Expressing opinion and feelings by commenting	VALUE	W_1
level 2	LIKE	Exposing use preferences by liking	PRIVACY	W_2
level 1	VIEW	Private engagement by viewing	EFFORT	W_3

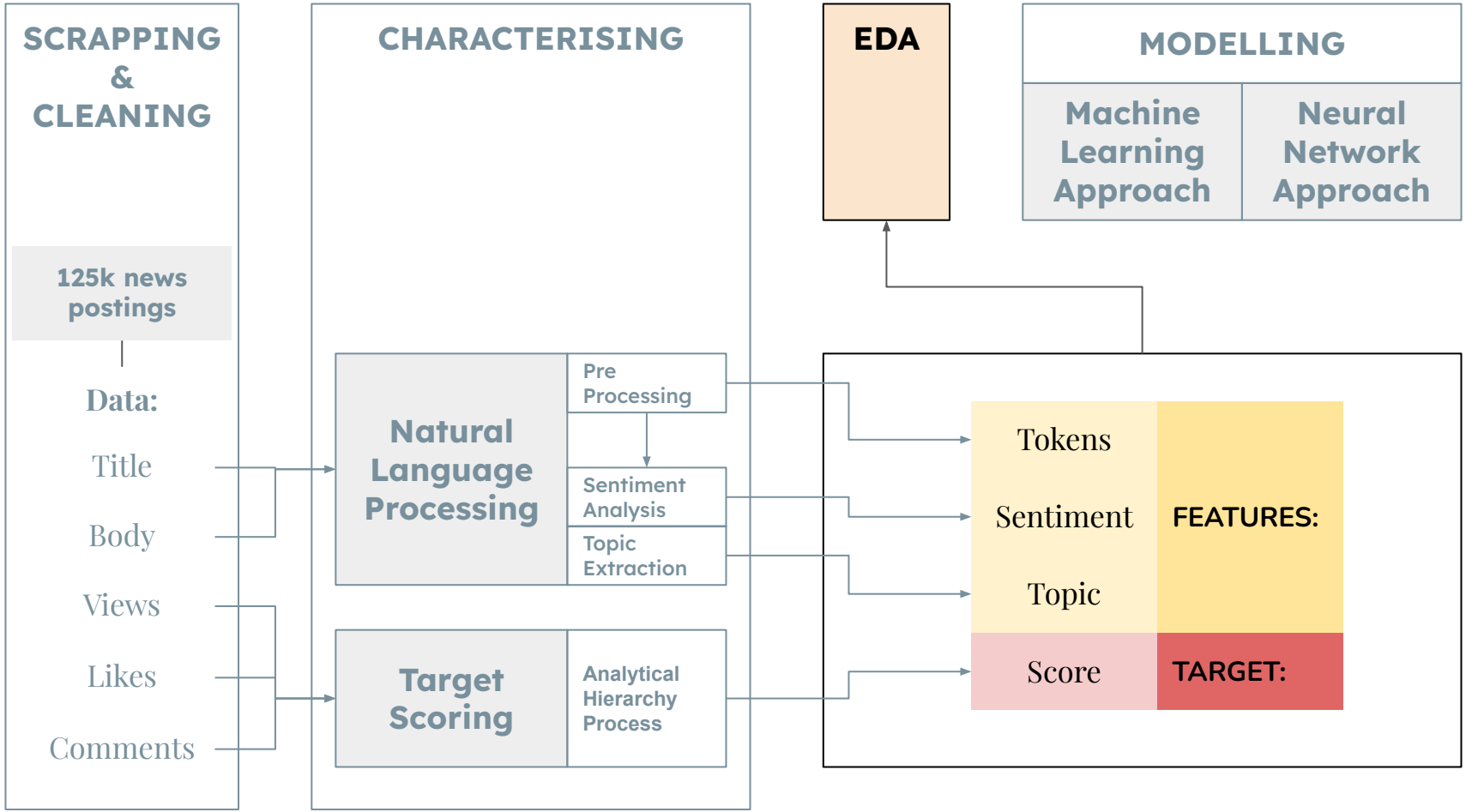
Score targeting: A. Hierarchy Process



W1 = 0.2125 W2 = 0.2932 W3 = 0.4943

PAIR-WISE COMPARISON

$$A = (w_i/w_j)_{n\times n} = \begin{pmatrix} w_1/w_1 & w_1/w_2 & \dots & w_1/w_n \\ w_2/w_1 & w_2/w_2 & \dots & w_2/w_n \\ \vdots & \vdots & \ddots & \vdots \\ w_n/w_1 & w_n/w_2 & \dots & w_n/w_n \end{pmatrix}$$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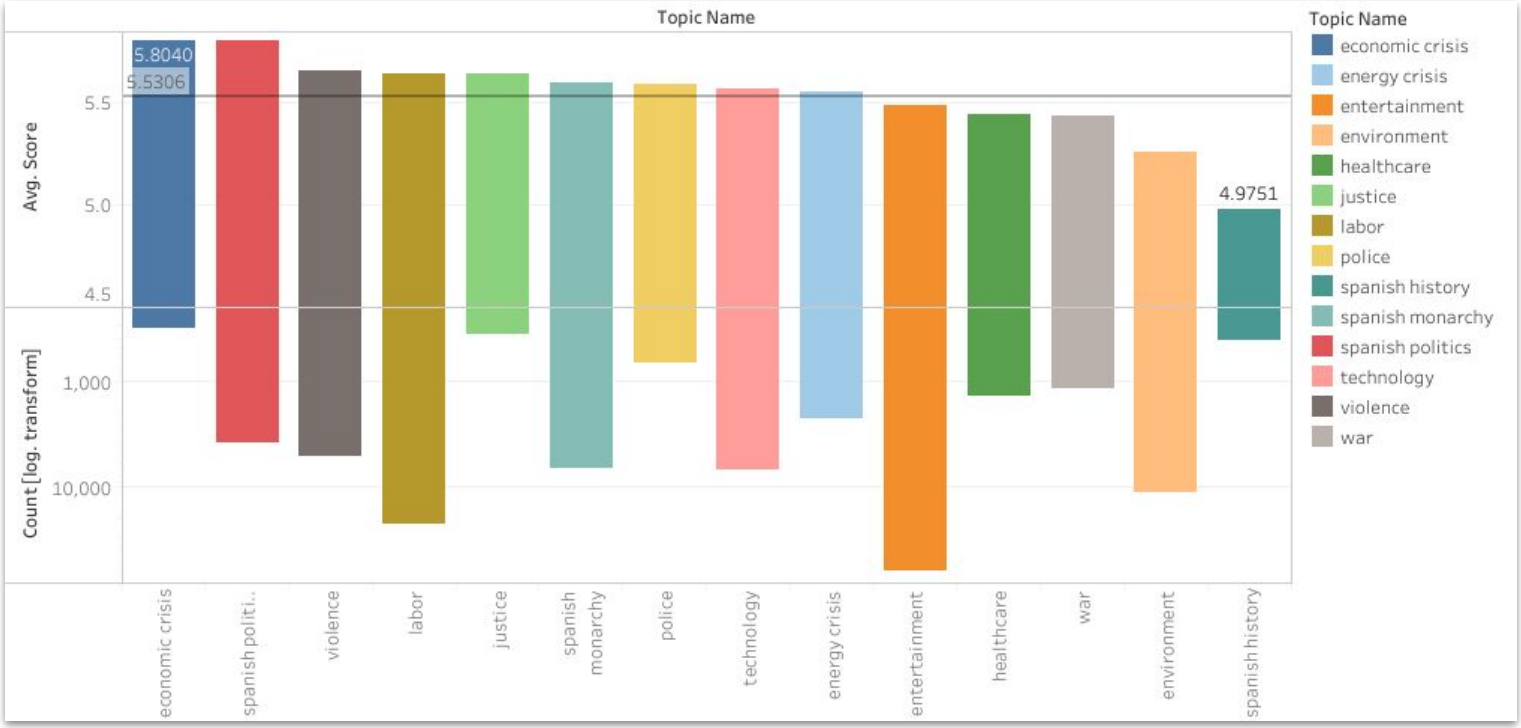
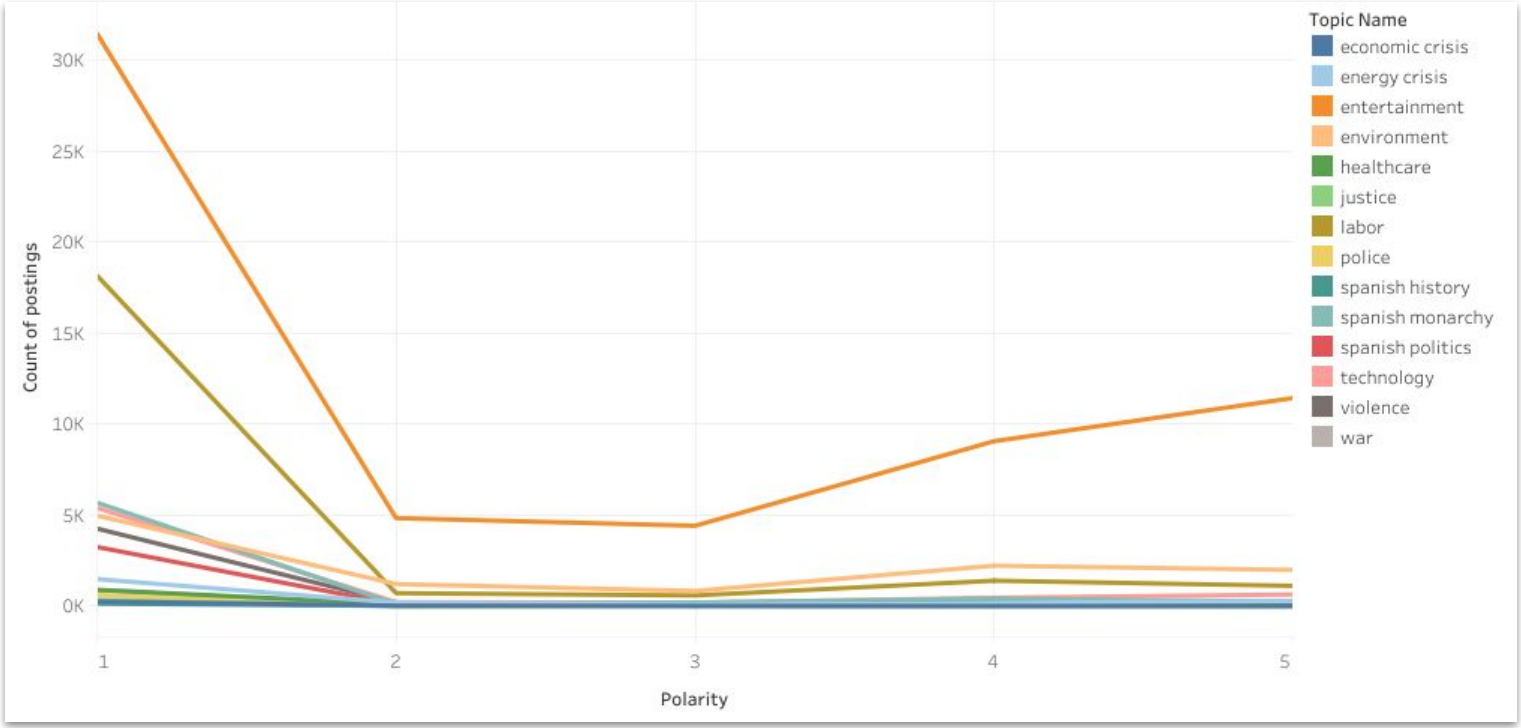
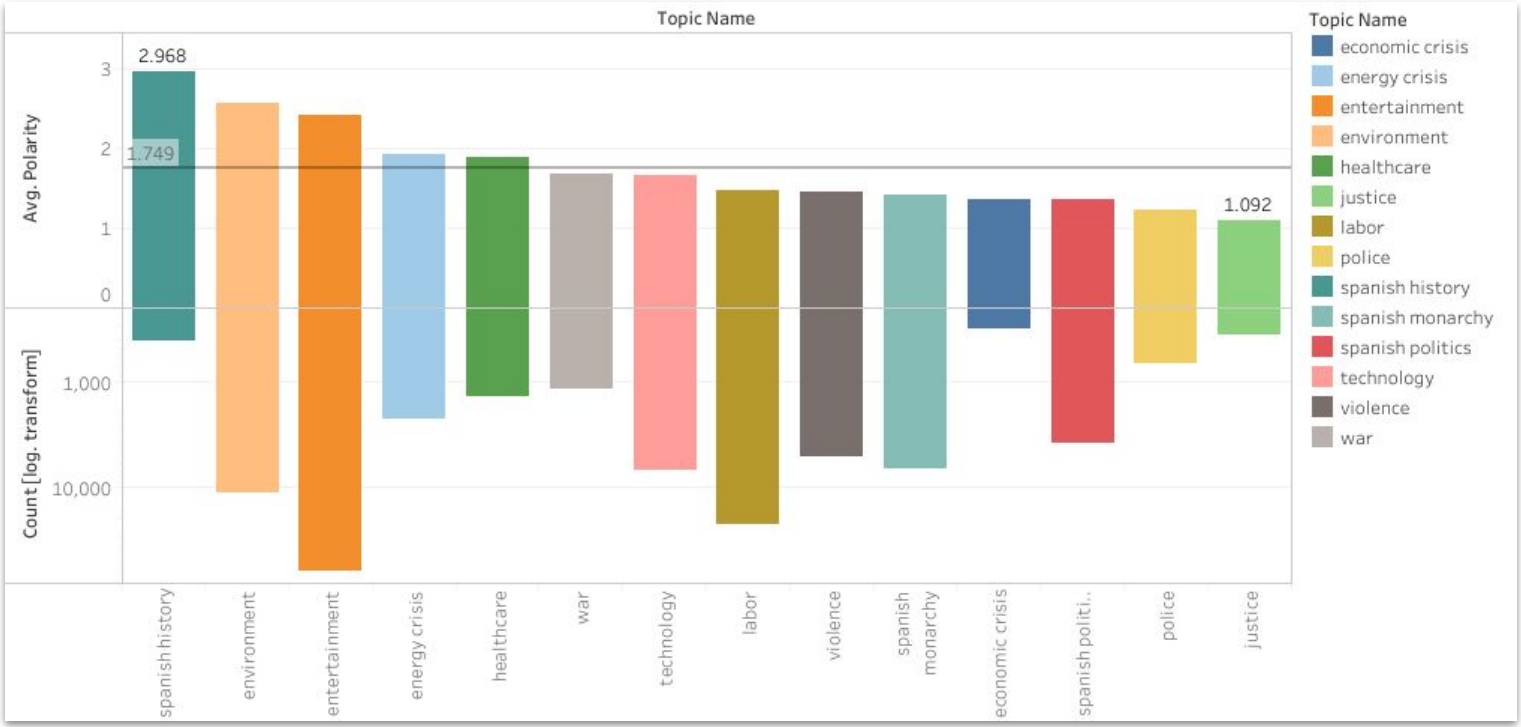
EDA: Score by Topic



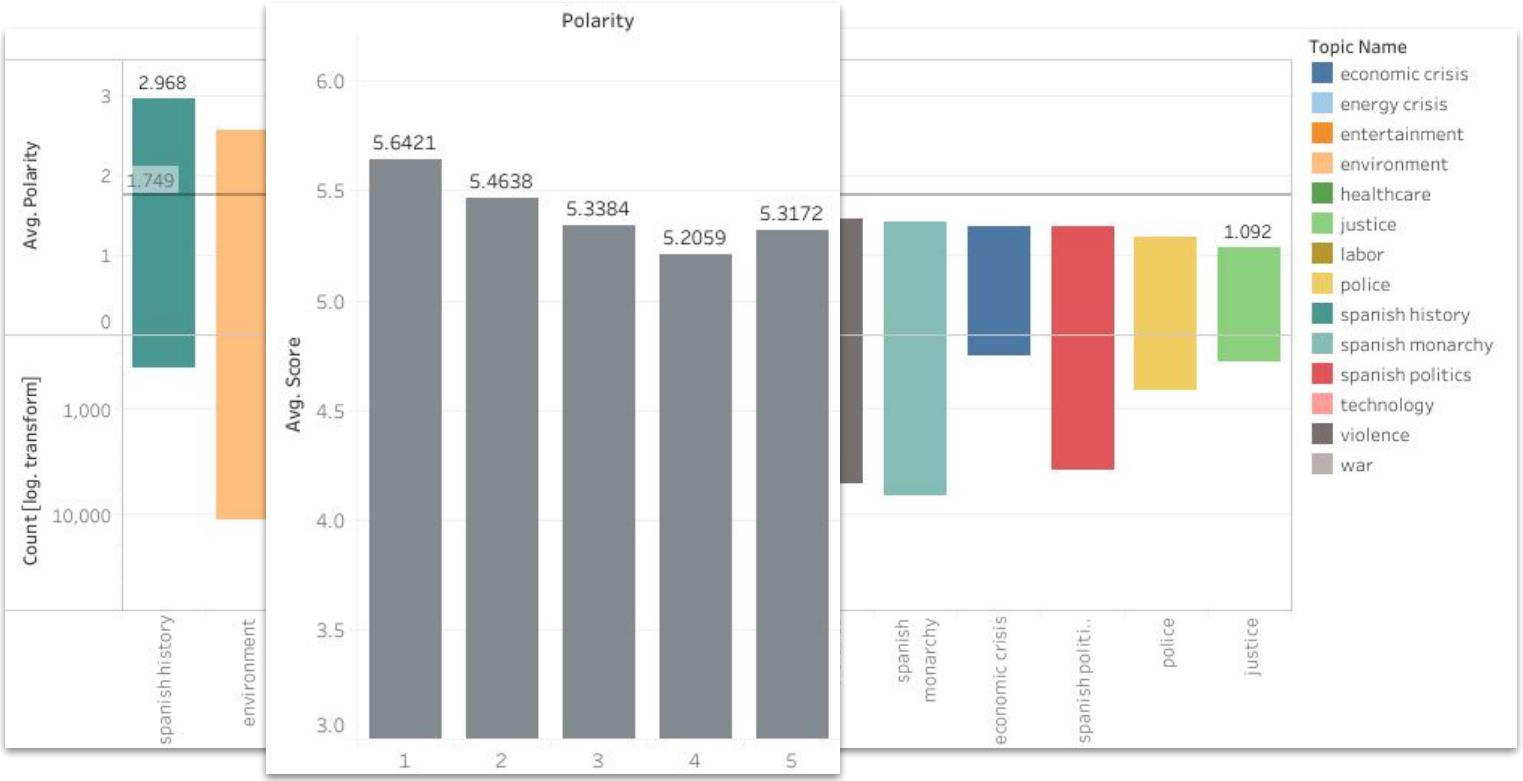
EDA: Score by Sentiment

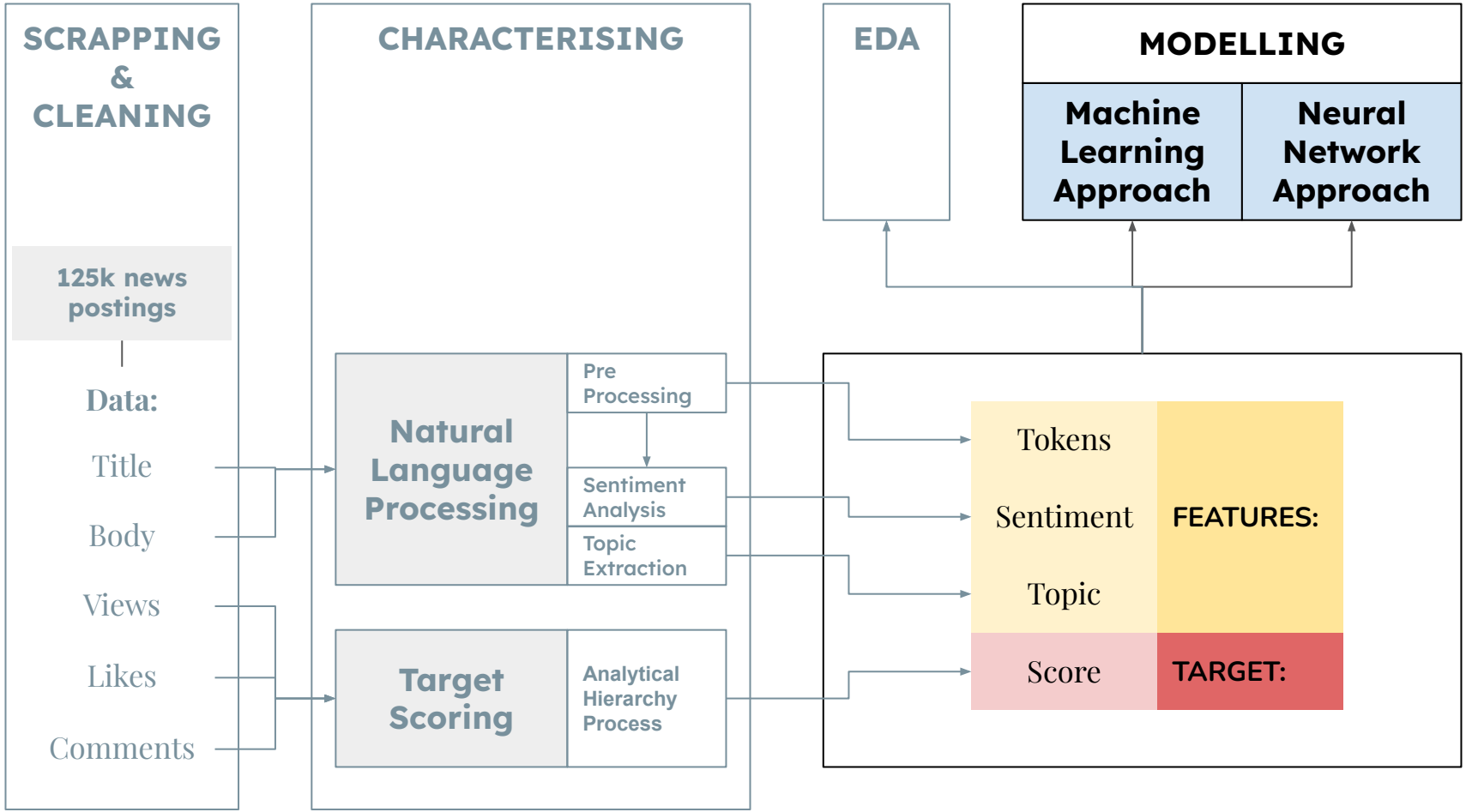


EDA: Topic by Sentiment



EDA: Score by Sentiment

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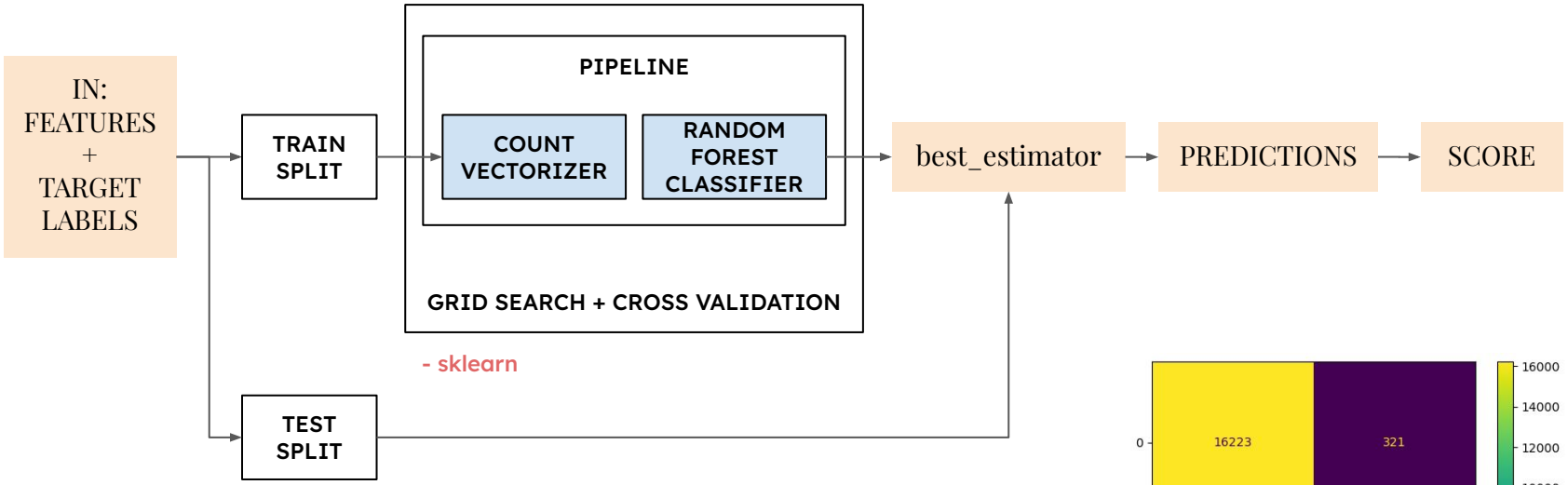
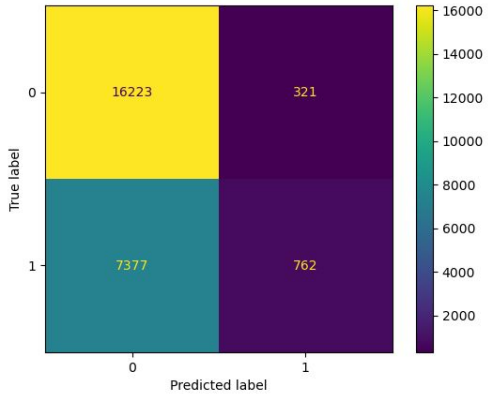
TARGET:

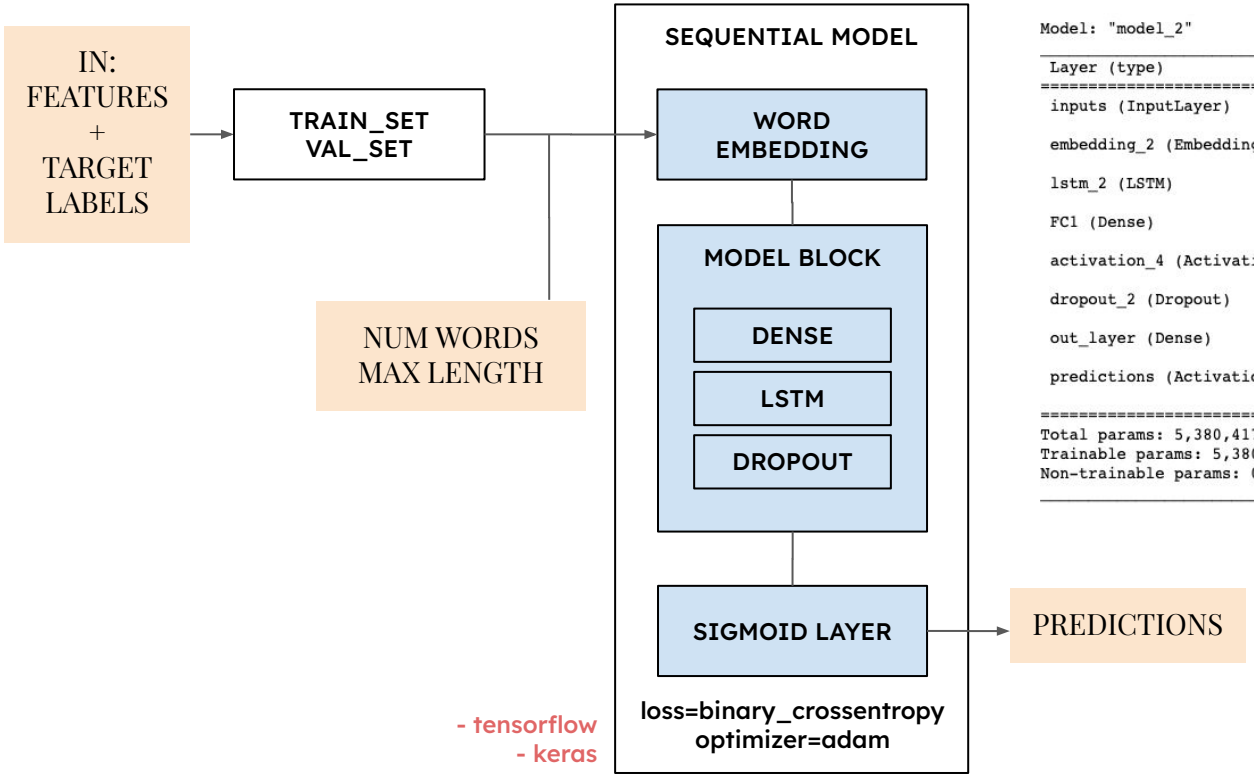
Model: ML Approach



RESULTS:
ACCURACY = 0.69
F1_LABEL(0) = 0.81
F1_LABEL(1) = 0.17



Model: NN Approach

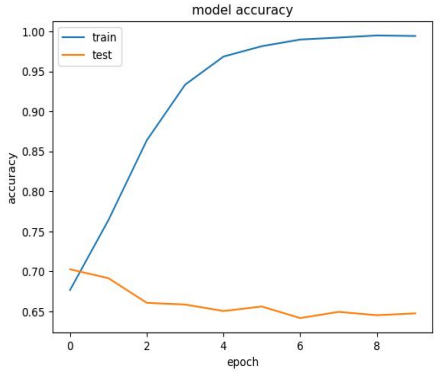


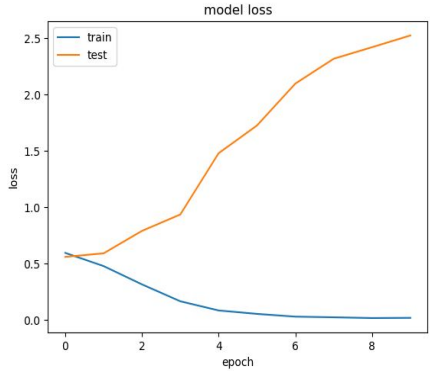
Model: "model_2"

Layer (type)	Output Shape	Param #
inputs (InputLayer)	[(None, 200)]	0
embedding_2 (Embedding)	(None, 200, 50)	5000000
lstm_2 (LSTM)	(None, 256)	314368
FC1 (Dense)	(None, 256)	65792
activation_4 (Activation)	(None, 256)	0
dropout_2 (Dropout)	(None, 256)	0
out_layer (Dense)	(None, 1)	257
predictions (Activation)	(None, 1)	0

Total params: 5,380,417
Trainable params: 5,380,417
Non-trainable params: 0

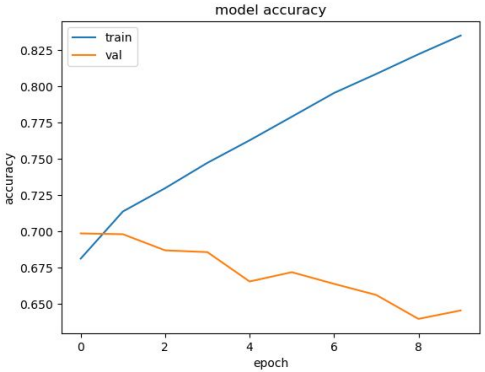
Results

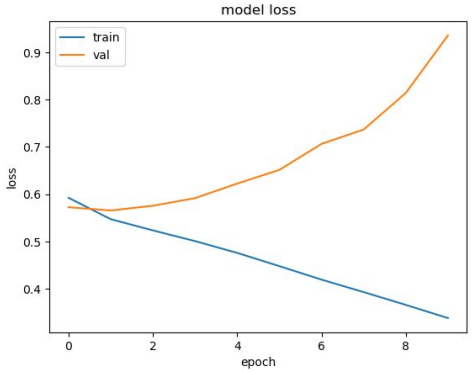




-NUM WORDS = 100000
-MAX LENGTH = 200

Test set
Loss: 0.693
Accuracy: 0.547





-NUM WORDS = 5000
-MAX LENGTH = 100

Test set
Loss: 0.911
Accuracy: 0.651

Further development...

- REVIEW THE ENGAGEMENT SCORE
- RUN REGRESSIONS INSTEAD OF CLASSIFICATIONS
- INCLUDE CREATED FEATURES
- GET BETTER SCORES...