CASE STUDY

SENSITIVE CONTENT TAGGING

SEPTEMBER 2019

POSTMEDIA

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USE CASE SUMMARY

Klangoo was contracted by Postmedia to develop a solution for filtering Ads based on type of content displayed. The solution included heavy usage of Klangoo's patented NLP technology and was successfully delivered within two months.

Automatically tagging content based on specific topics related to advertisers has been a rising issue the past few years. This can mainly be attributed to the changes in social and political rhetoric that became acceptable in the media recently with the shift to online/mobile/social.

PROBLEM

Postmedia AdOps team wanted the ability to filter the content whereby certain Ads would show. The filtering is based on certain topics being discussed or even mentioned and that are of Sensitive nature (hereby referred to as "Sensitive Content Types" or "SCT").

These topics are:

- Abortion
- Adult_Sexual
- Alcohol
- Death_By_Transportation
- Hate_Speech_Bullying
- Illegal_Drugs
- Online_Privacy
- Provoking_Murder_injury
- And several others

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SOLUTION:

Klangoo, using its proprietary NLP technology, described similar solutions developed for other companies for different purposes.
Postmedia contracted Klangoo to complete the task.

The plan included three phases:

Phase 1:

- Preparing definitions for each SCT + confirmation from Postmedia.
- Preparing a "Training" Set (TS1) to allow Klangoo's Data Science Team to understand the expectations +validation from Postmedia.

Phase 2:

- Part 1: Develop the solution and test the automated results against a newly prepared Test Set (TS2).
- Part 2: Prepare another Test Set (TS3), test it against the automated algorithm + validation from Postmedia.

Phase 3: integration in API and providing access to Postmedia.

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DIFFICULTIES FACED:

THE KLANGOO DATA SCIENCE TEAM WAS AWARE OF THE MANY LAYERS OF DIFFICULTIES THIS PROJECT PRESENTS INCLUDING:

- More than one SCT could be chosen for the same content.
- Many content items might fall under none of the SCTs.
- The SCTs are of different semantic levels (generic vs. very specific).
- Topics might be marginally mentioned and yet shift the decision on a particular SCT.
- Decision on around 20% of the cases is subjective to the tester/validator.
- Close correlation exists between some of the SCTs rendering the decision more difficult and many others.

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PROJECT OUTCOME

Klangoo's team developed the solution within a timeframe of 2 months including two testing/user acceptance phases, integration with current API, and custom prepared corpuses. The testing mechanism depended on the below accuracy metrics.

ALGORITHMS TESTING MECHANISM AND KPIS:

Accuracy metrics used:

- **Precision:** is the percentage of correct results retrieved from all retrieved instances.
- **Recall**: is the percentage of correct results retrieved over the total amount of correct instances that exist.
- **F1-score:** is a measure of a test's accuracy. It considers both the precision and the recall.

$$F_1 = \left(\frac{2}{\mathrm{recall}^{-1} + \mathrm{precision}^{-1}} \right) = 2 \cdot \frac{\mathrm{precision} \cdot \mathrm{recall}}{\mathrm{precision} + \mathrm{recall}}$$

- **Loose Accuracy** = percentage of cases where at least one correct SCT was retrieved by Magnet
- **Klangoo GPA** = similar to a university GPA (Grade Point Average) the Klangoo GPA is a reference score used to determine adequate accuracy in four important measures in similar exercises and the final grade is over 4.0. The four measures are: Loose Accuracy, Precision, Recall, F1-score.

GPA = (Loose Accuracy + Precision + Recall + F1-score)

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RESULTS:

Klangoo's solution scored 3.4/4 (85%) without any data/client specific additions to the algorithms. This accuracy was within the agreed upon limits for this project.

Precision achieved was > 80%, Recall > 85%, F1-Score > 80%, and Loose Accuracy >90%.

> *"The project was a success from both a scientific/technical point of view and as a business decision."*

The accuracy is expected to improve with time based on the continuous support of Klangoo's Data Science team and the client/data specific additions that will be added.

CONCLUSION:

The project was a success from both a scientific/technical point of view and as a business decision. Delivering the project within the set timeframe and within the accuracy limits was impressive. While, from a business perspective, the costs involved would have been at least 4 times more if the company wanted to hire internal resources with similar expertise to develop it (not considering the risk factor).