

alter way

# OpenReq evaluation

Helpdesk workflow automation

Hamburg, September 2019

# Alter Way : who are we ?

- French company, based in Paris, Lille and Lyon
- Web platform agency & Cloud services provider
- Mostly providing services based on Open Source
- 180 collabs with dedicated R&D team :
  - ⇒ ***Damien Gilles***, R&D Engineer, AI specialist
  - ⇒ ***Jonathan Rivalan***, R&D Manager

# NLP automation : Alter Way use case

- One of our team is dedicated at providing support for our customers
- An issue tracker is used to interface customers and our colleagues
- R&D objective to offer automation so support can scale up to 24/7
- Issues triage (qualification) is the first level of automation we implemented, enabling AI services to fill default and custom fields (tracker type, severity and priority levels, time estimation...) as a first, legacy, version.

# OpenReq : proposal and objectives

- Benchmarking OpenReq algorithms with our legacy ones
- Increase our features set by adding finer clustering
- Overall, improve our implementation efficiency, possibly with a better understanding at the research field
- 5 use cases were submitted :
  - French adaptation
  - Issues weight
  - Missing features
  - Domain type
  - Issues comparison and recommendation

# OpenReq : technologies used

use cases / technos	analytics-backend	ri-analytics-rationale-miner	tug-dependency-detection
#2 Issues weight		✓	
#3 Missing features		✓	
#4 Domain type	✓		
#5 Neighbor issues			✓

- All OpenReq components were evaluated prior to implementation
- 3 components were integrated within our features
- Analytics-backend received a performance patch (500x faster)

# DEMO

- Free Licences Sources :
  - <https://github.com/alterway/ORAW1-french-adaptation>
  - <https://github.com/alterway/ORAW2-issue-weight>
  - <https://github.com/alterway/ORAW3-missing-features>
  - <https://github.com/alterway/ORAW4-domain-type>
  - <https://github.com/alterway/ORAW5-issue-comparison>
  - <https://github.com/alterway/ORAW-evaluation>
- Docker images :
  - alterwayrnd/oraw-ri-warm
  - alterwayrnd/oraw-redmine

# #1 French adaptation

**Description** ⇒ Creation of French language oriented model, generic OpenNLP format, and domain specific datasets

**Methodology** ⇒ Iteration between our dataset and OpenREQ components to evaluate efficiency, along with anonymisation

## **Results** ⇒

2 French domain oriented datasets (1K and 15K)  
1 OpenNLP French model

## **Research** ⇒

Nothing aside OpenNLP build effort with Nicolas Hernandez, french scientist

## #2 Issues weight

**Description** ⇒ Creation of 2 classification models to prioritize the issues based on their type and urgency

**Methodology** ⇒ Comparison of OpenREQ and Alter Way supervised classification methods

### **Results** ⇒

A binary classifier to distinguish demands and anomalies

A ternary classifier to predict the urgency

An heuristic to apply a weight



### **Research** ⇒

Comparison on preprocessing and machine learning methods



## #3 Missing features

**Description** ⇒ Creation of a workflow to give back the control to the human operator

**Methodology** ⇒ Comparison of the results (error rates) returned by different algorithm

**Results** ⇒  
A workflow reducing the error rate and asking for human help when needed

with the workflow: 92% of good classification, 3% of error and 5% of the tickets require human classification

**Research** ⇒  
Research ways to reduce the error rate by implementing decision trees based on multiple classifiers results

## #4 domain type

**Description** ⇒ Creation of an unsupervised classification model to sort the issues by domains

**Methodology** ⇒ Comparison of different unsupervised classification methods

**Results** ⇒  
An unsupervised classification model

92% of precision on the tracker prediction on the 15k dataset with both algorithms

**Research** ⇒  
Comparison of the efficiency of different preprocessing methods to feed k-means models

# #5 Issue comparison

**Description** ⇒ Creation of a regroupement method to identify related issues

**Methodology** ⇒ Comparison of different distances and dimensionality reduction methods

**Results** ⇒  
A process returning related issues

Algorithm	recall
aw-closest-text	93%
tug-dependency-detection	90%

**Research** ⇒  
Comparison of different distance mesures

# Conclusion

## Many interesting results or new R&D topics :

- ⇒ **Missing features class** ; if missing descriptive elements, a +1 class is added within the classifier segments to enable human feedback
- ⇒ **Anonymisation** ; automated automation to assert big data sets (gdpr orientation)
- ⇒ **Openings on intentional programming** ; from intention (specifications) to code is one of our next targeted challenge ; within our use case, explore automated issues resolution

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