

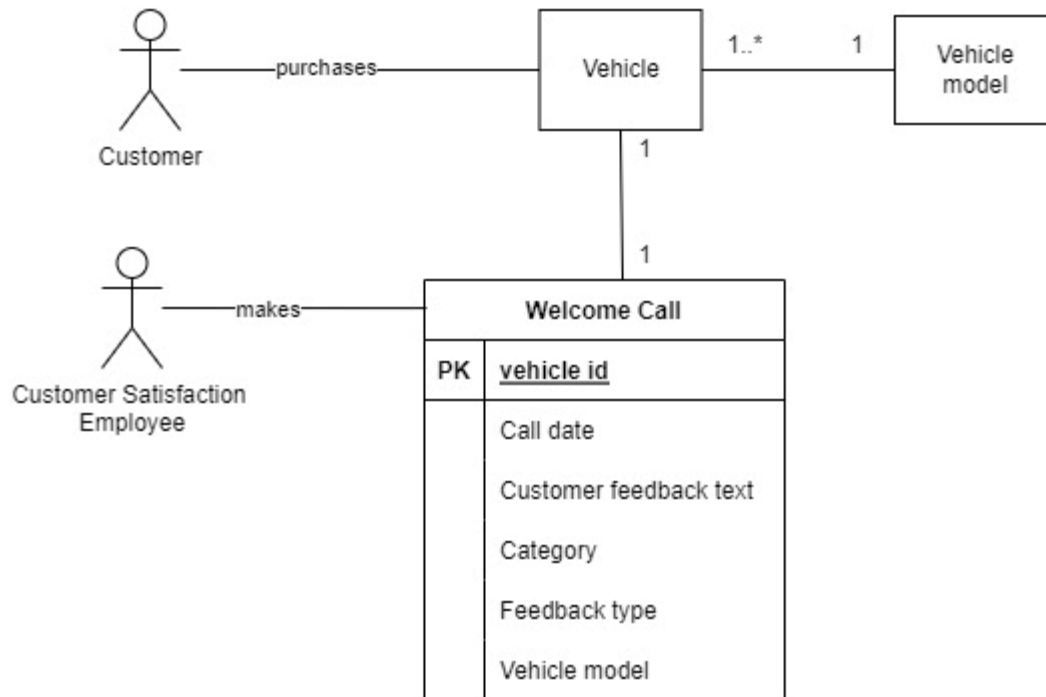
Early Detection of Issues in New Car Models using Natural Language Processing on Customer Call Data

Dilara Ademoglu, 02.05.2022, Master Thesis Kickoff Presentation

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- Introduction
 - Problem Statement
 - Motivation
- Background
 - Topic Modelling
 - Text Summarization
- Research Questions
- Methodology
- Timeline

WELCOME CALL PROCESS



Customer Feedback Text:

1. **Customer** stated he wants a lighter trunk because its too heavy.
2. **Customer** stated that he feels that the Navigation is hard to read at times. **Customer** stated that he wishes that it had more contrasting colors, because he feels the roads and travel lines are too similar in color and he has missed turns at times because of it.
3. **Customer** stated he wanted a UV Sunshade to protect his interior. **Writer** advised they can be found on the bmw shop site.

Problem Statement – BMW PQM Process

Problem Quality Management (PQM)

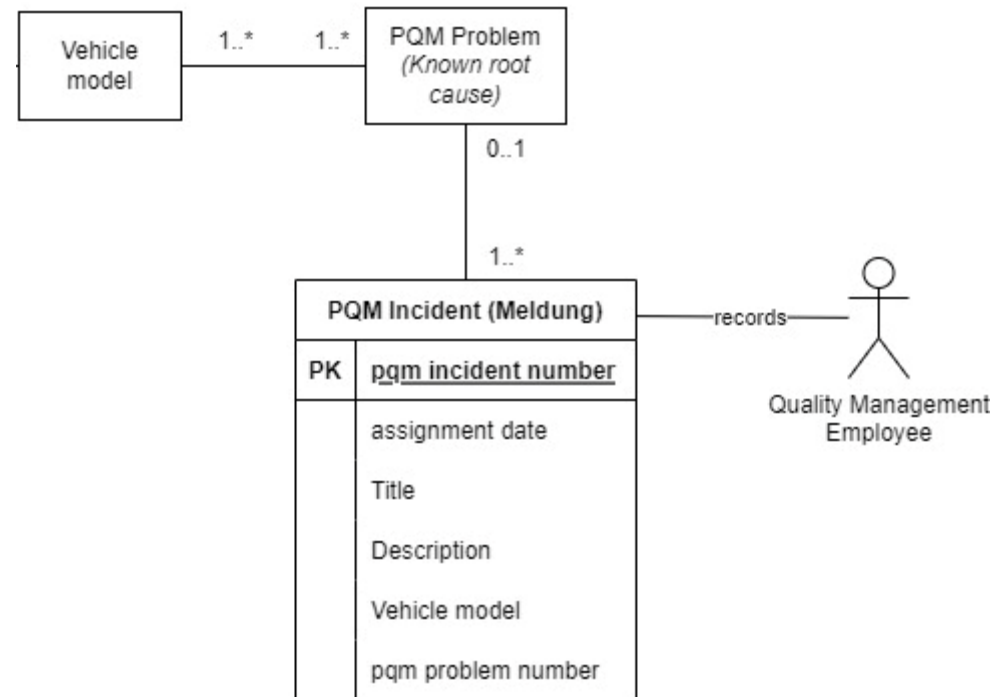
Problem:

Front Axle, Steering Wheel misalignment and vehicle pulling.

Incident:

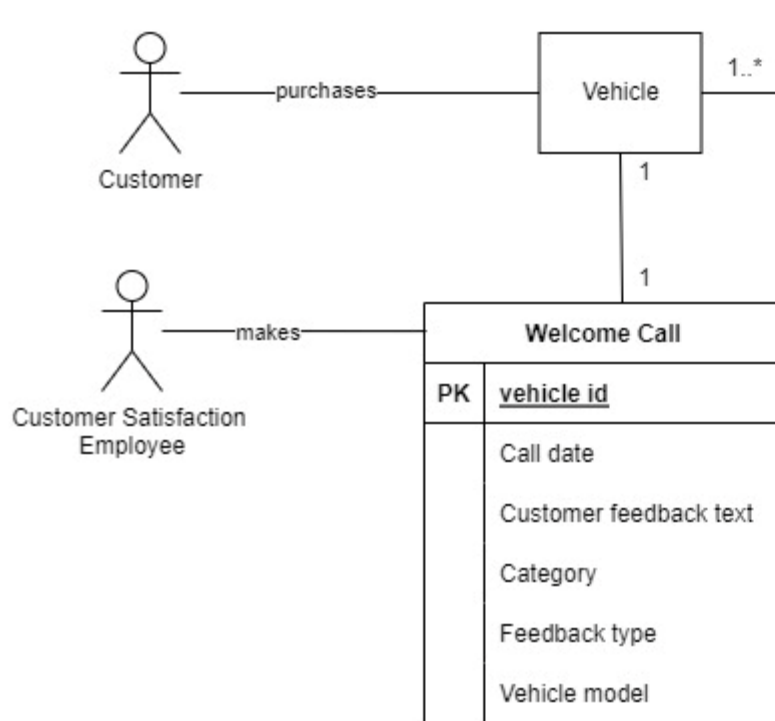
1. Customer complains about steering wheel being off Center respectively car pulling to one side.
2. Steering wheel not straight.
3. Front Axle, Steering Wheel misalignment

PQM PROCESS

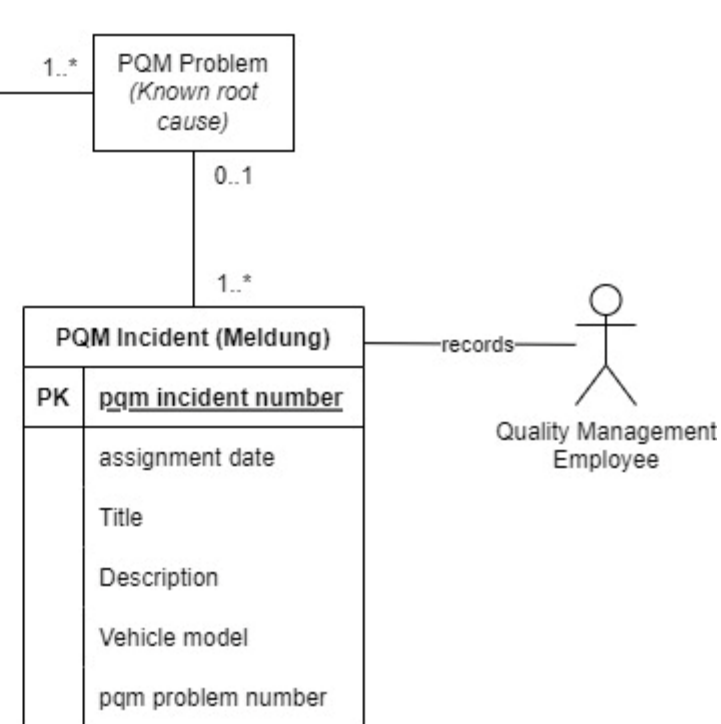


Goal: Detect issues earlier

WELCOME CALL PROCESS



PQM PROCESS



Target users: Quality management departments

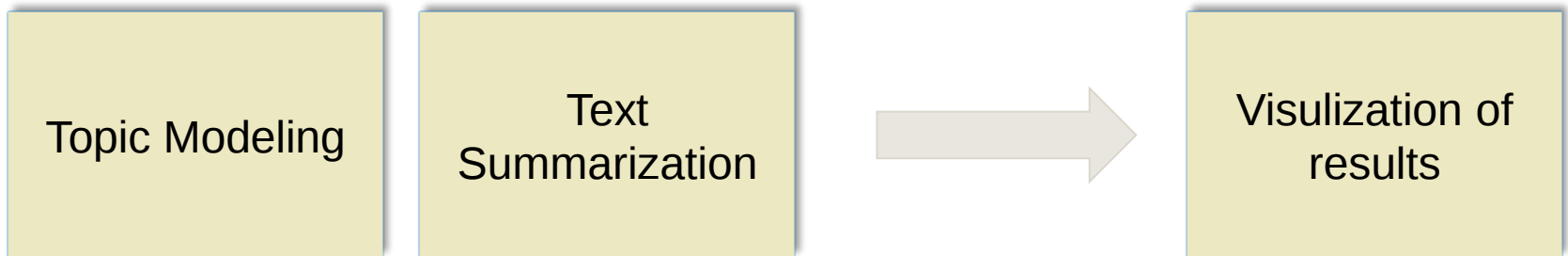
Motivation:

- Hand processing unstructured data is costly
 - Too much time, effort and resource
 - Non-uniform categorization of data
 - Issues are determined months later

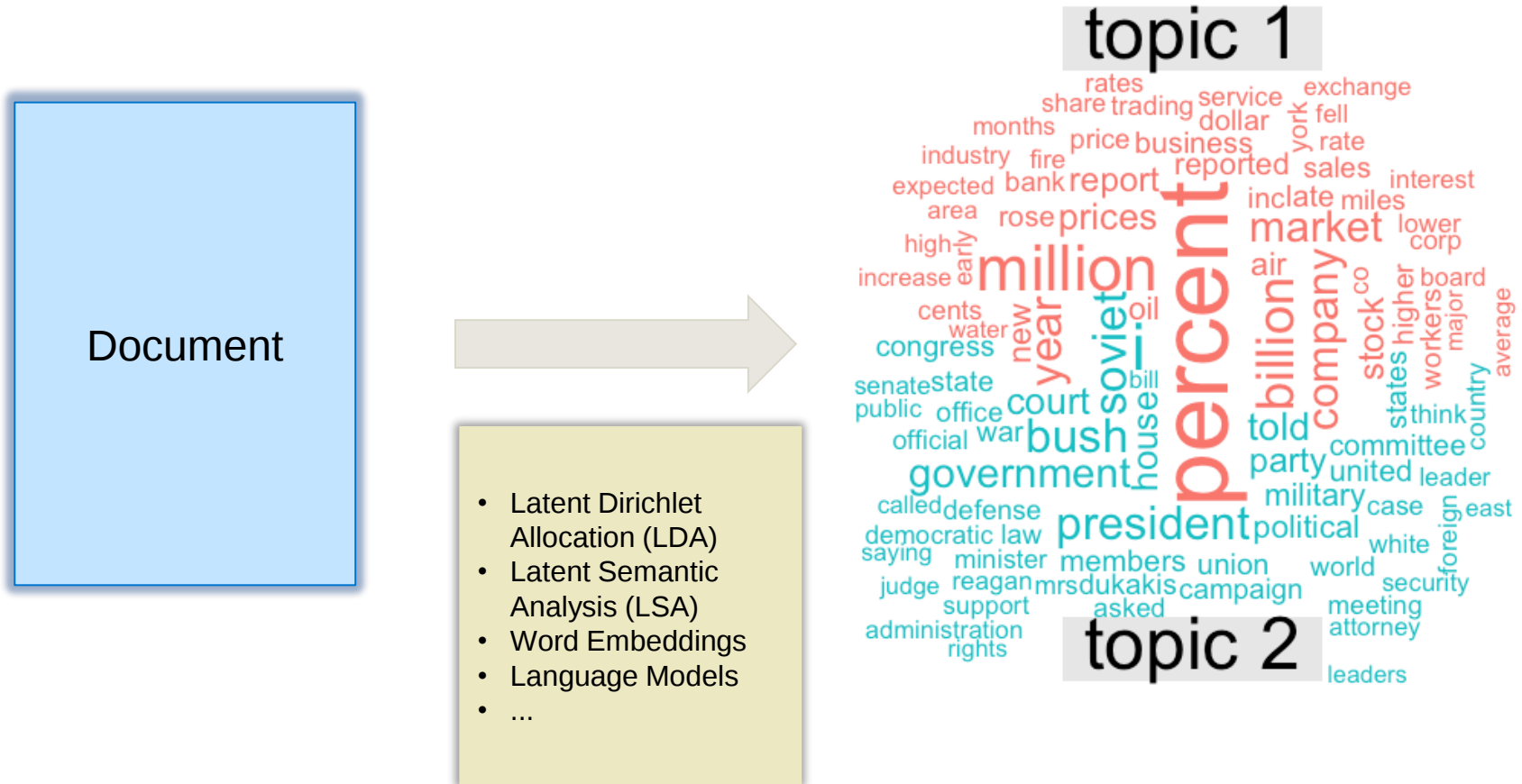
Goal:

- Helping users with categorization process and prioritization
 - Observing the existing issues
 - Detecting new issues

Proposed solution:

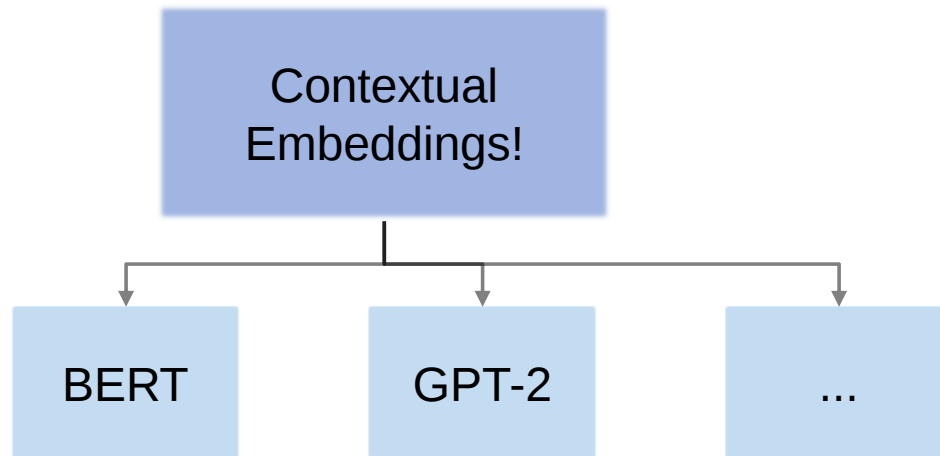


Background: Topic Modeling



Background: Text Summarization

- Transformer Models
- Transfer learning



Transformers

- 1** Which state-of-the-art topic modelling approaches would provide the best insight on BMW customer feedback datasets?
- 2** Can text summarization enhance the comprehensibility of BMW customer feedback datasets?
- 3** How to support quality control department with interactive topic maps of BMW customer feedback datasets?



Data Preprocessing

Datasets will be prepared and preprocessed

Implementation of Methods

Topic modelling:

- LDA
- BERTopic
- ...

Summarization:

- Transformer Models

Analysis and Evaluation

Analysis:

- Matching the resulted clusters from both datasets by using vehicle model information

Evaluation:

- User interactions
- Topic coherence measures

Visualization Techniques

Visualize the results:

- Wordcloud
- Intertopic distance map
- Bar chart
- Dendrogram
- ...

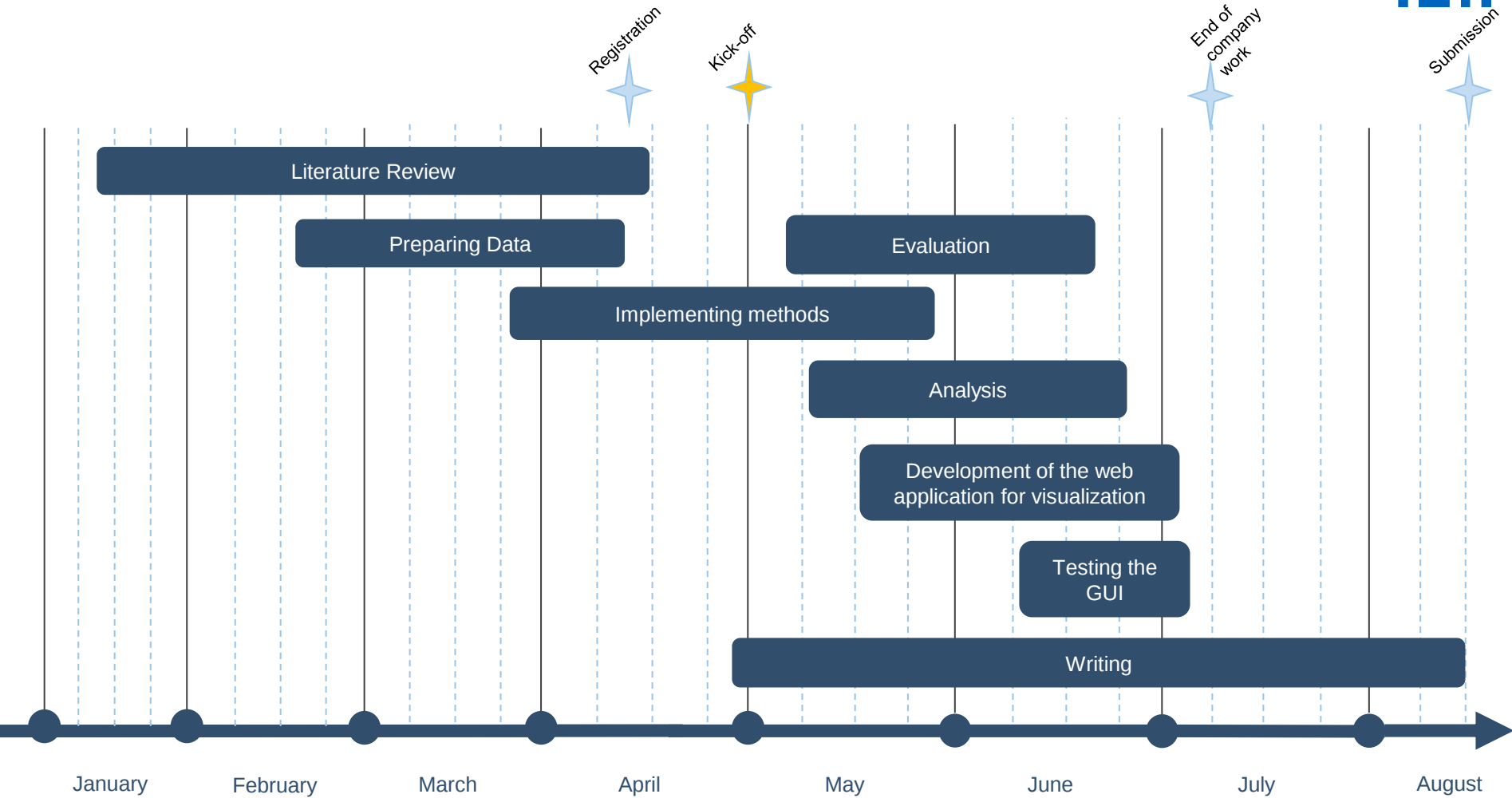
Graphical User Interface

Web-based GUI to visualize the results.

- Visualize frequent topics
- Filter visualizations by topics
- User study with quality experts for evaluation



Timeline





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