

# AI-Based Review Analysis

## Extracting product characteristics from user reviews

Students

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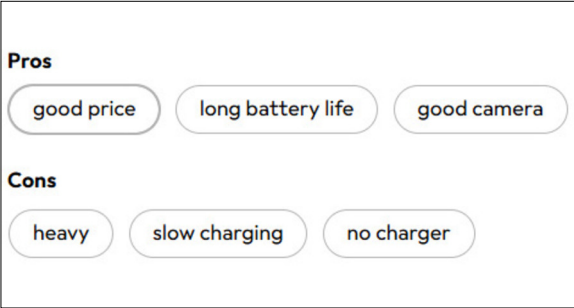
**Introduction:** The rapid expansion of e-commerce in Switzerland, especially during the COVID-19 pandemic, has led to a significant increase in product reviews. This term paper addresses the challenge of efficiently summarizing key aspects of a product from its reviews into keywords to help customers make decisions. The goal was to develop an AI solution capable of extracting and condensing product review insights into concise positive and negative keywords, following an approach similar to the AI-driven keyword generation used by Digitec Galaxus AG.

**Approach / Technology:** Several approaches were explored to process this data; finally, a Large-Language-Model (LLM)-centric approach was adopted due to its flexibility and performance. Jupyter Notebooks are used to analyze the different sentiments in each review and summarize all reviews of a product into 3 positive and 3 negative keywords. To achieve this, a multi-stage approach was implemented: Stage 1 extracts aspects from the reviews, stage 2 summarizes these aspects in chunks to avoid overloading the LLM. Stage 3 consolidates all mentions of the same aspects identified in stage 2 (across all chunks) into keywords. From these keywords, the top 3 are selected as the final keywords. This approach makes it easy to add and edit new reviews without having to redo all the other reviews. It is also easily extendable with other stages, for example, a summarizing sentence can be created using an LLM.

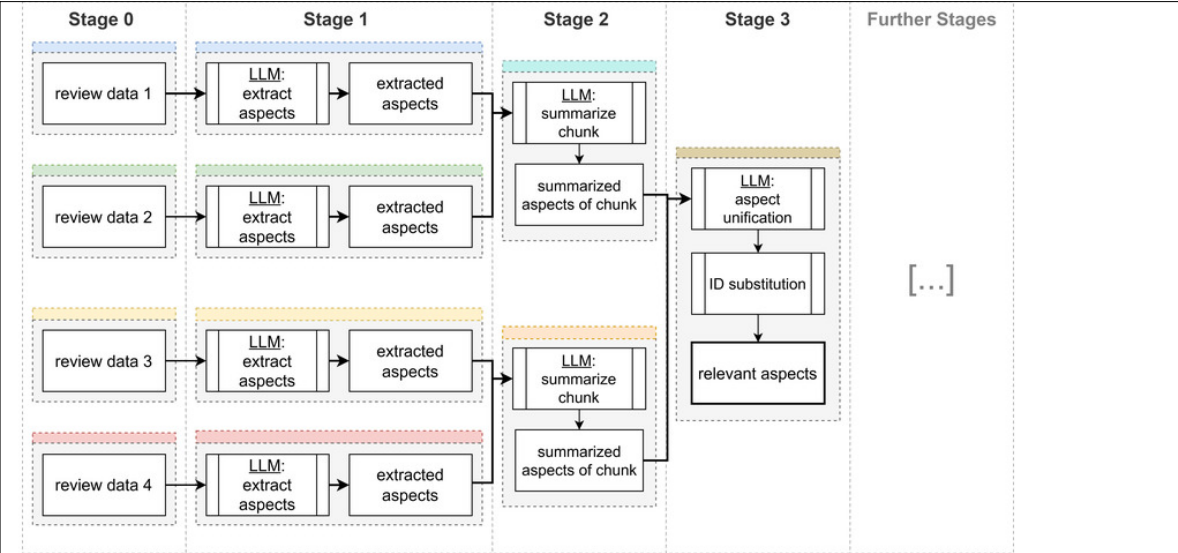
**Result:** The verification showed the ability to effectively summarize large amounts of product reviews into positive and negative keywords, capturing many key aspects mentioned in the reviews. However, some problems were observed during the verification phase. The keywords

generated were often overly broad or generic, making it difficult to identify specific product features. In addition, the system sometimes combined multiple features into a single keyword, resulting in some lost features. Despite these challenges, the approach demonstrated promising results and strong potential as a proof of concept. However further development is needed to improve the precision of keyword generation for productive use.

AI generated keywords from Galaxus.ch.  
Galaxus.ch (15.12.2024)



The multi-stage process used to analyze the reviews to extract the final keywords.  
Own presentation



Advisor

Prof. Dr. Daniel Patrick Politze

Subject Area

Artificial Intelligence