INVESTIGATING AMAZON'S CUSTOMER SATISFACTION USING SENTIMENT ANALYSIS WITH TRANSFORMER MODELS

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1. Introduction

• This study addresses the need for businesses to leverage customer review data to make informed decisions, understand customer behaviour, and to measure customer satisfaction.
• In the contemporary business landscape, obtaining feedback from customers is pivotal to making proper business decisions.
• This study investigates the reliability of customer reviews as an indicator of customer satisfaction using Amazon as a case study.
• This research makes use of various Natural Language Processing (NLP) techniques to accurately analyze and interpret the sentiments expressed in customer reviews.

2. Research Objectives

This research will investigate the relationship between Amazon's customer reviews and its American Customer Satisfaction Index ACSI scores, to determine if customer sentiments reflect the observed increase in ACSI scores from 2021 to 2022. This study will compare the performance of conventional lexicon-based sentiment classifiers and NLP transformers.
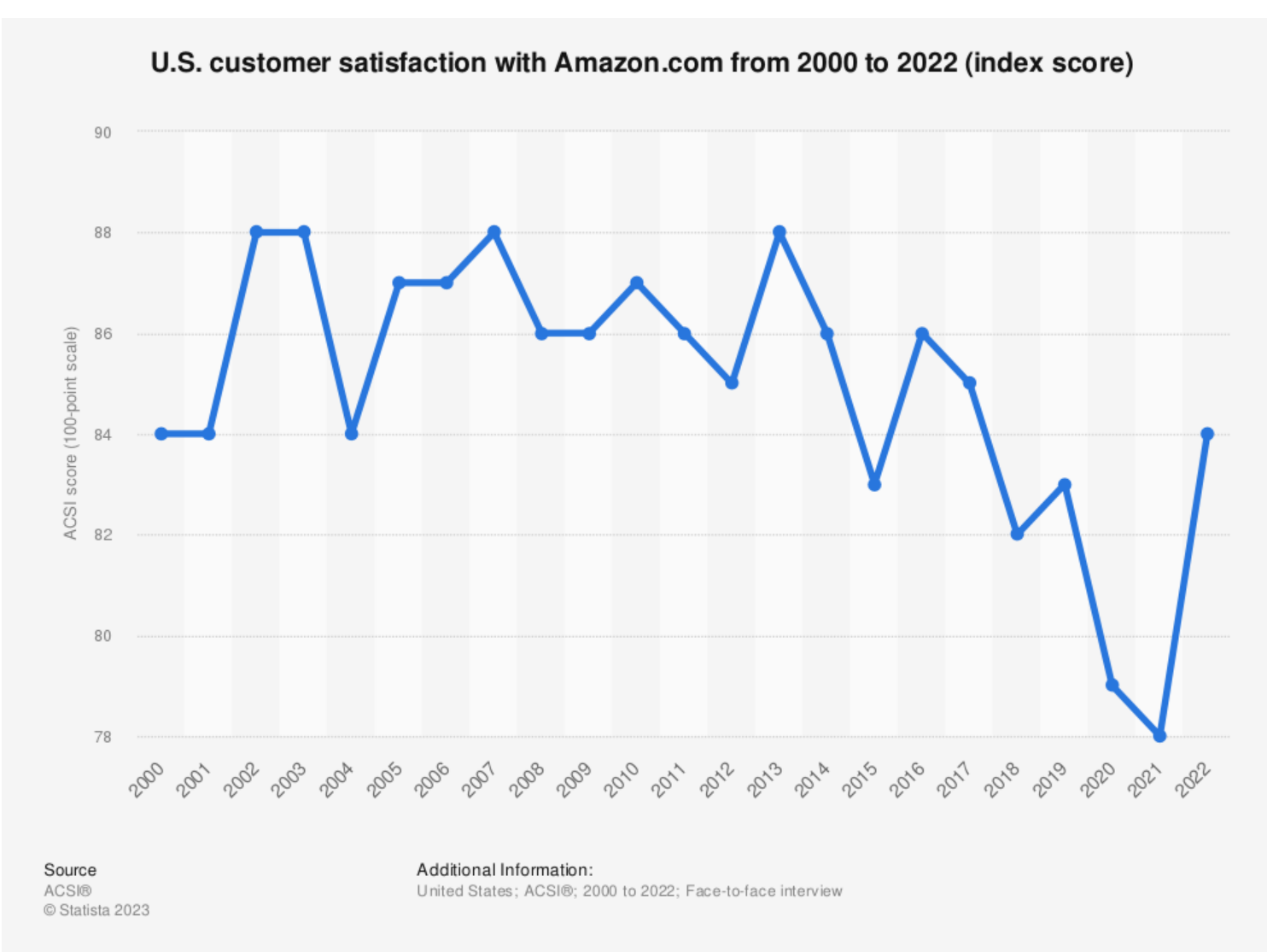

Chart 1: A plot of Amazon's U.S. customer ACSI score over the years (Coppola, 2023).

3. Literature review

• According to Anderson et al. (2004), customer satisfaction is the backbone of every successful business.
• Sentiment analysis is the process of analysing the emotion expressed by an author in a body of text, which could be positive, neutral, or negative (Prakoso et al., 2018).
• The conventional methods employed in sentiment analysis are the machine-learning-based approach (e.g. Support Vector Machine and Naïve Bayes) and the lexicon-based approach (e.g SentiWordNet, VADER and SenticNEt)
• A notable limitation of both the machine learning and lexicon-based approaches is their focus on semantics and syntax at the word level, making it unsuitable for all use cases.
• NLP transformers outshine Machine Learning and lexicon approach because they capture contextual information within a body of text (Mishev et al., 2020).
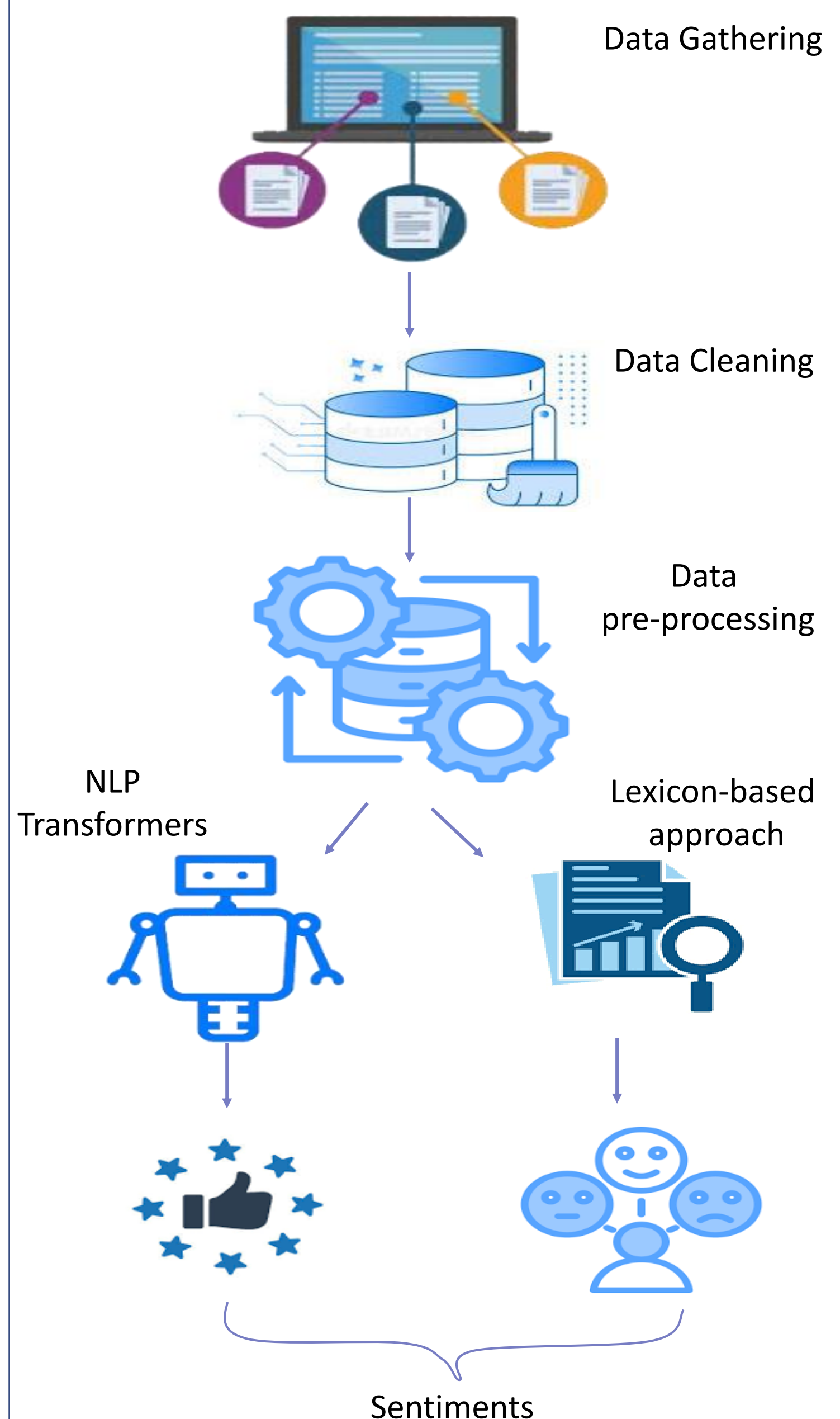
4. Methodology

Chart 2: The sentiment analysis flow chart.

5. Early indications/Next steps

• Early indications suggest that the low ACSI experienced by Amazon in 2021 will be validated by negative customer sentiments, reflecting customer dissatisfaction. Furthermore, NLP transformers are anticipated to outperform conventional techniques because they capture contexts in texts.
• As a next step, the performance of the lexicon-based approach and transformer model can be evaluated using the General Language Understanding Evaluation (GLUE) benchmark. The Stanford Sentiment Treebank (SST-2) in the GLUE framework can be used to assess the performance of the two approaches.

6. Technologies

References

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