

A Sentiment Analysis Framework for Social Issues

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Introduction

- **Definition:** Sentiment analysis extracts and analyzes opinions expressed by people regarding products or topics.
- **Opinion types:** attitudes, judgments, beliefs, feelings, evaluations, affective/emotional states, or wishes.
- **Area:** an interdisciplinary field which crosses natural language processing, artificial intelligence, and text mining.
- **Applications:** Sentiment classification, comparison, summarization, product and market analysis, and trend analysis
- **Domains:** shopping, entertainment, politics, education, marketing, and research and development.

Problem

- ❖ **Motivation:**
 - Differences between social, environmental, political issues and products
 - Doubts about usefulness of existing approaches
- ❖ **Problem:** design and development of a framework for sentiment analysis in social, environmental, and political domains.
- ❖ **Domains:** Social and Environmental

General Algorithm

❖ Step 1 - Opinion Structure extraction:

By performing syntax analysis, opinion verb is extracted and an opinion structure is constructed. It is enriched by the synonyms and antonyms of words by using WordNet as an advanced lexical source.

❖ Step 2 – Sentiment Map construction:

Semantic graphs of social issue and opinion structure are formed to analyze the relationships between social issue and opinion expressed.

❖ Step 3 – Sentiment closeness analysis:

Find the relationships between the social issue and the opinion structure and recognize the sentiment orientation of opinion structure regarding the social issue.

Literature concepts

- **Subjectivity classification:** classifies a given text as objective or subjective.
- **Sentiment Classification:** recognizes the orientation of sentiment of a document and classifies the document as positive or negative.
- **Feature Based Sentiment:** study of determining the opinions expressed on different features or aspects of products.
- **Object/Feature Extraction:** extracts the object(product) and features which opinions are expressed about.
- **Sentiment Extraction:** extracts the opinion terms and phrases which contains sentiments about products and features. Sometimes it recognizes the sentiment instead of extraction

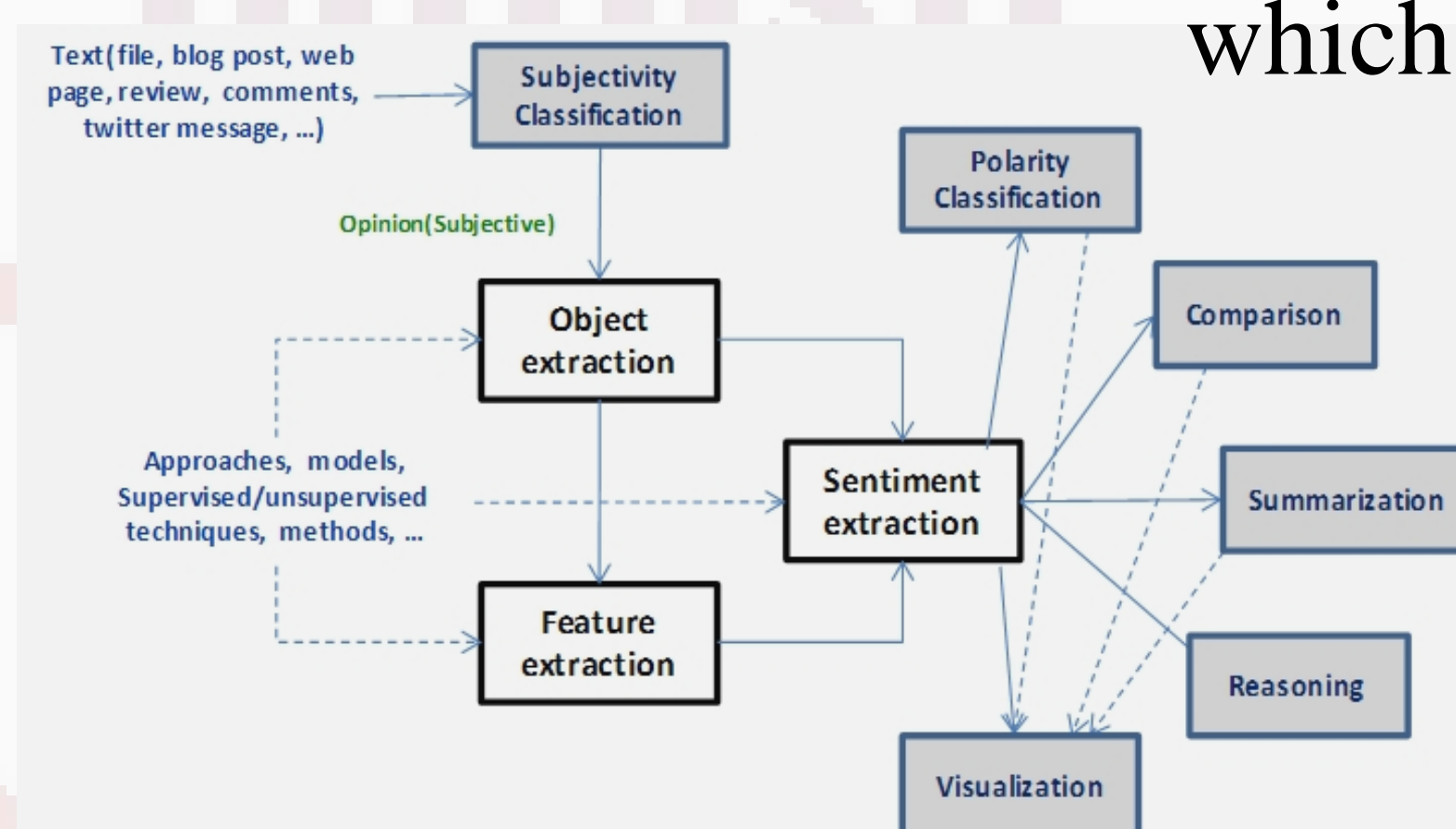


Fig 1: general sentiment analysis

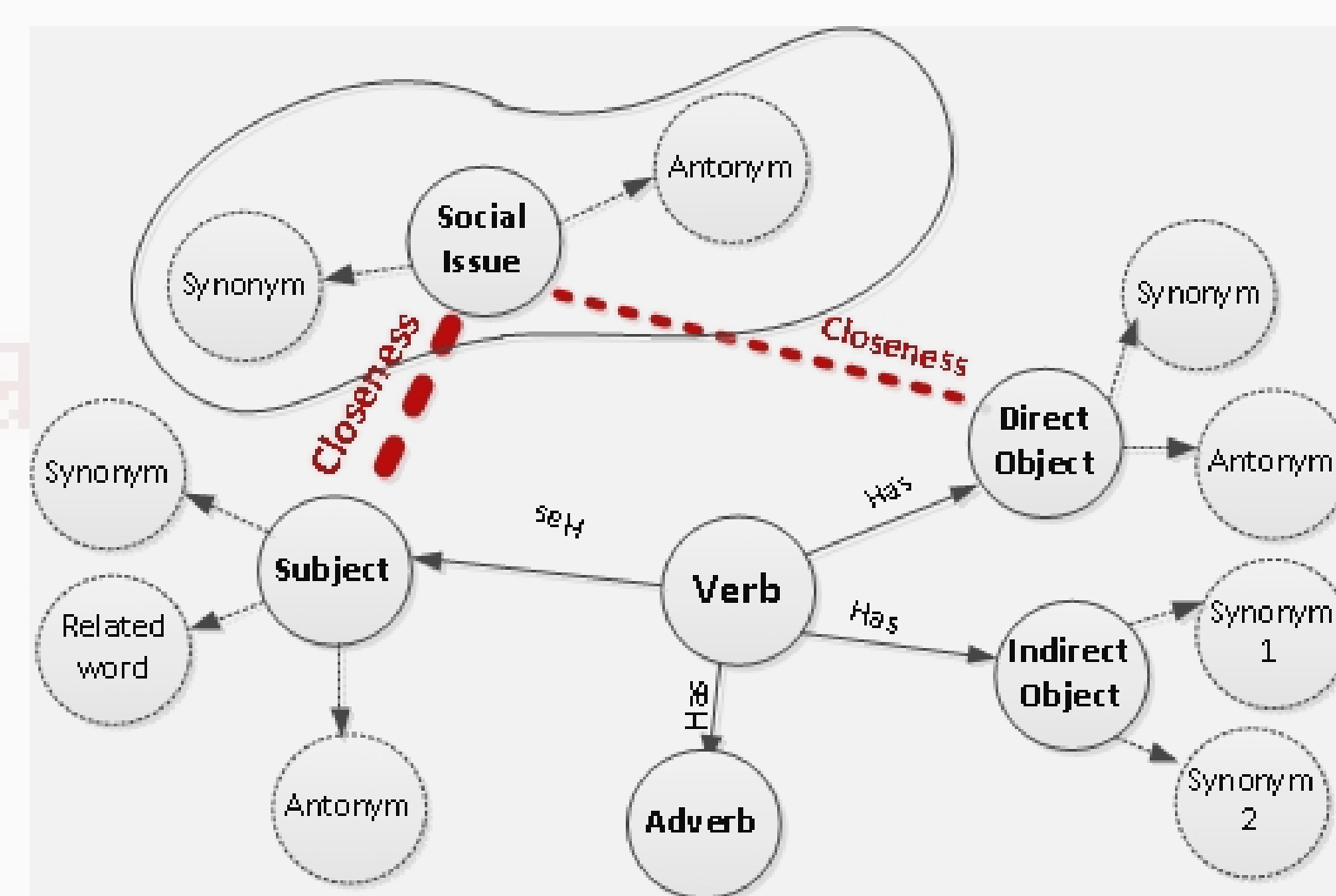


Fig 2: general view of Sentiment map

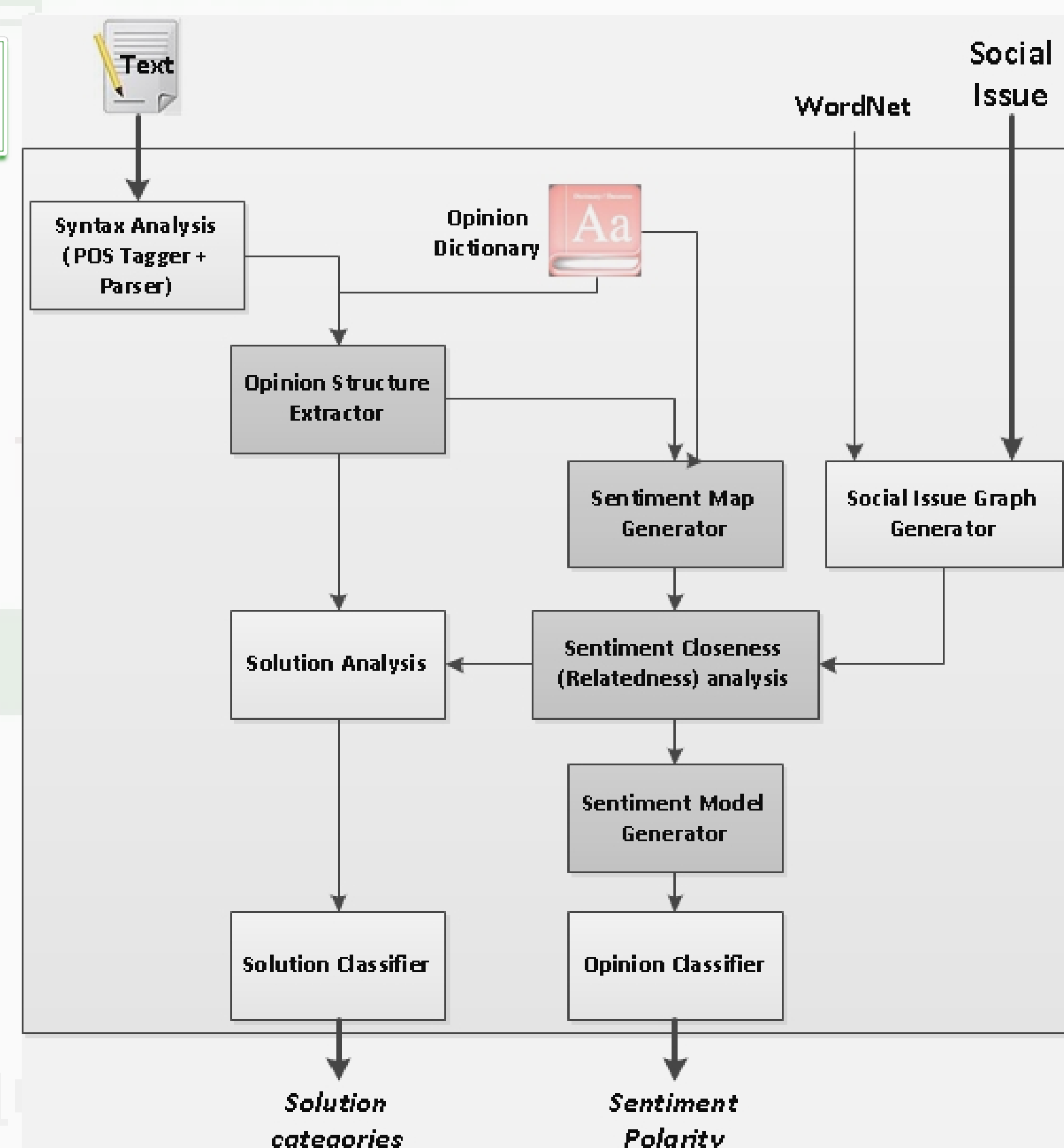


Fig 3: designed architecture for proposed framework

Architecture

❖ Configuration:

- ❑ **Opinion Terms:** a dictionary of opinion adjectives, adverbs, and nouns.
- ❑ **Opinion Verbs:** an advanced dictionary of verbs that have sentiment or propagate sentiment.
- ❑ **WordNet:** an advanced lexical dictionary in order to enrich the terms space by using synonyms and antonyms.

❖ Opinion extractors and concepts generators:

- extract and construct opinion structures and sentiment maps.

❖ Opinion analyzer:

- analyzes the sentiment orientation and calculate the sentiment model.

❖ Solution analyzer:

- extracts the recommended solutions and find the common solution.