Report of Task-1

Paper Title: Customer Perception Analysis Using Deep Learning and NLP

Summary:

1.1 Motivation:
The paper addresses the crucial need for businesses to understand and respond to customer perceptions for success in a competitive market. It emphasizes the significance of analyzing unstructured data, particularly text data from sources like social media, surveys, voice recordings, and chat transcripts. The goal is to leverage Deep Learning (DL) and Natural Language Processing (NLP) technologies to gain meaningful insights into customer feedback.

1.2 Contribution:
The paper explores technologies such as DL and NLP to analyze contextual information and capture customer feedback effectively. It investigates the possibility of understanding and extracting customer concerns and reasons beyond just sentiment analysis. The analysis is illustrated using a dataset of car reviews, focusing on customer experiences with different car types and features.

1.3 Methodology:
The analytical aspects of NLP and DL are explored to derive meaningful insights from customer perception (CP). The paper poses the question of whether it is possible to understand and capture customer concerns and reasons solely using DL/NLP. The dataset used for analysis consists of car reviews, and the paper delves into the challenges of interpreting unstructured text data.

1.4 Conclusion:
The paper emphasizes the business impact of customer perceptions on marketing, product quality, and overall business success. It highlights the challenge of scrutinizing large volumes of unstructured text data, which may contain valuable insights about customer concerns that could otherwise go unnoticed. The aim is to understand CP using NLP and DL to enable businesses to adapt to customer expectations.

2. **Customer Perception (CP):**
The paper introduces the concept of customer perception (CP) and categorizes customer experiences into three main categories: sentiments, sentiments with reasons, and CP reasons. It argues that sentiments alone are not sufficient for actionable insights, and understanding CP reasons is crucial for making informed business decisions. The paper proposes to concentrate on analyzing the text of reasons and reviews to derive meaningful insights.

3. Natural Language Modeling for CP:

The paper reviews the Natural Language Understanding (NLU) aspect of NLP, presenting a traditional NLP pipeline. It acknowledges the limitations of basic NLP processing for effective business analysis, especially when dealing with complex and domain-specific datasets. The challenges of interpreting millions of reviews without a deep understanding of key references are highlighted.

3.1 Rule-Based Semantics Annotation:
To address the limitations of basic NLP processing, the paper suggests the use of rule-based semantic annotation. It emphasizes the importance of understanding the business intention behind collecting customer feedback and proposes the construction of rule-based semantics for effective analysis. Named entity recognition (NER) is identified as a key step in creating explicit semantic representations.

Synthesis:

The paper explores the intersection of Deep Learning and Natural Language Processing to analyze customer perceptions effectively. By categorizing customer experiences and focusing on understanding CP reasons, the paper aims to provide actionable insights for businesses. The proposed rule-based semantics annotation adds a layer of business understanding to enhance the analysis of unstructured text data. The use of a car reviews dataset serves as a practical example, illustrating the challenges and potential solutions in interpreting customer feedback.