


# Chapter 8

## Opinion Mining and Product Review Summarization in E-Commerce

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### ABSTRACT

*With the immense increase of the number of users of the internet and simultaneously the massive expansion of the e-commerce platform, millions of products are sold online. To improve user experience and satisfaction, online shopping platform enables every user to give their reviews for each and every product that they buy online. Reviews are long and contain only a few sentences which are related to a particular feature of that product. It becomes very difficult for the user to understand other customer views about different features of the product. So, we need accurate opinion-based review summarization which will help both customers and product manufacture to understand and focus on a particular aspect of the product. In this chapter, the authors discuss the abstractive document summarization method to summarize e-commerce product reviews. This chapter has an in-depth explanation about different types of document summarization and how that can be applied to e-commerce product reviews.*

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## **INTRODUCTION**

With the current trends of internet user, e-commerce platforms are getting more popular and user started buying product starting from clothes to foods from online e-commerce platform. Some retail behemoth like amazon.com Walmart shipped over 100 million products during 24 to 36-hour in the USA in 2018 (Sharma, 2018). This trend is in everywhere across the world. So before order a product from online, user always try to get an insight about the product from the past reviews and as well as manufacturer also try to improve their product quality based on the customer reviews.

When users are buying product more from online, reviews are also increasing in large scale size. Among the products few popular products have thousands of reviews. Among thousands of reviews, few reviews are long and some are saying about the particular feature of that product. From these kind of reviews for a customer its really very hard to take the decision for that product. To get an insight view of any product, the customer needs to read almost all the reviews. Even Manufacturers also need to keep the trace for every reviews for any particular feature of the product. So, to get an unbiased feature wise insight of any particular product there is need of product review summarization.

Automatic document summarization is a process that takes a set of documents and generates the most important content as a summary in a manner sensitive to the central concept of the source documents. In this chapter, we discuss document summarization as a method to summarize e-commerce product reviews of a particular feature of a product. There are two types of summarization. Extractive summarization generates the summary by constructing sentences from the source document whereas the abstractive summarization tries to generate summary sentences by its own which may not be directly present in the source document.

Generating abstractive summarization is more challenging as compared to extractive summarization. There are different methods for generating extractive and abstractive summarization. In this chapter, we discuss abstractive summarization of the product reviews using deep neural network model. This chapter also discusses word embeddings that are used to represent words in vector space and represent each sentence in a review in the word's semantics space. Word embedding is a process of learning the vector space representation of words or phrases. Word embedding can be generated using a global matrix factorization method or shallow context windows-based method. These details will be discussed in detail.

Section 1 and section 2 start with a discussion on aspect and opinion identification and extraction from product reviews. Here we explain different methods used for opinion identification and extraction. Dependency parsing is explained in the context of identifying all nn modifier and amod modifier. Section 3 explains document summarization types, methods used for summarization and different evaluation

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