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Sentiment Analysis of Indonesian Halal Cosmetic Products

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ABSTRACT

This study aims to conduct a sentiment analysis on halal cosmetic products in Indonesia through online customer reviews. Consumer review data obtained from online platforms are used as a source of information to analyze consumer sentiment regarding halal cosmetic products. The engine-based sentiment analysis method is used to classify reviews into positive, negative or neutral sentiment categories. The results of the study show that the majority of consumer reviews have positive sentiments towards halal cosmetic products in Indonesia. Consumers appreciate good product quality, safe use, attractive packaging, and a variety of products that meet their needs. This conclusion provides important insights for halal cosmetics manufacturers in understanding consumer perceptions and preferences and developing marketing strategies that are more effective in meeting the demand for the halal cosmetics market in Indonesia.

Keywords: Halal cosmetic; Sentiment analysis; Online costumer review

1 Introduction

Indonesia's population continues to increase, including Muslims. Simultaneously, technological advances grow through artificial intelligence, which makes it easier for everyone to carry out their daily activities, including fulfilling their product needs. This provides a great opportunity for market players to provide secondary or primary products, both through the offline market and the online market. The presence of e-commerce in Indonesia is a manifestation of this convenience, people do not need to carry out movement activities to get the desired goods or needs. In fact, studies show that online shopping has become a habit and alternative for society [1]. On the other hand, to ensure the quality of the goods that will be purchased, people are getting smarter to make observations before making a purchase transaction, especially if the consumer is a Muslim, he will carry out detailed checks regarding the contents and halal labels in products such as food, beverages, cosmetics, and medicines are supported by the study [2] that image, trust and satisfaction are influential factors in increasing the shopping behavior of consumers who choose food labeled halal. The existence of Muslims is closely related to the halal industry, which is a selling point for the public when choosing the product, they will buy as a form of guarantee for a product issued by an official institution in Indonesia. Halal sentiment is a benchmark for other consumers. Through the Online Customer Review (OCR), this research will conduct more in-depth research in the last



decade regarding public enthusiasm regarding halal. The purpose of this study was to determine the sentiments of the Indonesian people towards the use of halal certificates in halal-certified cosmetic products through online reviews as a predictor of consumer product demand. Using electronic data from Shopee and Tokopedia this study predicts whether online review variables such as halal, halal logos, halal certificates provide positive predictions of support for the progress of the halal industry in Indonesia.

2 Materials and Methods

2.1 Halal Cosmetic Product in Indonesia

According to Law Number 33 of 2014 concerning Guarantees for Halal Products, regulates certification and labeling of halal products, including cosmetic products. In Indonesia, cosmetics manufacturers are required to obtain halal certification issued by the Halal Product Guarantee Agency (BPJPH) or an accredited halal certification body. BPJPH has also issued several regulations and guidelines related to the implementation of halal product guarantees, including for halal cosmetics. For example, BPJPH has issued BPJPH Regulation Number 1 of 2019 concerning Registration of Halal Products and Guidelines for Halal Product Certification. Studies about halal concept particularly about consumer very interesting for example in previous studies is three dimension of knowledge factors of Muslim consumers in purchasing Halal products in Majalengka, Indonesia [7] and there are also several other data analysis methodologies and concepts. But not many explained that halal certification is related to sentiment analysis and halal was found in a study by Hakim et al. that in twitter users give opinions through sentiments. Halal (halal) refers to the fulfillment of the conditions specified in the Islamic religion. *Toyyib* refers to product quality, cleanliness and safety. Halal products that are *toyyib* must be safe for consumption or use, do not contain hazardous materials, and are produced by maintaining good hygiene and sanitation. The *toyyib* concept also includes ethical values in production, including good treatment of animals, environmental sustainability, and transparency of information to consumers.

2.2 Online Costumer Review (OCR)

Review is part of analysis which makes it possible for other people to know about someone's opinion which is closely related to reciprocal activities such as buying and selling. Electronic Word of Mouth (eWOM) is part of the review which is a direct opinion from someone but not part of the advertisement. Review is positive helpfulness to help costumer s through rating and also can be a solution to influence people buy a product and doing silence promote. Shopping behaviors have online reviews as influence that is important to online consumer theory and reveal the effect of gender on this effect for the first time and explain it from an attention bias perspective [6].

2.3 Analysis Sentiment

Natural language processing, computational linguistics, and text mining, which have the aim of analysing the opinions, sentiments, evaluations, attitudes, judgements, and emotions of a person, whether the speaker or writer is pleased with a particular topic, product, service, organization, individual or activity are part of sentiment analysis [3]. On the other hand, research explains sentiment as a technique or method used to identify how a sentiment is expressed, process it using text, and then categorise it as positive or negative [4]. According to Rambocas and Pacheos [5], many researchers have highlighted the uniqueness of online sentiment analysis in marketing because of marketing's orientation and technical challenges, both practical and ethical. Sentiment analysis takes into account the meaning and description of something that can be positive, neutral, or negative.

2.4 Methods

The research uses a qualitative approach, the data collected will be analyzed descriptively and interpretively. Qualitative analysis can include identifying thematic patterns in reviews, grouping sentiments based on specific product themes or aspects, and presenting excerpts from reviews that are relevant. The main purpose of qualitative analysis is to understand the context, meaning and perceptions that arise from consumer reviews. To analyze sentiments related to halal cosmetic products in Indonesia, the general steps that can be taken are as follows: 1. Data Collection; 2. Data Preprocessing; 3. Sentiment Analysis; 4. Sentiment Category. Figure 1 shows the methodology scheme.

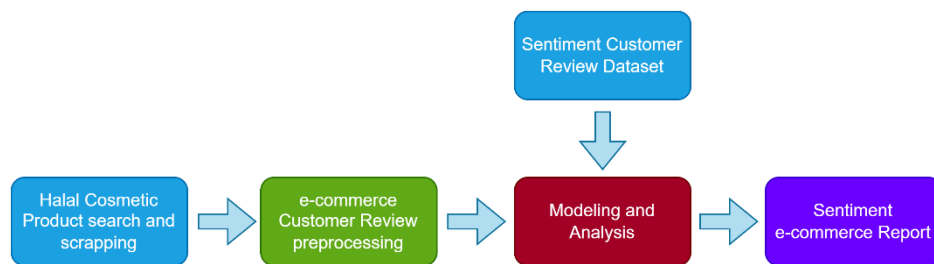


Figure 1: Methodology scheme

The data collection was taken from product comments using the search query "Halal Cosmetic" from e-commerce. Here, we utilized web scraping methods to extract customer review data. After obtaining the review data, we applied natural language preprocessing techniques, such as stop words removal to eliminate common words that do not carry significant meaning, like "dah," "wkwkwk," "sambil," and others. We also used stemming method for transforming words into their base form. Preprocessing sentences was necessary because customer reviews are often provided in informal language. We employed logistic regression as the method for classification and drawing conclusions from the analysis with probabilistic p formula.

$$p = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x)}} \quad (1)$$

We set probabilities for two categories, positive and negative sentiment, regarding halal products. We determine the category based on the presence of the term "halal" in the product title and the availability of a halal certificate in the product description. [OBJ]

3 Results

3.1 Data Analysis

3.1.1 Web Scraping Data Collect and Analysis

From the scraping results, we obtained 713 records of reviews with halal tags and non-halal tags as shown in Figure 2. In Figure 2, it is evident that there is more non-halal tagged reviews compared to halal tagged ones. However, the proportion changes with an increase in the number of ratings. Table 1 refers to halal tag from an online shopping platform.

Table 1: Tables of halal tag from online shopping platform.

Halal Tag	Non-Halal Tag
85	626

Here is a plot of ratings for the halal-tagged class and the non-halal-tagged class.

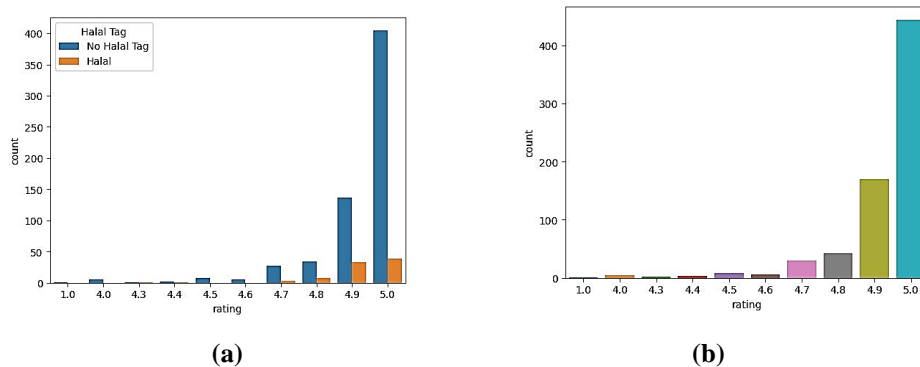


Figure 2: In this figure showing: (a) Halal tag by rating; (b) Halal cosmetic by rating

After preprocessing, we obtained 422 eligible reviews for analysis. By applying the analysis model using (1), we found that 76.77% of the sentiment was positive. Figure 3 illustrates the proportional distribution of positive and negative sentiments.

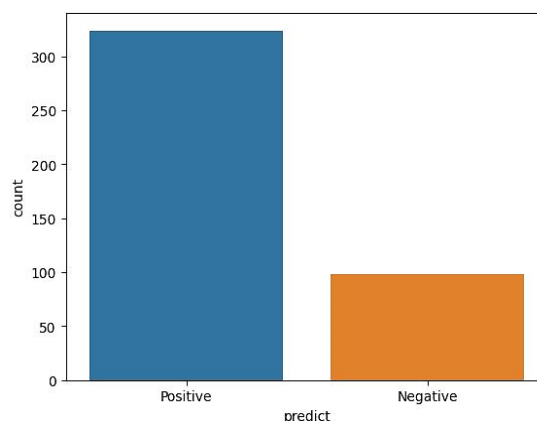


Figure 3: Sentiment Result from e-commerce with halal tag and non-halal tag.

4 Conclusions

Based on the results of sentiment analysis on halal cosmetic products in Indonesia, it can be concluded that most consumer reviews have positive sentiments. Consumers are generally satisfied with the halal cosmetic products available in the Indonesian market. Positive reviews often highlight the product's good quality, safe use, attractive packaging, and a variety of products that meet the needs of various consumers. This shows that halal cosmetic products in Indonesia get a positive response from consumers, which can strengthen brand reputation and increase competitiveness in the cosmetics market.

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