

Social Media Sentiment Analysis to Understand Agricultural Market Trends and Consumer Preferences

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ABSTRACT

Social media has become a very important communication platform in the daily life of modern society. People use these platforms to share their experiences, opinions, and preferences regarding various topics, including agricultural and food products. This research aims to conduct social media sentiment analysis to understand agricultural market trends and consumer preferences. This research is a literature review that adopts a qualitative method approach, which means it will analyse and interpret data by relying on information and text from various sources. The study results show that social media sentiment analysis is an invaluable tool for agricultural industry players in understanding market trends and consumer preferences. Using natural language processing and machine learning techniques, this analysis enables real-time monitoring of consumer opinions and feelings regarding agricultural products and agriculture-related issues.

Keyword: Social Media, Market Trends, Agriculture, Consumer Preferences

INTRODUCTION

In the context of the rapid development of information technology, social media has transformed into a communication platform that has an irreplaceable central role in the framework of the dynamics of the daily life of modern society (Ohara, 2023; Tarigan et al., 2023). This digital era has brought about a remarkable transformation where social media platforms are not just a means of interacting (Ferine et al., 2023; Maitri et al., 2023), but have also become a major backbone in the process of connecting with each other, sharing life experiences, expressing diverse opinions, and expressing various individual preferences related to a number of topics, including but not limited to agricultural and food products. In this wave of change, it is evident that the positive impact created by this phenomenon involves enormous opportunities for stakeholders in the agriculture industry and food producers (Malhi et al., 2021). They have a tremendous opportunity to delve deeper into evolving market trends and understand more accurately the preferences of increasingly diverse consumers (Wikansari et al., 2023). All of this allows them to plan and execute marketing and production strategies that are more precise, accurate and responsive to the ongoing dynamics in the global marketplace (Purnomo, 2023).

The agricultural market is one of the economic sectors that plays a crucial central role in the context of a country's economic growth as well as in ensuring adequate food availability for all people (Pawlak & Kołodziejczak, 2020). In an increasingly modern era, the agricultural industry is faced with multifaceted challenges, including volatile fluctuations in consumer demand, climate change that has a significant impact on production patterns and crop yields, and the constant evolution of increasingly dynamic and diverse consumption trends (Raza et al., 2019). To address these complex challenges, it has become imperative for agricultural industry players to develop a

very deep and comprehensive understanding of what their consumers want and expect (Calicioglu et al., 2019). By doing so, they can direct their efforts towards producing agricultural products that are more in line with market expectations, implementing sustainable agricultural practices, and adapting their business strategies to remain relevant and competitive in the ever-changing economic landscape.

The social media sentiment analysis approach is one that combines innovation and technology to delve into consumer views, opinions, and preferences (Ausat et al., 2023; Mahardhani, 2023). In this endeavour, we leverage various social media platforms, including but not limited to Twitter, Facebook, Instagram, as well as a host of other existing platforms, to mine and analyse widespread data. Through this analytical process, we are able to reveal evolving trends in online conversations involving agriculture and food products. Of course, the results of this sentiment analysis have great potential in providing valuable and in-depth insights that can help us in making smarter strategic decisions. The information generated from social media sentiment analysis can serve as a guide in directing more targeted marketing efforts, guiding product development steps that are more in line with market expectations, and supporting supply chain management in the increasingly complex agricultural industry (Lee & Mangalaraj, 2022; Rijal, 2023; Salamah, 2023; Sari, 2023; Sukenti, 2023). As such, this method becomes one of the essential tools in optimising performance and competitiveness in the ever-changing and rapidly evolving business realm (Karneli, 2023).

In addition to these benefits, social media sentiment analysis also plays a significant role in helping to identify highly relevant and essential issues in the context of the growing agricultural industry, including but not limited to sustainability, food safety, and quality of agricultural products (Stevens et al., 2018; Sutrisno, 2023). By carefully exploring and understanding consumer opinions and feelings related to these issues that are often at the centre of public attention, industry players are able to glean valuable information that serves as a foundation for better strategic planning (Krafft et al., 2021). The data and insights generated from social media sentiment analysis enable industry players to design strategies that are more holistic and responsive to increasing consumer demands, as well as to more proactively contribute to efforts to maintain environmental sustainability, ensure food safety, and improve the quality of their products (Abbas et al., 2019). In addition, by paying attention to these issues, they can build a stronger reputation and gain consumer trust, which are critical factors in long-term success in the competitive agriculture industry.

Within the scope of this research, the main objective is to conduct a social media sentiment analysis that has a focus on in-depth understanding related to market trends in the agriculture industry and consumer preferences (Ausat, 2023; Azzaakiyyah, 2023; Sudirjo, 2023). In an effort to achieve this goal, this research will utilise an approach that combines various text analysis techniques as well as advanced natural language processing. Through this combination of methods, the research will seek to identify and analyse patterns in various online conversations related to agricultural and food products, and simultaneously gauge sentiments related to various relevant aspects of the agricultural industry. As a consequence of this research, the results are expected to provide invaluable insights to agricultural industry players, government agencies, and related organisations. These insights are expected to serve as a strong guide in supporting their efforts to optimise various aspects such as production, marketing, as well as service to consumers. As such, this research can serve as a significant contribution in improving the performance and resilience of the agricultural sector in an increasingly dynamic and changing era.

Thus, it can be understood that this research has a very important relevance in the context of modern, rapidly evolving agriculture. This research is expected to make a meaningful and positive contribution to the development of smarter, more adaptive and sustainable strategies in this massively transforming agricultural industry. By approaching the challenges and opportunities comprehensively, this research is expected to serve as a pillar in enhancing the competitiveness and resilience of the agricultural sector amidst increasingly complex and rapidly changing dynamics.

LITERATURE REVIEW

Social Media

Social media, or social media, is a digital platform that allows users to interact, share information, and communicate with others via the internet (Jamil et al., 2022; Suherlan, 2023). These platforms allow individuals, groups and organisations to create online profiles, post content such as text, images, video and audio, and participate in various forms of social activity such as commenting, liking and sharing. Social media has become an integral part of modern society's daily life and has changed the way we communicate, interact and access information (Wong et al., 2021). Some examples of the most popular social media platforms include Facebook, Twitter, Instagram, LinkedIn, YouTube and WhatsApp. Each platform has a different focus and features, such as Facebook which supports friendship and sharing content with family and friends, Twitter which is famous for its short messages, Instagram which focuses on sharing photos and videos, and LinkedIn which is used for professional networking. Social media also allows users to participate in various online communities that match their interests and hobbies. This creates opportunities to discuss certain topics, share knowledge, and keep up to date in areas such as politics, entertainment, business, and more. In addition, social media is also used by many organisations and companies as a marketing and communication tool. They can utilise these platforms to promote their products, services or brands to a wider audience, as well as to listen to customer feedback and opinions. Social media has a huge impact in various aspects of modern life, including communication, politics, economics, entertainment, and culture (Intyaswati et al., 2021). While there are many benefits associated with the use of social media, such as global connectivity, quick access to information, and business opportunities, there are also issues such as data privacy, the spread of disinformation, and psychological impacts that need to be considered. Therefore, the use of social media needs to be managed wisely and responsibly to maximise the benefits while mitigating the risks.

Market Trends

Market trends refer to the direction or pattern of change in consumer demand, supply, price, or preference for products or services within a particular industry or market (Na et al., 2019). It is a reflection of how consumer needs, preferences, and behaviour as well as economic, social, and technological factors change over time. A good understanding of market trends is essential for companies and industry players as it can help them make better strategic decisions in developing products, planning marketing, and managing their operations (Melović et al., 2021). Market trends can be changes in:

1. **Consumer Demand:** This includes shifts in consumer preferences towards certain types of products or services. For example, increased consumer interest in organic products or healthy food is an example of a market trend in the food industry.
2. **Product Offerings:** Trends can include changes in the types of products or services offered by companies. An example would be technology companies releasing new models of electronic devices every year.
3. **Price:** Price trends include changes in the price of a product or service, which can affect demand and supply. For instance, the decline in solar energy prices has affected the demand for the renewable energy market.
4. **Technological Innovation:** New technological developments can trigger market trends by creating new business opportunities or changing the way existing products or services are consumed. An example of this is the development of blockchain technology that has influenced the financial and crypto markets.
5. **Regulatory Changes:** Changes in government regulations can affect business conditions and create new market trends. For example, strict regulations on data privacy are affecting the tech industry.

A good understanding of market trends allows companies to adjust their strategies, better fulfil consumer needs, identify new business opportunities, and address threats that may arise. Market trend analysis often involves collecting and analysing market data, consumer research, and monitoring industry and economic developments that may affect demand and supply. With this information, companies can take appropriate steps to follow or even lead emerging market trends.

Agriculture

Agriculture is an economic sector and human activity that involves the cultivation of crops, livestock, and the production of other natural resources for the purpose of obtaining food products, feed, fibre, or raw materials required by society (Oluseun Adejumo & Adebukola Adebisi, 2021). Agricultural activities have been an integral part of human civilisation for thousands of years and are one of the fundamental aspects of providing food, clothing, building materials, and raw materials for various industries (Padam et al., 2014). Here are some key elements in the definition of agriculture:

1. **Crop Cultivation:** This includes the activities of planting and raising crops such as wheat, rice, maize, vegetables, fruits, and other crops. Crop cultivation can be done on farmland or in controlled conditions such as greenhouses.
2. **Livestock:** This involves raising and breeding animals such as cows, goats, sheep, chickens, pigs, fish, and other animals. Livestock are used to produce meat, milk, eggs, and other animal products.
3. **Land Management:** Farmers are responsible for caring for and managing farmland, including fertilisation, irrigation, pest control, and maintenance of soil fertility.
4. **Use of Technology:** As science and technology evolve, agriculture has adopted various technologies including farm machinery, chemical fertilisers, pesticides, automated irrigation, and biotechnology to increase production and efficiency.
5. **Product Diversity:** Agriculture produces a variety of products such as grains, vegetables, fruits, meat, milk, wheat, fibre, and others. These products play an important role in fulfilling the food, nutritional, and material needs of humans.
6. **Agribusiness Activities:** Apart from production, agriculture also involves agribusiness activities that include distribution, processing, selling, and marketing of agricultural products. Agribusiness connects farmers with end consumers.

Agriculture has a key role in feeding the world's population, supporting the economies of many countries, and playing an important role in environmental sustainability. It can also evolve in various forms, from conventional farming to organic and sustainable farming, depending on the methods and principles applied. Agriculture is also constantly evolving by utilising technology and innovation to increase productivity and efficiency, address challenges related to climate change and sustainability, and meet growing global demand (Wanof, 2023).

Consumer Preferences

Consumer preferences refer to the inclinations, choices and desires of individuals or groups of consumers towards certain products, services or attributes that influence their decisions to purchase or use a product or service (Hopia et al., 2023). These preferences are based on a variety of factors, including personal values, aesthetic preferences, functional needs, culture and personal experience. Some important points related to consumer preferences are:

1. **Subjectivity:** Consumer preferences are subjective, meaning they stem from the perceptions, judgements, and views of a particular individual or group. What one consumer considers important or attractive may not be the same as another.
2. **Influencing Factors:** Consumer preferences can be influenced by a variety of factors, including cultural, religious, educational, social, environmental, and economic values. For example, a consumer may have vegetarian preferences based on ethical values related to animal protection.
3. **Variation:** Consumer preferences can vary greatly between individuals and groups. Each person has unique preferences based on their life experiences and personal needs.
4. **Advertising and Marketing Influence:** Companies often use advertising and marketing strategies to influence consumer preferences. They try to create a positive image of their product or service that matches the preferences of the target consumer.
5. **Change in Time:** Consumer preferences may change as time passes and the social, cultural and economic environment changes. For example, a person's food tastes may change with age.
6. **Importance in Purchase Decisions:** Consumer preferences play a key role in purchase decisions. Consumers tend to choose products or services that match their preferences, and this can affect the success or failure of a product or brand in the market.

It is important for companies and manufacturers to understand consumer preferences as this allows them to design products, services, and marketing strategies that are more in line with market desires. It also helps in identifying new opportunities, optimising existing products, and building long-term relationships with customers. Market research, consumer data analysis, and customer feedback are some of the methods used to understand consumer preferences and take more informed business decisions.

RESEARCH METHOD

This research is a literature review that adopts a qualitative approach, which means it will analyse and interpret data by relying on information and texts from various sources. The main focus of a qualitative literature review is to collate, evaluate and integrate existing knowledge on the topic under study, namely social media sentiment analysis to understand agricultural market trends and consumer preferences. In this research, data will be collected from various sources relevant to the topic under study, such as scientific journals, books, research reports, and other articles. The data period covers the time from 2014 to 2023, which allows the researcher to see developments, trends, and changes that have occurred during this period.

The qualitative approach in the literature review allows researchers to describe and characterise complex and multidimensional issues in greater depth (Elo et al., 2014). In addition, this method makes it possible to involve multiple sources of information and cover a range of different viewpoints, thus enriching the analysis and strengthening the validity of the findings. The data collection process will involve meticulous text analysis, searching for information, and categorising relevant data for the research topic. Subsequently, the author will collate this information in a structured format, compare and synthesise findings from multiple sources, and identify patterns, themes and trends that emerge from the collected data.

One of the advantages of a qualitative literature review is its flexibility in understanding and explaining complex phenomena, as it is not limited by numerical or statistical constraints (Rahman, 2016). This method also allows researchers to gain deep insights into how the topic under study has evolved over time, as well as how concepts and understandings of the topic have changed over the years. In this research, it is important to scrutinise the reliability and credibility of the sources used, as well as critically analyse the information collected. With a qualitative approach, the researcher must be able to present findings objectively and reflectively, provide clear and accurate interpretations, and recognise the limitations of the methods and data used (Bradshaw et al., 2017). The conclusion of this research will hopefully provide a comprehensive picture of the development of the topic under study over the 2014 to 2023 time period, and may also provide recommendations for further research that can broaden the understanding of issues related to the topic.

RESULTS AND DISCUSSION

In this rapidly evolving digital age, social media has grown into a major platform where people quickly and widely share their thoughts, feelings and preferences. For industry players in the agriculture and marketing sectors, a deep understanding of market trends and consumer preferences is not only important, but also more vital than ever (Mehrabi et al., 2022). Therefore, it is important to recognise that social media sentiment analysis has become one of the most effective and necessary tools in gathering valuable insights into how consumers perceive, interact and respond to agricultural products.

Social media sentiment analysis is a process that involves the collection, processing, and interpretation of data obtained from various social media platforms with the aim of comprehensively identifying and understanding the sentiments, opinions, and attitudes held by consumers regarding agricultural products and the dynamics of emerging market trends (Taherdoost & Madanchian, 2023). The analysis process involves the application of various algorithms in natural language processing (NLP) and techniques related to machine learning to categorise texts generated by social media users into three main categories: positive, negative or

neutral. Furthermore, through this process, social media sentiment analysis is able to provide a highly in-depth and contextualised view of consumer preferences, as well as the ability to identify significant changes in market trends that are constantly in motion. With its exceptional ability to extract meaning from large and complex social media data, sentiment analysis becomes an invaluable source of information in helping agricultural and marketing industry players formulate strategic decisions that are more targeted and responsive to changing market needs (Grande-Ramírez et al., 2022).

One of the most significant aspects of social media sentiment analysis capabilities is its ability to real-time and dynamically capture ongoing changes in consumer opinions and feelings (Xu et al., 2022). When a new agricultural product is launched into the market or when agriculture-related issues come up in the news and public debate, people often quickly flock to social media platforms to talk and share their views about it. Through careful and detailed research and monitoring of these online conversations, agricultural industry players can very quickly identify, measure and analyse whether consumer responses are positive, negative or even neutral (Pakurár et al., 2019). By having an in-depth understanding of these dynamics, they can design more responsive responses, adapt to changing market trends more efficiently, and direct more proactive strategies to meet consumer demands and expectations more accurately and sustainably.

As a concrete example, imagine if a farmer was recently faced with serious constraints in their crop yield as a result of extremely bad weather. In this kind of situation, social media sentiment analysis has the capability to not only identify, but also measure very precisely the level of frustration and concern that may arise among consumers in relation to this issue. The data generated from this analysis can then be used as a solid basis for developing more in-depth and effective communication strategies (Galli, 2021). For example, the results of this sentiment analysis can form the basis for designing a more comprehensive and efficient communication campaign. Such a campaign could focus on explaining in detail the challenges faced by farmers and the concrete efforts that have been or are being made to address these issues. By doing so, farmers and agricultural industry players can more effectively communicate with consumers and explain how they are working to ensure better quality and availability of agricultural products in the future.

Not only that, it should be emphasised that social media sentiment analysis also has very important capabilities in helping to identify trends that may be emerging or developing in the agricultural market. As a concrete example, let us imagine that more and more people are starting to initiate and discuss topics related to vegetarian and vegan diets on various social media platforms. This could be a very meaningful indication that the demand for agricultural products that suit these lifestyles may be experiencing a significant increase. Therefore, social media sentiment analysis has the potential to provide invaluable insights to the agricultural industry (Dilleen et al., 2023). By utilising the data and information found in these analyses, agricultural industry players can respond in a highly adaptive and responsive manner (Akhter & Sofi, 2022). They can adjust their production strategies to meet emerging needs or even develop new products that are more in line with emerging market trends. These are proactive measures that can help them stay relevant and competitive in a changing and dynamic era of agriculture.

However, it is important to remember that social media sentiment analysis is not without its challenges. In practice, we often have to be prepared to face some significant obstacles. One of the main obstacles is that the data obtained from social media platforms can be too noisy or not always accurate, and this requires us to perform more in-depth and careful data processing in order to generate truly meaningful and relevant insights (Stieglitz et al., 2018). In addition, it should not be forgotten that the issue of user privacy is also a very important one that needs serious attention. In using social media data for sentiment analysis, we must always keep the steps taken in line with applicable privacy guidelines and regulations, and respect the privacy rights of individuals. By ensuring that we take ethical and lawful actions, we can maintain the integrity of social media sentiment analysis while respecting and carefully safeguarding user privacy (Ryan & Stahl, 2021).

To further summarise, it is important to emphasise that social media sentiment analysis has proven to be an invaluable and indispensable tool for agricultural industry players in understanding the dynamics of market trends and evolving consumer preferences. By combining the power of

natural language analysis and machine learning, agricultural industry players are able to carry out critical tasks, such as identifying consumer sentiment in real-time, gauging consumer response to specific events or products, and designing more effective and responsive strategies in the face of changing market needs. Through this increasingly crucial role, social media sentiment analysis has become one of the key elements in the effort to guide the agriculture industry towards a smarter, adaptive and sustainable future. By utilising the insights provided by these analyses, industry players can make better decisions, innovate in the production and marketing of agricultural products, and maintain their relevance in the face of a rapidly changing era. In other words, social media sentiment analysis has become a crucial foundation in shaping a bright and sustainable future for the agriculture industry.

CONCLUSION

Social media sentiment analysis is an invaluable tool for agricultural industry players in understanding market trends and consumer preferences. Using natural language processing and machine learning techniques, these analyses enable real-time monitoring of consumer opinions and feelings regarding agricultural products and agriculture-related issues. Some of the main conclusions that can be drawn from this approach are:

- a) Identification of Market Trends: Social media sentiment analysis helps in identifying emerging market trends, such as changes in consumer preferences towards certain types of agricultural products or shifts in lifestyle that affect demand.
- b) Product Response Monitoring: Agricultural companies can use these analyses to understand the extent to which new products or changes in existing products are being accepted by consumers. This enables them to respond quickly to any problems or opportunities that arise.
- c) Communication Strategy Improvement: Sentiment analysis helps in designing more effective communication strategies by understanding how consumers perceive certain brands and products. This helps in building a positive brand image and strengthening customer relationships.

To maximise the benefits of social media sentiment analysis in the agriculture industry, here are some suggestions:

- a) Data Source Development: It is important to expand the data sources used in sentiment analysis. Apart from the major social media platforms such as Twitter and Facebook, considering other data sources such as agricultural blogs or discussion forums can provide more complete insights.
- b) Customisation of Analysis: Every agricultural enterprise has unique needs and goals. Therefore, it is important to customise sentiment analysis to the specific needs of the company and the market they serve.
- c) Integration with Other Systems: Integration of sentiment analysis results with customer management systems and supply chain management systems can help in taking more effective actions based on the insights gained.
- d) Privacy Protection: Companies must always maintain consumer privacy and ensure that the use of social media data complies with applicable privacy regulations.
- d) Personnel Training: Skills in social media sentiment analysis are valuable assets. Training personnel in natural language processing and data understanding can help maximise the benefits of this analysis.

By applying social media sentiment analysis wisely, agricultural industry players can take smarter and more proactive steps in meeting the changing market needs and ensuring the sustainability of their business in the future.

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