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ANALYSIS OF BRAND RANKINGS OF BUSINESS PROCESS OUTSOURCING COMPANIES USING SOCIAL NETWORK ANALYSIS AND TEXT ANALYSIS

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Abstract
By interacting on Twitter, this study seeks to ascertain the brand rankings of three companies in the Business Process Outsourcing (BPO) sector in Indonesia, namely Infomedia Nusantara, Vads Indonesia, and Teleperformance Indonesia. One of their work scopes is to provide employees to deliver outsourced services. Additionally, it seeks to ascertain the most frequently discussed topics on the platform, the opinion from internet contribute to the recruitment of qualified human resources in BPO companies. Descriptive research using a mixed-technique approach is what this study is. Utilizing interaction data from social media, Social Network Analysis and Text Analysis are the methodologies merged. People who engage with the research object using keywords on Twitter make up the population of this study, whereas people who do so during January 2021 and May 2023 make up the sample. Twitter tweets (tweet, retweet, respond, mention) comprise the data used in this study. PhantomBuster, Gephi, and Python are used to gather and examine data. The study's findings indicate that Infomedia Nusantara had the highest brand awareness ranking on social media for the value of these properties: Node, Edge, Average Degree, Average Clustering Coefficient, Number of Communities, and Connected Component. Teleperformance had the lowest amounts of Node and Edge representing the amount of conversation about it in Twitter, but also had the highest Density and Modularity. The dominant context of discussion is about job vacancies and work life at the three companies. Teleperformance Indonesia had the most favourable opinion from internet users on the three BPO companies that were the subject of the study. Brand awareness has the power to arouse curiosity and provide an overview of the company. High brand awareness among job seekers will make it easier for BPO companies to find prospective workers needed to provide services or business process outsourcing services to client companies.

Keywords: Brand Awareness, Social Media, Business Process Outsourcing, Social Network Analysis, Sentiment Analysis, Text Analysis

Introduction

The increasing usage of social media is one indicator of how quickly technology changes the way people communicate with one another. Social media is an application that facilitates interpersonal communication and the creation of social networks, which raises social capital. Social media serves as an example of how publishers can reach thousands of individuals with their words, fostering deep connections and fervent commitment. Using Facebook, blogs, Twitter, My Space, LinkedIn, and other platforms for communicating as well as uploading images and videos are examples of social media (Damota, 2019). Some people utilize social media as a source of

enjoyment. A person experiencing these emotions typically turns to social media as a means of overcoming the loneliness brought on by a dearth of face-to-face interactions. Long-distance contacts, education, news, information, and insights can all be found through social media. Social media users no longer have to worry about barriers like cost, location, or time to communicate, share information, or share news with one another (Yohanna, 2020).

Social media interactions between people have the ability to produce unstructured, more extensive, and detailed digital data. Large volumes of data, social media analytics, next-generation data management tools, real-time data, and much more are all included in the widely used term "big data." It also represents developments in technology trends that provide fresh perspectives on interpreting current patterns and helping people make wise choices. According to Matilda (2016), the majority of big data spikes are illogical and comprise text, pictures, videos, or a mix of these. Big Data is created from vast amounts of knowledge that are made up of many different kinds of data and are rapidly increasing. One of the most widely used internet technologies, big data gives organizations the ability to manage information about their physical surroundings for more precise performance monitoring in the face of obstacles. Big Data is produced when a single primary storage facility houses vast volumes of data supporting certain transactions. For the analysis and management of Big Data produced in the digital world, Big Data Technologies (BDT) is emerging as a promising technology (Ziezo et al., 2021). In social media, the accumulated of human social interaction form large scale unstructured data that possibly store timely knowledge. Social Network Analysis (SNA) methodology can be used to perform knowledge extraction from those unstructured data. SNA also provide the way to model user interaction pattern in social media (Alamsyah et al., 2018).

Big data analysis from social media is touted as the answer to creating traditional business intelligence tools and helping businesses and organisations make better decisions. Owing to the vast user base on social media sites, enormous amounts of unstructured data are produced quickly. It is necessary to analyse these data in order to get fresh insights. To address the rise in data generation on social media platforms, a variety of analyses, including sentiment analysis and network analysis, as well as numerous techniques, including data mining and machine learning, can be applied (Darwiesh et al., 2022).

Social media platforms are become the main online spaces where people express both good and negative feelings. Through blog entries, comments, pictures, likes, and other interactions, social media users can convey their emotions. The development of sentiment is largely dependent on social interactions. Recent studies demonstrating the emotional contagion among friends raise the prospect of sentiment prediction through network structure. Research on sentiment analysis focuses on predicting sentiment from text without taking into account how users' opinions and feelings are inevitably influenced by their peers. Just the structural characteristics of social networks can be used to forecast sentiment (Jin & Zafarani, 2019).

Social media platforms have emerged as crucial avenues for people to grow their social networks. People can create new communities or join ones that already exist, as well as friend or follow other people. The usage of social media also improves brand dominance, top-of-mind

awareness, recall, recognition, and awareness. The large number of talented job applicants encourages businesses to create strong company brands that project a positive impression to potential job applicants to attract job applicants with the best qualifications (Bahri-Ammari et al., 2022).

Employer Branding is positively and significantly related to intention to apply for a job. Employer Branding not only predicts the decision to apply for a job offer but also reduces turnover intentions. The research results show that the better the company's reputation in the labor market, the greater the intention to apply for a job. This means that the greater the reputation of the organization, in relation to the image of the workplace, the greater the candidate's motivation to work there. Similarly, when organizations have formal management strategies to improve their company reputation, for example using social media, it is likely that the number of job offer applicants will increase (Junça Silva & Dias, 2022). Research findings show that social values are very important values for employees or recruiting new employees in organizations. It is clear that job seekers prioritize social values. In looking for work they prioritize employer-employee relationships, good relationships with co-workers so that they can feel a sense of belonging to the organization (Kumari et al., 2020).

The concept of business development is wide and can be categorised based on the type of firm. The B2C model is where business procedures take place between the Business Company and the Customer. According to Kharat & Nagare (2021), the business process between two businesses occurs under the B2B model. A company that engages in business-to-business (B2B) transactions is a Business Process Outsourcing (BPO) organisation. Businesses all accross the world use business process outsourcing, or BPO, to do business. Business Process Outsourcing (BPO) yields additional advantages that ultimately contribute to increase corporate efficiency (Du & Miao, 2022). The act of assigning one or more business processes to a corporation (third party) that oversees and manages the chosen processes is known as business process outsourcing, or BPO. Business process outsourcing, or BPO, is used as a cost-cutting strategy for jobs that need to be done but are handled by a business that isn't dependent on them to stay in business. This lowers operating costs for the company by allowing it to concentrate on its main business. Generally, precise rules based on quantifiable performance measures and definitions are provided to third-party BPO providers. Companies often tend to outsource specifically non-core tasks such as people, resources, finance and payroll, customer relationship management and IT services. Business process outsourcing (BPO) is often divided into two categories: back office outsourcing which includes internal business functions such as billing or purchasing, and front office outsourcing which includes customer-related services such as marketing or technical support (Jilbert et al., 2002).

The top two BPO businesses in Indonesia according to data published by themanifest.com (2023) are Infomedia Nusantara and VADS Indonesia. Infomedia Nusantara is a local business that is part of the Telkom Group, while VADS is an international BPO company that has entered the Indonesian market. Another international BPO company, Teleperformance, was ranked eighth

out of the Top 23 BPO Businesses in the world according to runningremote.com in 2020. Additionally, Teleperformance established Teleperformance Indonesia as a business there. The problem formulation in this research is how can the brand awareness rating of the three BPO companies studied be seen from the social media discussion network that uses the SNA method according to the description above? Which BPO-related social media topics are most discussed by the public? What do netizens think about the three BPO companies that are the subject of this research? Apart from that, what is the impact of social media brand recognition, especially BPO, on job seekers?

Research on brand recognition for the three BPO companies under study—Infomedia Nusantara, Vads Indonesia, and Teleperformance Indonesia—as well as sentiment analysis through the use of social network analysis are crucial. Finding out how popular a topic is on social media for brand awareness, how netizens view the three BPO companies under investigation are the main objectives of this study. A related study titled "Social Network Modeling Approach for Brand Awareness" carried out by Alamsyah et al. (2014) states that brand awareness effort can be modelled using social network approach, which contributes in selection of cheap and widespread online conversation data, modeling the data into a social network/graph model. However, the qualitative effort has to be made to interpret the metrics and measurement results.

Another related study, "Social Network Analysis About Brand Awareness of Shopee Indonesia on Twitter" was carried out by Rumapea et al. (2022) through the use of the Netlytic and Gephi software and the Social Network Analysis (SNA) research method, the study seeks to ascertain brand awareness on the Shopee Indonesia social network on Twitter via the hashtag #ShopeeID. This research and Social Network Analysis (SNA) share the same methodology and tool, that is Gephi. Alamsyah et al. (2017), in a study titled "Top Brand Alternative Measurement Based on Consumer Network Activity", carried out a methodology to compare brands using SNA, as an alternative to measure top brand instead of using legacy methods. SNA measures social network dynamics of the market, while legacy methods measure property of each sampled individual with complete and in-depth exploration. SNA methodology is better adapted to the future of Big Data era for the reason of processing speed.

In addition, the distinction is also found in the subject of study. With the title "Combining Social Network Analysis and Sentiment Analysis to Explore the Potential for Online Radicalization," Bermingham et al. (2009) conducted a similar study. The study's similarities include the use of social network analysis and sentiment analysis tools, an examination of the themes covered, and the polarity of sentiment (favourable or unfavourable) to the subject. This research differs in that the thing under study is the centre of attention. Kurniawan (2022) carried out more pertinent study under the heading "Social Network Analysis On Twitter Sentiment Data Using Netlytic (Case Study: 'Ganjar' And 'World Cup')". The fact that both studies employ the Social Network Analysis On Twitter Sentiment Data approach is one of their commonalities. The subject under study makes a difference. The focus of the study is on "Ganjar" and the "World Cup," and the three BPOs are examined. This research has consequences for BPO companies in

terms of choosing social media branding programmes and assessing those that have already been implemented. This study adds to our understanding of how the Social Network Analysis approach is applied to measure brand awareness in BPO organisations, which is valuable information for other studies.

Research Method

This research is descriptive research with a mixed method quantitative and qualitative approach. The population is social media users on Twitter who interact using keywords related to the research object. The keywords in question are:

1. Object: Infomedia Nusantara
   Keywords: infomedia, "info media", infomedianusantara, infomed
   Exception: “solusi humanika”
2. Object: VADS Indonesia
   Keywords: Vads, Vadsid, Vadsindonesia, Vadsindo
3. Object: Teleperformance Indonesia
   Keywords: teleperformance, "TP Indonesia", "TP ind", "tele performance"

The sample in this research is Twitter social media users who interact using keywords related to the research object. The data source used in this research is based on the User Generated Concept (UGC) where the data is taken from social media which contains content created by the user themselves. The data taken in this research are tweets from Twitter (tweet, retweet, reply, mention). Data was collected using the PhantomBuster by scraping the keywords during the period Jan 2021 – May 2023, and had been validated to take out the irrelevant contents.

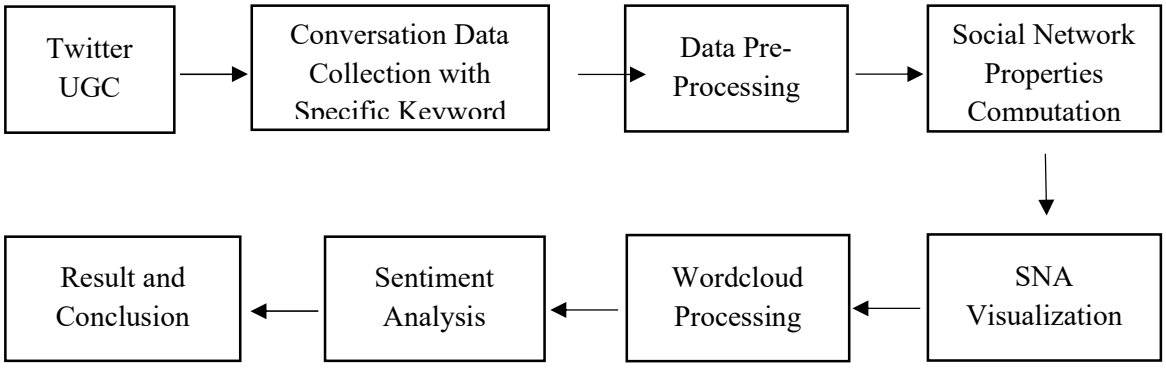


Figure 1. The Research Workflow

The techniques used in analyzing the data are as follows:

1. Social Network Analysis
   a. Collected data is processed using Gephi to determine the value of network properties

b. From this data, a visualization is created to make it easier to see the network that is formed
c. The network property values of each research object are then compared and ranked based on their relationship to brand awareness.
d. Then conclusions are drawn regarding the brand awareness ranking which is the result of SNA.

2. Text Analysis
   a. Collected data is processed using Phyton (wordcloud generator module) to get the most discussed topics. To get relevant topics, cleaning was carried out on words that had no meaning for the research object. An analysis is carried out on topics that are widely discussed.
   b. Collected data is processed to analyse the sentiment with VADER method (Valence Aware Dictionary and sEntiment Reasoner). Sentiment analysis was carried out to determine public perception of the research object.

Result and Discussion

After data analysis, several information was obtained such as social network properties, frequently discussed topics as well as positive, neutral and negative sentiment.

1. The brand awareness ranking of the three BPO companies that were the object of research was seen from conversation networks on social media using the SNA method

Calculating the social network's properties is one analysis that can be done on the newly established social network. Social network features of user interactions related to BPO were calculated through investigation on Twitter, and the Gephi programme was utilised for analysis. The social network computation findings that are comparable are as follows:

Table 1. Social Network Properties

Parameter	Infomedia	VADS	Teleperformance	Rank
Number of Community	445	212	141	1. Infomedia 2. VADS 3. Teleperformance
Node	1274	629	345	1. Infomedia 2. VADS 3. Teleperformance
Edge	2162	1085	425	1. Infomedia 2. VADS

				3. Teleperformance
Density	0.001	0.001	0.003	1. Teleperformance 2. Infomedia 3. VADS
Modularity	0.814	0.826	0.841	1. Infomedia 2. VADS 3. Teleperformance
Diameter	4	3	2	1. Teleperformance 2. VADS 3. Infomedia
Average Degree	0.989	0.909	0.89	1. Infomedia 2. VADS 3. Teleperformance
Average Path Length	1.417	1.092	1.014	1. Teleperformance 2. VADS 3. Infomedia
Average Clustering Coefficient	0.028	0.025	0.014	1. Infomedia 2. VADS 3. Teleperformance
Connected Component	1267	624	344	1. Teleperformance 2. VADS 3. Infomedia

Source: Rahmah, 2023

In relation to the BPO of three companies throughout the research period—Infomedia Nusantara, VADS Indonesia, and Teleperformance Indonesia—the table above compares the social network features created by user interactions on Twitter. The number of communities is the first attribute that needs to be compared. Communities may now appear rapidly and communicate efficiently thanks to social media. They may have comparable difficulties, interests in the same pastimes or political topics, or even similar TV series. There will be more subjects or interest in a particular issue to be discussed the more communities there are. With a value of 445, Infomedia has more communities than Vads Indonesia (212) and Teleperformance (141).

The nodes are the second property that is compared. The number of actors in the social network increases with node height. This in the business world may suggest that a large number of actors are aware that the BPO industry exists. Infomedia has the greatest node network property value, with 1274 nodes, indicating that there are 1274 players interacting on Twitter. Vads comes in second with 629 nodes, followed by Teleperformance with 345 nodes.

Edge is the third characteristic to be compared. Edge depicts the interactions that occur between actors. The higher the edge value, the more talks there are about the company on Twitter social media. Infomedia Nusantara has the greatest edge value, namely 2162 edges, followed by Vads Indonesia with 1085 edges and Teleperformance with 425 edges.

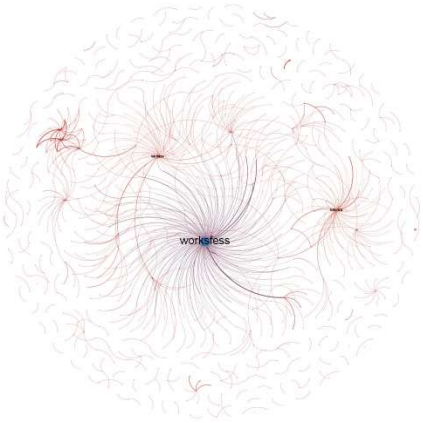


Figure 2. Visualisation of Social Network for Infomedia Nusantara

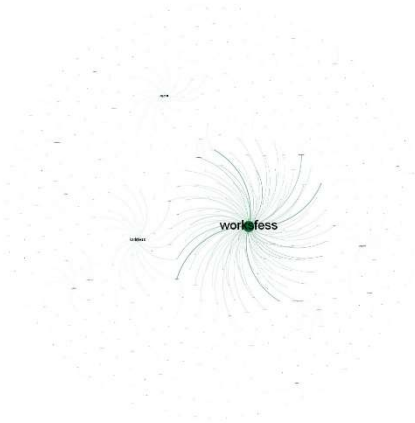


Figure 3. Visualisation of Social Network for VADS Indonesia

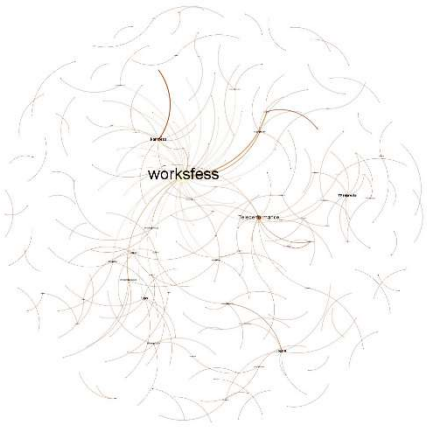


Figure 4. Visualisation of Social Network for Teleperformance Indonesia

Figure 1, 2 and 3 shows that the dominant actor for all research objects is "worksfess". “Worksfess” is an auto-based account for workers, has >700 thousand followers. Workers who follow this account usually share with each other on this account on topics regarding job vacancies, work experience and other work-related information. This makes sense considering that the three BPOs studied assigned one or more business processes to an organization (third party) tasked with supervising and managing the selected processes. Therefore, the majority of auto base account followers of "worksfess" workers also follow BPO accounts with the aim of getting information related to job vacancies and open recruitment which are frequently posted.

The fourth network property comparison is average degree. Average degree represents the average number of relationships an actor has in a social network. The greater the average degree number, the better because each player in the network has numerous relationships, which will improve the dissemination of information. The company which has the biggest average degree value is Infomedia with a value of 0.989, followed by Vads Indonesia with a value of 0.909, and in last place is Teleperformance with a value of 0.89.

The diameter comparison is the following one. The largest distance between nodes is called the diameter. Within the social network, information will spread more quickly the smaller the diameter. With a score of 2, Teleperformance has the smallest diameter in user talks about BPO, followed by VADS Indonesia with a value of 3, and Infomedia with a value of 4. Average path length is another metric that may be used to gauge how quickly information is shared across participants in a social network. The average path length, according to Alhajj and Rokne (2014), is the average distance between nodes. With an average path length value of 1.014, user interactions with Teleperformance have the lowest value. Vads Indonesia comes in second with a value of 1.092, Infomedia is last with a value of 1.417.

Density, also known as network density, is the next feature. It is the ratio of the number of relationships in a network to the total number of relationships that can exist in that network.

A network's density might range from 0 to 1. The link is more shaky the closer it gets to zero. With a number of 0.003, Teleperformance has the highest BPO density. Infomedia and Vads Indonesia follow with a density value of 0.001.

The next property is modularity, which means that the more time two people spend together, the more likely it is that they have friends in common and, eventually, that there is a greater chance that they will both be members of the same group or community. utilised to determine the number of group partitions needed to create the ideal or optimum community structure, as well as the quality of the network structure. The value of modularity ranges from 0 to 1. "A high modularity value indicates a more optimal partition." When the modularity value is zero, the network is regarded as a single community and there is no community partitioning. In the event of a negative result, every node is divided into discrete or unknown communities. Teleperformance had the highest modularity is 0.841, while Vads Indonesia follow with 0.826 and Infomedia with 0.814.

The Average Clustering Coefficient is the following characteristic. The degree to which vertices in a network prefer to cluster together is measured in graph theory by the clustering coefficient. Research indicates that nodes in most real-world networks, and particularly social networks, form close-knit groupings with a comparatively high tie density; this probability is typically higher than the average probability of a tie between two nodes arising at random. With an average clustering coefficient of 0.028, Infomedia leads the field. Vads Indonesia is next with a value of 0.025, and Teleperformance is last with a value of 0.014.

Connected Component is the following property. In an undirected graph, a connected component, also known as a simple component, is a subgraph where every pair of nodes is connected to every other node through a path. Still, let's attempt to simplify it even more. In an undirected graph, a set of nodes is said to be connected if each node in the set can traverse edges to reach any other node. Reachability is the key consideration here. Every node in a connected component can always be reached from every other node. Every node in a component with robust connectivity may always access every other node. Infomedia (1267), Vads Indonesia (624) and Teleperformance (344) are the three companies Connected Component .

2. The topics most discussed by the public on social media

Using the WordCloud Generator module in Phyton, we processed the data gathered to determine the most talked-about subjects. Figure 4 shows the most discussed topics on the Infomedia Nusantara account.

Figure 5. WordCloud for Infomedia Nusantara

In Figure 4 we can see that the words with the largest size are the words most often discussed. Telkom, Telkom Indonesia, Work, Lowongan Kerja (in English – Job Vacancy), are the words or topics most often discussed because Telkom Indonesia is one of Infomedia Nusantara's clients. One of Telkom Indonesia's projects handled by BPO Infomedia Nusantara is telecommunications call center services. This means that in working on the telecommunications call center project, Infomedia Nusantara was given the mandate to manage the project starting from opening call center job vacancies, talent search, interview process to human resource management.

Figure 6. WordCloud for VADS Indonesia

In Figure 5 we can see that the words with the largest size are the words or topics that are most often discussed, namely Jogja, Loker – abbreviation of Lowongan Kerja (Job Vacancy in Indonesian). This makes sense because VADS Indonesia is a BPO or third party that opens job vacancies in three cities, namely Jakarta, Semarang, and Yogyakarta (Jogja). Apart from that, topics such as Call Center, E-Commerce, and Telemarketing are also mentioned. The correlation of this topic with VADS Indonesia is reported on the site lokerjogja.id, several job vacancies opened by VADS Indonesia include Live Chat E-Commerce (English), CEC E-Commerce, Telecommunication Call Center, Telemarketing Provider, Telemarketing Mobile App, Call Center E-Commerce.

Figure 7. WordCloud for Teleperformance

In Figure 6 we can see that the words with the largest size are the words or topics that are most often discussed about Teleperformance, namely Vads, work, kerja (in English – work), jogja, and TP. This makes sense because Teleperformance or commonly abbreviated as "TP" is a BPO or third party that opens job vacancies in Jogja which is located at Jogja City Mall First Floor, Jl. Magelang, Kutu Patran, Sinduadi, District. Mlati, Sleman Regency, Special Region of Yogyakarta 55284. The topic "Vads" is mentioned because Teleperformance is also one of the BPO competitors of VADS Indonesia.

3. Netizens' perceptions of the three BPO companies

This study used VADER methodology for sentiment analysisChat. VADER Sentiment Analysis uses a pre-developed lexicon and is trained to recognize words along with weighting to calculate a sentiment score. The data findings from this study were descriptively analysed to determine the proportion of respondents who gave the three BPO companies under investigation positive responses.

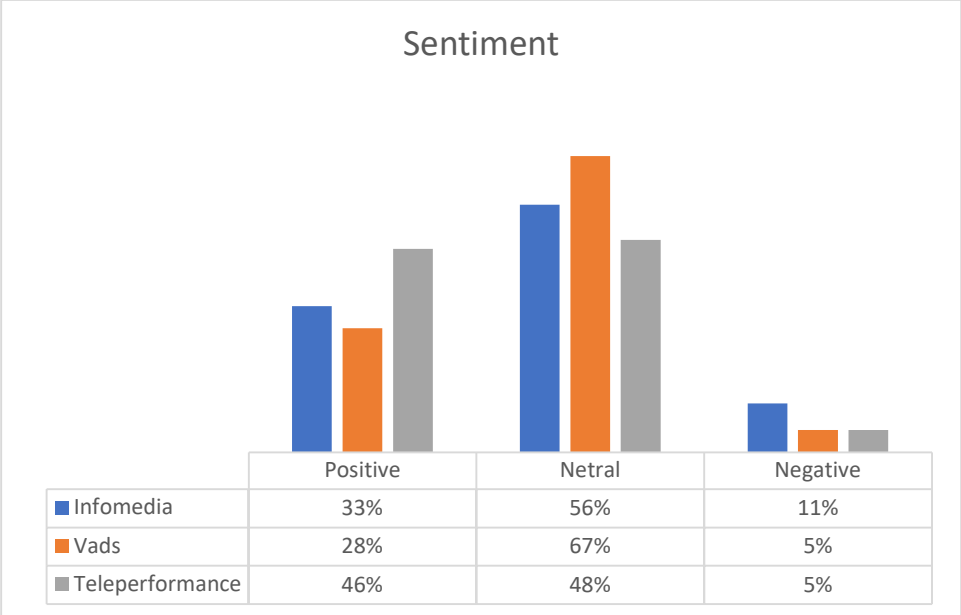
Table 2. Sentiment Data on Respondents' Perceptions

SENTIMENT	Infomedia		VADS Indonesia		Teleperformance	
	Total	**%**	**Total**	**%**	**Total**	**%**
Positive	720	33%	299	28%	197	46%
Netral	1214	56%	730	67%	206	48%
Negative	228	11%	56	5%	22	5%
Total	**2162**	**100%**	**1085**	**100%**	**425**	**100%**

Scores are measured by VADER Sentiment Analysis. Scores range from -1 (negative sentiment) to 1 (positive sentiment).

Sentiment: Neutral (0.0), Positive (>0.05), Negative (<-0.05).

Information on positive, neutral, and negative sentiment from the three BPO companies under study is shown in Table 2. By dividing the number of sentiments by the total number of sentiments for each company, the percentage is computed.



	Positive	Netral	Negative
Infomedia	33%	56%	11%
Vads	28%	67%	5%
Teleperformance	46%	48%	5%

Figure 8. Perceptions as a Percentage from the Three Companies

With a percentage of 46%, Teleperformance was seen as having the most positive perception, followed by Infomedia with a 33%. Finally, Vads Indonesia received a positive perception of 28%. The overwhelmingly good response Infomedia Nusantara received suggests that. Additionally, with a percentage of 67%, Vads Indonesia garnered the biggest neutral perception sentiment, followed by Infomedia at 56%. A neutral perception of 48% went to Teleperformance. With a percentage of 11%, the final attitude represents the highest negative perception of the Infomedia, followed by Vads Indonesia and Teleperformance at 5%.

4. Brand awareness of BPO Companies on social media

Brand awareness has been proposed as a tool that helps people recognize, identify and recall a brand. Even in its early stages, brand awareness has the power to arouse curiosity, paint a picture of the company, and demonstrate loyalty (Bilgin, 2018). Brand advertising on social media is an effective factor in building brand awareness (Dülek & Saydan, 2019).

High brand awareness among job seekers will make it easier for BPO companies to find prospective workers needed to provide services or business process outsourcing services to client companies. This is in line with research conducted by Rumangkit & Dwiyan (2019) which shows that employee branding can influence job seekers' interest in participating in the recruitment process. Therefore, companies are advised to create a policy to accommodate employee branding activities to attract labor market interest. The dimensions of Employer

Branding, namely psychological value, application and innovation, influence the company's reputation and this is positively related to the intention to apply for a job offer. Therefore, an organization's focus on implementing strategies to better manage their brand and reputation will not only increase the number of candidates but can also reduce the costs of recruiting and training new employees (Junça Silva & Dias, 2022). There is no visible discussion of BPO companies from the client side, such as positive experiences in outsourcing business processes to BPOs. This is normal because of course a company is not always open to the public about the parties behind it in carrying out its various business processes. However, the existence of BPO companies that receive positive sentiment on social media from employees and job seekers can be a consideration for companies that need business process outsourcing services to choose certain BPO companies as their business partners.

Conclusion

Based on SNA results and topics that are widely discussed, the highest brand awareness is Infomedia, followed by VADS, and finally Teleperformance. This shows that Infomedia is the BPO best known to job seekers, compared to Vads and Teleperformance. High brand awareness among job seekers will make it easier for BPO companies to find job candidates needed to provide services or business process outsourcing services at client companies. There is no visible discussion about BPO companies from the client side, such as positive experiences in outsourcing business processes to BPO. This is normal because of course a company is not always open to the public about the parties behind them in carrying out various business processes. However, the existence of BPO companies with positive sentiment on social media from employees and job seekers can be a consideration for companies that need business process outsourcing services to choose certain BPO companies as their business partners. The research has limitations because it only examined three business process outsourcing (BPO) objects and only connected them to one variable—brand awareness. Future research ideas include expanding the scope of the study or the number of business process outsourcing (BPO) cases, as well as connecting the latter to a variety of additional variables in addition to brand awareness.

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