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E-BOOK OF EXTENDED ABSTRACTS

ASPECT-BASED SENTIMENT ANALYSIS OF EMPLOYEE SATISFACTION AND COMPANY RECOMMENDATION IN MALAYSIA'S IT INDUSTRY BASED ON GLASSDOOR REVIEWS

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ABSTRACT

The Malaysian information technology (IT) sector has seen significant transformation, with job seekers increasingly relying on employee-generated content to assess company culture and workplace satisfaction. However, many existing platforms do not break down reviews into specific aspects, making it difficult for users to make employment decisions based on their preferences of aspects of employee satisfaction. This study addresses the need for structured insights by implementing aspect-based sentiment analysis (ABSA) on employee reviews sourced from Glassdoor. The system employs Support Vector Machine (SVM) classifiers to categorise reviews into sentiments, as well as into one of five aspects of employee satisfaction which are career growth, management, benefits, salary, and work-life balance. The classification models achieved 81.47% accuracy for sentiment classification and 75.64% for aspect classification. Moreover, a content-based filtering (CBF) approach, supported by cosine similarity, was used to generate personalised company recommendations based on user priority of each aspect of employee satisfaction. The system's features include interactive data visualisations using charts and word clouds which provide users with an intuitive understanding of sentiment trends. Usability testing showed that the system reduced decision-making time by 84.18%, with an average user satisfaction score of 4.93 out of 5. The findings demonstrate that applying ABSA and CBF to Glassdoor reviews can significantly improve career decision-making by offering structured, aspect-level insights and personalised recommendations.

Keywords: *Aspect-Based Sentiment Analysis, Employee Satisfaction, Support Vector Machine, Content-Based Filtering, Glassdoor*

INTRODUCTION

The use of job search platforms like Glassdoor has made employee-generated reviews a primary resource for job seekers assessing company culture and workplace satisfaction within Malaysia's rapidly expanding information technology (IT) sector (Feng, 2023). However, a significant challenge persists where these reviews are often unstructured and overwhelming, making it difficult for job seekers in Malaysia's IT industry to extract meaningful insights on the factors that matter most to them (Ren et al., 2022). This lack of structured data directly contributes to the difficulties job seekers face when comparing companies on specific aspects of employee satisfaction (Sainju et al., 2021). As a result, a common outcome is a mismatch between a job seeker's expectations and the actual work environment, which can lead to higher turnover rates and professional dissatisfaction (Wang, 2024).

To address this challenge, this research introduces a web-based system designed to provide structured, data-driven insights into employee satisfaction within Malaysia's IT industry. The core of this system is its implementation of Aspect-Based Sentiment Analysis (ABSA) on employee reviews from Glassdoor. It employs Support Vector Machine (SVM) classifiers to not only determine the overall sentiment of a review but also to categorize it into one of the five aspects of employee satisfaction including career growth and

development, management, benefits, salary, and work-life balance. Furthermore, the system incorporates a Content-Based Filtering (CBF) approach, leveraging cosine similarity to generate personalised company recommendations based on a user's chosen priorities for each of the aspects of employee satisfaction. This project's primary objectives were to design a classification and recommendation system, develop it into a functional web application, and validate its effectiveness and usability.

RESULTS AND DISCUSSION

The project successfully achieved its objectives by developing a web application that performs ABSA on employee reviews from Glassdoor and provides personalised company recommendations. Functionality testing, which included 18 test cases, confirmed that all system features were working as intended, from navigation and data visualisation to the core sentiment and aspect classification. This demonstrates the system's robustness and reliability in providing a fully functional platform for job seekers.

The core of the system's effectiveness lies in its SVM models. The sentiment classification model achieved a test accuracy of 81.47%, while the aspect classification model reached 75.64% accuracy. This proves the system is highly effective in assisting users to analyse and comprehend employee reviews with a high degree of precision. The sentiment confusion matrix shows that the model was highly effective at correctly identifying positive and negative reviews, while it had a slightly higher rate of misclassifying neutral reviews. Similarly, the aspect confusion matrix demonstrates the model's strength in accurately classifying reviews related to specific aspects like 'Work-Life Balance' and 'Career Growth and Development', while occasionally misclassifying other aspects. The model's predictive performance is further detailed in the confusion matrices for both sentiment and aspect models, as illustrated in Figure 1 and Figure 2.

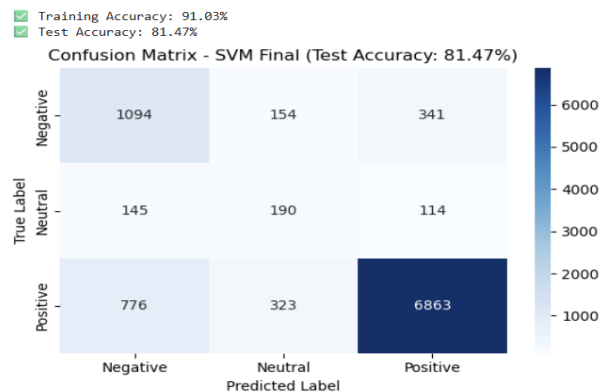


Figure 1: Confusion Matrix of Sentiment Classification Model

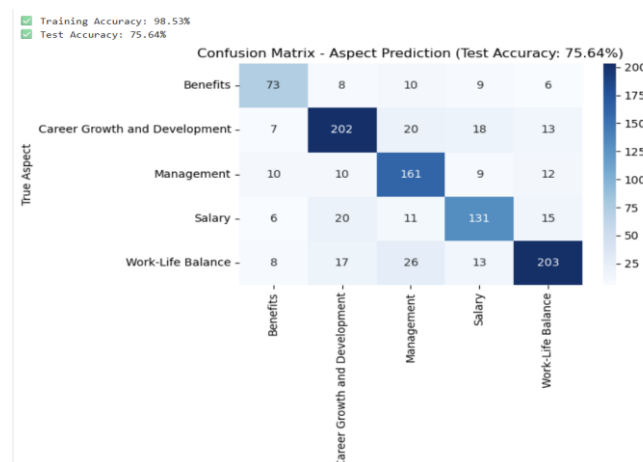


Figure 2: Confusion Matrix of Aspect Classification Model

The system's output, derived from an analysis of real employee review data from five leading Malaysian IT companies, is presented through interactive data visualisations. These include bar charts that show sentiment polarity distribution, pie charts that detail aspect distribution, line charts that track sentiment trends over time, and word clouds that highlight the most frequent terms associated with positive, neutral, and negative reviews. This visual approach transforms complex, unstructured text into intuitive and digestible insights. For example, a user can instantly see that while one company may have a high overall positive rating, its reviews specifically related to "work-life balance" might be predominantly negative, as shown in Figure 3. This demonstrates the system's robust capability in providing a fully functional platform for job seekers to gain structured, aspect-level insights of employee satisfaction in each company.

Sentiment Distribution By Aspect

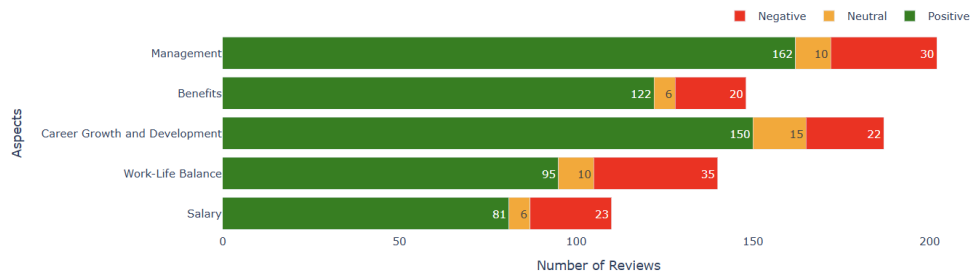


Figure 3: Sentiment Distribution by Aspect for Maxis Communications

Finally, the system's real-world efficacy was quantitatively assessed through a structured usability test involving 15 participants. This experiment was designed to compare the time required for manual versus system-assisted decision-making. A notable reduction in processing time when choosing a company was observed when participants utilised the system's features. Specifically, the system facilitated a significant average time reduction of 84.18% in the decision-making task, as shown in Table 1. This result, coupled with an average user satisfaction score of 4.93 out of 5, provides compelling evidence of the system's functional utility and user-centric design.

Table 1: Results of Usability Testing

Participant	Time Taken (Manual) (mins)	Selected Company (Manual)	Time Taken (System) (mins)	Selected Company (System)	Satisfaction Rating (1-5)
Participant 1	12.36	TM	0.35	TM	5
Participant 2	5.22	WT	1.04	TM	5
Participant 3	6.22	TM	1.29	TM	5
Participant 4	7.42	TM	0.44	TM	5
Participant 5	5.31	IBM	0.58	MC	5
Participant 6	2.45	TM	0.47	TM	5
Participant 7	10.07	TCS	5.26	TCS	4
Participant 8	4.31	TM	1.06	TM	5
Participant 9	6.01	TM	0.56	TM	5
Participant 10	9.54	MC	1.20	MC	5
Participant 11	7.23	MC	1.16	MC	5
Participant 12	3.40	MC	0.42	MC	5
Participant 13	5.18	TM	0.52	TM	5
Participant 14	3.57	MC	0.45	TM	5
Participant 15	6.16	IBM	0.49	IBM	5
Average	6.27	-	0.95	-	4.93

CONCLUSION

In conclusion, this project successfully developed and evaluated a web application that provides a structured, data-driven approach to analyzing employee satisfaction in Malaysia's IT sector. The system uses a Support Vector Machine (SVM) model to classify reviews and a Content-Based Filtering (CBF) approach to generate personalised company recommendations, addressing the problem of information overload for job seekers. The models achieved a strong predictive accuracy, with 81.47% for sentiment classification and 75.64% for aspect classification. More importantly, usability testing with 15 participants showed a significant practical benefit, with the system reducing decision-making time by 84.18%. While successful, the study was limited by its reliance on a static dataset from a single source and a single-label prediction methodology. Future work should focus on integrating with live data to ensure real-time relevance, expanding the model to handle multi-label aspect classification, and incorporating a hybrid recommendation model to further improve personalisation.

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