

This project employed Aspect-Based Sentiment Analysis (ABSA) to extract sentiments by aspects including camera, battery, display, operation, price, and design from smartphone reviews on leading brands like Apple, Samsung, OnePlus, and Huawei on Amazon. The results can guide companies in refining product features and tailoring marketing strategies to meet consumer expectations, thereby enhancing customer satisfaction and strengthening market presence.

Our approach leveraged various well-trained models and packages. Firstly, we utilised advanced tools such as Selenium for automated web scraping and BeautifulSoup for HTML parsing to efficiently gather and pre-process data from Amazon on a real-time basis. The ABSA-Instruction model then facilitated precise aspects and associated opinion extraction from complex and unstructured customer reviews. The aspect output from the model was then passed through semantic search to associate with predefined aspects. Comparing various sentiment analysis techniques, we selected VADER as the final tool to generate sentiment scores by aspects by reviews. The model performance was then evaluated using both manual assessment and Random Forest prediction model before deploying the model outputs in analyses.

Key findings highlighted the primary aspect (e.g. 'battery') that affects customers satisfaction, so we recommend companies to prioritise enhancements in these areas (e.g. improving battery longevity). Our competitive analysis revealed variations in sentiment across different aspects for each brand, offering a holistic view of consumer perceptions. For example, while some brands were frequently lauded for their battery life, others stood out for their camera or display quality. This understanding enables brands to pinpoint areas of strength to leverage in marketing efforts and identify weaknesses for improvements.

We acknowledge limitations such as limited language, platform bias, limited aspects focus, and difficulties to deal with neutral sentiment. Future research should involve extensive fine-tuning, larger datasets, and a broader selection of aspects to align with the company's objectives, enabling tailored recommendations.