



Masters Programmes: Group Assignment Cover Sheet

Student Number:	5554086, 5534230, 5584451, 5576453, 5538208, 5521398, 5582329, 5531616
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Question Attempted: <i>(question number/title, or description of assignment)</i>	Executive summary
Have you used Artificial Intelligence (AI) in any part of this assignment?	No

Academic Integrity Declaration

We're part of an academic community at Warwick. Whether studying, teaching, or researching, we're all taking part in an expert conversation which must meet standards of academic integrity. When we all meet these standards, we can take pride in our own academic achievements, as individuals and as an academic community.

Academic integrity means committing to honesty in academic work, giving credit where we've used others' ideas and being proud of our own achievements.

In submitting my work, I confirm that:

- I have read the guidance on academic integrity provided in the Student Handbook and understand the University regulations in relation to Academic Integrity. I am aware of the potential consequences of Academic Misconduct.
- I declare that the work is all my own, except where I have stated otherwise.
- No substantial part(s) of the work submitted here has also been submitted by me in other credit bearing assessments courses of study (other than in certain cases of a resubmission of a piece of work), and I acknowledge that if this has been done this may lead to an appropriate sanction.
- Where a generative Artificial Intelligence such as ChatGPT has been used I confirm I have abided by both the University guidance and specific requirements as set out in the Student Handbook and the Assessment brief. I have clearly acknowledged the use of any generative Artificial Intelligence in my submission, my reasoning for using it and which generative AI (or AIs) I have used. Except where indicated the work is otherwise entirely my own.
- I understand that should this piece of work raise concerns requiring investigation in relation to any of points above, it is possible that other work I have submitted for assessment will be checked, even if marks (provisional or confirmed) have been published.
- Where a proof-reader, paid or unpaid was used, I confirm that the proof-reader was made aware of and has complied with the University's proofreading policy.

Upon electronic submission of your assessment you will be required to agree to the statements above

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.