

Preliminary Executive Report

MA5853 Project 008 - Vodafone Net Promoter Text Analysis

Project Team

- Nichola Christie
- Michael Couzens
- Daniel Evans
- Nikki Fitzherbert
- Matthew Moore

Executive Summary (Nikki Fitzherbert)

Vodafone Australia (Vodafone) is a telecommunications brand offering mobile and fixed broadband services to over 23 million Australians, and has consistently rated highly on customer satisfaction over recent years (Vodafone Australia, n.d., TPG Telecom, n.d.). However, Vodafone currently receives approximately 100,000 customer contacts each week and 4,000 Net Promoter Score (NPS) surveys each week. If analysed, these surveys could provide valuable insights about how current customers view Vodafone's service offerings, the primary drivers behind promoters and detractors, and what actions could be taken to improve the customer experience and reduce customer churn. The risk of leaving this "gold mine" of information untouched is substantial as evidence suggests that over a third of a company's customer base is prone to just walking away from a single bad experience (PricewaterhouseCoopers [PwC], 2018).

Unforeseen legal and privacy issues related to the release of the required NPS dataset to the project team resulted in a necessary project re-scope during the planning stage. However, the project team is confident that the proposed solution will still provide value to Vodafone in helping to solve the business problem as described in the scoping document and at the project inception meeting.

The overarching objective of this project is to provide a framework and pathway for an automatic analysis of free text NPS and first contact resolution survey data that would produce a series of actionable insights regarding Vodafone customer sentiments, concerns and strengths. Over the next two-and-a-half weeks, the project team will deliver a literature review covering common drivers of customer satisfaction and loyalty in the telecommunications industry, and best-practice approaches to NPS analytics and natural language processing (NLP), a preliminary exploratory data analysis (EDA) of an appropriate substitute dataset (or the client dataset if it becomes available) and a high-level NLP design informed by the results of the literature review and the EDA.

Part A: The Data Science Problem (Nikki Fitzherbert)

Net Promoter Score (NPS) and First Contact Resolution (FCR) are two common metrics used to measure the satisfaction and loyalty of customers. A typical NPS survey asks customers how likely they are to recommend the company on a scale of zero to ten and why. The responses are then grouped into three distinct classes: promoters (9 or 10), passives (7 or 8) and detractors (0 to 6) and a NPS score is the percentage of promoters minus the percentage of detractors (Reichheld, 2003). In contrast, FCR measures the proportion of customer interactions resolved at first contact.

Vodafone Australia (Vodafone) receives approximately 4,000 NPS and FCR surveys each week (James Cook University [JCU], 2021). Whilst it is possible to manually read through each survey response, this is very time-consuming, inefficient and error-prone (Sinha, n.d.). However, that data also likely contains valuable information the client can use to:

- help understand what their customers are saying about their business and current service offering, and
- drive targeted internal changes that improve NPS and FCR scores and the customer experience, and help reduce customer churn.

With no procurement of an off-the-shelf data/text analytics product or internal data science project planned for the next 12 months (personal communication, July 2, 2021), Vodafone needs a way to analyse their survey data that can display the main themes, patterns and other actionable insights in a regularly-refreshable format (JCU, 2021).

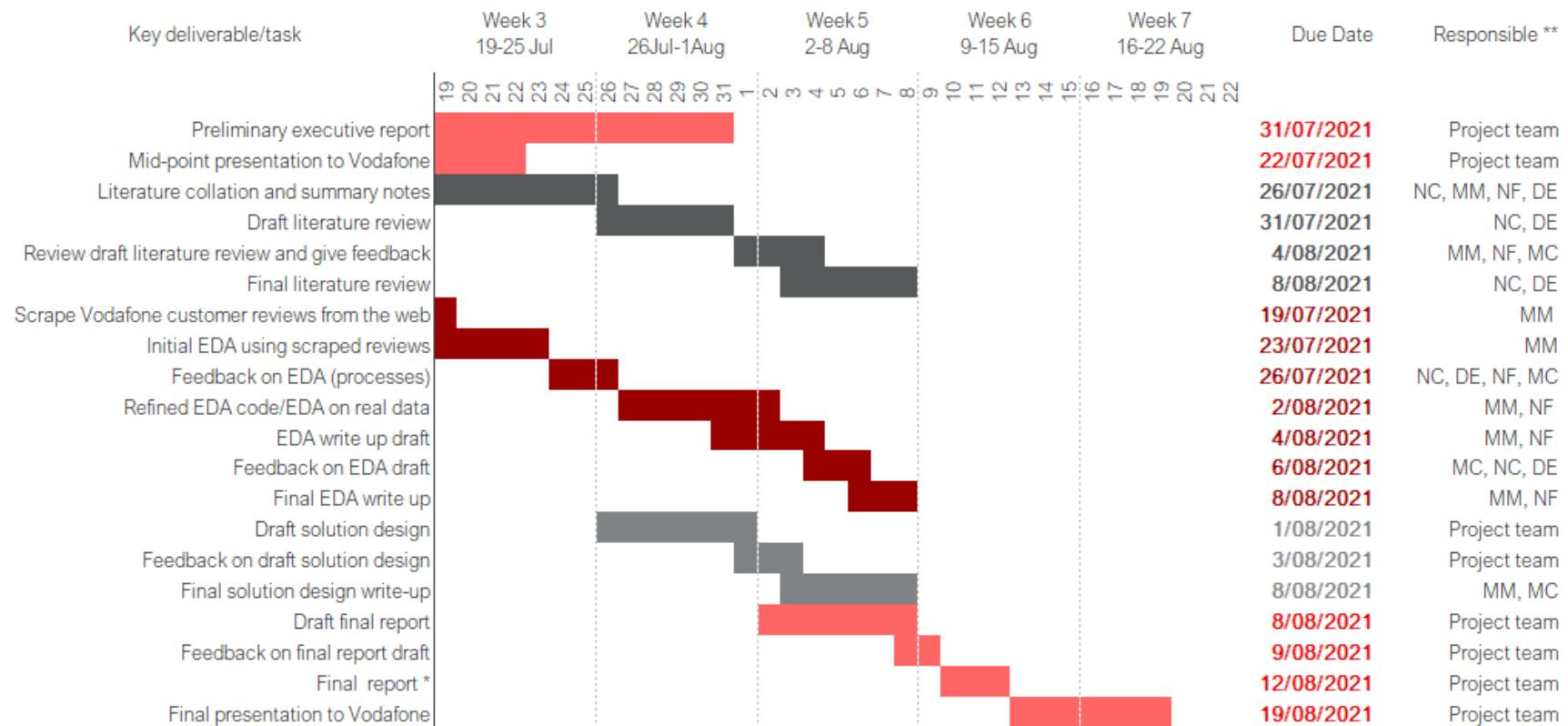
Part B: Consultancy Processes (Daniel Evans)

Consultancy engagement will undertake key fundamental processes consisting of five phases to deliver recommendations to the client. These phases are a framework for the client and consultant to develop a strategic plan with a shared understanding of the problem/solution as the engagement develops.

- Phase 1 (*initiation*) investigates the challenge presented by the client and unpacks the problem.
- Phase 2 (*discovery, design, and dialogue*) expands the initial problem scope to develop a strategy, begin data collection and define the approach used during the engagement.
- Phase 3 (*analysis and decision to act*) analyses data collected and presents any preliminary findings. The client has the opportunity to raise any resistance to the recommendations before proceeding.
- Phase 4 (*implementation*) proposes a developed solution, and the client decides whether to act.
- Phase 5 (*extension, recycle and termination*) will decide if the consultant has any further engagement, expanded scope or disengagement from the task.

Successful management consulting benefits from several shared attributes between the client and consultant (Bronnenmayer, 2016). Positive outcomes during consultancy engagement require a common vision, intensity of collaboration, consultant expertise, quality resources, management support, and compliance with budget/schedule.

Part C: Key Deliverables, Timeframes and Responsible Team Member(s) (Nichola Christie)



* Includes literature review and solution design

** DE = Daniel Evans, NF = Nikki Fitzherbert, NC = Nichola Christie, MM = Matthew Moore, MC = Michael Couzens, Project Team = DE, NF, NC, MM, MC

■ = external deliverable ■ = literature review tasks ■ = EDA tasks ■ = solution design tasks

Part D: Current Business Context, Opportunities and Threats (Michael Couzens)

A positive customer sentiment has long been considered a major ingredient to success and there have been many studies that validate this theory. Vodafone has a veritable “gold-mine” of qualitative data that is untouched in relation to the sentiment of their consumer customers, due to the inability to process this data into any form of meaningful information. This means that Vodafone are sitting in the unenviable position in which they know how their customers feel about their service offerings (from a quantitative perspective) but they do not know why.

The impacts of this knowledge gap on their business are enormous as they lack the information that could potentially reduce the churn of their customers and significantly enhance their retention numbers.

The opportunities for Vodafone in relation to this data is to learn the following (among others):

- What causes a customer to become a detractor?
- Why are some customers potential promoters?
- Why are some customers neutral in relation promoting or detracting?

This information could drive significant change in services and customer management which in turn can significantly improve customer growth and retention

Conversely, the threat is that by failing to understand the key drivers of customer (dis)satisfaction, internal processes are not targeted towards the right areas, which results in otherwise preventable customer churn, decreased growth and wasted resources. A third of a company’s customer base is prone to “walk away” after a single bad experience (PricewaterhouseCoopers, 2018), so preventing these experiences with informed and targeted action is crucial.

Part E: Data Collection and Methods (Nikki Fitzherbert)

The project scope and deliverables has had to be significantly revised due to Vodafone's difficulty in being able to supply the required NPS and FCR dataset in a timely manner. The project team understands that this stemmed from unexpected legal and privacy issues related to the release of confidential data outside the company (N. Fraser, personal communication, July, 2021).

The revised project now uses a mixed-methods approach, namely:

- the search for a dataset that can serve as an approximate substitution for the client dataset, either downloaded from a public repository¹ or created via web scraping. At a minimum, the proxy dataset must include a rating (preferably a NPS score), free text opinions, and come from the telecommunications sector;
- a preliminary exploration of the substitute dataset using methods commonly applied to unstructured text data including extraction of important n-grams, preliminary sentiment analysis, and part-of-speech (PoS) tagging²; and
- a desktop search and summarisation of relevant literature relating to the drivers of customer satisfaction and loyalty and the use of NPS as a measure of customer satisfaction in the telecommunications sector, as well as typical methods for extracting information and meaning from unstructured text data.

¹ Such as Kaggle, GitHub or the UC Irvine Machine Learning Repository.

² Depending on the project timeline, the preliminary exploratory data analysis may be able to be performed on the client dataset instead of the substitute dataset if it becomes available.

Part F: Proposed High-Level Solution (Matthew Moore)

The outcome for this project provides a path forward for automating the analysis of Vodafone's free text survey data and customer sentiment scores to provide actionable insights into customer sentiments and concerns. The deliverables consist of a literature review covering the drivers of customer satisfaction and loyalty, NPS analytics and Natural Language Processing (NLP), an Exploratory Data Analysis (EDA) of Vodafone's survey data (or a related dataset), and a high level NLP design based on the customer requirements, the literature review and EDA as outlined below:

Literature Review

- NPS and the telecommunications industry
- Drivers of customer satisfaction and/or loyalty
- Limitations of NPS
- Quantitative and qualitative analytics and their integration
- NLP and customer loyalty
- NLP techniques including sentiment analysis and topic modeling
- Conclusions in context with Vodafone's required business outcomes.

Exploratory Data Analysis

- Confirm data quality (identify missing, incorrect, or poorly encoded data)
- Word counts and frequencies
- N-gram frequencies
- Common misspellings, colloquialisms, and potential synonyms
- Survey score and sentiment distributions for common words and n-grams
- Relationship between metadata, language, and survey scores.

High-Level Solution Architecture

- Data pre-processing methodologies and cardinality reduction
- NLP methods including sentiment analysis, PoS tagging, n-gram extraction, and tokenisation
- Analysis methodologies such as topic modelling through Latent Semantic Analysis, Latent Dirichlet Allocation and Non-Negative Matrix Factorisation, as well as supervised learning to determine feature relevance
- Statistical analysis of the results
- A flow diagram linking pre-processing, analysis, and presentation of results and insights.

References

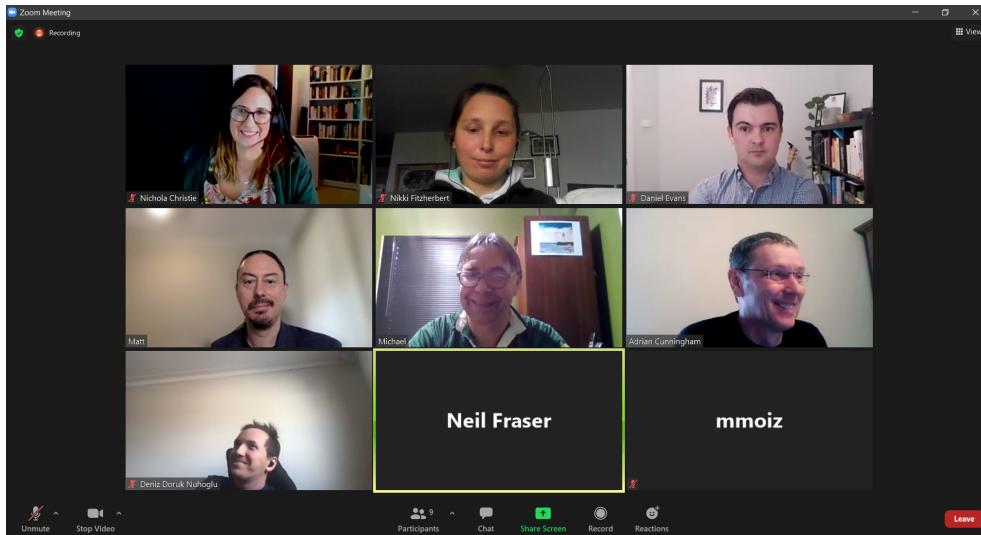
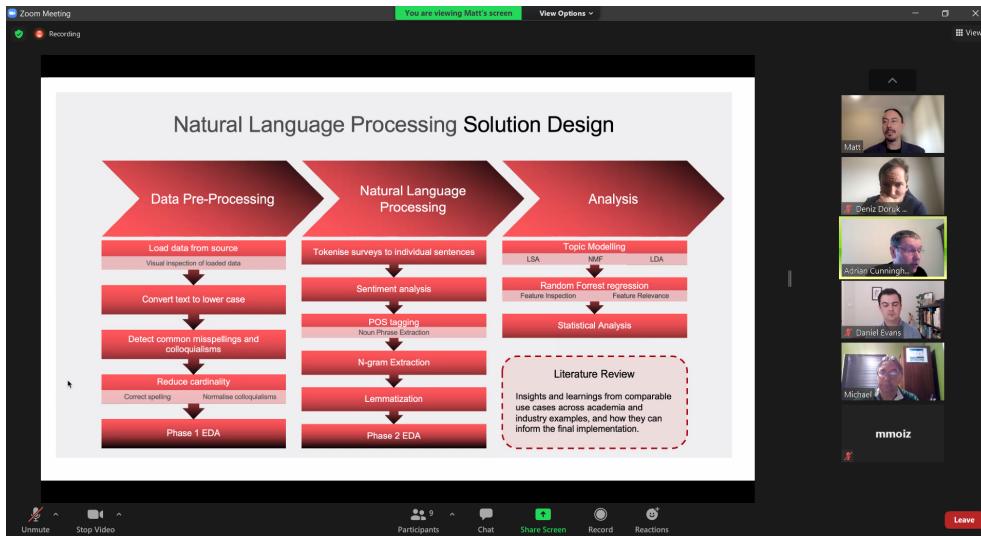
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Appendix A - Mid-Point Check-In Presentation

Held 11:00am-12:00pm Monday 26 July 2021.

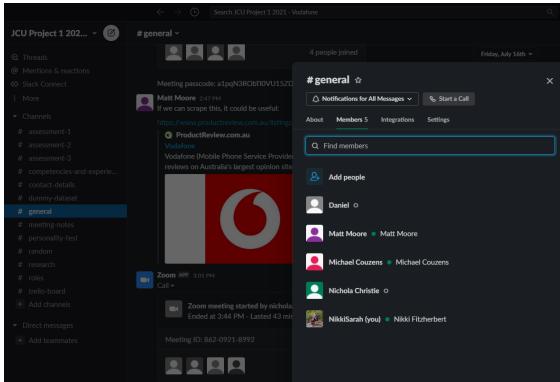
Attendees:

- JCU staff: Neil Fraser and Mateen Moiz
- JCU student team: Nichola Christie, Michael Couzens, Daniel Evans, Nikki Fitzherbert and Matthew Moore
- Vodafone: Adrian Cunningham and Deniz Nuhoglu

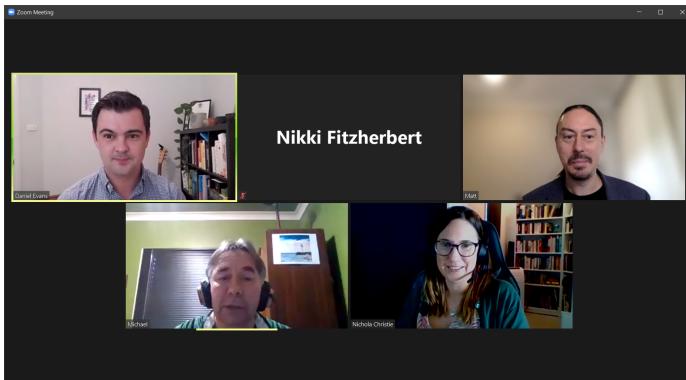


Appendix B - Project Team Collaboration Tools

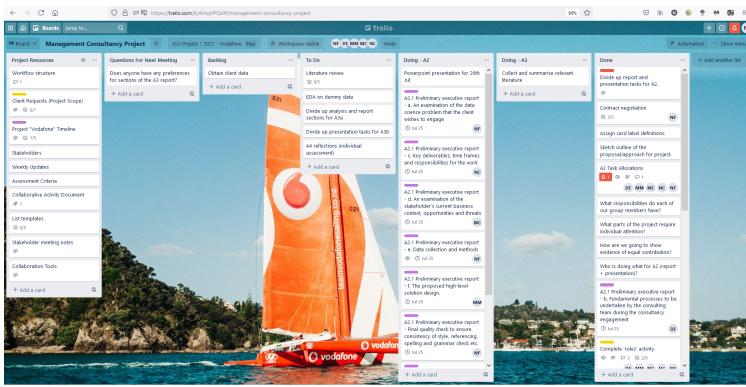
- Private Slack channel for general conversations



- Weekly Sunday morning catch-ups over Zoom plus additional meetings as required



- Group Trello board to manage project workflow and tasks



- GitHub repository to share and store data and code

The screenshot shows a GitHub repository named 'MA5853-Project1'. The repository has 1 branch and 0 tags. It contains three files: 'README.md', 'vodafone_reviews.csv', and a Gantt chart. The 'README.md' file is the active tab, showing its content: 'MA5853 Project 1 Vodafone Net Promoter Text Analysis'.

- Shared Google drive to share, store and simultaneously work on project documents

The screenshot shows a Google Drive folder named 'JCU Project 1'. Inside the folder, there are several files and sub-folders:

- Papers from Ned
- Research articles
- Gantt chart.png
- Gantt chart.xlsx
- JCU Project 1 2021 - Vodafone - A2
 - Lit review - reading list, summaries, allocation
 - Mid-point check-in.pptx
 - Signed Vodafone contract.pdf
 - Vodafone colours.PNG
 - vodafone_reviews.csv

Appendix C - Mid-Point Check-In Powerpoint

Attached as a separate document.