



## Virtual Internship Case Studies

July 2020



# Who is Deloitte?



**150 countries**

Universal presence



**7 regions**

Choose your city!



**1400+ employees**

And growing!



**120+ partners**

Supporting career progression



**80 hours**

of Learning & Development in your first year



**29 sectors**

Our client work spans 29 industry sectors



**1:1 mentors**

Our support from day one



**18,000+ clients**

We worked with more than 18,00 clients in FY20



**9 qualifications**

On offer. Study with our support



**180,000+ hours**

Of volunteering and pro-bono time, valued at over \$2m



**27 secondments**

In the last 12 months. Where will you go?

## Our Shared Values

### Ā mātou tikanga mahi



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Our Shared Values are a set of core principles that guide our collective behaviour. They set the expectations we have for one another and define how we should behave as Deloitte people. They provide common ground to unite us across cultures and geographies. And, importantly, they help us to earn the trust and respect of our key stakeholders.

# Our Service Lines

## Overview

### Risk Advisory

In Risk Advisory you will advise our clients on how to effectively manage their financial and non-financial risk and make informed and intelligent risk decisions to maximise opportunities and drive efficiencies. This includes helping organisations prevent risks around their business processes, cyber security, technology and operations.

### Tax

As part of the Deloitte Tax team you will provide a full range of services to an extensive portfolio of clients from NZ owned and international multinationals to hospitality, retail, agricultural etc. businesses nationwide. . You'll build your commercial, industry and technical knowledge, using it to consult with clients and deliver practical advice.

### Private

A career with Deloitte Private means you will be working with some of New Zealand's most progressive and interesting companies. You will deliver specialist advice and services to fast growing businesses, established enterprises, individuals and families

### Audit & Assurance

Audit team you'll spend the majority of your time at the client's workplace. It is your job to gain a full view of every aspect of your client's business through the numbers. Whether it's conducting due diligence reviews and statutory audits or providing accounting advice on technical issues or corporate governance, we provide our clients with the highest quality accounting information

### Corporate Finance

Everything we do is about value, whether that be financial profitability, economic or social value. We do valuations, transaction support, lead mergers & acquisition (M&A) advisory, restructuring and capital raising.

### Consulting

In Consulting we use logical thinking, leading global methodologies and our knowledge of industries to help New Zealand's largest organisations solve their most complex problems. We spend a lot of time with our clients, meaning that we form lasting relationships and become increasingly familiar with the industries they operate within.



# Meet the Mentors



**Laura Waller**  
Consultant, Tax & Private



**Grace Harrison**  
Analyst, Risk Advisory



**Maggie Zheng**  
Manager, Risk Advisory



**Mariette Van Niekerk**  
Associate Director, Risk Advisory

# Meet the Clients



**Adriana Hitch**

Graduate Recruitment Advisor

## Projects

Case Study 2: MBIE

Case Study 3: Boutique Data Agency



**Shane Kelly**

Corporate Responsibility & Sustainability

## Projects

Case Study 1: Covid-19 Twitter

Case Study 4: Sustainable Events Guide

# Overview of Case Study



01

## **Covid-19 Twitter Data**

You're an intern for a minister looking for re-election this year. Your job is to figure out the key themes of New Zealand's Covid related Twitter feed (several official Twitter channels). You will be provided Twitter data in an easy to use csv and will perform (with our guidance) data cleansing and then concept/cluster analysis.

02

## **MBIE**

You're a group of interns at MBIE and you have a group of businesses you're considering providing funding to. You must figure out who is most at risk after Covid-19 has shaken up the world as we know it. You have been provided some aged debtors information from a client as well as publicly available mapping data. Using this information, you will model key attributes that could affect the riskiness of a business. The output for this will be a description of your modelling in finding at risk businesses and the steps taken to aggregate this less than perfect data together.

03

## **Boutique Data Agency**

You are starting a boutique data agency in New Zealand and to do this you must create a portfolio of data to offer clients. Create a playbook document (PowerPoint, word doc etc.) with the list of free data sources you find – there pros and cons (safety, reliability, frequency of updates)

04

## **Sustainable Events Guide**

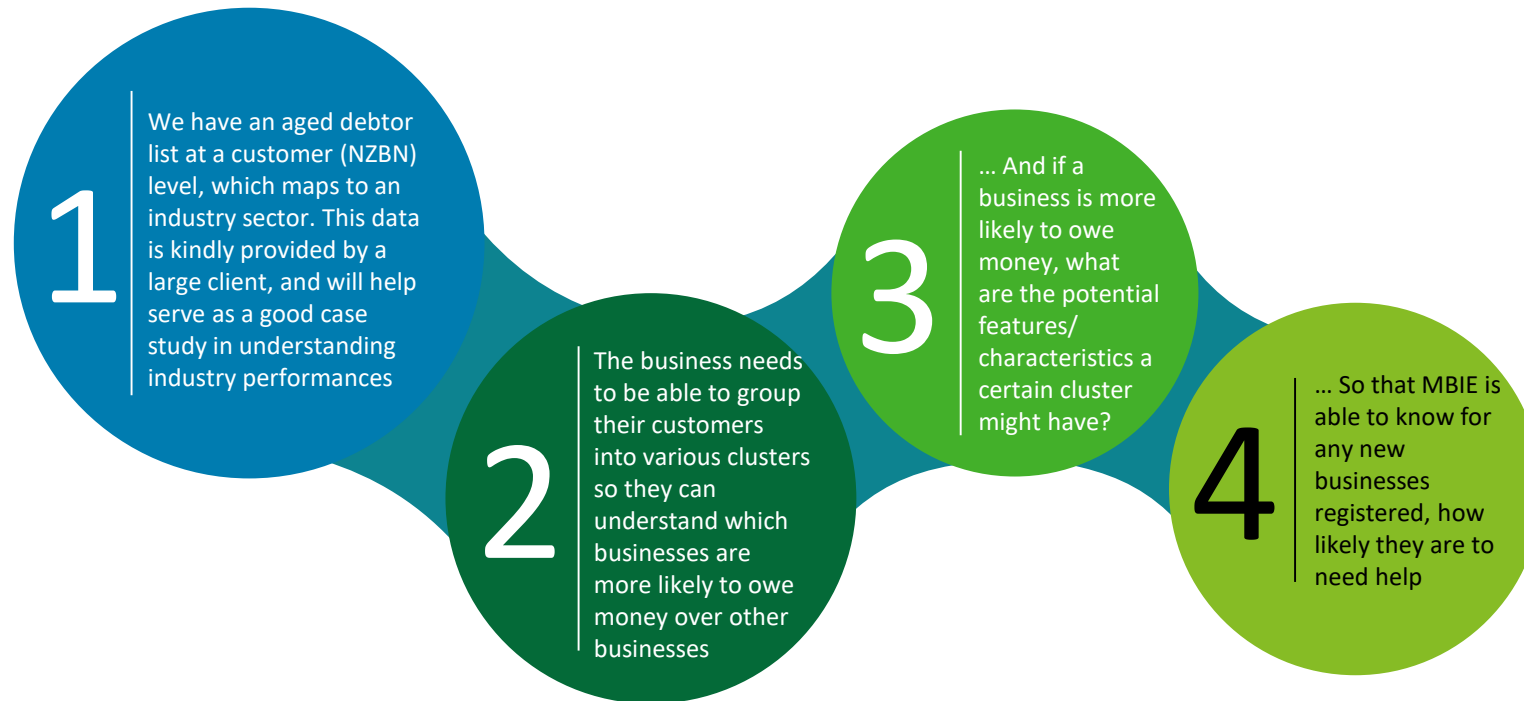
A large corporate who is involved in lots of events both on premise and off premise needs to take a look at how they can run these more sustainably. Consideration should be given to all phases of the event planning process and how the event can minimise its impact on the environment. Using industry knowledge and information create a Sustainable Events play book that looks at cost analysis and procurement. The playbook should be user friendly for any employee to be able to use when planning an event of all sizes. Then plan a "event" using your new guide for an event of around 200 people.

# Case Study 2: MBIE

You're a group of interns at MBIE and you have a group of businesses you're considering providing funding to. You must figure out who is most at risk after Covid-19 has shaken up the world as we know it. You have been provided some aged debtors information from a client as well as publicly available mapping data. Using this information, you will model key attributes that could affect the riskiness of a business. The output for this will be a description of your modelling in finding at risk businesses and the steps taken to aggregate this less than perfect data together.



## Problem Explained...



# Project Outline

## Model Research

- Investigate **unsupervised clustering** methodologies
  - Some helpful links: <https://towardsdatascience.com/unsupervised-learning-and-data-clustering-eeecb78b422a>

## Data Preparation

- **Tidy** the data
  - Do any columns need to be removed due to correlation?
  - Create additional flags

## Model Application

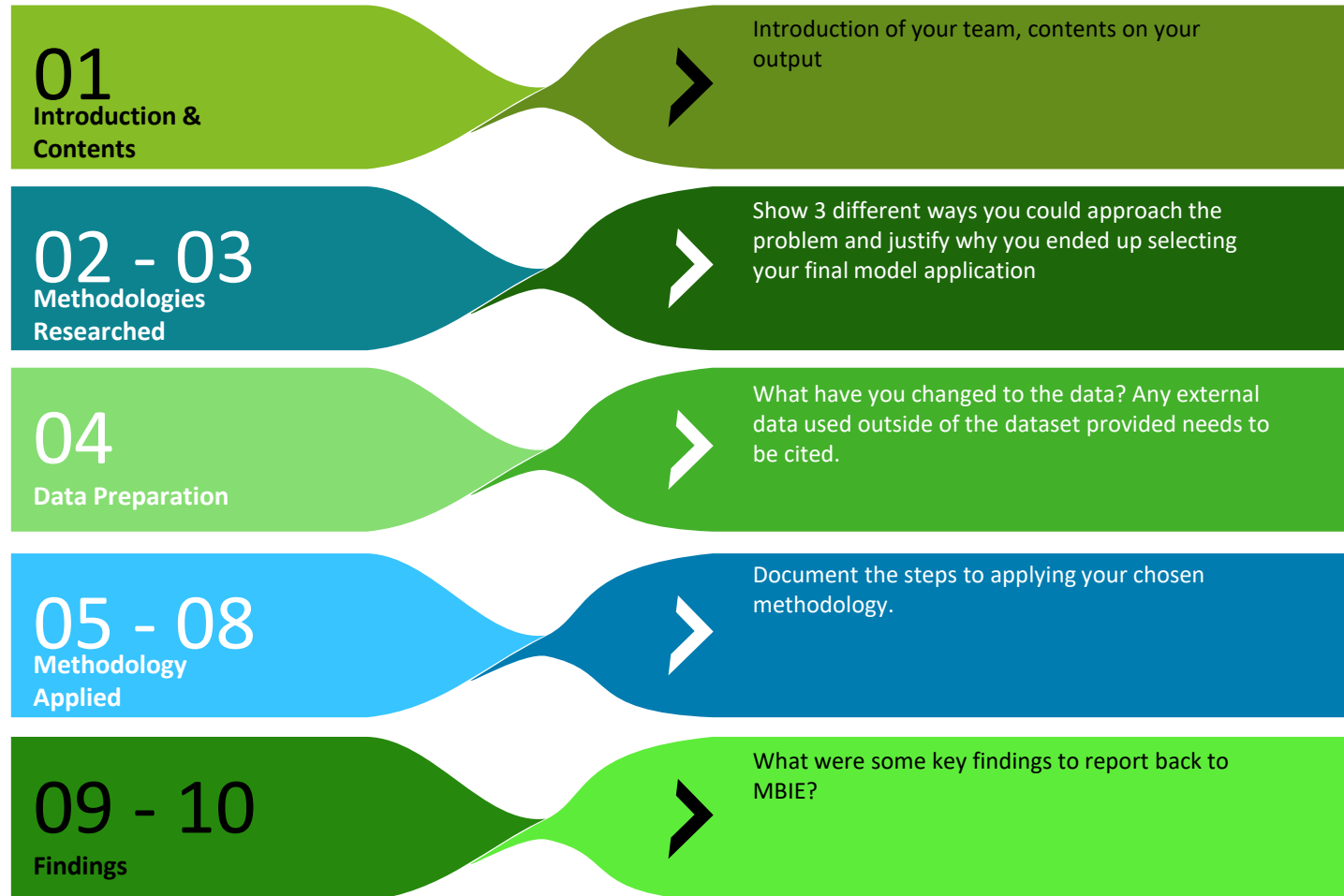
- Select the **unsupervised learning methodology** you wish to apply to the dataset
  - We recommend coding in python or R
  - Useful python shells include: Jupyter or Spyder
  - Useful R shells: RStudio

## Documentation

- **Document** the results
  - Take it back to the case study and identify the cluster of most risky customers
    - What makes these customers risky? (key attributes?)
  - Output: Present findings back in a word or ppt document, no more than 12 slides / pages (not including the title or any reference / appendix pages).

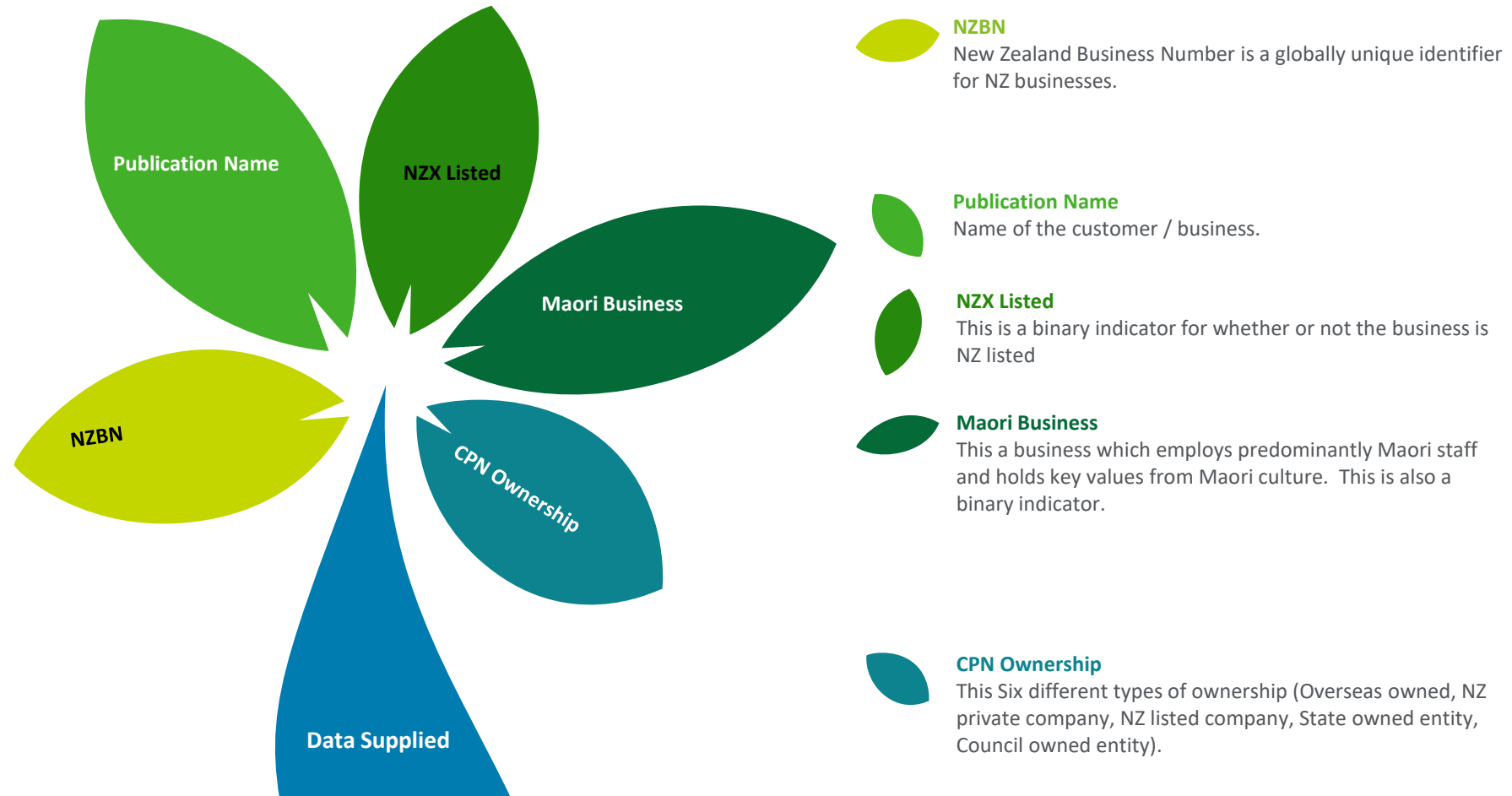
# Output structure

Slide / page expectations



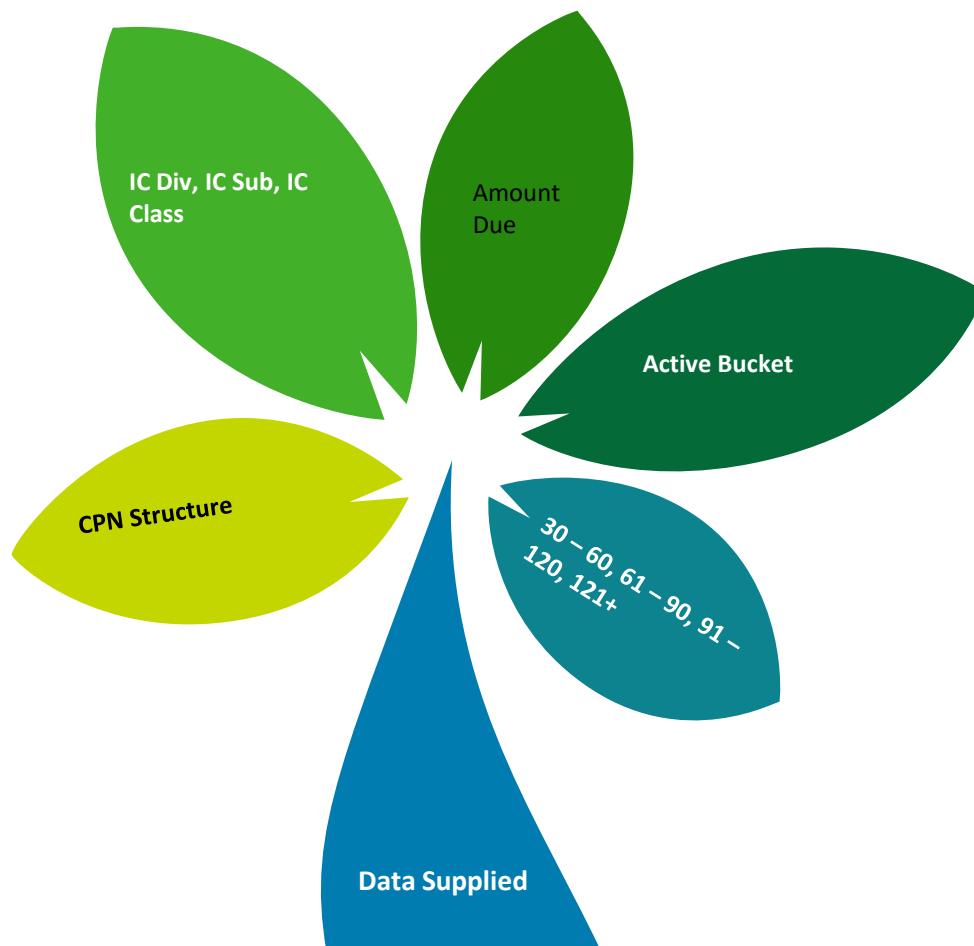
# Data dictionary

## Debtor data



# Data dictionary

## Debtor data



### CPN Structure

The type of structure in which the company conforms to (Government, limited, cooperative etc.)

### IC Div, IC Sub, IC Class

Name IC Division is the broadest category the business sits within, Sub division is the next broadest and IC Class is the most granular categorisation. Keeping all three of this in your model will likely cause correlation issues.

### Amount Due

This is the sum of the amounts overdue, and includes any period greater than 31 days owing.

### Active Bucket

This the amount owed for the most recent month of billing. (Less than 30 days invoices)

### 30 - 60, 61 - 90, 91 - 120, 121+

This is a grouping of the number of days the amount billed has not been paid for.

# Readings

Understanding different types of clustering

<https://towardsdatascience.com/clustering-clearly-explained-5561642ec20c>

What are the different types of unsupervised learning algorithms?

<https://towardsdatascience.com/unsupervised-machine-learning-clustering-analysis-d40f2b34ae7e>

Walkthrough of one unsupervised learning example

<https://towardsdatascience.com/k-means-clustering-algorithm-applications-evaluation-methods-and-drawbacks-aa03e644b48a>

<https://towardsdatascience.com/k-means-clustering-13430ff3461d>



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