T Level Technical Qualification in Digital Business Services

Occupational specialism assessment (OSA)

Data Technician

Task 2

Assignment brief

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About this assignment

Introduction

This occupational specialism assessment (OSA) is set by NCFE and administered by your provider during a 3 week window. It contains 4 separate tasks which will be completed one after the other during this assessment window.

All 4 tasks will be completed under supervised conditions.

You must complete all tasks in this assignment independently. You are required to sign a declaration of authenticity to confirm that the work is your own. This is to ensure authenticity and to prevent potential malpractice and maladministration. If any evidence was found not to be your own work, it could impact your overall grade.

You will be given a copy of the assignment brief and any relevant supporting information with each task, so you do not have to memorise any information.

Timings

You have a total maximum time of 29 hours to complete all tasks within this assignment, and each task has the following number of hours to complete it:

Task 1 = 5 hours

Task 2 = 10 hours

Task 3 = 8 hours

Task 4 = 6 hours

Individual tasks must be completed within the timescales stated, but it is up to you to decide how long you spend on each part of the task, therefore you should manage your time appropriately.

Details on the separate marks available are provided in each task.

You should attempt to complete all of the tasks.

Read the instructions carefully.

Performance outcomes

Marks will be awarded against the skills and knowledge performance outcomes (POs) as follows:

Task 2

This task is divided into 2 parts (part A and B) and carries a total of 52 marks.

These are divided between the following performance outcomes:

- PO1: Source, organise and format data securely in a relevant way for analysis (16 marks)
- PO2: Blend data from multiple sources (20 marks)
- PO3: Analyse structured and unstructured data to support business outcomes (16 marks)

Scenario

Many businesses use data analytics as it enables them to discover new insights into their business and collect data. This leads to smarter decisions, more efficient operations, higher profits, and happier customers.

Work in a data analytics business is usually done by a small, specialised team of people who are focused on industry.

About you and your employer

Your employer, Rankins Analytics Ltd, specialises in providing decision support solutions for various industries.

You work in the automotive data analytics department at Rankins as a junior data technician. You work with a small team of 3 people including your data analytics manager, John Hopkins.

John Hopkins reports regularly to Fathema Patel, who is the corporate analytic lead for the leadership group. John is responsible for monitoring the progress and performance of all data departments. John will need you to assist in the following:

- locating and mining data sources
- reviewing and validating sources
- identifying trends, patterns and possible issues in data sources
- occasionally producing reports for Fathema

About the client

Your client is a successful vehicle dealership business. The client sells new and used vehicles regionally and nationally in the UK. They advertise vehicles online on CarBay marketplace and in the Vehicle Daily Trader. The client wants to change to supplying and selling electric vehicles only. The client has limited knowledge of the electric vehicle market and is unsure how to make this change in the business.

The client's objectives for the next 5 years are:

- short-term:
    - to upskill and educate current and new staff on the electrical vehicle industry and its technology to increase electric vehicle sales
    - to implement an efficient marketing strategy to promote the sales of electric vehicles
- long-term:
    - to supply and sell both new and used electric vehicles with net zero emissions that cater for both the affordable and prestige market
    - to retain current customers' loyalty and support customers in the transition from petrol and diesel to electric vehicles
    - to efficiently stock the types of vehicles that are in demand and reflect prices people can afford

The brief

The client has selected Rankins Analytics Ltd to help them make informed decisions about how they are going to change to supplying and selling electrical vehicles only.

As a junior data technician, your role will be to inform the client about the current electric vehicle industry in the UK. You must source and select the most appropriate datasets. You will research both internal and external data sources on the electric vehicles industry. You will source relevant, up-to-date data on the types of vehicle technology, with a focus on consumer perceptions and attitudes towards electric vehicles.

The client wants to see a proposal before the project starts. The client is also concerned about the amount of data the company has on its vehicle owners and drivers. The client wants to know how well his business strategies and business practices protect that data. The company is particularly interested in protecting the data using connective automotive technology.

The client has told you the following things about his business:

- most of his sales are still petrol and diesel new and used vehicles in the UK
- there is a lack of demand for electrical vehicles as consumers are concerned about charging times, costs and the availability of chargers in the UK
- electric vehicles can be charged at home, work and at public charging stations, however, there are a range of technical differences such as charging speed, voltages, battery sizes, mileage ranges and connector types
- there is a government plan to ban all sales for new diesel and petrol vehicles by 2030
- customers who purchase electrical vehicles may be eligible for a grant up to £3,000
- electric vehicle owners pay zero vehicle tax (unless vehicle is over £40,000)
- installation of vehicle charger at home is £800, and there is an electric home charger grant scheme of up to £350

The client has provided you with vehicle sales information, the business objectives and the electric vehicle incentives available in the UK. You should use this information to help you justify the decisions about the project.

Your role

You need to collect and select relevant data from a variety of different sources both internal and external. These data should meet the client's short- and long-term business objectives and their target audience for this project. You need to judge how useful the data is. You need to combine datasets that do not contain errors. Datasets may need fixing (cleansing) before they can be used by the client, as they are often not properly structured. You must consider all the client's business objectives, even though not all of these will be relevant to every task. This will make sure the work you produce will help the client to make important strategic decisions.

Your role is to identify any trends or patterns you see in the data you collect. You may need to process statistical data that needs to be cleansed, transformed and modelled so it is useful for business decision-making. Once this has been completed, you will present the results on a summarised dashboard.

Throughout the project you must keep a log of the decisions that you have made. The log will include the types of data formatting and the methods for verification and validation of your data. You also need to consider the security measures you took to minimise the risks of control and data handling; you must consider current legislation. You will provide the client with a detailed proposal that helps him to understand fully your insights and recommendations. The client should be able to explore the possible options and possible outcomes based on your data.

Task 2

Time limit and marks available

Maximum time allowed = 10 hours (you can use this time how you want during each session, but task 2 must be completed within this time limit).

(52 marks)

Instructions for students

The average cost of a vehicle is between £12,000 and £28,000 depending on size, specification, vehicle make and model. The client is concerned that the range of electric vehicles makes the customers anxious that they will not be able to do the same things they could with a petrol or diesel fueled vehicle and they may become stranded. Many of their potential customers that they have spoken to have voiced their concerns over the availability and number of chargers for vehicles, the time it takes to charge the electric vehicles and the mileage the vehicles can do before they need to be recharged.

The client wants to expand their range of vehicles to include electrical vehicles. They hope to offer something more interesting, such as how an electrical vehicle looks or drives to its customers. They want to focus on 3 target audiences:

- the customers who make shorter journeys in cities and towns
- those people seeking prestige
- business customers who need to do high mileage in their jobs daily

John Hopkins has provided you with some internal data and external datasets.

Part A

The client is concerned that electrical vehicles make the customers anxious. Customers think the electrical vehicle may not be able to do what a petrol or diesel vehicle can do. They are worried that they might get stranded. Many of the customers worry about the cost of electrical vehicles, the time it takes to charge and the mileage before the vehicle needs to be rechavarged.

John Hopkins has asked you to join the external data into one dataset. Make sure the dataset has appropriate variables which reflects the client's business objectives, as it will eventually help to create a dashboard for the client.

You must clean and validate the dataset, then calculate the operating cost comparison between a petrol and diesel vehicle and an electrical vehicle. Exclude any electrical vehicles that have a connector type 3 pin type G(B51363), as they are being phased out of the market due to the very slow charging times and the high current demands on electricity.

John would like you to keep a log of your progress and any decisions you make. This log must include:

- which variables you consider relevant to the business objectives and why
- errors you have found in the datasets
- ways you have validated the data
- which columns you feel are appropriate to the business objectives and why
- the primary keys for each dataset

- data using different currencies converted into UK pounds
- data you have removed and why
- any calculations and aggregations you have applied to the data
- how you have blended the internal and external data

Include any code or formulas you used to automate the above tasks.

Part B

The client plans to upload the single dataset you created in part A to their business resources. The database will include the following tables:

- client_data_product information
- client_data_sales
- client_data_personal
- client_data_payment
- your new operating costs comparison

In addition to part A**,** John has asked you to write a separate additional section in your log. You must:

- describe the normalisation form of this new database, giving a clear explanation of your reasons
- identify the primary, alternate, and foreign keys in each table – write a sentence for each key describing why you have identified it as such
- explain how you reformatted the data to be joined to the external data
- explain how you manipulated data to make it more organised and easier to read
- provide a data validation template for each column in your new table which includes **data types and constraints**
- explain how you removed any variables from the internal datasets that is **not** applicable for your analysis
- include any code or formulas you used to automate the above tasks.

Resources

You will have access to the following resources, plus the original brief:

- task 2 datasets:
  - charging_times
  - client_data_payment
  - client_data_personal
  - client_data_product_information
  - client_data_sales
  - household_income_number_vehicles_owned
  - national_charge_point_information

    - operating_costs
- software applications to clean and blend data (for example, Microsoft or Google)
- word processing software (for example, Microsoft or Google)

Evidence required for submission to NCFE

- single joined dataset
- decision log of processes and steps you took as described in the instructions for both part A and part B

Document information

Owner: Head of Assessment Design