After completing a double degree in business and environmental sustainability, Sophie White planned to use her business skills to build a successful eco-friendly business on the Sunshine Coast in Queensland. Sophie put her plan into practice and is now the owner of her retail business organisation called Electric Wheels Transport (EWT) which currently specialises in electric scooters. EWT has two retail outlets on the Sunshine Coast (Coolum Beach and Mooloolaba) and one in Manly (east of Brisbane).

These retail outlets enable Sophie to offer customers an attractive form of transport that is fun, practical, and cheap to run, and it also appeals to her passion for the environment. Other incentives encouraging EWT customers to adopt electric scooters include the relatively low outlay to purchase an electric scooter and the increasing need for sustainable urban mobility. Hence, the demand for electric scooters is increasing as an alternative eco-friendly mode of transport. These factors are encouraging for Sophie’s business outlook and growth potential especially compared to the business performance when Sophie

first purchased the business.

Sophie purchased EWT as an established business that had grown too quickly, was overstocked, diversified too much, and had cash-flow problems. After assessing the business, Sophie developed a business plan and adopted a strategy that had more achievable outcomes and better performance potential. However, Sophie had to implement some major changes to operate successfully. When Sophie purchased the business, its stock was included in the contract. Stock that was largely used for tourist hires had to be sold and the excessive quantity of new stock on-hand also had to be reduced. The new business model would sell a smaller range of electric scooters that were popular and EWT would no longer hire out scooters.

When Sophie purchased EWT, the digital business records largely consisted of Excel spreadsheets. Sophie still uses these Excel spreadsheets to record customer details including each customer’s name, age, address, and email address. Each customer is given a unique customer identification number and registered to the retail outlet where they make their purchase. Details of each electric scooter purchase are also recorded (excluding payment details and invoices). Electric scooters do not have vehicle identification numbers like motor vehicles, so purchase records are based on the type of electric scooter purchased including the brand and model and also the purchase date.

EWT also sells accessories for their scooters such as safety helmets, scooter locks, phone holders and attachable carry-bags. These accessories are compatible with all stocked electric scooters. The purchase details are recorded manually in a hardcopy register including the customer that purchased the accessory, the purchase date, and the accessory type. An Excel spreadsheet has additional details recorded about each of the accessories such as a unique accessory code (identifier), accessory name, description, and price. Each retail outlet offers the same accessories and electric scooters.

The patchwork of systems and manual recordkeeping at EWT has become difficult to maintain and various system-related issues and data anomalies have been increasing. Consequently, the reliability and usefulness of business information that can be accessed are questionable. Sophie aims to monitor the business activities and would like to periodically analyse the excel spreadsheets and other business records to explore the demographics of customers (e.g. their age and city where they live) and any trends such as the most popular electric scooters and patterns in demand. Technical data associated with each type (brand and model) of in the business is also stored, but Sophie finds it difficult working with disparate information systems.

In this context, Sophie is unable to explore the feasibility of business improvements without reliable information. Continued growth in the global electric scooter and the growing awareness of clean energy transportation is anticipated to drive the adoption of other forms of electric transportation. With this thriving market, sophie is keen to develop growth strategies including the possibility of introducing e bikes and e skateboards to EWT retail stock. Currently such major business decisions cannot be made by sophie because of poor quality data and unreliable information systems.

Sophie recognises that business decisions and overall business performance outcomes require easy and timely access to accurate, complete, consistent, and useful business information. It is clear to Sophie that EWT’s system issues need to be resolved. Therefore, Sophie has decided that EWT’s information systems need to be upgraded before any further business growth opportunities are pursued. As a database design consultancy team, you have been asked to make recommendations for a way forward.

Ultimately, a centralised database system that maintains data about the complete business will be required. However, Sophie has suggested that a phased approach be adopted with Phase 1 focussing on EWT’s core business needs. Therefore, Sophie requires that the database created in Phase 1 should enable access to basic details of each of the three retail outlets (address, phone number and email), the customer details, the details of electric scooters and accessories available for sale and the purchase records of electric scooters and accessories.

While the range of electric scooters that the previous owners offered are still listed in an Excel spreadsheet, only the types of electric scooters available at EWT should be stored in the new database. The type of electric scooters available for sale at EWT include those listed in the following table:

Table 1: Scooter Types For Sale at EWT

Kaabo Mantis V2

UScooters GT

Sport NIU KQi2 Pro

NAMI BURN-E 2

Okai ES20 Neon

ANYHILL UM-2

EMOVE Cruiser

Kaabo Wolf King GT

UScooters Booster V

Segway GT2  
Vsett 10+  
Hiboy S2

Inokim OXO  
Apollo City Pro  
EMOVE RoadRunner

Unagi Model One (E500)

Apollo Air

Kaabo Wolf Warrior X

The above scooter types are available at each of EWT’s retail outlets and identify the scooter brand and model. While various other details are stored in the Excel spreadsheet, Sophie does not require all of that data to be stored in the new database. For example, the new database does not need to store data specifying the water resistance, maximum weight, lights, and battery. Sophie requires all other data in the Excel spreadsheet relating to EWT’s electric scooter types.

You should consider the future growth of EWT when designing Phase 1 of the proposed system. Therefore, Phase 1 should be designed in a manner that will enable the integration of future enhancements and additional functionality. However, your design should reflect the “as-is” processes or present state, not the “to-be” state, of EWT’s business processes.

**Phase 1 Limitations:**

**You are only required to complete the first phase of the project which has a limited scope. In particular, the first phase of the project should not include the following in your database design:**

* *staff details (e.g. name, salary, job title);*
* *inventory stock control*
* *customer invoices and customer payments (accounts receivable);*
* *EWT’s accounts payable.*

*TO DO -*

1. Sophie has provided you with an excel workbook containing the original datasets used by the previous business owners (ExistingData.xlsx). You are required to cleanse and filter this data so that data imported into the new database is accurate, complete, and consistent. You are required to **use this data to populate part of the new database** (and incorporate this into your logical database design).

a) Cleanse and filter the worksheets and import the data into the new database:

* Document the step-by-step process you apply to achieve the requirements of 1a. e.g.

- What did you change or do to cleanse and filter the data in each step?

- How did you import the data into the new database?

* Carefully consider and apply the details in the background narrative.
* Ensure that all fields are free of data errors and contain valid, accurate, complete and consistent data.
* Make sure that all the units of measure in the data don't get lost in the transfer.

b) Display results:

* Write a SELECT statement in MySQL Workbench to display the column headings and first row

of each table created in 4a) above.

* Display the complete dataset created in 4a) above, in alphabetical order by *brand* and *model*,

using **one** SELECT statement.

* After executing these scripts, **copy** the SQL scripts and **paste** into your report. Then, take a **screenshot** of the **Result Grid** (displaying the full results) and **paste** this into your report as an image. Check that all the details in this image are complete and legible.

*MySQL* ***scripts*** *must be* ***copied*** *from MySQL Workbench and* ***pasted*** *into your Microsoft Word document (not as an image).* ***Do not embed links to .sql files as these will not be marked and you will receive zero marks for your SQL scripts.***