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IFS 244

BUSINESS INFORMATION SYSTEMS

ASSIGNMENT 2: DATABASE DESIGN

TOPIC: DRONE DELIVERY SYSTEM

2022

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Introduction:

The following report serves as a basis to explain a database design. The database is designed for a business that specialises in the delivery of physical products using drones. The database is able to track the business's drones, its deliveries, as well as the associated products.

Customer Data:

A database should contain as much customer information as possible. The customer information recorded and presented in this database refers to the first and last names of customers, their respective email addresses and phone numbers, as well as the customer's delivery address. Each customer is given a customer ID such that records in the database may be accessed and queried more easily. This customer ID also acts as the primary key for the customer table. The delivery address of customers had to be recorded so that the business knows where order deliveries should go. Customer email and phone numbers are also recorded to allow contact and communication between customers and the business in regards to their orders or deliveries. These two attributes were provided with the unique constraint to prevent data duplication in the database, (Fernigrini, 2022). This means that one customer can only have one email and one phone number.

Categories, Suppliers and Their Products:

A category table is vital in a database as it makes data sorting and querying easier. In this database there are 5 categories of products. Each category contains a category ID that acts as the primary key, as well as a name and a description. The description was included to allow a user to gain more clarity to the associated category name.

A category can have many suppliers. However, to make this database more simple and easy to understand, it was decided that each category should only have a single supplier. The business has 5 main suppliers who it delivers products for. A supplier has an ID that is its primary key, a name, a unique email and phone number, and its location. The table also has a foreign key, which is the category ID of the products that the suppliers provide. Each supply provides many products for a specific category.

The business that uses this database acts as a middleman between the suppliers of the products and its customers. As such, the business itself does not have a physical store in which customers can purchase products. Because the business specialises in drone delivery, all the products from a particular supplier are kept in stock at the business warehouse. According to (Sacha, 2020), key information to record about products include product name, weight, supplier, etc. The designed database also records information such as product description, product price, and its category. Each product has a product ID, which is the primary key, as well two foreign keys namely, Supplier ID, Category ID. It was important to record these two attributes as a way for the business to know who exactly supplies the product, and which category it falls under, thus preventing confusion or data entry errors. The product shipping weight is an important component of the table because it allows the business to select an appropriate drone to deliver the product based on the product's weight and the drone's payload (carrying capacity). It is important to note that throughout the database prices are stated in ZAR, and weight is recorded as KG as per the metric system.

The Order Process:

An order is placed by the customer. In this database, one specific order belongs only to one customer, but a customer can have multiple orders. The orders are tracked using an order ID, which is the primary key. The orders table contains information such as the customer email and delivery address. These attributes are important as the business would need to know who to contact with regards to the order, as well as where to dispatch the drone to. The order table also has an order date. This is the date at which the customer placed the order and is needed to project a scheduled delivery date by the business.

When the order is placed and recorded, it goes to a table in the database called order details. This table contains information relating to the product/s that were ordered, the quantity of the ordered product, as well as the shipping weight. The order shipping weight is used to determine which drone would be suitable for the delivery. The order total is also calculated and recorded because it allows the business to determine a delivery fee (which is the main source of revenue for the business). The delivery fee has a standard rate of 10% of the order total. Once this is

computed and recorded, the order subtotal can be recorded. This information is communicated to the customer as well as the supplier of the ordered products.

The Delivery Process:

Since the business using this database specialises in drone delivery, it is important to record all information relating to the specific drones that are used during the delivery. For the purpose of this database, the business uses 5 various drones for delivery. These drones are some of the best in the industry at this moment. The names of these drones were acquired in an article, (Corrigan, 2020). Some other aspects relating to some drones such as the endurance and range were estimated in the creation of this database. According to, (Wynn & Pratt, 2017), it is important that the business tracks the drone registration number, drone name, delivery capacity, and range in the database. The drone registration number is used for tracking purposes both by the business and other external forces. Each drone is given a primary key, which is the drone ID, used to track the drone internally. In this database, the drone type was included. There are various drone types, but for the purpose of this database, we distinguish between two types. These are lightweight and heavyweight drones, which are determined based on the drone's payload. The drones table also includes information about the drones endurance. This is an important feature as it allows the business to see how long a drone can be used before it has to be recharged/refuelled/re-energised. Furthermore, dates relating to how long a drone has been in service and when it retires are also included to allow the business to determine when drones need to be discarded for new drones.

A delivery can only belong and be made for one order, but an order can have multiple deliveries depending on its weight or status. (Wynn & Pratt, 2017), highlights that information such as drone used in delivery, scheduled delivery date, actual delivery date, status of delivery, and comments about delivery are important attributes needed in a drone delivery database. The drone used in the delivery is dependent on both the weight of the order, and the distance from the warehouse. The scheduled and actual delivery dates are recorded for quality assurance purposes. The delivery status includes statements that refer to the current status of the delivery, such as completed, pending, or delayed and the comments are remarks/reasons made based on the delivery status.

Reference List:

Corrigan, F. (2020, July 2). *Drones For Deliveries From Medicine To Post, Packages And Pizza*. DroneZon.

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Appendices:

Appendix A: Topic Reservation Confirmation

 **IFS244 - Assignment 2 Topic Reservation**

Name	Muizz Manuel
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Choose a topic	Drone delivery system

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