DELITASTE PIZZA

Assignment 1

COMP1140

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Contents

Requirement Analysis

Data Requirements

Menu Item:

Delitaste Pizza has several menu items offered to customers. Menu items have a unique code identifying them, size, name and selling price. Each menu item is composed of several ingredients and for each ingredient particular quantity of said ingredients for a menu item.

Ingredient:

Each Delitaste Pizza Menu Item is composed of ingredients. An ingredient has a unique code, name, description, type, suggested stock level and a suggested re-order level. An ingredient has a 'current stock level as of the last stocktake date'. To record the quantity of a given ingredient a stocktake is recorded once a week (i.e., all the actual stock of every ingredient in the physical store is recorded).

Stock-Take

A stock-take occurs every week. In this event all the actual levels of ingredients in store and the date of the stocktake is recorded. A stocktake has a date, and many ingredients stock levels.

Stock Order

When stock levels are too low then new stock must be ordered, this is a stock order. Each stock order is kept and stored. This includes the order number, date of order, the date when the order was received, order status and total price. A stock order also contains for each of the ingredient ordered a quantity, price, description and ingredient code.

Customer

A customer is a person who uses Delitaste pizza. In the system a customer's phone number, name, address and whether they are or are not a hoax is recorded. A customer makes orders through Delitaste pizza.

Order

An order is made by a customer. An order is composed of menu items and for each menu item in an order there is a quantity. An order also has a total amount due, order status, price, staff id description, mode of reception and date. There are two different modes of making an order, one way is by phone and the other way is by walking in. There are 2 different modes of receiving an order, one being by pickup and the other being by delivery. An order also has a payment. If the payment type is via card, then the payment approval number is recorded.

Mode of Order:

This is how the order is taken.

Phone Order:

A phone order occurs when a customer calls Delitaste Pizza by phone to make an order. A phone order has a time when the call was made and terminated. (A phone order is a subclass of an order)

Walk-in order:

A walk-in order occurs when a customer walks into the physical store to make an order. A walk-in order records the time when the customer walked in. A walk-in order may only be received by pickup. (A walk-in order is a subclass of an order).

Mode of Reception

This is how the customer should receive the order.

Pickup order:

If an order is to be picked up by the customer in the store, then the pickup-time is recorded.
Delivery Order:

If an order is to be delivered to the customer at their desired address, then the delivery time, address and the driver to deliver the order is recorded.

Payment:

Each order has a payment. A payment is any kind of transaction that occurred in Delitaste Pizza where money is exchanged for menu items or for work. A payment consists of the amount due, and what type of payment was used (card, cash, visa, etc.) 6

Card Payment:

A card payment Is a payment which occurred through a debit or credit card. For each card payment that occurs the payment approval number is recorded. (This is a subclass of payment).

Employee

An employee is a person who provides work for Delitaste Pizza in exchange for money. An employee that is not a driver is a shop worker. Shop workers are paid for the hours worked. Each employee has a number (unique code), first name, last name, postal address, contact number, tax file number, payment rate, status and description. An employee also has a set of bank details.

Driver:

A driver is an employee at Delitaste Pizza who deliveries orders to customers. A driver delivers orders to customers. For each driver in addition to all the employee details kept their drivers license numbers are kept. A driver is paid for the number of deliveries they complete.

Bank Details:

A bank details describes the bank details for an employee. This includes the bank code, bank name and account number.

Shift

Shifts are a pre-designated amount of time where an employee works for the store in exchange for money. Shifts are not regular and fixed beforehand, and employees are paid per shift. A shift has a start date, start time, end date, end time. A shift also has a payment record.

Driver Shift:

A driver shift is a that contains the number of deliveries made so that drivers can be accurately paid for the amount of deliveries they complete. (This is a subclass of a shift).

Payment Record:

A payment record is kept every time an employee is paid. This contains all the relevant details about payments to an employee's bank details. Employee payments include the gross payment, tax withheld, the total amount paid, payment date, payment start period, payment end date and the bank details of the employee. (This is a subclass of payment).

Business Rules

- Drivers are paid for the number of deliveries they do, and shop workers are paid for the number of hours they complete.
- Shifts are not fixed or regular.
- Employees are paid per shift
- All employee payment records are kept.
- There are two distinct types of workers, shop workers and drivers.
- A stock-take is taken every week and is recorded in the system.
- All stock-orders are recorded in the system.
- Walk-in orders may not receive by delivery and only by pickup.
- Phone orders may be picked up or delivered.
- If a customer has not previously ordered at a store they must be recorded in the system and customers are uniquely identified by their phone number.
- All phone orders must be verified. If an order is not verified a customer is declared a hoax and the order status is changed to hold.

Transactions:

Data Manipulation Queries

- Insert, Update and Delete and Employee
- Insert, update and delete a shift
- Insert and update or delete a payment record
- Insert update and delete a customer
- Insert update and delete an order
- Insert and update or delete a stock-take
- Insert update and delete a stock order
- Insert update and delete an ingredient
- Insert update and delete a menu item (Although this was not explicitly stated in the briefing if this could not be done then there would be no way to change the menu and thus if something went wrong, for example a menu item no longer complies with regulation then the business could not change this).
- Insert update or delete bank details
- Insert update or delete a payment
- Insert update or delete a payment record

Queries

- Search all information about an employee from name, contact number or id.
- Search all shifts of an employee from name, contact number or id.
- Search all shifts past a certain date (Although this transaction is not explicitly stated in the briefing if they could not do this the business would not have the ability to contact employees to work or have any kind of pre-planning for a shift).

- Search all payment records for an employee by name, contact number or id.
- Search the details of a customer by phone number
- Search a customer's order by their phone number and vice versa (Although this query is not explicitly stated in the briefing, if they could not do this, they would not this the verification process would be impossible, and it would be impossible to work out what order a custom has whether they walk in or where an order should be delivered.
- Search all orders by a given order status (Although this query is not explicitly stated in the briefing, if they could not do this then they would not know which orders to prepare, serve, deliver and to dial back for verification and thus the business could not fundamentally operate as according to the briefing).
- Search all information about an ingredient such as stock as of last stock-take date, suggested re-order levels, suggested stock levels, costs and re-order status (if it is being re-ordered and if so, how much is being reordered, the total cost of the re-order) from the description, name or unique code of an ingredient.
- Search all information about a menu item such a price, and ingredient composition from the name or unique code.

Documentation of EER Model (Data Dictionary)

Entity Types

Entity Name	Description	Aliases	Occurrence
Menu Item	Any item that can be purchased by customers on the Delitaste Pizza Menu. Menu Items are identified by their code and casually by their name.	Pizza	In the store on the store menu. Items being cooked with ingredients. On the phone when customers make an order
Ingredient	Physical Ingredients which are used to make menu items. Ingredients can be identified by their code and casually by their name		All ingredients are stored inside the store usually away from the customers view.
StockTake	A stocktake is an event where all the levels of ingredients in the store are measured once a week.	Stock Take	When a stock take occurs once a week
StockOrder	An event where ingredients (stock) is ordered and delivered to the business. The stock order is based on the suggested re-order quantities of the ingredients		When stock is bought from external suppliers.
Order	An order is when an event where a customer purchases several items for money and then when the order is made out the customer can then receive their items.		When the customer makes an order.
Customer	A person who purchases items at the shop.		Any person who purchases item including people who walk in or order by phone.
PhoneOrder	An order which is taken by phone	Phone Order	When a customer orders something by phone
WalkInOrder	An order which is taken when a customer walks into the store	Walk In Order	When a customer enters the physical store and orders something.
Payment	An event where money is exchanged for goods or services	Transaction	When a customer gives money in exchange for menu items. When an employee is given money in exchange for their work
CardPayment	A payment where the transaction method is by card. I.e the payment is by a credit or debit card	Card Payment, Card Transaction	
HumanAddress	A physical address which belongs to a person. This is often the place where they live.	Address	The address of a person. The address of an employee. The address of a delivery.
ModeOfReception	The way a customer receives an order. Currently this is either by	Delivery Order, Pickup Order	When an order is delivered to a customer or picked up at the store by the customer

	the customer picking up the order or by a driver delivering it		
DeliveryReception	When an order is delivered to the customer. A delivery has an address and a driver. Delivery receptions can only be made by phone orders.	Delivery	When an order is delivered to the customer
Employee	A person who works in the business providing useful work in exchange for money	Staff, Worker, Shop worker	Any person who works for Delitaste pizza (i.e provides work in exchange for money)
Driver	An employee who works for Delitaste Pizza that can drive so they can deliver orders to customer. Drivers earn money on shifts based on the number of deliveries.	Delivery Person	Any employee who works for Delitaste Pizza that can drive.
Shift	A span of time across two date-times which an employee provides work. Shifts can be delegated to employees whenever they are needed		When an employee turns up to work for a given amount of time.
DriverShift	A shift which records the number of deliveries that occurred so that the driver can be paid based on the number of deliveries rather than hours worked	Driver Shift	When a driver turns up to work and deliveries orders to customers.
BankDetails	Information that is needed to identify an employee's account so that they can be paid. This includes the BSB, account number and bank name.	Bank Details	All bank details for employees and payment records in the store.
PaymentRecord	A record that shows that an employee was paid. This includes other financial details about the payment such as the tax withheld and the bank details.	Payment Record, Employee Payment	When an employee is paid for the work that they do.

Relationships

Entity Name	Multiplicity	Relationship	Multiplicity	Entity Name
StockTake	1..*	Has	1..*	Ingredients
StockOrder	0..*	Has	0..*	Ingredients
MenuItem	1..*	Contains	1..*	Ingredients
Order	0..*	Has	1..*	MenuItem
Order	0..*	Has	1..1	Employee
Customer	1..1	Purchases	0..*	Order
Order	1..1	Has	1..1	Mode of Reception
Order	1..1	Has	1..1	Payment

PhoneOrder	1..1	Has	0..1	DeliverReception
DeliveryReception	1..1	Has	0..1	HumanAddress
DeliveryReception	0..*	Delivered by	1..1	Driver
Customer	0..1	Has	1..1	HumanAddress
Driver	1..1	Works	0..*	DriverShift
Employee	1..1	Works	0..*	Shift
Employee	0..1	Has	1..1	HumanAddress
Employee	1..1	Has	1..1	BankDetails
Shift	1..1	Has	1..1	PaymentRecord
DriverShift	1..1	Has	1..1	PaymentRecord
PaymentRecord	0..1	Has	1..1	BankDetails

Attributes

Entity Name	Attributes	Description	Data Type & Length	Nulls	Multi-valued	Derived	Default
Stocktake	StockTakeID	Uniquely Identifies a stocktake	Auto increment number	No	No	No	None
	Date	Unique date of the stocktake	Date	No	No	No	None
Ingredient	Ingredient Code	Unique code to identify an ingredient	Not enough information on the format of ingredient codes in the briefing!	No	No	No	None
	Name	Name of given ingredient	30-character varchar	No	No	No	None
	Type	The type of ingredient	30-character varchar	No	No	No	None
	Suggested Reorder Level	How much of an ingredient should be ordered in a stock order given it's below the suggested stock level	Positive integer	No	No	No	None
	Suggested Stock Level	How stock there should be of an ingredient after a stocktake	Positive Integer	No	No	No	None
	Quantity	How much of an ingredient there is in a	Positive Integer	No	No	Yes, derived from the	

		store as of the last stock-take				last stocktake	
StockOrder	StockOrder Number	Unique number to identify a stock order	Not enough information on the format of a stock order number to answer!				
	Total cost	The total cost of a stock order	Integer	N/A	No	Yes, by summation of all of the prices of the ingredients in an order	None
	Date (Ordered)	The date when a stock order was made	Date (dd/mm/yyyy)	No	No	No	None
	Date (Received)	When an order is received	Date (dd/mm/yyyy)	No	No	No	None
	Status	The current status of a stock order i.e if it was purchased but not delivered, if it has been received etc	2-character char (Status can be represented in a code)	No	No	No	PR (Purchased but not received)
MenuItem	Menu Item Code	A unique identifier for a menu item	Not enough information on the format of menu codes to answer!	No	No	No	None
	Name	The name of a menu item	15-character varchar	No	No	No	None
	Size	The size of a menu item (L, M, S) etc.	2-character varchar	No	No	No	None
	Selling Price	The current selling price of a menu item	Float point number, size 3 with 2 decimal places	No	No	No	None
Order	Order Number	A unique identifier for an order	Not enough information on the order	No	No	No	None

			number format to answer				
	Description	A small description or other information about an order	150-character varchar	No	No	No	None
	Status	The status of a given order, for example its being prepared, ready to serve, being verified etc.	2-character char (Status can be represented in a code to save space).	No	No	No	PR (Purchased and being prepared)
	Date	The date when an order occurred	Date (dd/mm/yyyy)	No	No	No	None
	Type	The type of order (walk in, phone order)	N/A	No	No	Yes, Derived from the mode of reception	None
	Total Price due	The total cost of a given order	Integer	No	No	Yes, derived from summing the cost of all menu items	None
	Payment Method	The way a payment was done	Varchar 15 character	No	No	Yes, Derived from the payment type of a payment	None
Walk-in Order	Walk-in Time	The time when a customer walked in the store to make an order	Time Format (This is usually a fraction of a day).	No	No	Ye	
Phone Order	Call Time	The time when a customer called the store	Time Format (as above)	No	No	No	None

	Termination Time	The time when a customer ended its call to the store	Time Format (As above)	No	No	No	None
	Call Duration	The amount of time a call lasted	Time format (as above)	No	No	Yes, derived from the difference in termination and call time	None
Mode of Reception	ReceptionID	A unique code to distinguish a reception type (i.e pickup or delivery)	1 character char	No	No	No	None
Mode of Reception	Time of Reception	The time the order needs to be received by the customer	Time format	No	No	No	None
Payment	Payment ID	A unique code to identify a payment transaction that occurred.	Integer	No	No	No	None
	Amount Due	The total amount of money spent in a payment	Floating point, size 5 with 2 decimal places	No	No	No	None
	Payment Type	A code to identify a type of payment	1 character char	No	No	No	None
Card Payment	Payment Approval Number	A unique code sent by a bank or financial instution to prove that a payment was received from a payment that occurs via card	Not enough information on the approval number format to answer	No	No	No	None
Human Address	Address (Street No)	A number which	Small integer	No	No	No	None

		identifies which house an address is on a given street					
	Address (City)	The city in which an address lies in	30-character varchar	No	No	No	None
	Address (State)	The state in which an address lies in	3-character variable char	No	No	No	None
	Address (Postcode)	The postcode of an address	4-character variable char	No	No	No	None
Customer	Customer ID	A unique code to identify a customer	Auto-incrementing integer	No	No	No	None
	Phone Number	The phone number of a customer	15-character varchar, digits only	No	No	No	None
	Name (First)	The first name of a customer	30-character varchar	No	No	No	None
	Name (Last)	The last name of a customer	30-character varchar	No	No	No	None
	Is Hoax	Whether a customer is or is not declared a hoax (based on the verification procedure)	Boolean	No	No	No	None
Employee	Employee Number	A unique number to identify an employee	Not enough information on the format of employee numbers to answer	No	No	No	None
	Name (First)	The first name of an employee	30-character varchar	No	No	No	None
	Name (Last)	The last name of an employee	30-character varchar	No	No	No	None
	Tax File Number	A unique number which the government uses to identify taxpayers	9-character fixed char	No	No	No	None

	Description	A short description about an employee's role	500-character variable char.	No	No	No	None
	Payment Rate	How much an employee is paid	Floating point number size 3 2 decimal places	No	No	No	None
Driver	Driver's License Number	The drivers license of a driver employee	11-character variable char digits only	No	No	No	None
Shift	Shift ID	A unique code to identify a shift	Auto-incrementing integer.	No	No	No	None
	Date-time(start)	The date in which the shift started	Date (dd/mm/yyyy)	No	No	No	None
	Date-time (end)	The date in which the shift ended	Date (dd/mm/yyyy)	No	No	No	None
Driver Shift	Number of Deliveries	The number of deliveries completed by a driver in each shift	Tiny Integer (Highly unlikely a driver will do more than 256 deliveries in a shift).	No	No	No	None
Bank Details	Account Number	The unique account number of a bank account.	16-character varchar (digits only)	No	No	No	None
	Bank Code	The Bank code that identifies a bank and its branch, also known as BSB	6-character char, digits only	No	No	No	None
	Bank name	The name of a bank	50-character varchar	No	No	No	None
Payment Record	Total Payment	The gross amount on a payment without tax being removed.	5-digit floating point number with 2 decimal places	No	No	No	None
	Date (Start)	The date when a payment begins	Date (dd/mm/yyyy)	No	No	No	None

	Date (End)	The date when a payment ends	Date (dd/mm/yyyy)	No	No	No	None
	Tax withheld	The amount of tax paid on a payment record	Floating point number 3 digits 2 decimal places	No	No	No	None
	Payment Period (Start)	The date from when a debt is incurred on the business	Date (dd/mm/yyyy)	No	No	No	None
	Payment Period (End)	The date due on a payment	Date (dd/mm/yyyy)	No	No	No	None

EER Diagram

- Please find the **completed EER inside** of the **Assignments Folder**.

Justification of Design Choices

- A stock-take contains a date and a list of ingredients. For each ingredient in a stock-take it has a quantity as of the stock-take. Thus, to reduce data redundancy and normalise the quantity of an ingredient is stored on stock-takes, i.e. Each stock-take has many ingredients.
- Stock Order total price was omitted as this can be calculated from the sum of the prices of all the ingredients in a stock order. Each stock order contains a list of ingredients, thus, to normalise and reduce redundancy a relationship is formed.
- A phone order and a walk-in order are both subclasses of an order. Thus, they do not show a primary key. This is because they are distinct types of orders with different business rules and procedures apply to them, but they still function exactly like an order.
- Only a phone order can have a delivery reception, thus delivery only points to a phone order
- Only a delivery reception can have a driver assigned to it. Thus, one driver can have many deliveries.
- Payment was made a separate entity for a few reasons, one being for data analysis, it would be easier to work out which payment type is most popular and support it better and because both card payment and payment record which both inherit it have unique properties. Mode of reception was made a separate table for similar reasons with a delivery reception being which entity inherits.
- A Human Address was split off from customer because both a customer, employee and delivery may have an address. It is not mandatory for a human address to have a customer because it could have an employee or a delivery. The human address is a weak entity that requires either a customer or an employee to be uniquely identified
- Price is deliberately omitted from order as it can be derived by adding the price of all the menu items and it is on the payment

- Mode of Reception is delivery made a separate entity because depending on the mode of reception it may have different attributes, i.e., a delivery also contains a human-address. There are also only two types of deliveries.
- Bank Details is a separate entity because both a payment record and an employee have these details. Bank details is also a weak entity attached to an employee