Edith Cowan University
CSG1207
Systems & Database Design
Assignment 2A

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Contents

1 Pizza store database design brief

You are required to design and create a database for a pizza store. The database must encompass the customers, staff, pizza details, and the pizza orders made by customers. You have the following information about the way the store operates:

- Customer details must be recorded. This includes a customer ID number, name, address and email. Customer details are recorded when they make their first order.
- Staff details must be recorded. This includes a staff ID number, first name, last name, date of birth and phone number.
  - Each staff member may have a supervisor, which is another staff member. A staff member may supervise many other staff members. Not all staff have a supervisor.
- The details of pizza orders must be recorded. This includes an order ID number, the date and time that the order was placed, the ID number of the customer who made the order, and the ID number of the staff member who took the order.
  - The table also needs to contain the staff ID number of the staff who delivered the order. Since the pizza order will be recorded before the pizzas are delivered, this value will originally be empty.
  - Each order can contain multiple pizzas.
- The store has divided their pizza selection into "ranges" (e.g. "traditional" and "gourmet") to simplify pricing. All of the pizzas in a range have the same price.
  - The database must store an ID, name and price for each range.
- The details of the types of pizza available must be recorded. This includes a pizza ID number, the pizza's name, a description and a foreign key identifying which pizza range it is in.
- The database also needs two tables to store the details of crust types and sauce types that can be chosen when ordering a pizza. Some crust/sauce types attract a surcharge.
  - These tables require an ID number, name and surcharge (default of 0) column.
  - When ordering a pizza, a customer must choose which crust and sauce they want.
- The database must track which pizzas were ordered in which orders. This will involve:
  - An auto-incrementing ordered pizza ID number.
  - A foreign key identifying the order that this pizza is part of.

  - A foreign key identifying which pizza was chosen.
  - A foreign key identifying which crust was chosen.
  - A foreign key identifying which sauce was chosen.
  - A "ready" column containing a "Y" or "N" to indicate whether the pizza has been made and cooked yet (default of "N").

2 Assumptions

2.1 ER diagrams

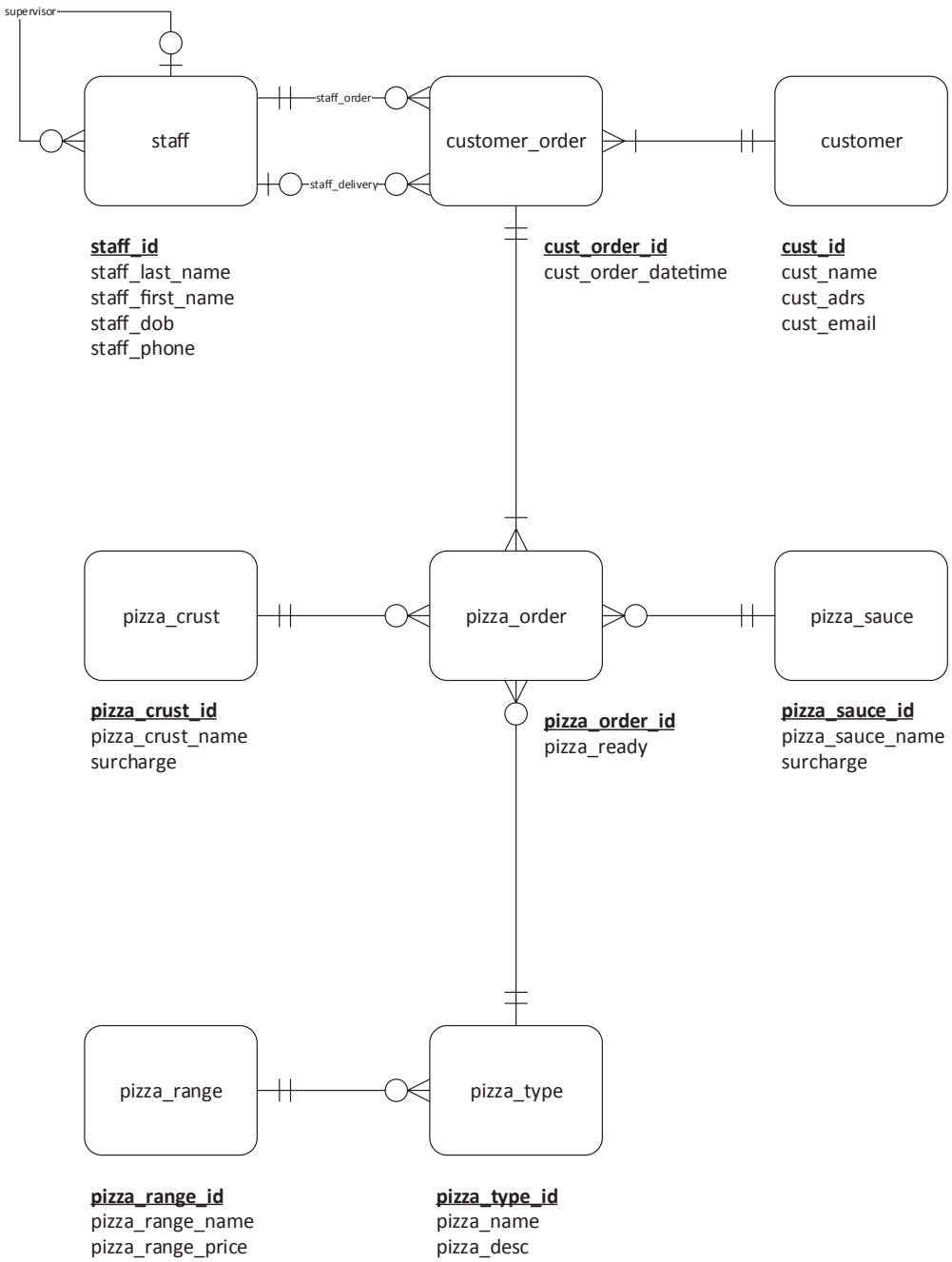
- A `customer` must make at least one `customer_order` to exist on database
- A `customer_order` must contain at least one `pizza_order`
- A `pizza_order` must include one `pizza_type` selection
  - It is possible that a `pizza_type` may never be selected for a `pizza_order`
- A `pizza_order` must include one `pizza_crust` selection
  - It is possible that a `pizza_crust` may never be selected for a `pizza_order`
- A `pizza_order` must include one `pizza_sauce` selection
  - It is possible that a `pizza_sauce` may never be selected for a `pizza_order`
- A `pizza_type` must include one `pizza_range` selection
  - It is possible that a `pizza_range` may never be selected for a `pizza_order`
- A `staff` member may be a `supervisor` to many `staff` members
  - A `staff` member may only have one `supervisor`
  - Some `staff` may not have a `supervisor`
- A `staff` member may not deliver any pizzas

2.2 Data dictionary

- Database will not be implented in SQL 2005
- Total number of `staff` will not exceed 255
- Total number of `customer` will not exceed 32,767
- Price of `pizza_crust` or `pizza_sauce` will each not exceed $9.99
- Price of `pizza_range` will not exceed $99.99
- Total number of `pizza_crust`, `pizza_sauce` or `pizza_range` will each not exceed 255
- Total number of `customer_order` or `pizza_order` will each not exceed 2,147,483,647

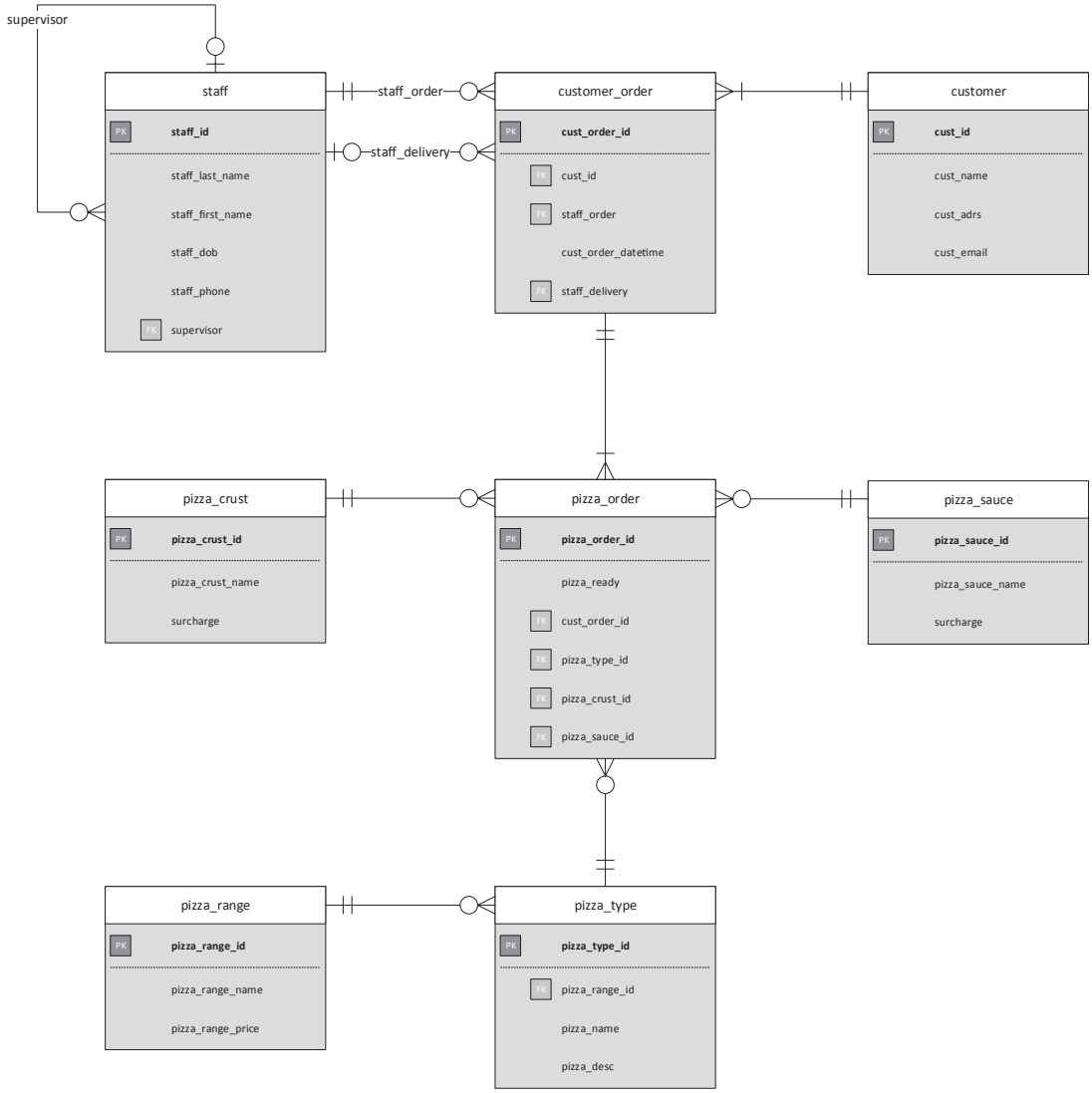
3 Logical E-R diagram

Figure 1: Pizza Store Logical E-R Diagram



4 Physical E-R diagram

Figure 2: Pizza Store Physical E-R Diagram



5 Data dictionary & creation order

Table 1: **"staff"** stores details about staff

Column name	Type/Length	Null	Constraints	Other
staff_id	TINYINT	NOT NULL	PK	IDENTITY
staff_last_name	VARCHAR(20)	NOT NULL		
staff_first_name	VARCHAR(20)	NOT NULL		
staff_dob	DATE	NOT NULL	CHECK (DATEDIFF(year, GETDATE(), staff_dob) >= 16)	
staff_phone	VARCHAR(10)	NOT NULL		
supervisor	TINYINT	NULL	FK (staff.staff_id)	

Table 2: **"customer"** stores details about customer

Column name	Type/Length	Null	Constraints	Other
cust_id	SMALLINT	NOT NULL	PK	IDENTITY
cust_name	VARCHAR(50)	NOT NULL		
cust_adrs	TEXT	NOT NULL		
cust_email	VARCHAR(20)	NOT NULL	CHECK (cust_email LIKE '_%@_%.___%')	

Table 3: **"customer_order"** stores details about customer order

Column name	Type/Length	Null	Constraints	Other
cust_order_id	INT	NOT NULL	PK	IDENTITY
cust_id	SMALLINT	NOT NULL	FK (customer.cust_id)	
staff_order	TINYINT	NOT NULL	FK (staff.staff_id)	
cust_order_datetime	DATETIME	NOT NULL		
staff_delivery	TINYINT	NULL	FK (staff.staff_id)	

Table 4: **"pizza_crust"** stores details about pizza crust

Column name	Type/Length	Null	Constraints	Other
pizza_crust_id	TINYINT	NOT NULL	PK	IDENTITY
pizza_crust_name	VARCHAR(20)	NOT NULL	UNIQUE	
surcharge	DECIMAL(3,2)	NOT NULL		DEFAULT 0.00

Table 5: **"pizza_sauce"** stores details about pizza sauce

Column name	Type/Length	Null	Constraints	Other
pizza_sauce_id	TINYINT	NOT NULL	PK	IDENTITY
pizza_sauce_name	VARCHAR(20)	NOT NULL	UNIQUE	
surcharge	DECIMAL(3,2)	NOT NULL		DEFAULT 0.00

Table 6: **"pizza_range"** stores details about pizza range

Column name	Type/Length	Null	Constraints	Other
pizza_range_id	TINYINT	NOT NULL	PK	IDENTITY
pizza_range_name	VARCHAR(20)	NOT NULL	UNIQUE	
pizza_range_price	DECIMAL(4,2)	NOT NULL		

Table 7: **"pizza_type"** stores details about pizza type

Column name	Type/Length	Null	Constraints	Other
pizza_type_id	TINYINT	NOT NULL	PK	IDENTITY
pizza_range_id	TINYINT	NOT NULL	FK (pizza_range.pizza_range_id)	
pizza_name	VARCHAR(20)	NOT NULL	UNIQUE	
pizza_desc	TEXT	NOT NULL		

Table 8: **"pizza_order"** stores details about pizza order

Column name	Type/Length	Null	Constraints	Other
pizza_order_id	INT	NOT NULL	PK	IDENTITY
pizza_ready	CHAR(1)	NOT NULL	CHECK (pizza_ready IN ('Y', 'N'))	DEFAULT 'N'
cust_order_id	INT	NOT NULL	FK (customer.cust_id)	
pizza_type_id	TINYINT	NOT NULL	FK (pizza_type.pizza_type_id)	
pizza_crust_id	TINYINT	NOT NULL	FK (pizza_crust.pizza_crust_id)	
pizza_sauce_id	TINYINT	NOT NULL	FK (pizza_sauce.pizza_sauce_id)	