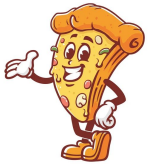
Project NYC Pizza



Data 604

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Project Title

Pizza Delivery Business Database System

Contents

Introduction

- Analyzed NYC Restaurants data food ordering and delivery (NYC Restaurants Data - Food Ordering and Delivery (kaggle.com))

food_order

order_id	customer_id	restaurant_name	cuisine_type	cost_of_the_order	day_of_the_week	rating	food_preparation_time	delivery_time
1477147	337525	Hangawi	Korean	30.75	Weekend	Not given	25	20
1477685	358141	Blue Ribbon Sushi Izakaya	Japanese	12.08	Weekend	Not given	25	23
1477070	66393	Cafe Habana	Mexican	12.23	Weekday	5	23	28
1477334	106968	Blue Ribbon Fried Chicken	American	29.2	Weekend	3	25	15
1478249	76942	Dirty Bird to Go	American	11.59	Weekday	4	25	24
1477224	147468	Tamarind TriBeCa	Indian	25.22	Weekday	3	20	24
1477894	157711	The Meatball Shop	Italian	6.07	Weekend	Not given	28	21
1477859	89574	Barbounia	Mediterranean	5.97	Weekday	3	33	30
1477174	121706	Anjappar Chettinad	Indian	16.44	Weekday	5	21	26
1477311	39705	Bukhara Grill	Indian	7.18	Weekday	5	29	26
1477895	143926	Big Wong Restaurant _¤¾Ñ¼	Chinese	5.92	Weekday	Not given	34	28
1478437	221206	Empanada Mama (closed)	Mexican	8.1	Weekend	5	23	22
1476966	129969	Blue Ribbon Fried Chicken	American	24.3	Weekend	5	23	17
1477449	104548	Pylos	Mediterranean	11.3	Weekend	3	24	23

Objectives

- Create a database system that will contribute to increased efficiency, improved customer satisfaction, and better decision-making processes.
- Employ a scalable and flexible system to handle growing data volumes and user interactions.

Business Process

A pizza delivery business relies on a well-organized database system to manage orders, customers, inventory, deliveries and more. Here's an overview of the business process.

1.Order Placement:

- Customer Information: Store customer details like name, address, contact information.
- Order Details: Record specific order items, quantities, special instructions.
- Order Status: Track order status (placed, in preparation, out for delivery, delivered).

2. Menu and Inventory Management:

- Menu Items: Maintain the data of available pizzas, toppings, sizes, and prices.
- Inventory Control: Update stock levels for ingredients to ensure availability.
- Specials and Promotions: Manage the data of any ongoing promotions or special offers.

Business Process

3. Order Processing:

- Order Assignment: Assign orders to available delivery staff based on their schedule and location.
- Preparation: Track the progress of order preparation and estimated completion time.
- Order Tracking: Track the payment status and delivery status of an order.

4. Delivery Management:

- Driver Information: Maintain a list of delivery drivers identification details, vehicle details and the orders assigned to them.
- Real-time Tracking: Monitor the status of deliveries and update customers accordingly.

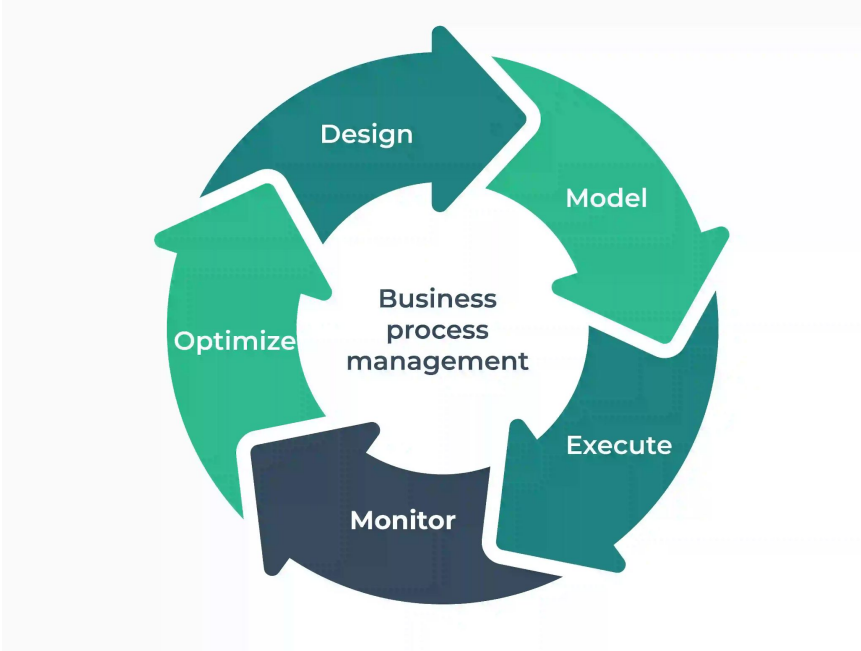
5.Payment and Invoicing:

- Payment Processing: Record payment methods (cash, credit card, online payment).
- Invoicing: Generate invoices for orders and keep track of payments.

Business Process

6.Customer Relationship Management (CRM):

- Customer History: Store order history to personalize future experiences.
- Customer Review: Record customer feedback to improve services.



Business Requirements

Enable users to create profiles for personalized services and promotions.

Pizza order system

- Display a menu with a variety of pizza options.
- Implement a cart system for order review and modifications.
- Provide real-time pricing based on user selections.

Enable real time order processing.

- Order confirmation & estimated delivery time
- Notification of order status/ update

contd..

- Secure payment processing
- Provide analytics services for data-driven decision-making.
- Handling unstructured data like pictures, and customer reviews
- Optimize inventory levels of pizza ingredients.
- Prevent stockouts, reduce waste, and ensure availability of popular items.

Technical Requirements

On premise Hardware

- Display monitors
- User-friendly interfaces (to manage incoming orders).

Cloud Platform for Data storage and Processing (PaaS for AWS considering MongoDB for storage)

- Cloud platform that can scale resources based on demand(Enough CPU, RAM, GPU)

Storage Service

- MongoDB Atlas, storage for both structured and unstructured data
- Starting point of 100GB – 200GB
- MongoDB Atlas clusters M20

contd..

Real time order management

- AWS Lambda
- 50GB memory – scaled based on demand.

Backup Service

- AWS backup and MongoDB Atlas backup
- 5– 10GB daily backup

Analytic Service (Structured and unstructured data processing)

- Amazon Redshift
- Amazon Athena

Customer authentication and authorization

- Amazon Cognito

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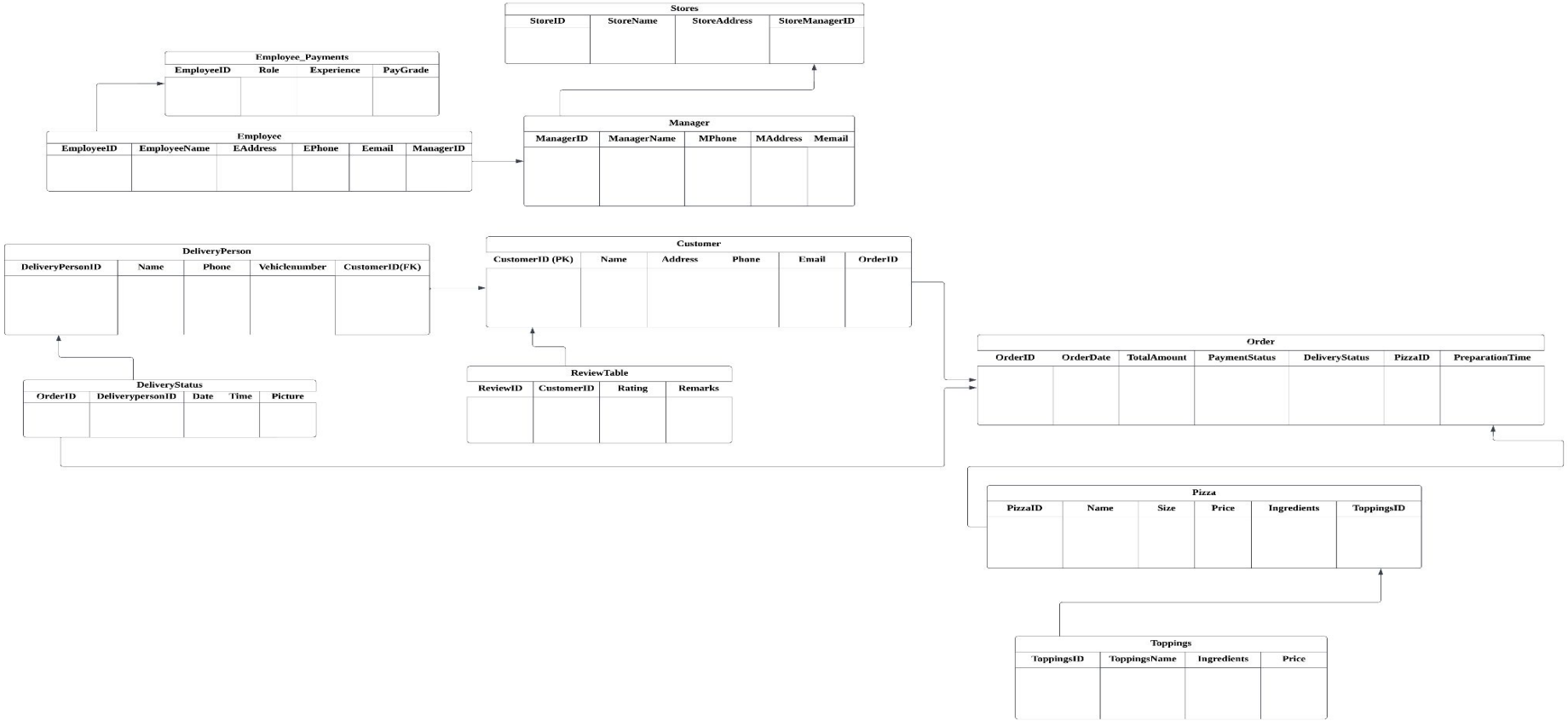
Data collection

- Order data /UI system to collect customer order data
- Payment / financial data collection
- Delivery related data collection
- Inventory related data
- Employee related data
- Customer account & review data



ERD Diagram: based on the business requirements

Cost estimation

- Cost estimation which is related to technical requirements includes Hardware, software and cloud.
- When we consider employee salaries, customer acquisition and marketing etc..
- On-premise cost for 1 year would be around $ 10,500 and for 5 years would be same and may increase according to updates.
- Cloud cost estimation be based on the services and upgradation over the time

contd..

Estimated Cloud Service Costs (Per Month):

MongoDB Atlas:

Cost: Starting at $57/month for M20 cluster (estimate).

AWS Lambda:

Cost: Varies based on usage. Assume $20 - $50/month.

AWS Backup and MongoDB Atlas Backup:

Cost: Varies based on backup storage usage. Assume $10 - $20/month.

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Amazon Redshift:

Cost: Starting at $0.25/hour for dc2.large node (estimate).

Amazon Athena:

Cost: Pay per query. Assume $5 - $10/month.

Amazon Cognito:

Cost: Varies based on monthly active users. Assume $50 - $100/month.

Estimated for 1 year: $ 3084, Estimated for 5 years : $ 15420

Project risks

There are different types of risks, some are listed below:

1. Technical risks
2. Resource constraints
3. Vendor or third party Risks
4. Security concerns
5. Budget Overruns
6. Quality Assurance and Testing
7. Scalability issues

Conclusion

- Implementation of a robust database system for the pizza delivery business.
- Control various aspects, including order management, inventory control, and delivery tracking.
- Store and manage customer information efficiently.
- Enhance decision-making processes for increased efficiency and improved customer satisfaction.
- Ability to handle growing data volumes and interactions as data usage increases.
- Optimization of delivery processes to reduce time and costs.
- Development of customer profiles for personalized services and promotions using stored customer data.
- Utilization of inventory levels for pizza ingredients to prevent stockouts, reduce waste, and ensure availability of popular items.
- Data-driven insights into sales trends, customer preferences, and operational efficiency.